Licensed user:
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Calculated:
11/06/2025 09:22/4.0.552

SHADOW - Main Result

Calculation: 6839 Garrane WF Real Case - V150

Assumptions for shadow calculations

Maximum distance for influence
Calculate only when more than 20 % of sun is covered by the blade
Please look in WTG table

Minimum sun height over horizon for influence	3 °
Day step for calculation	1 days
Time step for calculation	1 minutes

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

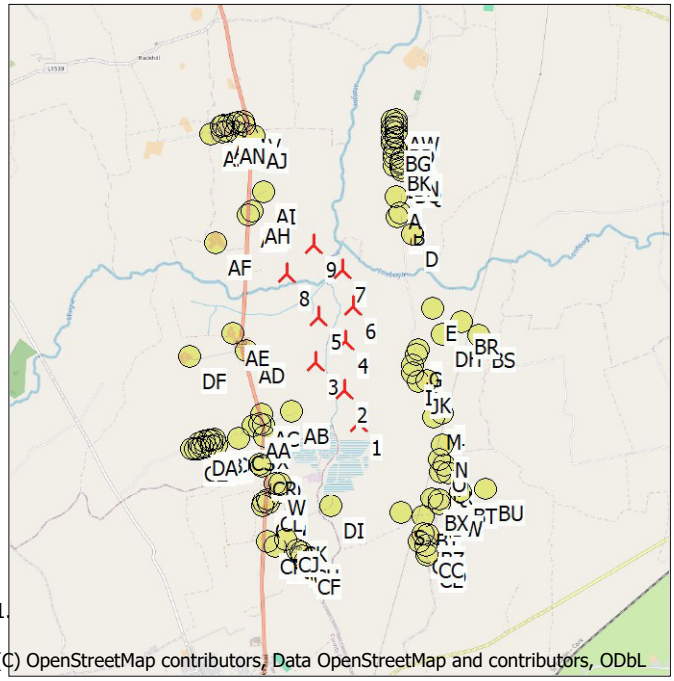
Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW
211	277	155	351	176	225	510	804	979	1,075	826	665

W	WNW	NW	NNW	Sum
564	773	750	419	8,760

Monthly aggregation of real case reduction
A ZVI (Zones of Visual Influence) calculation is performed before flicker calculation so non visible WTG do not contribute to calculated flicker values. A WTG will be visible if it is visible from any part of the receiver window. The ZVI calculation is based on the following assumptions:
Height contours used: Height Contours: CONTOURLINE_6839_Garrane_WF_1.
Receptor grid resolution: 1.0 m

All coordinates are in
Irish ITM-IRENET95 (IE), geocentric, GRS80



WTGs

	Easting	Northing	Z	Row data/Description	WTG type Valid	Manufact.	Type-generator	Power, rated	Rotor diameter	Hub height	Shadow data Calculation distance	RPM
			[m]					[kW]	[m]	[m]	[m]	[RPM]
1	554,494	626,040	61.3	T01	Yes	VESTAS	V150-6.0-6,000	6,000	150.0	95.0	1,902	-
2	554,358	626,367	58.0	T02	Yes	VESTAS	V150-6.0-6,000	6,000	150.0	95.0	1,902	-
3	554,070	626,632	58.9	T03	Yes	VESTAS	V150-6.0-6,000	6,000	150.0	95.0	1,902	-
4	554,378	626,844	57.7	T04	Yes	VESTAS	V150-6.0-6,000	6,000	150.0	95.0	1,902	-
5	554,107	627,092	58.6	T05	Yes	VESTAS	V150-6.0-6,000	6,000	150.0	95.0	1,902	-
6	554,452	627,196	57.3	T06	Yes	VESTAS	V150-6.0-6,000	6,000	150.0	95.0	1,902	-
7	554,352	627,558	57.6	T07	Yes	VESTAS	V150-6.0-6,000	6,000	150.0	95.0	1,902	-
8	553,804	627,520	58.7	T08	Yes	VESTAS	V150-6.0-6,000	6,000	150.0	95.0	1,902	-
9	554,073	627,806	59.1	T09	Yes	VESTAS	V150-6.0-6,000	6,000	150.0	95.0	1,902	-

Shadow receptor-Input

No.	Name	Easting	Northing	Z	Width	Height	Elevation a.g.l.	Slope of window	Direction mode	Eye height (ZVI) a.g.l.
				[m]	[m]	[m]	[m]	[°]		[m]
A	1	554,890	628,270	62.5	2.0	2.0	0.5	90.0	"Green house mode"	2.5
B	2	554,927	628,102	62.3	2.0	2.0	0.5	90.0	"Green house mode"	2.5
C	3	554,909	628,076	61.6	2.0	2.0	0.5	90.0	"Green house mode"	2.5
D	4	555,053	627,900	60.7	2.0	2.0	0.5	90.0	"Green house mode"	2.5
E	5	555,248	627,163	62.1	2.0	2.0	0.5	90.0	"Green house mode"	2.5
F	6	555,099	626,752	62.2	2.0	2.0	0.5	90.0	"Green house mode"	2.5
G	7	555,074	626,712	62.4	2.0	2.0	0.5	90.0	"Green house mode"	2.5
H	8	555,045	626,607	63.2	2.0	2.0	0.5	90.0	"Green house mode"	2.5
I	9	555,044	626,526	63.9	2.0	2.0	0.5	90.0	"Green house mode"	2.5
J	10	555,100	626,434	64.9	2.0	2.0	0.5	90.0	"Green house mode"	2.5
K	11	555,177	626,448	65.9	2.0	2.0	0.5	90.0	"Green house mode"	2.5
L	12	555,329	626,120	65.2	2.0	2.0	0.5	90.0	"Green house mode"	2.5
M	13	555,250	626,093	65.0	2.0	2.0	0.5	90.0	"Green house mode"	2.5
N	14	555,329	625,807	69.0	2.0	2.0	0.5	90.0	"Green house mode"	2.5
O	15	555,304	625,667	69.1	2.0	2.0	0.5	90.0	"Green house mode"	2.5
P	16	555,349	625,612	69.0	2.0	2.0	0.5	90.0	"Green house mode"	2.5
Q	17	555,310	625,539	68.6	2.0	2.0	0.5	90.0	"Green house mode"	2.5
R	18	555,384	625,532	68.2	2.0	2.0	0.5	90.0	"Green house mode"	2.5

To be continued on next page...

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SHADOW - Main Result

Calculation: 6839 Garrane WF Real Case - V150

...continued from previous page

No.	Name	Easting	Northing	Z	Width	Height	Elevation a.g.l.	Slope of window	Direction mode	Eye height (ZVI) a.g.l.
				[m]	[m]	[m]	[m]	[°]		[m]
S	19	554,912	625,134	68.7	2.0	2.0	0.5	90.0	"Green house mode"	2.5
T	20	553,714	625,349	65.6	2.0	2.0	0.5	90.0	"Green house mode"	2.5
U	21	553,722	625,387	65.4	2.0	2.0	0.5	90.0	"Green house mode"	2.5
V	22	553,714	625,434	65.3	2.0	2.0	0.5	90.0	"Green house mode"	2.5
W	23	553,661	625,440	64.6	2.0	2.0	0.5	90.0	"Green house mode"	2.5
X	24	553,566	625,907	64.9	2.0	2.0	0.5	90.0	"Green house mode"	2.5
Y	25	553,552	626,017	64.3	2.0	2.0	0.5	90.0	"Green house mode"	2.5
Z	26	553,518	626,038	63.9	2.0	2.0	0.5	90.0	"Green house mode"	2.5
AA	27	553,445	626,008	65.4	2.0	2.0	0.5	90.0	"Green house mode"	2.5
AB	28	553,834	626,159	66.0	2.0	2.0	0.5	90.0	"Green house mode"	2.5
AC	29	553,532	626,131	61.8	2.0	2.0	0.5	90.0	"Green house mode"	2.5
AD	30	553,379	626,762	58.2	2.0	2.0	0.5	90.0	"Green house mode"	2.5
AE	31	553,252	626,931	63.3	2.0	2.0	0.5	90.0	"Green house mode"	2.5
AF	32	553,094	627,829	64.0	2.0	2.0	0.5	90.0	"Green house mode"	2.5
AG	33	553,426	628,112	63.2	2.0	2.0	0.5	90.0	"Green house mode"	2.5
AH	34	553,451	628,146	63.1	2.0	2.0	0.5	90.0	"Green house mode"	2.5
AI	35	553,575	628,329	65.1	2.0	2.0	0.5	90.0	"Green house mode"	2.5
AJ	36	553,486	628,892	68.0	2.0	2.0	0.5	90.0	"Green house mode"	2.5
AK	37	553,408	628,905	69.2	2.0	2.0	0.5	90.0	"Green house mode"	2.5
AL	38	553,398	628,993	72.8	2.0	2.0	0.5	90.0	"Green house mode"	2.5
AM	39	553,295	628,921	72.3	2.0	2.0	0.5	90.0	"Green house mode"	2.5
AN	40	553,221	628,934	73.0	2.0	2.0	0.5	90.0	"Green house mode"	2.5
AO	41	553,175	628,924	72.8	2.0	2.0	0.5	90.0	"Green house mode"	2.5
AP	42	553,052	628,901	68.7	2.0	2.0	0.5	90.0	"Green house mode"	2.5
AQ	46	553,161	628,986	70.7	2.0	2.0	0.5	90.0	"Green house mode"	2.5
AR	47	553,189	628,997	70.3	2.0	2.0	0.5	90.0	"Green house mode"	2.5
AS	48	553,229	629,001	70.7	2.0	2.0	0.5	90.0	"Green house mode"	2.5
AT	49	553,285	629,011	70.4	2.0	2.0	0.5	90.0	"Green house mode"	2.5
AU	50	553,325	629,016	70.9	2.0	2.0	0.5	90.0	"Green house mode"	2.5
AV	51	553,376	629,036	70.9	2.0	2.0	0.5	90.0	"Green house mode"	2.5
AW	62	554,895	629,036	73.0	2.0	2.0	0.5	90.0	"Green house mode"	2.5
AX	63	554,864	629,031	73.3	2.0	2.0	0.5	90.0	"Green house mode"	2.5
AY	64	554,899	628,995	71.5	2.0	2.0	0.5	90.0	"Green house mode"	2.5
AZ	65	554,860	628,961	69.6	2.0	2.0	0.5	90.0	"Green house mode"	2.5
BA	66	554,900	628,954	69.3	2.0	2.0	0.5	90.0	"Green house mode"	2.5
BB	67	554,861	628,927	68.7	2.0	2.0	0.5	90.0	"Green house mode"	2.5
BC	68	554,901	628,917	68.7	2.0	2.0	0.5	90.0	"Green house mode"	2.5
BD	69	554,902	628,908	68.7	2.0	2.0	0.5	90.0	"Green house mode"	2.5
BE	70	554,904	628,867	69.0	2.0	2.0	0.5	90.0	"Green house mode"	2.5
BF	71	554,904	628,858	68.9	2.0	2.0	0.5	90.0	"Green house mode"	2.5
BG	72	554,862	628,836	68.6	2.0	2.0	0.5	90.0	"Green house mode"	2.5
BH	73	554,860	628,794	67.9	2.0	2.0	0.5	90.0	"Green house mode"	2.5
BI	74	554,885	628,752	67.6	2.0	2.0	0.5	90.0	"Green house mode"	2.5
BJ	75	554,876	628,695	66.2	2.0	2.0	0.5	90.0	"Green house mode"	2.5
BK	76	554,879	628,657	65.5	2.0	2.0	0.5	90.0	"Green house mode"	2.5
BL	77	554,953	628,657	64.7	2.0	2.0	0.5	90.0	"Green house mode"	2.5
BM	78	554,941	628,622	64.9	2.0	2.0	0.5	90.0	"Green house mode"	2.5
BN	79	554,942	628,591	64.5	2.0	2.0	0.5	90.0	"Green house mode"	2.5
BO	80	554,870	628,575	65.0	2.0	2.0	0.5	90.0	"Green house mode"	2.5
BP	81	554,948	628,565	64.3	2.0	2.0	0.5	90.0	"Green house mode"	2.5
BQ	82	554,951	628,528	63.8	2.0	2.0	0.5	90.0	"Green house mode"	2.5
BR	83	555,536	627,030	64.1	2.0	2.0	0.5	90.0	"Green house mode"	2.5
BS	84	555,700	626,885	66.3	2.0	2.0	0.5	90.0	"Green house mode"	2.5
BT	85	555,514	625,336	73.4	2.0	2.0	0.5	90.0	"Green house mode"	2.5
BU	86	555,754	625,366	74.0	2.0	2.0	0.5	90.0	"Green house mode"	2.5
BV	87	555,303	625,256	68.9	2.0	2.0	0.5	90.0	"Green house mode"	2.5
BW	88	555,298	625,212	68.8	2.0	2.0	0.5	90.0	"Green house mode"	2.5
BX	89	555,222	625,276	68.8	2.0	2.0	0.5	90.0	"Green house mode"	2.5
BY	90	555,135	625,094	68.9	2.0	2.0	0.5	90.0	"Green house mode"	2.5
BZ	91	555,175	624,909	72.0	2.0	2.0	0.5	90.0	"Green house mode"	2.5
CA	92	555,131	624,919	70.2	2.0	2.0	0.5	90.0	"Green house mode"	2.5
CB	93	555,091	624,842	71.3	2.0	2.0	0.5	90.0	"Green house mode"	2.5
CC	94	555,157	624,807	73.2	2.0	2.0	0.5	90.0	"Green house mode"	2.5
CD	95	555,181	624,733	77.0	2.0	2.0	0.5	90.0	"Green house mode"	2.5

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SHADOW - Main Result

Calculation: 6839 Garrane WF Real Case - V150

...continued from previous page

No.	Name	Easting	Northing	Z	Width	Height	Elevation a.g.l.	Slope of window	Direction mode	Eye height (ZVI) a.g.l.
				[m]	[m]	[m]	[m]	[°]		[m]
CE	96	555,168	624,715	76.9	2.0	2.0	0.5	90.0	"Green house mode"	2.5
CF	122	553,948	624,658	75.9	2.0	2.0	0.5	90.0	"Green house mode"	2.5
CG	123	553,926	624,708	74.4	2.0	2.0	0.5	90.0	"Green house mode"	2.5
CH	124	553,915	624,753	71.5	2.0	2.0	0.5	90.0	"Green house mode"	2.5
CI	125	553,882	624,769	70.0	2.0	2.0	0.5	90.0	"Green house mode"	2.5
CJ	126	553,767	624,877	68.2	2.0	2.0	0.5	90.0	"Green house mode"	2.5
CK	127	553,809	624,982	67.3	2.0	2.0	0.5	90.0	"Green house mode"	2.5
CL	128	553,578	625,279	64.0	2.0	2.0	0.5	90.0	"Green house mode"	2.5
CM	129	553,546	625,258	63.3	2.0	2.0	0.5	90.0	"Green house mode"	2.5
CN	130	553,597	625,237	63.6	2.0	2.0	0.5	90.0	"Green house mode"	2.5
CO	131	553,527	625,219	63.6	2.0	2.0	0.5	90.0	"Green house mode"	2.5
CP	132	553,580	624,855	70.0	2.0	2.0	0.5	90.0	"Green house mode"	2.5
CQ	141	553,519	625,617	62.6	2.0	2.0	0.5	90.0	"Green house mode"	2.5
CR	142	553,516	625,637	62.6	2.0	2.0	0.5	90.0	"Green house mode"	2.5
CS	143	553,302	625,898	70.4	2.0	2.0	0.5	90.0	"Green house mode"	2.5
CT	144	553,081	625,833	70.5	2.0	2.0	0.5	90.0	"Green house mode"	2.5
CU	145	553,035	625,813	69.7	2.0	2.0	0.5	90.0	"Green house mode"	2.5
CV	146	552,972	625,807	70.7	2.0	2.0	0.5	90.0	"Green house mode"	2.5
CW	147	552,937	625,803	70.8	2.0	2.0	0.5	90.0	"Green house mode"	2.5
CX	148	552,905	625,800	70.5	2.0	2.0	0.5	90.0	"Green house mode"	2.5
CY	149	552,872	625,797	70.0	2.0	2.0	0.5	90.0	"Green house mode"	2.5
CZ	150	552,836	625,790	69.7	2.0	2.0	0.5	90.0	"Green house mode"	2.5
DA	170	552,903	625,855	71.9	2.0	2.0	0.5	90.0	"Green house mode"	2.5
DB	171	552,953	625,860	72.3	2.0	2.0	0.5	90.0	"Green house mode"	2.5
DC	172	553,003	625,872	71.7	2.0	2.0	0.5	90.0	"Green house mode"	2.5
DD	173	553,034	625,878	71.3	2.0	2.0	0.5	90.0	"Green house mode"	2.5
DE	174	553,057	625,881	71.3	2.0	2.0	0.5	90.0	"Green house mode"	2.5
DF	177	552,817	626,710	67.0	2.0	2.0	0.5	90.0	"Green house mode"	2.5
DG	178	553,652	624,809	69.1	2.0	2.0	0.5	90.0	"Green house mode"	2.5
DH	179	555,336	626,905	62.7	2.0	2.0	0.5	90.0	"Green house mode"	2.5
DI	180	554,207	625,213	65.9	2.0	2.0	0.5	90.0	"Green house mode"	2.5

Calculation Results

Shadow receptor

		Shadow, worst case			**Shadow, expected values**
No.	Name	Shadow hours per year [h/year]	Shadow days per year [days/year]	Max shadow hours per day [h/day]	Shadow hours per year [h/year]
A	1	67:40	134	0:42	9:47
B	2	97:57	166	0:47	14:39
C	3	104:48	171	0:49	15:46
D	4	118:33	197	0:57	18:19
E	5	130:20	305	0:47	25:49
F	6	175:09	340	0:57	33:03
G	7	181:12	336	1:04	34:00
H	8	213:06	331	1:10	40:57
I	9	194:12	327	1:05	37:38
J	10	143:49	257	0:53	28:11
K	11	135:20	255	0:52	27:13
L	12	59:27	160	0:42	12:35
M	13	69:18	137	0:48	14:54
N	14	66:34	138	0:41	14:57
O	15	57:06	106	0:41	12:54
P	16	49:53	98	0:38	11:14
Q	17	37:00	77	0:40	8:14
R	18	38:55	84	0:36	8:42
S	19	0:00	0	0:00	0:00
T	20	0:00	0	0:00	0:00
U	21	0:00	0	0:00	0:00
V	22	2:46	27	0:09	0:34
W	23	10:09	45	0:19	2:06
X	24	62:00	130	0:41	13:09
Y	25	70:15	154	0:42	15:06

To be continued on next page...

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SHADOW - Main Result

Calculation: 6839 Garrane WF Real Case - V150

...continued from previous page

No.	Name	Shadow, worst case			Shadow, expected values
		Shadow hours per year [h/year]	Shadow days per year [days/year]	Max shadow hours per day [h/day]	Shadow hours per year [h/year]
Z	26	54:07	125	0:41	11:43
AA	27	42:36	111	0:37	9:18
AB	28	147:21	185	1:06	30:38
AC	29	50:32	113	0:42	10:40
AD	30	147:27	275	0:50	29:23
AE	31	105:09	274	0:44	20:24
AF	32	78:55	198	0:49	13:40
AG	33	116:31	164	1:03	18:26
AH	34	106:10	155	1:00	16:47
AI	35	70:24	104	0:53	10:55
AJ	36	0:00	0	0:00	0:00
AK	37	0:00	0	0:00	0:00
AL	38	0:00	0	0:00	0:00
AM	39	0:00	0	0:00	0:00
AN	40	6:44	24	0:24	0:58
AO	41	12:46	34	0:28	1:51
AP	42	16:18	56	0:24	2:24
AQ	46	6:48	24	0:23	0:59
AR	47	1:30	13	0:09	0:13
AS	48	0:00	0	0:00	0:00
AT	49	0:00	0	0:00	0:00
AU	50	0:00	0	0:00	0:00
AV	51	0:00	0	0:00	0:00
AW	62	0:00	0	0:00	0:00
AX	63	0:00	0	0:00	0:00
AY	64	0:00	0	0:00	0:00
AZ	65	0:00	0	0:00	0:00
BA	66	0:00	0	0:00	0:00
BB	67	0:00	0	0:00	0:00
BC	68	2:15	16	0:11	0:18
BD	69	3:26	20	0:13	0:27
BE	70	8:28	32	0:21	1:08
BF	71	9:32	34	0:21	1:17
BG	72	8:41	32	0:21	1:10
BH	73	14:09	40	0:26	1:54
BI	74	21:28	52	0:30	2:55
BJ	75	26:45	62	0:31	3:41
BK	76	28:28	68	0:32	3:58
BL	77	23:43	76	0:30	3:21
BM	78	23:24	80	0:31	3:20
BN	79	22:08	84	0:31	3:11
BO	80	29:02	80	0:34	4:07
BP	81	20:47	72	0:31	3:01
BQ	82	20:28	66	0:32	3:00
BR	83	80:05	279	0:31	15:19
BS	84	49:41	213	0:25	9:47
BT	85	15:00	57	0:23	3:18
BU	86	17:12	88	0:22	3:54
BV	87	0:00	0	0:00	0:00
BW	88	0:00	0	0:00	0:00
BX	89	0:00	0	0:00	0:00
BY	90	0:00	0	0:00	0:00
BZ	91	0:00	0	0:00	0:00
CA	92	0:00	0	0:00	0:00
CB	93	0:00	0	0:00	0:00
CC	94	0:00	0	0:00	0:00
CD	95	0:00	0	0:00	0:00
CE	96	0:00	0	0:00	0:00
CF	122	0:00	0	0:00	0:00
CG	123	0:00	0	0:00	0:00
CH	124	0:00	0	0:00	0:00
CI	125	0:00	0	0:00	0:00
CJ	126	0:00	0	0:00	0:00

To be continued on next page...

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SHADOW - Main Result

Calculation: 6839 Garrane WF Real Case - V150

...continued from previous page

		Shadow, worst case			Shadow, expected values
No.	Name	Shadow hours per year [h/year]	Shadow days per year [days/year]	Max shadow hours per day [h/day]	Shadow hours per year [h/year]
CK	127	0:00	0	0:00	0:00
CL	128	0:00	0	0:00	0:00
CM	129	0:00	0	0:00	0:00
CN	130	0:00	0	0:00	0:00
CO	131	0:00	0	0:00	0:00
CP	132	0:00	0	0:00	0:00
CQ	141	27:15	72	0:34	6:00
CR	142	25:21	66	0:35	5:37
CS	143	29:01	94	0:30	6:22
CT	144	15:55	69	0:23	3:30
CU	145	14:46	77	0:22	3:15
CV	146	14:42	89	0:20	3:13
CW	147	15:23	93	0:19	3:21
CX	148	16:30	96	0:19	3:34
CY	149	17:39	100	0:18	3:47
CZ	150	18:23	102	0:17	3:55
DA	170	22:37	108	0:20	4:48
DB	171	20:50	105	0:20	4:27
DC	172	19:56	102	0:21	4:18
DD	173	19:31	100	0:22	4:14
DE	174	18:54	99	0:22	4:07
DF	177	36:01	169	0:26	7:15
DG	178	0:00	0	0:00	0:00
DH	179	126:42	334	0:44	24:12
DI	180	0:00	0	0:00	0:00

Total amount of flickering on the shadow receptors caused by each WTG

No.	Name	Worst case [h/year]	Expected [h/year]
1	T01	405:17	76:50
2	T02	357:03	70:49
3	T03	192:45	37:38
4	T04	256:06	54:39
5	T05	253:04	51:41
6	T06	204:32	39:30
7	T07	269:39	46:30
8	T08	196:10	32:52
9	T09	289:20	48:23

Total times in Receptor wise and WTG wise tables can differ, as a WTG can lead to flicker at 2 or more receptors simultaneously and/or receptors may receive flicker from 2 or more WTGs simultaneously.

The calculation of the total expected values for a given receptor assumes a weighted average directional reduction for all WTGs contributing to shadow flicker within the same day. In the case where shadow flicker from different WTGs is not concurrent within the day, the total expected time at a given receptor may deviate marginally from the individual flicker time caused by each turbine separately.

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Calculated:
11/06/2025 09:22/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Real Case - V150 **Shadow receptor:** A - 1

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January		February		March	April	May	June	July	August	September	October		November		December	
1	08:46		14:59 (7)	08:18		16:29 (8)	07:23	07:12	06:06	05:20	05:17	05:54	06:45	07:35		07:30		16:06 (8)	08:22		14:47 (7)
	16:32	41	15:40 (7)	17:20	21	16:50 (9)	18:13	20:08	21:00	21:47	22:01	21:28	20:25	19:14		17:07	32	16:38 (9)	16:26	37	15:24 (7)
2	08:45		14:59 (7)	08:16		16:29 (8)	07:21	07:09	06:04	05:19	05:17	05:55	06:46	07:36		07:31		16:04 (8)	08:23		14:47 (7)
	16:33	41	15:40 (7)	17:22	23	16:52 (9)	18:15	20:10	21:02	21:48	22:01	21:26	20:23	19:12		17:05	32	16:36 (9)	16:25	38	15:25 (7)
3	08:45		15:00 (7)	08:15		16:29 (8)	07:19	07:07	06:02	05:18	05:18	05:57	06:48	07:38		07:33		16:03 (8)	08:24		14:47 (7)
	16:34	40	15:40 (7)	17:24	25	16:54 (9)	18:17	20:11	21:03	21:49	22:00	21:25	20:20	19:10		17:04	31	16:34 (9)	16:25	38	15:25 (7)
4	08:45		15:01 (7)	08:13		16:29 (8)	07:17	07:05	06:00	05:17	05:19	05:59	06:50	07:40		07:35		16:02 (8)	08:26		14:47 (7)
	16:35	40	15:41 (7)	17:26	27	16:56 (9)	18:18	20:13	21:05	21:50	22:00	21:23	20:18	19:07		17:02	30	16:32 (9)	16:24	39	15:26 (7)
5	08:45		15:01 (7)	08:11		16:30 (8)	07:15	07:02	05:58	05:17	05:20	06:00	06:51	07:42		07:37		16:01 (8)	08:27		14:47 (7)
	16:36	40	15:41 (7)	17:28	27	16:57 (9)	18:20	20:15	21:07	21:51	21:59	21:21	20:16	19:05		17:00	29	16:30 (9)	16:24	39	15:26 (7)
6	08:44		15:02 (7)	08:10		16:31 (8)	07:12	07:00	05:56	05:16	05:20	06:02	06:53	07:43		07:39		16:00 (8)	08:28		14:48 (7)
	16:37	40	15:42 (7)	17:30	29	17:00 (9)	18:22	20:17	21:08	21:52	21:59	21:19	20:13	19:03		16:58	28	16:28 (9)	16:23	40	15:28 (7)
7	08:44		15:02 (7)	08:08		16:32 (8)	07:10	06:58	05:55	05:15	05:21	06:03	06:55	07:45		07:41		16:00 (8)	08:30		14:48 (7)
	16:39	39	15:41 (7)	17:32	30	17:02 (9)	18:24	20:18	21:10	21:53	21:58	21:18	20:11	19:01		16:56	26	16:26 (9)	16:23	40	15:28 (7)
8	08:44		15:02 (7)	08:06		16:33 (8)	07:08	06:56	05:53	05:15	05:22	06:05	06:56	07:47		07:42		16:00 (8)	08:31		14:48 (7)
	16:40	39	15:41 (7)	17:33	31	17:04 (9)	18:26	20:20	21:12	21:54	21:57	21:16	20:09	18:58		16:55	24	16:24 (9)	16:22	40	15:28 (7)
9	08:43		15:04 (7)	08:04		16:35 (8)	07:05	06:53	05:51	05:14	05:23	06:07	06:58	07:48		07:44		15:59 (8)	08:32		14:48 (7)
	16:41	38	15:42 (7)	17:35	31	17:06 (9)	18:27	20:22	21:13	21:55	21:57	21:14	20:06	18:56		16:53	23	16:22 (9)	16:22	40	15:28 (7)
10	08:43		15:04 (7)	08:02		16:37 (8)	07:03	06:51	05:49	05:14	05:24	06:08	07:00	07:50		07:46		15:59 (8)	08:33		14:49 (7)
	16:43	38	15:42 (7)	17:37	31	17:08 (9)	18:29	20:24	21:15	21:56	21:56	21:12	20:04	18:54		16:51	22	16:21 (9)	16:22	41	15:30 (7)
11	08:42		15:05 (7)	08:01		16:38 (9)	07:01	06:49	05:48	05:13	05:25	06:10	07:01	07:52		07:48		16:00 (8)	08:34		14:49 (7)
	16:44	37	15:42 (7)	17:39	32	17:10 (9)	18:31	20:25	21:17	21:56	21:55	21:10	20:02	18:51		16:50	19	16:19 (8)	16:22	41	15:30 (7)
12	08:41		15:05 (7)	07:59		16:38 (9)	06:59	06:46	05:46	05:13	05:26	06:12	07:03	07:54		07:50		16:00 (8)	08:35		14:49 (7)
	16:46	36	15:41 (7)	17:41	34	17:12 (9)	18:33	20:27	21:18	21:57	21:54	21:08	19:59	18:49		16:48	17	16:17 (8)	16:22	42	15:31 (7)
13	08:41		15:06 (7)	07:57		16:38 (9)	06:56	06:44	05:44	05:13	05:28	06:13	07:05	07:55		07:51		16:00 (8)	08:36		14:50 (7)
	16:47	35	15:41 (7)	17:43	37	17:15 (9)	18:35	20:29	21:20	21:58	21:53	21:06	19:57	18:47		16:47	16	16:16 (8)	16:21	41	15:31 (7)
14	08:40		15:08 (7)	07:55		16:38 (9)	06:54	06:42	05:43	05:13	05:29	06:15	07:06	07:57		07:53		16:00 (8)	08:37		14:50 (7)
	16:49	34	15:42 (7)	17:45	38	17:16 (9)	18:36	20:31	21:22	21:58	21:52	21:04	19:55	18:45		16:45	13	16:13 (8)	16:21	42	15:32 (7)
15	08:39		15:08 (7)	07:53		16:39 (9)	06:52	06:40	05:41	05:12	05:30	06:16	07:08	07:59		07:55		16:00 (8)	08:38		14:50 (7)
	16:50	33	15:41 (7)	17:47	37	17:16 (9)	18:38	20:32	21:23	21:59	21:51	21:02	19:52	18:42		16:44	12	16:12 (8)	16:21	42	15:32 (7)
16	08:38		15:09 (7)	07:51		16:39 (9)	06:49	06:37	05:39	05:12	05:31	06:18	07:10	08:01	17:23 (9)	07:57		16:01 (8)	08:39		14:51 (7)
	16:52	32	15:41 (7)	17:49	37	17:16 (9)	18:40	20:34	21:25	21:59	21:50	21:00	19:50	18:40	11 17:34 (9)	16:42	9	16:10 (8)	16:22	42	15:33 (7)
17	08:37		15:11 (7)	07:49		16:39 (9)	06:47	06:35	05:38	05:12	05:32	06:20	07:11	08:02	17:20 (9)	07:59		16:02 (8)	08:40		14:51 (7)
	16:54	29	15:40 (7)	17:51	37	17:16 (9)	18:42	20:36	21:26	22:00	21:49	20:58	19:48	18:38	18 17:38 (9)	16:41	7	16:09 (8)	16:22	42	15:33 (7)
18	08:36		15:12 (7)	07:47		16:40 (9)	06:45	06:33	05:36	05:12	05:34	06:21	07:13	08:04	17:17 (9)	08:00		16:03 (8)	08:41		14:51 (7)
	16:55	28	15:40 (7)	17:52	35	17:15 (9)	18:43	20:38	21:28	22:00	21:48	20:56	19:45	18:36	23 17:40 (9)	16:40	4	16:07 (8)	16:22	42	15:33 (7)
19	08:35		15:14 (7)	07:45		16:40 (9)	06:42	06:31	05:35	05:12	05:35	06:23	07:15	08:06	17:14 (9)	08:02		14:58 (7)	08:41		14:52 (7)
	16:57	25	15:39 (7)	17:54	34	17:14 (9)	18:45	20:39	21:29	22:01	21:47	20:54	19:43	18:34	27 17:41 (9)	16:38	10	16:06 (8)	16:22	42	15:34 (7)
20	08:34		15:16 (7)	07:43		16:41 (9)	06:40	06:29	05:33	05:12	05:36	06:25	07:16	08:08	17:13 (9)	08:04		14:55 (7)	08:42		14:52 (7)
	16:59	22	15:38 (7)	17:56	32	17:13 (9)	18:47	20:41	21:31	22:01	21:46	20:52	19:40	18:32	29 17:42 (9)	16:37	15	15:10 (7)	16:23	42	15:34 (7)
21	08:33		15:17 (7)	07:41		16:42 (9)	06:38	06:27	05:32	05:12	05:38	06:26	07:18	08:10	17:12 (9)	08:06		14:53 (7)	08:43		14:53 (7)
	17:00	19	15:36 (7)	17:58	30	17:12 (9)	18:49	20:43	21:32	22:01	21:45	20:49	19:38	18:29	31 17:43 (9)	16:36	19	15:12 (7)	16:23	42	15:35 (7)
22	08:32		15:20 (7)	07:39		16:43 (9)	06:35	06:24	05:31	05:13	05:39	06:28	07:20	08:11	17:11 (9)	08:07		14:52 (7)	08:43		14:53 (7)
	17:02	15	15:35 (7)	18:00	28	17:11 (9)	18:50	20:44	21:34	22:01	21:43	20:47	19:36	18:27	33 17:44 (9)	16:35	22	15:14 (7)	16:24	42	15:35 (7)
23	08:31		15:24 (7)	07:36		16:45 (9)	06:33	06:22	05:29	05:13	05:40	06:30	07:21	08:13	17:10 (9)	08:09		14:51 (7)	08:44		14:54 (7)
	17:04	10	16:32 (8)	18:02	25	17:10 (9)	18:52	20:46	21:35	22:02	21:42	20:45	19:33	18:25	34 17:44 (9)	16:33	25	15:16 (7)	16:24	42	15:36 (7)
24	08:29		16:29 (8)	07:34		16:47 (9)	06:31	06:20	05:28	05:13	05:42	06:31	07:23	08:15	17:09 (9)	08:11		14:49 (7)	08:44		14:54 (7)
	17:06	4	16:33 (8)	18:04	21	17:08 (9)	18:54	20:48	21:37	22:02	21:40	20:43	19:31	18:23	36 17:45 (9)	16:32	28	15:17 (7)	16:25	42	15:36 (7)
25	08:28		16:29 (8)	07:32		16:48 (9)	06:28	06:18	05:27	05:13	05:43	06:33	07:25	07:17		16:09 (9)	08:12		14:49 (7)	08:45		14:55 (7)
	17:07	7	16:36 (8)	18:05	16	17:04 (9)	18:56	20:50	21:38	22:02	21:39	20:41	19:29	17:21	36 16:45 (9)	16:31	29	15:18 (7)	16:25	42	15:37 (7)
26	08:27		16:28 (8)	07:30		16:53 (9)	06:26	06:16	05:26	05:14	05:45	06:35	07:26	07:19		16:08 (9)	08:14		14:48 (7)	08:45		14:55 (7)
	17:09	9	16:37 (8)	18:07	7	17:00 (9)	18:57	20:51	21:39	22:02	21:38	20:39	19:26	17:19	38 16:46 (9)	16:30	32	15:20 (7)	16:26	42	15:37 (7)
27	08:25		16:28 (8)	07:28			06:23	06:14	05:25	05:14	05:46	06:36	07:28	07:20		16:08 (9)	08:15		14:48 (7)	08:45		14:56 (7)
	17:11	12	16:40 (8)	18:09			18:59	20:53	21:41	22:02	21:36	20:36	19:24	17:17	38 16:46 (9)	16:29	33	15:21 (7)	16:27	42	15:38 (7)
28	08:24		16:28 (8)	07:26			06:21	06:12	05:24	05:15	05:48	06:38	07:30	07:22		16:08 (9)	08:17		14:47 (7)	08:45		14:56 (7)
	17:13	13	16:41 (8)	18:11			19:01	20:55	21:42	22:02	21:35	20:34	19:22	17:15	38 16:46 (9)	16:28	34	15:21 (7)	16:28	42	15:38 (7)
29	08:22		16:28 (8)				07:19	06:10	05:23	05:15	05:49	06:40	07:31	07:24		16:08 (9)	08:19		14:47 (7)	08:45		14:57 (7)
	17:15	16	16:44 (8)				20:03	20:57	21:43	22:01	21:33	20:32	19:19	17:13	36 16:44 (9)	16:28	35	15:22 (7)	16:28	41	15:38 (7)
30	08:21		16:28 (8)				07:16	06:08	05:22	05:16	05:51	06:41	07:33	07:26		16:08 (9)	08:20		14:47 (7)	08:46		14:57 (7)
	17:17	18	16:46 (8)				20:04	20:58	21:44	22:01	21:31	20:30	19:17	17:11	34 16:42 (9)	16:27	36	15:23 (7)	16:29	42	15:39 (7)
31	08:19		16:28 (8)				07:14		05:21		05:52	06:43		07:28		16:08 (9)			08:46		14:58 (7)
	17:18	19	16:47 (8)				20:06		21:46		21:30	20:27		17:09	32 16:40 (9)				16:30	41	15:39 (7)
Potential sun hours	257		277		367	417	487	502	504	455	381	331		264		241					
Total, worst case	849		755									494		692		1270	
Sun reduction	0.22		0.24									0.28		0.26		0.22	
Oper. time red.	1.00		1.00									1.00		1.00		1.00	
Wind dir. red.	0.61		0.60									0.60		0.61		0.62	
Total reduction	0.13		0.15									0.17		0.16		0.13	
Total, real	113		110									83		110		171	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

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Calculated:
11/06/2025 09:22/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Real Case - V150 **Shadow receptor:** B - 2

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January		February		March		April	May	June
1	08:46		15:19 (5)	08:18		15:44 (7)	07:23	17:11 (9)	07:12	06:06	05:20
	16:32	37	15:56 (7)	17:20	42	16:26 (7)	18:13	35	17:46 (9)	20:08	21:00	21:47
2	08:45		15:19 (5)	08:16		15:45 (7)	07:21	17:11 (9)	07:09	06:04	05:19
	16:33	38	15:57 (7)	17:22	40	16:25 (7)	18:15	37	17:48 (9)	20:10	21:02	21:48
3	08:45		15:20 (5)	08:15		15:46 (7)	07:19	17:11 (9)	07:07	06:02	05:18
	16:34	38	15:58 (7)	17:24	38	16:24 (7)	18:17	39	17:50 (9)	20:11	21:03	21:49
4	08:45		15:21 (5)	08:13		15:46 (7)	07:17	17:10 (9)	07:05	06:00	05:17
	16:35	39	16:00 (7)	17:26	38	16:24 (7)	18:18	39	17:49 (9)	20:13	21:05	21:50
5	08:45		15:21 (5)	08:11		15:47 (7)	07:15	17:11 (9)	07:02	05:58	05:17
	16:36	40	16:01 (7)	17:28	36	16:23 (7)	18:20	37	17:48 (9)	20:15	21:07	21:51
6	08:44		15:23 (5)	08:10		15:50 (7)	07:12	17:11 (9)	07:00	05:56	05:16
	16:37	40	16:03 (7)	17:30	34	17:00 (8)	18:22	37	17:48 (9)	20:17	21:08	21:52
7	08:44		15:23 (5)	08:08		15:51 (7)	07:10	17:11 (9)	06:58	05:55	05:15
	16:39	41	16:04 (7)	17:32	35	17:02 (8)	18:24	35	17:46 (9)	20:18	21:10	21:53
8	08:44		15:24 (5)	08:06		15:53 (7)	07:08	17:12 (9)	06:56	05:53	05:15
	16:40	41	16:05 (7)	17:33	34	17:04 (8)	18:26	34	17:46 (9)	20:20	21:12	21:54
9	08:43		15:26 (5)	08:04		15:55 (7)	07:05	17:13 (9)	06:53	05:51	05:14
	16:41	41	16:07 (7)	17:35	33	17:06 (8)	18:27	32	17:45 (9)	20:22	21:13	21:55
10	08:43		15:27 (5)	08:02		15:58 (7)	07:03	17:13 (9)	06:51	05:49	05:14
	16:43	41	16:08 (7)	17:37	30	17:08 (8)	18:29	30	17:43 (9)	20:24	21:15	21:56
11	08:42		15:29 (5)	08:01		16:04 (7)	07:01	17:15 (9)	06:49	05:48	05:13
	16:44	41	16:10 (7)	17:39	21	17:10 (8)	18:31	26	17:41 (9)	20:25	21:17	21:56
12	08:41		15:32 (5)	07:59		16:54 (8)	06:59	17:17 (9)	06:46	05:46	05:13
	16:46	39	16:11 (7)	17:41	18	17:12 (8)	18:33	23	17:40 (9)	20:27	21:18	21:57
13	08:41		15:37 (7)	07:57		16:54 (8)	06:56	17:19 (9)	06:44	05:44	05:13
	16:47	36	16:13 (7)	17:43	21	17:15 (8)	18:35	17	17:36 (9)	20:29	21:20	21:58
14	08:40		15:38 (7)	07:55		16:54 (8)	06:54	17:24 (9)	06:42	05:43	05:13
	16:49	37	16:15 (7)	17:45	23	17:17 (8)	18:36	8	17:32 (9)	20:31	21:22	21:58
15	08:39		15:37 (7)	07:53		16:54 (8)	06:52			06:40	05:41	05:12
	16:50	39	16:16 (7)	17:47	25	17:19 (8)	18:38			20:32	21:23	21:59
16	08:38		15:38 (7)	07:51		16:54 (8)	06:49			06:37	05:39	05:12
	16:52	40	16:18 (7)	17:49	27	17:21 (8)	18:40			20:34	21:25	21:59
17	08:37		15:38 (7)	07:49		16:55 (8)	06:47			06:35	05:38	05:12
	16:54	42	16:20 (7)	17:51	26	17:21 (8)	18:42			20:36	21:26	22:00
18	08:36		15:38 (7)	07:47		16:56 (8)	06:45			06:33	05:36	05:12
	16:55	44	16:22 (7)	17:52	26	17:25 (9)	18:43			20:38	21:28	22:00
19	08:35		15:38 (7)	07:45		16:56 (8)	06:42			06:31	05:35	05:12
	16:57	46	16:24 (7)	17:54	28	17:26 (9)	18:45			20:39	21:29	22:01
20	08:34		15:39 (7)	07:43		16:57 (8)	06:40			06:29	05:33	05:12
	16:59	46	16:25 (7)	17:56	30	17:28 (9)	18:47			20:41	21:31	22:01
21	08:33		15:38 (7)	07:41		16:59 (8)	06:38			06:27	05:32	05:12
	17:00	47	16:25 (7)	17:58	31	17:31 (9)	18:49			20:43	21:32	22:01
22	08:32		15:39 (7)	07:39		17:01 (8)	06:35			06:24	05:31	05:13
	17:02	47	16:26 (7)	18:00	30	17:33 (9)	18:50			20:44	21:34	22:01
23	08:31		15:40 (7)	07:36		17:06 (8)	06:33			06:22	05:29	05:13
	17:04	46	16:26 (7)	18:02	24	17:35 (9)	18:52			20:46	21:35	22:02
24	08:29		15:39 (7)	07:34		17:14 (9)	06:31			06:20	05:28	05:13
	17:06	47	16:26 (7)	18:04	23	17:37 (9)	18:54			20:48	21:37	22:02
25	08:28		15:40 (7)	07:32		17:13 (9)	06:28			06:18	05:27	05:13
	17:07	47	16:27 (7)	18:05	25	17:38 (9)	18:56			20:50	21:38	22:02
26	08:27		15:40 (7)	07:30		17:12 (9)	06:26			06:16	05:26	05:14
	17:09	46	16:26 (7)	18:07	28	17:40 (9)	18:57			20:51	21:39	22:02
27	08:25		15:41 (7)	07:28		17:12 (9)	06:23			06:14	05:25	05:14
	17:11	46	16:27 (7)	18:09	31	17:43 (9)	18:59			20:53	21:41	22:02
28	08:24		15:41 (7)	07:26		17:12 (9)	06:21			06:12	05:24	05:15
	17:13	45	16:26 (7)	18:11	33	17:45 (9)	19:01			20:55	21:42	22:02
29	08:22		15:42 (7)				07:19			06:10	05:23	05:15
	17:15	45	16:27 (7)				20:03			20:57	21:43	22:01
30	08:21		15:43 (7)				07:16			06:08	05:22	05:16
	17:17	43	16:26 (7)				20:04			20:58	21:44	22:01
31	08:19		15:43 (7)				07:14				05:21	
	17:18	43	16:26 (7)				20:06				21:46	
Potential sun hours	257			277			367			417	487	502
Total, worst case		1308			830			429				
Sun reduction		0.22			0.24			0.28				
Oper. time red.		1.00			1.00			1.00				
Wind dir. red.		0.62			0.61			0.60				
Total reduction		0.13			0.15			0.17				
Total, real		175			123			72				

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
Jennings O'Donovan
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F91 RHH9 Sligo
+353719161416
padraig / podowd@jodireland.com
Calculated:
11/06/2025 09:22/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Real Case - V150 **Shadow receptor:** B - 2

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	July	August	September			October			November			December		
1	05:17	05:54	06:45			07:35		17:57 (9)	07:30		15:27 (7)	08:22		15:11 (5)
	22:01	21:28	20:25			19:14	20	18:17 (9)	17:07	32	16:38 (8)	16:26	41	15:52 (7)
2	05:17	05:55	06:46			07:36		17:55 (9)	07:31		15:24 (7)	08:23		15:11 (5)
	22:01	21:26	20:23			19:12	24	18:19 (9)	17:05	34	16:36 (8)	16:25	40	15:51 (7)
3	05:18	05:57	06:48			07:38		17:53 (9)	07:33		15:22 (7)	08:24		15:09 (5)
	22:00	21:25	20:20			19:10	28	18:21 (9)	17:04	36	16:34 (8)	16:25	41	15:50 (7)
4	05:19	05:59	06:50			07:40		17:51 (9)	07:35		15:21 (7)	08:26		15:09 (5)
	22:00	21:23	20:18			19:07	30	18:21 (9)	17:02	36	16:32 (8)	16:24	41	15:50 (7)
5	05:20	06:00	06:51			07:42		17:49 (9)	07:37		15:19 (7)	08:27		15:08 (5)
	21:59	21:21	20:16			19:05	33	18:22 (9)	17:00	35	16:30 (8)	16:24	41	15:49 (7)
6	05:20	06:02	06:53			07:43		17:48 (9)	07:39		15:18 (7)	08:28		15:09 (5)
	21:59	21:19	20:13			19:03	35	18:23 (9)	16:58	35	15:53 (7)	16:23	40	15:49 (7)
7	05:21	06:03	06:55			07:45		17:48 (9)	07:41		15:17 (7)	08:30		15:08 (5)
	21:58	21:18	20:11			19:01	36	18:24 (9)	16:56	37	15:54 (7)	16:23	40	15:48 (7)
8	05:22	06:05	06:56			07:47		17:46 (9)	07:42		15:16 (7)	08:31		15:08 (5)
	21:57	21:16	20:09			18:58	37	18:23 (9)	16:55	39	15:55 (7)	16:22	39	15:47 (7)
9	05:23	06:07	06:58			07:48		17:46 (9)	07:44		15:16 (7)	08:32		15:08 (5)
	21:57	21:14	20:06			18:56	37	18:23 (9)	16:53	40	15:56 (7)	16:22	39	15:47 (7)
10	05:24	06:08	07:00			07:50		17:45 (9)	07:46		15:15 (7)	08:33		15:09 (5)
	21:56	21:12	20:04			18:54	39	18:24 (9)	16:51	42	15:57 (7)	16:22	38	15:47 (7)
11	05:25	06:10	07:01			07:52		17:45 (9)	07:48		15:15 (7)	08:34		15:09 (5)
	21:55	21:10	20:02			18:51	39	18:24 (9)	16:50	43	15:58 (7)	16:22	38	15:47 (7)
12	05:26	06:12	07:03			07:54		17:45 (9)	07:50		15:14 (7)	08:35		15:09 (5)
	21:54	21:08	19:59			18:49	36	18:21 (9)	16:48	44	15:58 (7)	16:22	37	15:46 (7)
13	05:28	06:13	07:05			07:55		17:44 (9)	07:51		15:14 (7)	08:36		15:09 (5)
	21:53	21:06	19:57			18:47	34	18:18 (9)	16:47	45	15:59 (7)	16:21	37	15:46 (7)
14	05:29	06:15	07:06			07:57		17:44 (9)	07:53		15:13 (7)	08:37		15:09 (5)
	21:52	21:04	19:55			18:45	32	18:16 (9)	16:45	45	15:58 (7)	16:21	37	15:46 (7)
15	05:30	06:16	07:08			07:59		17:44 (9)	07:55		15:13 (7)	08:38		15:10 (5)
	21:51	21:02	19:52			18:42	30	18:14 (9)	16:44	46	15:59 (7)	16:21	36	15:46 (7)
16	05:31	06:18	07:10			08:01		17:45 (9)	07:57		15:13 (7)	08:39		15:10 (5)
	21:50	21:00	19:50			18:40	27	18:12 (9)	16:42	46	15:59 (7)	16:22	36	15:46 (7)
17	05:32	06:20	07:11			08:02		17:45 (9)	07:59		15:13 (7)	08:40		15:10 (5)
	21:49	20:58	19:48			18:38	25	18:10 (9)	16:41	47	16:00 (7)	16:22	36	15:46 (7)
18	05:34	06:21	07:13			08:04		17:46 (9)	08:00		15:13 (7)	08:41		15:10 (5)
	21:48	20:56	19:45			18:36	22	18:08 (9)	16:40	47	16:00 (7)	16:22	36	15:46 (7)
19	05:35	06:23	07:15			08:06		17:34 (8)	08:02		15:14 (7)	08:41		15:11 (5)
	21:47	20:54	19:43			18:34	27	18:05 (9)	16:38	46	16:00 (7)	16:22	36	15:47 (7)
20	05:36	06:25	07:16			08:08		17:31 (8)	08:04		15:14 (7)	08:42		15:11 (5)
	21:46	20:52	19:40			18:32	29	18:02 (9)	16:37	47	16:01 (7)	16:23	35	15:46 (7)
21	05:38	06:26	07:18			08:10		17:29 (8)	08:06		15:14 (7)	08:43		15:12 (5)
	21:45	20:49	19:38			18:29	30	18:00 (9)	16:36	47	16:01 (7)	16:23	35	15:47 (7)
22	05:39	06:28	07:20			08:11		17:27 (8)	08:07		15:15 (7)	08:43		15:12 (5)
	21:43	20:47	19:36			18:27	30	17:58 (9)	16:35	46	16:01 (7)	16:24	35	15:47 (7)
23	05:40	06:30	07:21			08:13		17:26 (8)	08:09		15:16 (7)	08:44		15:13 (5)
	21:42	20:45	19:33			18:25	28	17:56 (9)	16:33	45	16:01 (7)	16:24	35	15:48 (7)
24	05:42	06:31	07:23			08:15		17:25 (8)	08:11		15:15 (7)	08:44		15:13 (5)
	21:40	20:43	19:31			18:23	25	17:50 (8)	16:32	44	15:59 (7)	16:25	36	15:49 (7)
25	05:43	06:33	07:25			07:17		16:24 (8)	08:12		15:16 (7)	08:45		15:14 (5)
	21:39	20:41	19:29			17:21	27	16:51 (8)	16:31	42	15:58 (7)	16:25	36	15:50 (7)
26	05:45	06:35	07:26			07:19		16:24 (8)	08:14		15:17 (7)	08:45		15:15 (5)
	21:38	20:38	19:26			17:19	26	16:50 (8)	16:30	40	15:57 (7)	16:26	35	15:50 (7)
27	05:46	06:36	07:28			07:20		16:24 (8)	08:15		15:17 (7)	08:45		15:15 (5)
	21:36	20:36	19:24			17:17	24	16:48 (8)	16:29	39	15:56 (7)	16:27	36	15:51 (7)
28	05:48	06:38	07:30			07:22		16:23 (8)	08:17		15:17 (7)	08:45		15:15 (5)
	21:35	20:34	19:22			17:15	23	16:46 (8)	16:28	37	15:54 (7)	16:28	37	15:52 (7)
29	05:49	06:40	07:31			07:24		16:23 (8)	08:19		15:18 (7)	08:45		15:16 (5)
	21:33	20:32	19:19			17:13	21	16:44 (8)	16:28	36	15:54 (7)	16:28	37	15:53 (7)
30	05:51	06:41	07:33		18:00 (9)	07:26		16:23 (8)	08:20		15:14 (5)	08:46		15:17 (5)
	21:31	20:30	19:17	15	18:15 (9)	17:11	19	16:42 (8)	16:27	39	15:53 (7)	16:29	37	15:54 (7)
31	05:52	06:43				07:28		15:32 (7)				08:46		15:17 (5)
	21:30	20:27				17:09	24	16:40 (8)				16:30	38	15:55 (7)
Potential sun hours	504	455	381			331			264			241		
Total, worst case				15			897			1237			1161	
Sun reduction				0.34			0.28			0.26			0.22	
Oper. time red.				1.00			1.00			1.00			1.00	
Wind dir. red.				0.60			0.60			0.62			0.62	
Total reduction				0.20			0.17			0.16			0.13	
Total, real				3			152			199			157	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
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Calculated:
11/06/2025 09:22/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Real Case - V150 **Shadow receptor:** C - 3

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January		February		March		April	May	June
1	08:46		15:18 (5)	08:18		15:44 (7)	07:23	17:14 (9)	07:12	06:06	05:20
	16:32	38	15:56 (7)	17:20	45	16:29 (7)	18:13	32	17:46 (9)	20:08	21:00	21:47
2	08:45		15:18 (5)	08:16		15:44 (7)	07:21	17:14 (9)	07:09	06:04	05:19
	16:33	39	15:57 (7)	17:22	45	16:29 (7)	18:15	34	17:48 (9)	20:10	21:02	21:48
3	08:45		15:19 (5)	08:15		15:45 (7)	07:19	17:14 (9)	07:07	06:02	05:18
	16:34	39	15:58 (7)	17:24	43	16:28 (7)	18:17	36	17:50 (9)	20:11	21:03	21:49
4	08:45		15:20 (5)	08:13		15:45 (7)	07:17	17:13 (9)	07:05	06:00	05:17
	16:35	40	16:00 (7)	17:26	42	16:27 (7)	18:18	39	17:52 (9)	20:13	21:05	21:50
5	08:45		15:20 (5)	08:11		15:46 (7)	07:15	17:13 (9)	07:02	05:58	05:17
	16:36	41	16:01 (7)	17:28	40	16:26 (7)	18:20	40	17:53 (9)	20:15	21:07	21:51
6	08:44		15:22 (5)	08:10		15:48 (7)	07:12	17:13 (9)	07:00	05:56	05:16
	16:37	41	16:03 (7)	17:30	38	16:26 (7)	18:22	40	17:53 (9)	20:17	21:08	21:52
7	08:44		15:22 (5)	08:08		15:49 (7)	07:10	17:13 (9)	06:58	05:55	05:15
	16:39	42	16:04 (7)	17:32	38	17:02 (8)	18:24	39	17:52 (9)	20:18	21:10	21:53
8	08:44		15:23 (5)	08:06		15:50 (7)	07:08	17:13 (9)	06:56	05:53	05:15
	16:40	42	16:05 (7)	17:33	39	17:04 (8)	18:26	38	17:51 (9)	20:20	21:12	21:54
9	08:43		15:25 (5)	08:04		15:52 (7)	07:05	17:14 (9)	06:53	05:51	05:14
	16:41	42	16:07 (7)	17:35	39	17:06 (8)	18:27	37	17:51 (9)	20:22	21:13	21:55
10	08:43		15:26 (5)	08:02		15:54 (7)	07:03	17:14 (9)	06:51	05:49	05:14
	16:43	42	16:08 (7)	17:37	38	17:08 (8)	18:29	35	17:49 (9)	20:24	21:15	21:56
11	08:42		15:27 (5)	08:01		15:56 (7)	07:01	17:15 (9)	06:49	05:48	05:13
	16:44	43	16:10 (7)	17:39	37	17:10 (8)	18:31	33	17:48 (9)	20:25	21:17	21:56
12	08:41		15:29 (5)	07:59		15:59 (7)	06:59	17:16 (9)	06:46	05:46	05:13
	16:46	42	16:11 (7)	17:41	33	17:12 (8)	18:33	31	17:47 (9)	20:27	21:18	21:57
13	08:41		15:31 (5)	07:57		16:04 (7)	06:56	17:17 (9)	06:44	05:44	05:13
	16:47	42	16:13 (7)	17:43	26	17:15 (8)	18:35	28	17:45 (9)	20:29	21:20	21:58
14	08:40		15:39 (7)	07:55		16:56 (8)	06:54	17:19 (9)	06:42	05:43	05:13
	16:49	36	16:15 (7)	17:45	21	17:17 (8)	18:36	24	17:43 (9)	20:31	21:22	21:58
15	08:39		15:38 (7)	07:53		16:56 (8)	06:52	17:21 (9)	06:40	05:41	05:12
	16:50	38	16:16 (7)	17:47	23	17:19 (8)	18:38	20	17:41 (9)	20:32	21:23	21:59
16	08:38		15:39 (7)	07:51		16:56 (8)	06:49	17:23 (9)	06:37	05:39	05:12
	16:52	39	16:18 (7)	17:49	25	17:21 (8)	18:40	14	17:37 (9)	20:34	21:25	21:59
17	08:37		15:39 (7)	07:49		16:56 (8)	06:47		06:35	05:38	05:12
	16:54	41	16:20 (7)	17:51	27	17:23 (8)	18:42		20:36	21:26	22:00
18	08:36		15:39 (7)	07:47		16:57 (8)	06:45		06:33	05:36	05:12
	16:55	43	16:22 (7)	17:52	27	17:24 (8)	18:43		20:38	21:28	22:00
19	08:35		15:39 (7)	07:45		16:56 (8)	06:42		06:31	05:35	05:12
	16:57	45	16:24 (7)	17:54	26	17:22 (8)	18:45		20:39	21:29	22:01
20	08:34		15:40 (7)	07:43		16:57 (8)	06:40		06:29	05:33	05:12
	16:59	46	16:26 (7)	17:56	26	17:28 (9)	18:47		20:41	21:31	22:01
21	08:33		15:39 (7)	07:41		16:58 (8)	06:38		06:27	05:32	05:12
	17:00	48	16:27 (7)	17:58	30	17:31 (9)	18:49		20:43	21:32	22:01
22	08:32		15:40 (7)	07:39		17:00 (8)	06:35		06:24	05:31	05:13
	17:02	48	16:28 (7)	18:00	31	17:33 (9)	18:50		20:44	21:34	22:01
23	08:31		15:40 (7)	07:36		17:02 (8)	06:33		06:22	05:29	05:13
	17:04	48	16:28 (7)	18:02	30	17:35 (9)	18:52		20:46	21:35	22:02
24	08:29		15:40 (7)	07:34		17:05 (8)	06:31		06:20	05:28	05:13
	17:06	48	16:28 (7)	18:04	27	17:37 (9)	18:54		20:48	21:37	22:02
25	08:28		15:40 (7)	07:32		17:18 (9)	06:28		06:18	05:27	05:13
	17:07	49	16:29 (7)	18:05	20	17:38 (9)	18:56		20:50	21:38	22:02
26	08:27		15:40 (7)	07:30		17:17 (9)	06:26		06:16	05:26	05:14
	17:09	49	16:29 (7)	18:07	23	17:40 (9)	18:57		20:51	21:39	22:02
27	08:25		15:41 (7)	07:28		17:16 (9)	06:23		06:14	05:25	05:14
	17:11	48	16:29 (7)	18:09	27	17:43 (9)	18:59		20:53	21:41	22:02
28	08:24		15:41 (7)	07:26		17:16 (9)	06:21		06:12	05:24	05:15
	17:13	48	16:29 (7)	18:11	29	17:45 (9)	19:01		20:55	21:42	22:02
29	08:22		15:42 (7)				07:19		06:10	05:23	05:15
	17:15	47	16:29 (7)				20:03		20:57	21:43	22:01
30	08:21		15:42 (7)				07:16		06:08	05:22	05:16
	17:17	47	16:29 (7)				20:04		20:58	21:44	22:01
31	08:19		15:42 (7)				07:14			05:21	
	17:18	47	16:29 (7)				20:06			21:46	
Potential sun hours	257			277			367		417	487	502
Total, worst case		1348			895			520			
Sun reduction		0.22			0.24			0.28			
Oper. time red.		1.00			1.00			1.00			
Wind dir. red.		0.62			0.61			0.60			
Total reduction		0.13			0.15			0.17			
Total, real		180			132			87			

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
Jennings O'Donovan
Finisklin Business Park
F91 RHH9 Sligo
+353719161416
padraig / podowd@jodireland.com
Calculated:
11/06/2025 09:22/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Real Case - V150 **Shadow receptor:** C - 3

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	July	August	September	October	November	December
1	05:17	05:54	06:45	07:35	17:56 (9)	07:30	15:23 (7)	08:22	15:09 (5)
	22:01	21:28	20:25	19:14	30	18:26 (9)	17:07	39	16:38 (8)	16:26	43	15:52 (7)
2	05:17	05:55	06:46	07:36	17:54 (9)	07:31	15:21 (7)	08:23	15:09 (5)
	22:01	21:26	20:23	19:12	33	18:27 (9)	17:05	40	16:36 (8)	16:25	42	15:51 (7)
3	05:18	05:57	06:48	07:38	17:53 (9)	07:33	15:20 (7)	08:24	15:08 (5)
	22:00	21:25	20:20	19:10	35	18:28 (9)	17:04	39	16:34 (8)	16:25	42	15:50 (7)
4	05:19	05:59	06:50	07:40	17:51 (9)	07:35	15:19 (7)	08:26	15:08 (5)
	22:00	21:23	20:18	19:07	36	18:27 (9)	17:02	38	16:32 (8)	16:24	42	15:50 (7)
5	05:20	06:00	06:51	07:42	17:51 (9)	07:37	15:18 (7)	08:27	15:07 (5)
	21:59	21:21	20:16	19:05	37	18:28 (9)	17:00	38	15:56 (7)	16:24	42	15:49 (7)
6	05:20	06:02	06:53	07:43	17:50 (9)	07:39	15:17 (7)	08:28	15:08 (5)
	21:59	21:19	20:13	19:03	38	18:28 (9)	16:58	40	15:57 (7)	16:23	41	15:49 (7)
7	05:21	06:03	06:55	07:45	17:50 (9)	07:41	15:16 (7)	08:30	15:07 (5)
	21:58	21:18	20:11	19:01	39	18:29 (9)	16:56	42	15:58 (7)	16:23	41	15:48 (7)
8	05:22	06:05	06:56	07:47	17:48 (9)	07:42	15:15 (7)	08:31	15:07 (5)
	21:57	21:16	20:09	18:58	40	18:28 (9)	16:55	44	15:59 (7)	16:22	40	15:47 (7)
9	05:23	06:07	06:58	07:48	17:48 (9)	07:44	15:15 (7)	08:32	15:07 (5)
	21:57	21:14	20:06	18:56	40	18:28 (9)	16:53	44	15:59 (7)	16:22	40	15:47 (7)
10	05:24	06:08	07:00	07:50	17:48 (9)	07:46	15:15 (7)	08:33	15:08 (5)
	21:56	21:12	20:04	18:54	38	18:26 (9)	16:51	45	16:00 (7)	16:22	39	15:47 (7)
11	05:25	06:10	07:01	07:52	17:48 (9)	07:48	15:14 (7)	08:34	15:08 (5)
	21:55	21:10	20:02	18:51	36	18:24 (9)	16:50	46	16:00 (7)	16:22	39	15:47 (7)
12	05:26	06:12	07:03	07:54	17:48 (9)	07:50	15:14 (7)	08:35	15:08 (5)
	21:54	21:08	19:59	18:49	33	18:21 (9)	16:48	47	16:01 (7)	16:22	38	15:46 (7)
13	05:28	06:13	07:05	07:55	17:48 (9)	07:51	15:14 (7)	08:36	15:08 (5)
	21:53	21:06	19:57	18:47	30	18:18 (9)	16:47	47	16:01 (7)	16:21	38	15:46 (7)
14	05:29	06:15	07:06	07:57	17:48 (9)	07:53	15:13 (7)	08:37	15:09 (5)
	21:52	21:04	19:55	18:45	28	18:16 (9)	16:45	48	16:01 (7)	16:21	37	15:46 (7)
15	05:30	06:16	07:08	07:59	17:49 (9)	07:55	15:13 (7)	08:38	15:09 (5)
	21:51	21:02	19:52	18:42	25	18:14 (9)	16:44	48	16:01 (7)	16:21	37	15:46 (7)
16	05:31	06:18	07:10	08:01	17:49 (9)	07:57	15:13 (7)	08:39	15:10 (5)
	21:50	21:00	19:50	18:40	23	18:12 (9)	16:42	48	16:01 (7)	16:22	36	15:46 (7)
17	05:32	06:20	07:11	08:02	17:50 (9)	07:59	15:13 (7)	08:40	15:09 (5)
	21:49	20:58	19:48	18:38	20	18:10 (9)	16:41	49	16:02 (7)	16:22	37	15:46 (7)
18	05:34	06:21	07:13	08:04	17:35 (8)	08:00	15:14 (7)	08:41	15:10 (5)
	21:48	20:56	19:45	18:36	29	18:08 (9)	16:40	48	16:02 (7)	16:22	36	15:46 (7)
19	05:35	06:23	07:15	08:06	17:31 (8)	08:02	15:14 (7)	08:41	15:11 (5)
	21:47	20:54	19:43	18:34	31	18:05 (9)	16:38	48	16:02 (7)	16:22	36	15:47 (7)
20	05:36	06:25	07:16	08:08	17:30 (8)	08:04	15:15 (7)	08:42	15:10 (5)
	21:46	20:52	19:40	18:32	29	18:02 (9)	16:37	48	16:03 (7)	16:23	36	15:46 (7)
21	05:38	06:26	07:18	08:10	17:28 (8)	08:06	15:15 (7)	08:43	15:11 (5)
	21:45	20:49	19:38	18:29	28	18:00 (9)	16:36	48	16:03 (7)	16:23	36	15:47 (7)
22	05:39	06:28	07:20	08:11	17:27 (8)	08:07	15:16 (7)	08:43	15:11 (5)
	21:43	20:47	19:36	18:27	25	17:52 (8)	16:35	46	16:02 (7)	16:24	36	15:47 (7)
23	05:40	06:30	07:21	08:13	17:27 (8)	08:09	15:16 (7)	08:44	15:12 (5)
	21:42	20:45	19:33	18:25	26	17:53 (8)	16:33	45	16:01 (7)	16:24	36	15:48 (7)
24	05:42	06:31	07:23	08:15	17:26 (8)	08:11	15:16 (7)	08:44	15:12 (5)
	21:40	20:43	19:31	18:23	28	17:54 (8)	16:32	43	15:59 (7)	16:25	37	15:49 (7)
25	05:43	06:33	07:25	07:17	16:26 (8)	08:12	15:17 (7)	08:45	15:14 (5)
	21:39	20:41	19:29	17:21	26	16:52 (8)	16:31	41	15:58 (7)	16:25	36	15:50 (7)
26	05:45	06:35	07:26	07:19	16:25 (8)	08:14	15:18 (7)	08:45	15:14 (5)
	21:38	20:38	19:26	17:19	25	16:50 (8)	16:30	39	15:57 (7)	16:26	36	15:50 (7)
27	05:46	06:36	07:28	18:07 (9)	07:20	16:25 (8)	08:15	15:19 (7)	08:45	15:14 (5)
	21:36	20:36	19:24	10	18:17 (9)	17:17	23	16:48 (8)	16:29	37	15:56 (7)	16:27	37	15:51 (7)
28	05:48	06:38	07:30	18:03 (9)	07:22	16:25 (8)	08:17	15:18 (7)	08:45	15:15 (5)
	21:35	20:34	19:22	18	18:21 (9)	17:15	21	16:46 (8)	16:28	36	15:54 (7)	16:28	37	15:52 (7)
29	05:49	06:40	07:31	18:00 (9)	07:24	15:32 (7)	08:19	15:12 (5)	08:45	15:15 (5)
	21:33	20:32	19:19	23	18:23 (9)	17:13	30	16:44 (8)	16:28	42	15:54 (7)	16:28	38	15:53 (7)
30	05:51	06:41	07:33	17:57 (9)	07:26	15:28 (7)	08:20	15:11 (5)	08:46	15:16 (5)
	21:31	20:30	19:17	27	18:24 (9)	17:11	35	16:42 (8)	16:27	42	15:53 (7)	16:29	38	15:54 (7)
31	05:52	06:43			07:28	15:25 (7)			08:46	15:17 (5)
	21:30	20:27			17:09	38	16:40 (8)			16:30	38	15:55 (7)
Potential sun hours	504	455	381	331	264	241
Total, worst case			78	955	1305	1187
Sun reduction			0.34	0.28	0.26	0.22
Oper. time red.			1.00	1.00	1.00	1.00
Wind dir. red.			0.60	0.60	0.61	0.62
Total reduction			0.20	0.17	0.16	0.13
Total, real			16	162	209	160

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

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SHADOW - Calendar

Calculation: 6839 Garrane WF Real Case - V150 **Shadow receptor:** D - 4

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January		February		March		April		May	June
1	08:46		15:13 (6)	08:18		16:12 (5)	07:23		16:46 (7)	07:12		18:59 (9)	06:06	05:20
	16:32	41	15:54 (6)	17:20	17	16:29 (5)	18:13	57	17:46 (8)	20:08	16	19:15 (9)	21:00	21:47
2	08:45		15:12 (6)	08:16		16:14 (5)	07:21		16:47 (7)	07:09		19:03 (9)	06:04	05:19
	16:33	41	15:53 (6)	17:22	13	16:27 (5)	18:15	57	17:48 (8)	20:10	6	19:09 (9)	21:02	21:48
3	08:45		15:13 (6)	08:15		16:18 (5)	07:19		16:48 (7)	07:07			06:02	05:18
	16:34	41	15:54 (6)	17:24	5	16:23 (5)	18:17	57	17:50 (8)	20:11			21:03	21:49
4	08:45		15:14 (6)	08:13			07:17		16:49 (7)	07:05			06:00	05:17
	16:35	41	15:55 (6)	17:26			18:18	55	17:52 (8)	20:13			21:05	21:50
5	08:45		15:14 (6)	08:11			07:15		16:51 (7)	07:02			05:58	05:17
	16:36	41	15:55 (6)	17:28			18:20	53	17:53 (8)	20:15			21:07	21:51
6	08:44		15:15 (6)	08:10		16:59 (7)	07:12		16:53 (7)	07:00			05:56	05:16
	16:37	42	16:03 (5)	17:30	1	17:00 (7)	18:22	47	17:52 (8)	20:17			21:08	21:52
7	08:44		15:15 (6)	08:08		16:56 (7)	07:10		16:56 (7)	06:58			05:55	05:15
	16:39	44	16:04 (5)	17:32	6	17:02 (7)	18:24	38	17:50 (8)	20:18			21:10	21:53
8	08:44		15:15 (6)	08:06		16:54 (7)	07:08		17:01 (7)	06:56			05:53	05:15
	16:40	45	16:05 (5)	17:33	10	17:04 (7)	18:26	25	17:49 (8)	20:20			21:12	21:54
9	08:43		15:16 (6)	08:04		16:52 (7)	07:05		17:33 (8)	06:53			05:51	05:14
	16:41	46	16:07 (5)	17:35	14	17:06 (7)	18:27	14	17:47 (8)	20:22			21:13	21:55
10	08:43		15:17 (6)	08:02		16:51 (7)	07:03		17:35 (8)	06:51			05:49	05:14
	16:43	47	16:08 (5)	17:37	17	17:08 (7)	18:29	8	17:43 (8)	20:24			21:15	21:55
11	08:42		15:17 (6)	08:01		16:50 (7)	07:01			06:49			05:48	05:13
	16:44	49	16:10 (5)	17:39	20	17:10 (7)	18:31			20:25			21:17	21:56
12	08:41		15:17 (6)	07:59		16:49 (7)	06:59		18:04 (9)	06:46			05:46	05:13
	16:46	50	16:11 (5)	17:41	23	17:12 (7)	18:33	3	18:07 (9)	20:27			21:18	21:57
13	08:41		15:18 (6)	07:57		16:48 (7)	06:56		18:01 (9)	06:44			05:44	05:13
	16:47	51	16:13 (5)	17:43	27	17:15 (7)	18:35	7	18:08 (9)	20:29			21:20	21:58
14	08:40		15:19 (6)	07:55		16:47 (7)	06:54		17:59 (9)	06:42			05:43	05:13
	16:49	51	16:14 (5)	17:45	30	17:17 (7)	18:36	11	18:10 (9)	20:31			21:22	21:58
15	08:39		15:19 (6)	07:53		16:46 (7)	06:52		17:58 (9)	06:40			05:41	05:12
	16:50	53	16:16 (5)	17:47	33	17:19 (7)	18:38	15	18:13 (9)	20:32			21:23	21:59
16	08:38		15:20 (6)	07:51		16:46 (7)	06:49		17:56 (9)	06:37			05:39	05:12
	16:52	54	16:18 (5)	17:49	35	17:21 (7)	18:40	18	18:14 (9)	20:34			21:25	21:59
17	08:37		15:21 (6)	07:49		16:45 (7)	06:47		17:55 (9)	06:35			05:38	05:12
	16:54	55	16:20 (5)	17:51	38	17:23 (7)	18:42	21	18:16 (9)	20:36			21:26	22:00
18	08:36		15:22 (6)	07:47		16:45 (7)	06:45		17:55 (9)	06:33			05:36	05:12
	16:55	55	16:22 (5)	17:52	40	17:25 (7)	18:43	23	18:18 (9)	20:37			21:28	22:00
19	08:35		15:23 (6)	07:45		16:44 (7)	06:42		17:53 (9)	06:31			05:35	05:12
	16:57	56	16:24 (5)	17:54	42	17:26 (7)	18:45	26	18:19 (9)	20:39			21:29	22:01
20	08:34		15:24 (6)	07:43		16:44 (7)	06:40		17:53 (9)	06:29			05:33	05:12
	16:59	56	16:26 (5)	17:56	44	17:28 (7)	18:47	28	18:21 (9)	20:41			21:31	22:01
21	08:33		15:25 (6)	07:41		16:44 (7)	06:38		17:53 (9)	06:27			05:32	05:12
	17:00	56	16:27 (5)	17:58	45	17:29 (7)	18:49	30	18:23 (9)	20:43			21:32	22:01
22	08:32		15:26 (6)	07:39		16:44 (7)	06:35		17:52 (9)	06:24			05:31	05:13
	17:02	55	16:29 (5)	18:00	45	17:29 (7)	18:50	33	18:25 (9)	20:44			21:34	22:01
23	08:31		15:28 (6)	07:36		16:44 (7)	06:33		17:52 (9)	06:22			05:29	05:13
	17:04	55	16:32 (5)	18:02	46	17:35 (8)	18:52	35	18:27 (9)	20:46			21:35	22:02
24	08:29		15:29 (6)	07:34		16:43 (7)	06:31		17:51 (9)	06:20			05:28	05:13
	17:06	54	16:33 (5)	18:04	49	17:36 (8)	18:54	35	18:26 (9)	20:48			21:36	22:02
25	08:28		15:31 (6)	07:32		16:44 (7)	06:28		17:52 (9)	06:18			05:27	05:13
	17:07	50	16:33 (5)	18:05	51	17:38 (8)	18:56	34	18:26 (9)	20:50			21:38	22:02
26	08:27		15:33 (6)	07:30		16:44 (7)	06:26		17:52 (9)	06:16			05:26	05:14
	17:09	45	16:32 (5)	18:07	53	17:40 (8)	18:57	33	18:25 (9)	20:51			21:39	22:02
27	08:25		15:36 (6)	07:28		16:45 (7)	06:23		17:52 (9)	06:14			05:25	05:14
	17:11	40	16:33 (5)	18:09	56	17:43 (8)	18:59	31	18:23 (9)	20:53			21:41	22:02
28	08:24		16:06 (5)	07:26		16:46 (7)	06:21		17:53 (9)	06:12			05:24	05:15
	17:13	26	16:32 (5)	18:11	56	17:45 (8)	19:01	29	18:22 (9)	20:55			21:42	22:01
29	08:22		16:08 (5)				07:19		18:54 (9)	06:10			05:23	05:15
	17:15	24	16:32 (5)				20:03	27	19:21 (9)	20:57			21:43	22:01
30	08:21		16:09 (5)				07:16		18:55 (9)	06:08			05:22	05:16
	17:17	22	16:31 (5)				20:04	24	19:19 (9)	20:58			21:44	22:01
31	08:19		16:10 (5)				07:14		18:57 (9)				05:21	
	17:18	20	16:30 (5)				20:06	20	19:17 (9)				21:46	
Potential sun hours	257			277			367			417			487	501
Total, worst case		1406			816			894			22			
Sun reduction		0.22			0.24			0.28			0.38			
Oper. time red.		1.00			1.00			1.00			1.00			
Wind dir. red.		0.62			0.60			0.60			0.60			
Total reduction		0.13			0.15			0.17			0.23			
Total, real		188			120			150			5			

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
Jennings O'Donovan
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padraig / podowd@jodireland.com
Calculated:
11/06/2025 09:22/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Real Case - V150 **Shadow receptor:** D - 4

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	July		August		September		October		November		December	
1	05:17		05:54		06:45		07:35		18:42 (9)	07:30		16:21 (7)	08:21		14:59 (6)
	22:01		21:28		20:25		19:14	5	18:47 (9)	17:07	17	16:38 (7)	16:26	49	15:52 (5)
2	05:17		05:55		06:46		07:36			07:31		16:22 (7)	08:23		15:00 (6)
	22:00		21:26		20:23		19:12			17:05	14	16:36 (7)	16:25	47	15:51 (5)
3	05:18		05:57		06:48		07:38			07:33		16:24 (7)	08:24		14:59 (6)
	22:00		21:25		20:20		19:10			17:04	10	16:34 (7)	16:25	46	15:50 (5)
4	05:19		05:59		06:50		07:40		18:11 (8)	07:35		16:26 (7)	08:26		15:00 (6)
	22:00		21:23		20:18		19:07	12	18:23 (8)	17:02	6	16:32 (7)	16:24	45	15:50 (5)
5	05:20		06:00		06:51		07:42		18:09 (8)	07:37			08:27		15:00 (6)
	21:59		21:21		20:16		19:05	16	18:25 (8)	17:00			16:24	44	15:49 (5)
6	05:20		06:02		06:53		07:43		17:35 (7)	07:39			08:28		15:01 (6)
	21:59		21:19		20:13		19:03	33	18:27 (8)	16:58			16:23	42	15:49 (5)
7	05:21		06:03		06:55		07:45		17:31 (7)	07:41			08:30		15:01 (6)
	21:58		21:18		20:11		19:01	43	18:28 (8)	16:56			16:23	41	15:42 (6)
8	05:22		06:05		06:56		07:47		17:27 (7)	07:42		15:48 (5)	08:31		15:01 (6)
	21:57		21:16		20:09		18:58	50	18:28 (8)	16:55	6	15:54 (5)	16:22	41	15:42 (6)
9	05:23		06:07		06:58		07:48		17:25 (7)	07:44		15:45 (5)	08:32		15:01 (6)
	21:57		21:14		20:06		18:56	55	18:28 (8)	16:53	13	15:58 (5)	16:22	41	15:42 (6)
10	05:24		06:08		07:00	18:58 (9)	07:50		17:23 (7)	07:46		15:43 (5)	08:33		15:03 (6)
	21:56		21:12		20:04	2 19:00 (9)	18:54	57	18:26 (8)	16:51	17	16:00 (5)	16:22	40	15:43 (6)
11	05:25		06:10		07:01	18:52 (9)	07:52		17:22 (7)	07:48		15:42 (5)	08:34		15:03 (6)
	21:55		21:10		20:02	14 19:06 (9)	18:51	57	18:24 (8)	16:50	20	16:02 (5)	16:22	41	15:44 (6)
12	05:26		06:12		07:03	18:49 (9)	07:54		17:21 (7)	07:50		15:40 (5)	08:35		15:03 (6)
	21:54		21:08		19:59	20 19:09 (9)	18:49	56	18:21 (8)	16:48	23	16:03 (5)	16:22	41	15:44 (6)
13	05:28		06:13		07:05	18:46 (9)	07:55		17:19 (7)	07:51		15:40 (5)	08:36		15:04 (6)
	21:53		21:06		19:57	24 19:10 (9)	18:47	56	18:18 (8)	16:47	24	16:04 (5)	16:21	40	15:44 (6)
14	05:29		06:15		07:06	18:45 (9)	07:57		17:18 (7)	07:53		15:38 (5)	08:37		15:04 (6)
	21:52		21:04		19:55	26 19:11 (9)	18:45	56	18:16 (8)	16:45	26	16:04 (5)	16:21	41	15:45 (6)
15	05:30		06:16		07:08	18:43 (9)	07:59		17:17 (7)	07:55		15:08 (6)	08:38		15:05 (6)
	21:51		21:02		19:52	29 19:12 (9)	18:42	54	18:14 (8)	16:44	40	16:05 (5)	16:21	40	15:45 (6)
16	05:31		06:18		07:10	18:42 (9)	08:01		17:16 (7)	07:57		15:06 (6)	08:39		15:05 (6)
	21:50		21:00		19:50	31 19:13 (9)	18:40	54	18:12 (8)	16:42	45	16:05 (5)	16:22	41	15:46 (6)
17	05:32		06:20		07:11	18:41 (9)	08:02		17:16 (7)	07:59		15:04 (6)	08:40		15:05 (6)
	21:49		20:58		19:48	32 19:13 (9)	18:38	51	18:10 (8)	16:41	51	16:06 (5)	16:22	41	15:46 (6)
18	05:34		06:21		07:13	18:39 (9)	08:04		17:16 (7)	08:00		15:03 (6)	08:41		15:06 (6)
	21:48		20:56		19:45	34 19:13 (9)	18:36	48	18:08 (8)	16:40	55	16:07 (5)	16:22	40	15:46 (6)
19	05:35		06:23		07:15	18:39 (9)	08:06		17:14 (7)	08:02		15:02 (6)	08:41		15:06 (6)
	21:47		20:54		19:43	34 19:13 (9)	18:34	46	18:00 (7)	16:38	55	16:06 (5)	16:22	41	15:47 (6)
20	05:36		06:25		07:16	18:39 (9)	08:08		17:14 (7)	08:04		15:01 (6)	08:42		15:06 (6)
	21:46		20:52		19:40	35 19:14 (9)	18:32	46	18:00 (7)	16:37	57	16:05 (5)	16:23	40	15:46 (6)
21	05:38		06:26		07:18	18:37 (9)	08:10		17:14 (7)	08:06		15:01 (6)	08:43		15:07 (6)
	21:44		20:49		19:38	34 19:11 (9)	18:29	45	17:59 (7)	16:36	56	16:03 (5)	16:23	40	15:47 (6)
22	05:39		06:28		07:20	18:37 (9)	08:11		17:14 (7)	08:07		15:00 (6)	08:43		15:07 (6)
	21:43		20:47		19:36	32 19:09 (9)	18:27	44	17:58 (7)	16:35	56	16:02 (5)	16:24	40	15:47 (6)
23	05:40		06:30		07:21	18:37 (9)	08:13		17:14 (7)	08:09		15:00 (6)	08:44		15:08 (6)
	21:42		20:45		19:33	30 19:07 (9)	18:25	42	17:56 (7)	16:33	56	16:01 (5)	16:24	40	15:48 (6)
24	05:42		06:31		07:23	18:37 (9)	08:15		17:15 (7)	08:11		14:59 (6)	08:44		15:08 (6)
	21:40		20:43		19:31	26 19:03 (9)	18:23	39	17:54 (7)	16:32	55	15:59 (5)	16:25	41	15:49 (6)
25	05:43		06:33		07:25	18:37 (9)	07:17		16:15 (7)	08:12		14:59 (6)	08:45		15:10 (6)
	21:39		20:41		19:29	24 19:01 (9)	17:21	37	16:52 (7)	16:31	55	15:58 (5)	16:25	40	15:50 (6)
26	05:45		06:35		07:26	18:38 (9)	07:19		16:15 (7)	08:14		14:59 (6)	08:45		15:10 (6)
	21:38		20:38		19:26	21 18:59 (9)	17:19	35	16:50 (7)	16:30	54	15:57 (5)	16:26	40	15:50 (6)
27	05:46		06:36		07:28	18:37 (9)	07:20		16:16 (7)	08:15		14:59 (6)	08:45		15:10 (6)
	21:36		20:36		19:24	19 18:56 (9)	17:17	32	16:48 (7)	16:29	53	15:56 (5)	16:27	41	15:51 (6)
28	05:48		06:38		07:30	18:38 (9)	07:22		16:17 (7)	08:17		14:59 (6)	08:45		15:11 (6)
	21:35		20:34		19:22	16 18:54 (9)	17:15	29	16:46 (7)	16:28	52	15:55 (5)	16:28	40	15:51 (6)
29	05:49		06:40		07:31	18:40 (9)	07:24		16:18 (7)	08:19		14:59 (6)	08:45		15:11 (6)
	21:33		20:32		19:19	12 18:52 (9)	17:13	26	16:44 (7)	16:28	51	15:54 (5)	16:28	41	15:52 (6)
30	05:51		06:41		07:33	18:40 (9)	07:26		16:18 (7)	08:20		15:00 (6)	08:46		15:11 (6)
	21:31		20:30		19:17	9 18:49 (9)	17:11	24	16:42 (7)	16:27	49	15:53 (5)	16:29	41	15:52 (6)
31	05:52		06:43				07:28		16:20 (7)				08:46		15:12 (6)
	21:30		20:27				17:09	20	16:40 (7)				16:30	41	15:53 (6)
Potential sun hours	504		455		381		331			264			241		
Total, worst case						504		1168			1016			1287	
Sun reduction						0.34		0.28			0.26			0.22	
Oper. time red.						1.00		1.00			1.00			1.00	
Wind dir. red.						0.60		0.60			0.61			0.62	
Total reduction						0.20		0.17			0.16			0.14	
Total, real						102		198			163			174	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
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Calculated:
11/06/2025 09:22/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Real Case - V150 **Shadow receptor:** E - 5

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January		February		March		April		May		June		
1	08:46		15:54 (2)	08:18		16:10 (2)	07:23		17:08 (4)	07:12		19:08 (6)	06:06		20:21 (7)	05:20		20:26 (7)
	16:32	3	15:57 (2)	17:20	10	16:20 (2)	18:13	38	17:46 (4)	20:08	34	19:42 (6)	21:00	10	20:31 (7)	21:47	39	21:05 (9)
2	08:45		15:53 (2)	08:16			07:21		17:09 (4)	07:09		19:07 (6)	06:04		20:19 (7)	05:19		20:27 (7)
	16:33	4	15:57 (2)	17:22			18:15	37	17:46 (4)	20:10	36	19:43 (6)	21:02	14	20:33 (7)	21:48	35	21:04 (9)
3	08:45		15:54 (2)	08:15			07:19		17:09 (4)	07:07		19:07 (6)	06:02		20:18 (7)	05:18		20:28 (7)
	16:34	4	15:58 (2)	17:24			18:17	37	17:46 (4)	20:11	38	19:45 (6)	21:03	16	20:34 (7)	21:49	32	21:04 (9)
4	08:45		15:54 (2)	08:13			07:17		17:09 (4)	07:05		19:06 (6)	06:00		20:17 (7)	05:17		20:30 (7)
	16:35	6	16:00 (2)	17:26			18:18	36	17:45 (4)	20:13	41	19:47 (6)	21:05	19	20:36 (7)	21:50	28	21:04 (9)
5	08:45		15:54 (2)	08:11			07:15		17:10 (4)	07:02		19:05 (6)	05:58		20:16 (7)	05:17		20:32 (7)
	16:36	7	16:01 (2)	17:28			18:20	34	17:44 (4)	20:15	43	19:48 (6)	21:07	21	20:37 (7)	21:51	22	21:03 (9)
6	08:44		15:54 (2)	08:10			07:12		17:10 (4)	07:00		19:05 (6)	05:56		20:16 (7)	05:16		20:48 (9)
	16:37	9	16:03 (2)	17:30			18:22	33	17:43 (4)	20:17	44	19:49 (6)	21:08	23	20:39 (7)	21:52	15	21:03 (9)
7	08:44		15:54 (2)	08:08			07:10		17:11 (4)	06:58		19:05 (6)	05:55		20:15 (7)	05:15		20:48 (9)
	16:39	10	16:04 (2)	17:32			18:24	30	17:41 (4)	20:18	44	19:49 (6)	21:10	25	20:40 (7)	21:53	14	21:02 (9)
8	08:44		15:54 (2)	08:06			07:08		17:12 (4)	06:56		19:06 (6)	05:53		20:15 (7)	05:15		20:50 (9)
	16:40	11	16:05 (2)	17:33			18:26	28	17:40 (4)	20:20	43	19:49 (6)	21:12	27	20:42 (7)	21:54	12	21:02 (9)
9	08:43		15:54 (2)	08:04			07:05		17:14 (4)	06:53		19:05 (6)	05:51		20:15 (7)	05:14		20:50 (9)
	16:41	13	16:07 (2)	17:35			18:27	25	17:39 (4)	20:22	42	19:47 (6)	21:13	29	20:44 (7)	21:55	11	21:01 (9)
10	08:42		15:54 (2)	08:02			07:03		17:15 (4)	06:51		19:05 (6)	05:49		20:14 (7)	05:14		20:52 (9)
	16:43	14	16:08 (2)	17:37			18:29	21	17:36 (4)	20:24	42	19:47 (6)	21:15	31	20:45 (7)	21:55	8	21:00 (9)
11	08:42		15:54 (2)	08:01		17:09 (3)	07:01		17:18 (4)	06:49		19:06 (6)	05:48		20:15 (7)	05:13		20:53 (9)
	16:44	16	16:10 (2)	17:39	1	17:10 (3)	18:31	15	17:33 (4)	20:25	40	19:46 (6)	21:17	32	20:47 (7)	21:56	7	21:00 (9)
12	08:41		15:54 (2)	07:59		17:08 (3)	06:59		17:23 (4)	06:46		19:07 (6)	05:46		20:14 (7)	05:13		20:54 (9)
	16:46	17	16:11 (2)	17:41	4	17:12 (3)	18:33	5	17:28 (4)	20:27	38	19:45 (6)	21:18	34	20:48 (7)	21:57	3	20:57 (9)
13	08:40		15:54 (2)	07:57		17:07 (3)	06:56			06:44		19:06 (6)	05:44		20:14 (7)	05:13		
	16:47	19	16:13 (2)	17:43	8	17:15 (3)	18:35			20:29	39	20:01 (8)	21:20	35	20:49 (7)	21:58		
14	08:40		15:54 (2)	07:55		17:06 (3)	06:54			06:42		19:07 (6)	05:43		20:14 (7)	05:13		
	16:49	20	16:14 (2)	17:45	11	17:17 (3)	18:36			20:31	40	20:03 (8)	21:21	37	20:51 (7)	21:58		
15	08:39		15:55 (2)	07:53		17:06 (3)	06:52		18:12 (5)	06:40		19:09 (6)	05:41		20:15 (7)	05:12		
	16:50	21	16:16 (2)	17:47	13	17:19 (3)	18:38	1	18:13 (5)	20:32	40	20:05 (8)	21:23	38	20:53 (9)	21:59		
16	08:38		15:55 (2)	07:51		17:06 (3)	06:49		18:09 (5)	06:37		19:10 (6)	05:39		20:14 (7)	05:12		
	16:52	23	16:18 (2)	17:49	15	17:21 (3)	18:40	5	18:14 (5)	20:34	40	20:07 (8)	21:25	40	20:54 (9)	21:59		
17	08:37		15:55 (2)	07:49		17:05 (3)	06:47		18:08 (5)	06:35		19:12 (6)	05:38		20:15 (7)	05:12		
	16:54	25	16:20 (2)	17:51	18	17:23 (3)	18:42	8	18:16 (5)	20:36	39	20:09 (8)	21:26	40	20:55 (9)	22:00		
18	08:36		15:56 (2)	07:47		17:04 (3)	06:45		18:07 (5)	06:33		19:14 (6)	05:36		20:15 (7)	05:12		
	16:55	26	16:22 (2)	17:52	20	17:24 (3)	18:43	11	18:18 (5)	20:37	36	20:10 (8)	21:28	41	20:56 (9)	22:00		
19	08:35		15:56 (2)	07:45		17:04 (3)	06:42		18:05 (5)	06:31		19:16 (6)	05:35		20:15 (7)	05:12		
	16:57	28	16:24 (2)	17:54	22	17:26 (3)	18:45	14	18:19 (5)	20:39	33	20:12 (8)	21:29	43	20:58 (9)	22:01		
20	08:34		15:57 (2)	07:43		17:05 (3)	06:40		18:04 (5)	06:29		19:20 (6)	05:34		20:16 (7)	05:12		
	16:59	29	16:26 (2)	17:56	23	17:28 (3)	18:47	17	18:21 (5)	20:41	25	20:13 (8)	21:31	43	20:59 (9)	22:01		
21	08:33		15:57 (2)	07:41		17:05 (3)	06:38		18:04 (5)	06:27		19:55 (8)	05:32		20:17 (7)	05:12		
	17:00	30	16:27 (2)	17:58	26	17:31 (3)	18:49	19	18:23 (5)	20:43	20	20:15 (8)	21:32	44	21:01 (9)	22:01		
22	08:32		15:58 (2)	07:39		17:06 (3)	06:35		18:02 (5)	06:24		19:56 (8)	05:31		20:17 (7)	05:13		
	17:02	30	16:28 (2)	18:00	27	17:33 (4)	18:50	23	18:25 (5)	20:44	20	20:16 (8)	21:34	45	21:02 (9)	22:01		
23	08:31		15:59 (2)	07:36		17:07 (3)	06:33		18:02 (5)	06:22		19:57 (8)	05:29		20:17 (7)	05:13		
	17:04	29	16:28 (2)	18:02	28	17:35 (4)	18:52	25	18:27 (5)	20:46	19	20:16 (8)	21:35	46	21:03 (9)	22:01		
24	08:29		15:59 (2)	07:34		17:07 (3)	06:31		18:02 (5)	06:20		19:57 (8)	05:28		20:18 (7)	05:13		
	17:06	29	16:28 (2)	18:04	29	17:36 (4)	18:54	26	18:28 (5)	20:48	18	20:15 (8)	21:36	46	21:04 (9)	22:02		
25	08:28		16:00 (2)	07:32		17:08 (3)	06:28		18:02 (5)	06:18		19:59 (8)	05:27		20:19 (7)	05:13		
	17:07	28	16:28 (2)	18:05	30	17:38 (4)	18:56	28	18:30 (5)	20:50	14	20:13 (8)	21:38	47	21:06 (9)	22:02		
26	08:27		16:00 (2)	07:30		17:09 (4)	06:26		18:02 (5)	06:16		20:01 (8)	05:26		20:20 (7)	05:14		
	17:09	27	16:27 (2)	18:07	32	17:41 (4)	18:57	30	18:32 (6)	20:51	10	20:11 (8)	21:39	46	21:06 (9)	22:02		
27	08:25		16:02 (2)	07:28		17:09 (4)	06:23		18:02 (5)	06:14			05:25		20:20 (7)	05:14		
	17:11	25	16:27 (2)	18:09	34	17:43 (4)	18:59	31	18:33 (6)	20:53			21:40	46	21:06 (9)	22:02		
28	08:24		16:02 (2)	07:26		17:09 (4)	06:21		18:03 (5)	06:12			05:24		20:21 (7)	05:15		
	17:13	24	16:26 (2)	18:11	36	17:45 (4)	19:01	32	18:35 (6)	20:55			21:42	45	21:06 (9)	22:01		
29	08:22		16:04 (2)				07:19		19:04 (5)	06:10		20:23 (7)	05:23		20:22 (7)	05:15		
	17:15	22	16:26 (2)				20:03	33	19:37 (6)	20:56	4	20:27 (7)	21:43	43	21:05 (9)	22:01		
30	08:21		16:05 (2)				07:16		19:04 (5)	06:08		20:22 (7)	05:22		20:23 (7)	05:16		
	17:17	19	16:24 (2)				20:04	34	19:38 (6)	20:58	8	20:30 (7)	21:44	42	21:05 (9)	22:01		
31	08:19		16:07 (2)				07:14		19:06 (5)				05:21		20:25 (7)			
	17:18	16	16:23 (2)				20:06	34	19:40 (6)				21:45	41	21:06 (9)			
Potential sun hours	257			277			367			417			487			501		
Total, worst case		584			387			710			890			1089			226	
Sun reduction		0.22			0.24			0.28			0.38			0.39			0.35	
Oper. time red.		1.00			1.00			1.00			1.00			1.00			1.00	
Wind dir. red.		0.61			0.60			0.60			0.61			0.63			0.64	
Total reduction		0.13			0.15			0.17			0.23			0.25			0.22	
Total, real		78			57			119			206			272			50	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
Jennings O'Donovan
Finisklin Business Park
F91 RHH9 Sligo
+353719161416
padraig / podowd@jodireland.com
Calculated:
11/06/2025 09:22/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Real Case - V150 **Shadow receptor:** E - 5

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	July		August		September		October		November		December		
1	05:17		20:58 (9)	05:54		20:25 (7)	06:45		19:05 (6)	07:35		07:30		08:21		15:36 (2)
	22:01	5	21:03 (9)	21:28	33	20:58 (7)	20:25	40	19:45 (6)	19:14		17:07		16:26	16	15:52 (2)
2	05:17		20:56 (9)	05:55		20:24 (7)	06:46		19:04 (6)	07:36		17:58 (4)	07:31		08:23		15:37 (2)
	22:00	8	21:04 (9)	21:26	32	20:56 (7)	20:23	42	19:46 (6)	19:12	13	18:11 (4)	17:05		16:25	14	15:51 (2)
3	05:18		20:56 (9)	05:57		20:25 (7)	06:48		19:03 (6)	07:38		17:54 (4)	07:33		08:24		15:37 (2)
	22:00	9	21:05 (9)	21:25	30	20:55 (7)	20:20	42	19:45 (6)	19:10	19	18:13 (4)	17:04		16:25	13	15:50 (2)
4	05:19		20:55 (9)	05:59		20:24 (7)	06:50		19:03 (6)	07:40		17:52 (4)	07:35		08:26		15:39 (2)
	22:00	12	21:07 (9)	21:23	29	20:53 (7)	20:18	43	19:46 (6)	19:07	23	18:15 (4)	17:02		16:24	11	15:50 (2)
5	05:20		20:55 (9)	06:00		20:25 (7)	06:51		19:01 (6)	07:42		17:50 (4)	07:37		08:27		15:39 (2)
	21:59	13	21:08 (9)	21:21	26	20:51 (7)	20:16	44	19:45 (6)	19:05	27	18:17 (4)	17:00		16:24	10	15:49 (2)
6	05:20		20:55 (9)	06:02		20:25 (7)	06:53		19:01 (6)	07:43		17:48 (4)	07:39		08:28		15:40 (2)
	21:59	14	21:09 (9)	21:19	24	20:49 (7)	20:13	44	19:45 (6)	19:03	30	18:18 (4)	16:58		16:23	9	15:49 (2)
7	05:21		20:53 (9)	06:03		20:26 (7)	06:55		19:01 (6)	07:45		17:47 (4)	07:41		08:30		15:41 (2)
	21:58	16	21:09 (9)	21:17	22	20:48 (7)	20:11	43	19:44 (6)	19:01	32	18:19 (4)	16:56		16:23	7	15:48 (2)
8	05:22		20:37 (7)	06:05		20:26 (7)	06:56		19:00 (6)	07:47		17:45 (4)	07:42		08:31		15:41 (2)
	21:57	26	21:10 (9)	21:16	20	20:46 (7)	20:09	41	19:41 (6)	18:58	34	18:19 (4)	16:55		16:22	6	15:47 (2)
9	05:23		20:36 (7)	06:07		20:27 (7)	06:58		19:01 (6)	07:48		17:44 (4)	07:44		08:32		15:42 (2)
	21:57	31	21:11 (9)	21:14	18	20:45 (7)	20:06	39	19:40 (6)	18:56	35	18:19 (4)	16:53		16:22	5	15:47 (2)
10	05:24		20:35 (7)	06:08		20:28 (7)	07:00		19:00 (6)	07:50		17:44 (4)	07:46	15:41 (2)	08:33		15:43 (2)
	21:56	33	21:11 (9)	21:12	15	20:43 (7)	20:04	37	19:37 (6)	18:54	36	18:20 (4)	16:51	11 15:52 (2)	16:22	4	15:47 (2)
11	05:25		20:34 (7)	06:10		20:28 (7)	07:01		19:00 (6)	07:52		17:43 (4)	07:48	15:39 (2)	08:34		15:44 (2)
	21:55	36	21:12 (9)	21:10	13	20:41 (7)	20:02	35	19:35 (6)	18:51	37	18:20 (4)	16:50	16 15:55 (2)	16:22	3	15:47 (2)
12	05:26		20:33 (7)	06:12		20:30 (7)	07:03		18:59 (5)	07:54		17:42 (4)	07:50	15:37 (2)	08:35		15:44 (2)
	21:54	40	21:13 (9)	21:08	9	20:39 (7)	19:59	34	19:33 (6)	18:49	37	18:19 (4)	16:48	19 15:56 (2)	16:22	2	15:46 (2)
13	05:28		20:32 (7)	06:13		20:30 (7)	07:05		18:56 (5)	07:55		17:42 (4)	07:51	15:35 (2)	08:36		15:45 (2)
	21:53	41	21:13 (9)	21:06	7	20:37 (7)	19:57	34	19:30 (6)	18:47	36	18:18 (4)	16:47	22 15:57 (2)	16:21	1	15:46 (2)
14	05:29		20:31 (7)	06:15		20:32 (7)	07:06		18:54 (5)	07:57		17:41 (4)	07:53	15:34 (2)	08:37		
	21:52	43	21:14 (9)	21:04	4	20:36 (7)	19:55	34	19:28 (6)	18:45	35	18:16 (4)	16:45	24 15:58 (2)	16:21		
15	05:30		20:31 (7)	06:16			07:08		18:52 (5)	07:59		17:41 (4)	07:55	15:34 (2)	08:38		
	21:51	44	21:15 (9)	21:02			19:52	33	19:25 (6)	18:42	33	18:14 (4)	16:44	25 15:59 (2)	16:22		
16	05:31		20:30 (7)	06:18		20:11 (8)	07:10		18:51 (5)	08:01		17:42 (3)	07:57	15:33 (2)	08:39		
	21:50	45	21:15 (9)	21:00	5	20:16 (8)	19:50	32	19:23 (6)	18:40	30	18:12 (4)	16:42	27 16:00 (2)	16:22		
17	05:32		20:29 (7)	06:20		20:07 (8)	07:11		18:51 (5)	08:02		17:40 (3)	07:59	15:33 (2)	08:40		
	21:49	47	21:16 (9)	20:58	11	20:18 (8)	19:48	30	19:21 (6)	18:38	30	18:10 (4)	16:41	28 16:01 (2)	16:22		
18	05:34		20:29 (7)	06:21		20:05 (8)	07:13		18:49 (5)	08:04		17:39 (3)	08:00	15:33 (2)	08:41		
	21:48	47	21:16 (9)	20:56	15	20:20 (8)	19:45	29	19:18 (5)	18:36	29	18:08 (4)	16:40	29 16:02 (2)	16:22		
19	05:35		20:28 (7)	06:23		20:03 (8)	07:15		18:49 (5)	08:06		17:37 (3)	08:02	15:33 (2)	08:41		
	21:47	47	21:15 (9)	20:54	18	20:21 (8)	19:43	27	19:16 (5)	18:34	28	18:05 (4)	16:38	29 16:02 (2)	16:22		
20	05:36		20:28 (7)	06:25		20:02 (8)	07:16		18:49 (5)	08:08		17:36 (3)	08:04	15:33 (2)	08:42		
	21:46	46	21:14 (9)	20:51	20	20:22 (8)	19:40	25	19:14 (5)	18:32	26	18:02 (3)	16:37	30 16:03 (2)	16:23		
21	05:38		20:27 (7)	06:26		20:02 (8)	07:18		18:48 (5)	08:10		17:35 (3)	08:05	15:33 (2)	08:43		
	21:44	46	21:13 (9)	20:49	20	20:22 (8)	19:38	23	19:11 (5)	18:29	25	18:00 (3)	16:36	30 16:03 (2)	16:23		
22	05:39		20:27 (7)	06:28		20:00 (8)	07:20		18:48 (5)	08:11		17:35 (3)	08:07	15:33 (2)	08:43		
	21:43	44	21:11 (9)	20:47	19	20:19 (8)	19:36	21	19:09 (5)	18:27	23	17:58 (3)	16:35	29 16:02 (2)	16:24		
23	05:40		20:26 (7)	06:30		19:24 (6)	07:21		18:49 (5)	08:13		17:35 (3)	08:09	15:32 (2)	08:44		
	21:42	44	21:10 (9)	20:45	26	20:17 (8)	19:33	18	19:07 (5)	18:25	21	17:56 (3)	16:33	28 16:00 (2)	16:24		
24	05:42		20:26 (7)	06:31		19:19 (6)	07:23		18:48 (5)	08:15		17:35 (3)	08:11	15:33 (2)	08:44		
	21:40	43	21:09 (9)	20:43	33	20:15 (8)	19:31	15	19:03 (5)	18:23	19	17:54 (3)	16:32	26 15:59 (2)	16:25		
25	05:43		20:26 (7)	06:33		19:16 (6)	07:25		18:49 (5)	07:17		16:35 (3)	08:12	15:33 (2)	08:45		
	21:39	42	21:08 (9)	20:41	37	20:13 (8)	19:29	12	19:01 (5)	17:21	17	16:52 (3)	16:31	25 15:58 (2)	16:25		
26	05:45		20:25 (7)	06:35		19:14 (6)	07:26		18:50 (5)	07:19		16:35 (3)	08:14	15:34 (2)	08:45		
	21:38	41	21:06 (9)	20:38	39	20:11 (8)	19:26	9	18:59 (5)	17:19	15	16:50 (3)	16:30	23 15:57 (2)	16:26		
27	05:46		20:25 (7)	06:36		19:12 (6)	07:28		18:50 (5)	07:20		16:36 (3)	08:15	15:35 (2)	08:45		
	21:36	40	21:05 (9)	20:36	40	20:09 (8)	19:24	6	18:56 (5)	17:17	12	16:48 (3)	16:29	21 15:56 (2)	16:27		
28	05:48		20:25 (7)	06:38		19:10 (6)	07:30		18:52 (5)	07:22		16:36 (3)	08:17	15:34 (2)	08:45		
	21:35	38	21:03 (9)	20:34	41	20:07 (8)	19:22	2	18:54 (5)	17:15	10	16:46 (3)	16:28	21 15:55 (2)	16:28		
29	05:49		20:25 (7)	06:40		19:08 (6)	07:31			07:24		16:37 (3)	08:18	15:35 (2)	08:45		
	21:33	38	21:03 (9)	20:32	40	20:04 (8)	19:19			17:13	7	16:44 (3)	16:28	19 15:54 (2)	16:28		
30	05:51		20:25 (7)	06:41		19:07 (6)	07:33			07:26		16:38 (3)	08:20	15:36 (2)	08:46		15:53 (2)
	21:31	36	21:01 (7)	20:29	39	20:02 (8)	19:17			17:11	4	16:42 (3)	16:27	17 15:53 (2)	16:29	1	15:54 (2)
31	05:52		20:25 (7)	06:43		19:06 (6)				07:28		16:39 (3)			08:46		15:53 (2)
	21:30	35	21:00 (7)	20:27	38	19:44 (6)				17:09	1	16:40 (3)			16:30	2	15:55 (2)
Potential sun hours	504			455			381			331			264			241		
Total, worst case		1050			723			834			724			499			104	
Sun reduction		0.33			0.35			0.34			0.28			0.26			0.22	
Oper. time red.		1.00			1.00			1.00			1.00			1.00			1.00	
Wind dir. red.		0.63			0.62			0.61			0.60			0.61			0.61	
Total reduction		0.21			0.22			0.21			0.17			0.16			0.13	
Total, real		221			158			171			123			80			14	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
Jennings O'Donovan
Finisklin Business Park
F91 RHH9 Sligo
+353719161416
padraig / podowd@jodireland.com
Calculated:
11/06/2025 09:22/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Real Case - V150 **Shadow receptor:** F - 6

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January		February		March		April		May		June	
1	08:46		15:11 (1)	08:18		07:23	16:49 (2)	07:12	19:31 (4)	06:06	19:27 (4)	05:20	20:49 (6)
	16:32	41	15:52 (1)	17:20		18:13	26	17:15 (2)	20:08	11	19:42 (4)	21:00	49	20:31 (5)	21:47	25	21:14 (6)
2	08:45		15:12 (1)	08:16		07:21	16:51 (2)	07:09	19:28 (4)	06:04	19:30 (4)	05:19	20:49 (6)
	16:33	41	15:53 (1)	17:22		18:15	22	17:13 (2)	20:10	15	19:43 (4)	21:02	44	20:33 (5)	21:48	26	21:15 (6)
3	08:45		15:13 (1)	08:15		07:19	16:54 (2)	07:07	19:26 (4)	06:02	20:01 (5)	05:18	20:48 (6)
	16:34	40	15:53 (1)	17:24		18:17	17	17:11 (2)	20:11	19	19:45 (4)	21:03	33	20:34 (5)	21:49	27	21:15 (6)
4	08:45		15:14 (1)	08:13	16:53 (2)	07:17	16:58 (2)	07:05	19:24 (4)	06:00	20:01 (5)	05:17	20:49 (6)
	16:35	40	15:54 (1)	17:26	3	16:56 (2)	18:18	7	17:05 (2)	20:13	23	19:47 (4)	21:05	33	20:34 (5)	21:50	28	21:17 (6)
5	08:45		15:14 (1)	08:11		16:51 (2)	07:15			07:02		19:22 (4)	05:58		20:02 (5)	05:17		20:48 (6)
	16:36	40	15:54 (1)	17:28	7	16:58 (2)	18:20			20:15	26	19:48 (4)	21:07	33	20:35 (5)	21:51	29	21:17 (6)
6	08:44		15:15 (1)	08:10		16:49 (2)	07:12			07:00		19:21 (4)	05:56		20:02 (5)	05:16		20:48 (6)
	16:37	40	15:55 (1)	17:30	10	16:59 (2)	18:22			20:17	29	19:50 (4)	21:08	32	20:34 (5)	21:52	31	21:19 (6)
7	08:44		15:15 (1)	08:08		16:49 (2)	07:10			06:58		19:20 (4)	05:55		20:02 (5)	05:15		20:48 (6)
	16:39	40	15:55 (1)	17:32	13	17:02 (2)	18:24			20:18	32	19:52 (4)	21:10	31	20:33 (5)	21:53	31	21:19 (6)
8	08:44		15:15 (1)	08:06		16:47 (2)	07:08			06:56		19:19 (4)	05:53		20:02 (5)	05:15		20:48 (6)
	16:40	40	15:55 (1)	17:33	17	17:04 (2)	18:26			20:20	35	19:54 (4)	21:12	30	20:32 (5)	21:54	32	21:20 (6)
9	08:43		15:16 (1)	08:04		16:46 (2)	07:05			06:53		19:17 (4)	05:51		20:04 (5)	05:14		20:48 (6)
	16:41	40	15:56 (1)	17:35	20	17:06 (2)	18:27			20:22	38	19:55 (4)	21:13	28	20:32 (5)	21:55	33	21:21 (6)
10	08:42		15:16 (1)	08:02		16:45 (2)	07:03		18:02 (3)	06:51		19:17 (4)	05:49		20:04 (5)	05:14		20:48 (6)
	16:43	40	15:56 (1)	17:37	23	17:08 (2)	18:29	1	18:03 (3)	20:24	40	19:57 (4)	21:15	27	20:31 (5)	21:55	34	21:22 (6)
11	08:42		15:17 (1)	08:01		16:45 (2)	07:01		18:00 (3)	06:49		19:16 (4)	05:48		20:05 (5)	05:13		20:48 (6)
	16:44	39	15:56 (1)	17:39	25	17:10 (2)	18:31	5	18:05 (3)	20:25	43	19:59 (4)	21:17	25	20:30 (5)	21:56	35	21:23 (6)
12	08:41		15:17 (1)	07:59		16:44 (2)	06:59		17:58 (3)	06:46		19:16 (4)	05:46		20:06 (5)	05:13		20:49 (6)
	16:46	39	15:56 (1)	17:41	29	17:13 (2)	18:33	9	18:07 (3)	20:27	45	20:01 (4)	21:18	23	20:29 (5)	21:57	35	21:24 (6)
13	08:40		15:18 (1)	07:57		16:43 (2)	06:56		17:56 (3)	06:44		19:15 (4)	05:44		20:07 (5)	05:13		20:48 (6)
	16:47	38	15:56 (1)	17:43	32	17:15 (2)	18:35	12	18:08 (3)	20:29	46	20:01 (4)	21:20	20	20:27 (5)	21:58	35	21:23 (6)
14	08:40		15:18 (1)	07:55		16:43 (2)	06:54		17:55 (3)	06:42		19:15 (4)	05:43		20:09 (5)	05:13		20:48 (6)
	16:49	38	15:56 (1)	17:45	34	17:17 (2)	18:36	15	18:10 (3)	20:31	48	20:03 (4)	21:21	17	20:26 (5)	21:58	36	21:24 (6)
15	08:39		15:19 (1)	07:53		16:43 (2)	06:52		17:54 (3)	06:40		19:15 (4)	05:41		20:11 (5)	05:12		20:48 (6)
	16:50	37	15:56 (1)	17:47	36	17:19 (2)	18:38	19	18:13 (3)	20:32	48	20:03 (4)	21:23	15	20:53 (8)	21:59	37	21:25 (6)
16	08:38		15:20 (1)	07:51		16:42 (2)	06:49		17:52 (3)	06:37		19:14 (4)	05:39		20:14 (5)	05:12		20:49 (6)
	16:52	36	15:56 (1)	17:49	39	17:21 (2)	18:40	22	18:14 (3)	20:34	49	20:03 (4)	21:25	10	20:54 (8)	21:59	36	21:25 (6)
17	08:37		15:21 (1)	07:49		16:42 (2)	06:47		17:52 (3)	06:35		19:15 (4)	05:38		20:50 (8)	05:12		20:49 (6)
	16:54	35	15:56 (1)	17:51	41	17:23 (2)	18:42	24	18:16 (3)	20:36	47	20:02 (4)	21:26	5	20:55 (8)	22:00	37	21:26 (6)
18	08:36		15:22 (1)	07:47		16:41 (2)	06:45		17:52 (3)	06:33		19:15 (4)	05:36		20:49 (8)	05:12		20:49 (6)
	16:55	34	15:56 (1)	17:52	43	17:24 (2)	18:43	26	18:18 (3)	20:37	47	20:02 (4)	21:28	7	20:56 (8)	22:00	37	21:26 (6)
19	08:35		15:23 (1)	07:45		16:42 (2)	06:42		17:51 (3)	06:31		19:15 (4)	05:35		20:49 (8)	05:12		20:49 (6)
	16:57	33	15:56 (1)	17:54	42	17:24 (2)	18:45	28	18:19 (3)	20:39	47	20:02 (4)	21:29	9	20:58 (8)	22:01	37	21:26 (6)
20	08:34		15:24 (1)	07:43		16:42 (2)	06:40		17:51 (3)	06:29		19:14 (4)	05:34		20:49 (8)	05:12		20:49 (6)
	16:59	32	15:56 (1)	17:56	42	17:24 (2)	18:47	30	18:21 (3)	20:41	48	20:13 (5)	21:31	10	20:59 (8)	22:01	37	21:26 (6)
21	08:33		15:24 (1)	07:41		16:42 (2)	06:38		17:51 (3)	06:27		19:15 (4)	05:32		20:49 (8)	05:12		20:49 (6)
	17:00	31	15:55 (1)	17:58	42	17:24 (2)	18:49	32	18:23 (3)	20:43	51	20:15 (5)	21:32	12	21:01 (8)	22:01	37	21:26 (6)
22	08:32		15:26 (1)	07:39		16:43 (2)	06:35		17:51 (3)	06:24		19:15 (4)	05:31		20:48 (8)	05:13		20:50 (6)
	17:02	29	15:55 (1)	18:00	40	17:23 (2)	18:50	32	18:23 (3)	20:44	53	20:16 (5)	21:34	13	21:01 (8)	22:01	37	21:27 (6)
23	08:31		15:28 (1)	07:36		16:43 (2)	06:33		17:51 (3)	06:22		19:16 (4)	05:30		20:49 (8)	05:13		20:50 (6)
	17:04	27	15:55 (1)	18:02	40	17:23 (2)	18:52	32	18:23 (3)	20:46	54	20:18 (5)	21:35	14	21:03 (8)	22:01	37	21:27 (6)
24	08:29		15:28 (1)	07:34		16:43 (2)	06:31		17:51 (3)	06:20		19:16 (4)	05:28		20:49 (8)	05:13		20:50 (6)
	17:06	25	15:53 (1)	18:04	39	17:22 (2)	18:54	30	18:21 (3)	20:48	56	20:20 (5)	21:36	15	21:04 (8)	22:02	37	21:27 (6)
25	08:28		15:31 (1)	07:32		16:44 (2)	06:28		17:52 (3)	06:18		19:17 (4)	05:27		20:49 (8)	05:13		20:51 (6)
	17:07	21	15:52 (1)	18:06	37	17:21 (2)	18:56	28	18:20 (3)	20:50	56	20:21 (5)	21:38	17	21:06 (8)	22:02	37	21:28 (6)
26	08:27		15:32 (1)	07:30		16:45 (2)	06:26		17:53 (3)	06:16		19:18 (4)	05:26		20:49 (8)	05:14		20:51 (6)
	17:09	18	15:50 (1)	18:07	35	17:20 (2)	18:57	26	18:19 (3)	20:51	57	20:23 (5)	21:39	18	21:07 (8)	22:02	36	21:27 (6)
27	08:25		15:36 (1)	07:28		16:46 (2)	06:23		17:53 (3)	06:14		19:19 (4)	05:25		20:49 (8)	05:14		20:51 (6)
	17:11	13	15:49 (1)	18:09	33	17:19 (2)	18:59	24	18:17 (3)	20:53	56	20:24 (5)	21:40	19	21:08 (8)	22:02	37	21:28 (6)
28	08:24			07:26		16:48 (2)	06:21		17:55 (3)	06:12		19:20 (4)	05:24		20:50 (8)	05:15		20:51 (6)
	17:13			18:11	30	17:18 (2)	19:01	20	18:15 (3)	20:55	56	20:26 (5)	21:42	19	21:09 (8)	22:01	36	21:27 (6)
29	08:22						07:19		18:58 (3)	06:10		19:22 (4)	05:23		20:50 (8)	05:15		20:52 (6)
	17:15						20:03	14	19:12 (3)	20:56	54	20:27 (5)	21:43	20	21:10 (8)	22:01	36	21:28 (6)
30	08:21						07:16		19:02 (3)	06:08		19:25 (4)	05:22		20:49 (6)	05:16		20:52 (6)
	17:17						20:04	4	19:06 (3)	20:58	52	20:30 (5)	21:44	22	21:11 (8)	22:01	35	21:27 (6)
31	08:19						07:14		19:34 (4)				05:21		20:50 (6)			
	17:18						20:06	6	19:40 (4)				21:45	23	21:13 (8)			
Potential sun hours	257			277			367			417			487			501		
Total, worst case		927			752			511			1281			673			1023	
Sun reduction		0.22			0.24			0.28			0.38			0.39			0.35	
Oper. time red.		1.00			1.00			1.00			1.00			1.00			1.00	
Wind dir. red.		0.62			0.60			0.60			0.61			0.63			0.64	
Total reduction		0.13			0.15			0.17			0.23			0.25			0.22	
Total, real		125			110			85			297			166			226	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
Jennings O'Donovan
Finisklin Business Park
F91 RHH9 Sligo
+353719161416
padraig / podowd@jodireland.com
Calculated:
11/06/2025 09:22/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Real Case - V150 **Shadow receptor:** F - 6

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	July		August		September		October		November		December		
1	05:17		20:52 (6)	05:54		20:16 (5)	06:45		19:15 (4)	07:35		18:36 (3)	07:30		16:15 (2)	08:21		14:59 (1)
	22:01	35	21:27 (6)	21:28	24	20:40 (5)	20:25	43	19:58 (4)	19:14	11	18:47 (3)	17:07	23	16:38 (2)	16:26	39	15:38 (1)
2	05:17		20:52 (6)	05:55		20:14 (5)	06:46		19:16 (4)	07:36		18:38 (3)	07:31		16:16 (2)	08:23		14:59 (1)
	22:00	34	21:26 (6)	21:26	26	20:40 (5)	20:23	40	19:56 (4)	19:12	7	18:45 (3)	17:05	20	16:36 (2)	16:25	40	15:39 (1)
3	05:18		20:53 (6)	05:57		20:14 (5)	06:48		19:15 (4)	07:38		18:39 (3)	07:33		16:17 (2)	08:24		14:59 (1)
	22:00	33	21:26 (6)	21:25	28	20:42 (5)	20:20	38	19:53 (4)	19:10	3	18:42 (3)	17:04	17	16:34 (2)	16:25	40	15:39 (1)
4	05:19		20:53 (6)	05:59		20:13 (5)	06:50		19:16 (4)	07:40			07:35		16:18 (2)	08:26		15:00 (1)
	22:00	33	21:26 (6)	21:23	29	20:42 (5)	20:18	35	19:51 (4)	19:07			17:02	14	16:32 (2)	16:24	40	15:40 (1)
5	05:20		20:54 (6)	06:00		20:12 (5)	06:51		19:16 (4)	07:42			07:37		16:20 (2)	08:27		15:00 (1)
	21:59	32	21:26 (6)	21:21	31	20:43 (5)	20:16	32	19:48 (4)	19:05			17:00	10	16:30 (2)	16:24	40	15:40 (1)
6	05:20		20:55 (6)	06:02		20:11 (5)	06:53		19:17 (4)	07:43			07:39		16:22 (2)	08:28		15:00 (1)
	21:59	30	21:25 (6)	21:19	32	20:43 (5)	20:13	29	19:46 (4)	19:03			16:58	6	16:28 (2)	16:23	40	15:40 (1)
7	05:21		20:54 (6)	06:03		20:11 (5)	06:55		19:18 (4)	07:45			07:41		16:24 (2)	08:30		15:01 (1)
	21:58	30	21:24 (6)	21:17	33	20:44 (5)	20:11	26	19:44 (4)	19:01			16:56	2	16:26 (2)	16:23	40	15:41 (1)
8	05:22		20:55 (6)	06:05		20:10 (5)	06:56		19:18 (4)	07:47			07:42			08:31		15:01 (1)
	21:57	29	21:24 (6)	21:16	33	20:43 (5)	20:09	23	19:41 (4)	18:58			16:55			16:22	40	15:41 (1)
9	05:23		20:55 (6)	06:07		20:10 (5)	06:58		19:20 (4)	07:48			07:44			08:32		15:01 (1)
	21:57	28	21:23 (6)	21:14	34	20:44 (5)	20:06	20	19:40 (4)	18:56			16:53			16:22	40	15:41 (1)
10	05:24		20:56 (6)	06:08		20:10 (5)	07:00		19:21 (4)	07:50		17:30 (2)	07:46			08:33		15:02 (1)
	21:56	26	21:22 (6)	21:12	33	20:43 (5)	20:04	16	19:37 (4)	18:54	13	17:43 (2)	16:51			16:22	41	15:43 (1)
11	05:25		20:56 (6)	06:10		19:37 (4)	07:01		19:23 (4)	07:52		17:26 (2)	07:48			08:34		15:03 (1)
	21:55	26	21:22 (6)	21:10	46	20:41 (5)	20:02	12	19:35 (4)	18:51	20	17:46 (2)	16:50			16:22	40	15:43 (1)
12	05:26		20:57 (6)	06:12		19:35 (4)	07:03		19:26 (4)	07:54		17:23 (2)	07:50			08:35		15:03 (1)
	21:54	24	21:21 (8)	21:08	49	20:39 (5)	19:59	7	19:33 (4)	18:49	24	17:47 (2)	16:48			16:22	40	15:43 (1)
13	05:28		20:57 (6)	06:13		19:32 (4)	07:05		19:29 (4)	07:55		17:21 (2)	07:51			08:36		15:03 (1)
	21:53	23	21:20 (8)	21:06	53	20:37 (5)	19:57	1	19:30 (4)	18:47	28	17:49 (2)	16:47			16:21	41	15:44 (1)
14	05:29		20:58 (8)	06:15		19:30 (4)	07:06		18:49 (3)	07:57		17:19 (2)	07:53			08:37		15:04 (1)
	21:52	21	21:19 (8)	21:04	55	20:36 (5)	19:55	13	19:02 (3)	18:45	32	17:51 (2)	16:45			16:21	40	15:44 (1)
15	05:30		20:59 (8)	06:16		19:28 (4)	07:08		18:45 (3)	07:59		17:18 (2)	07:55		15:08 (1)	08:38		15:04 (1)
	21:51	20	21:19 (8)	21:02	56	20:33 (5)	19:52	19	19:04 (3)	18:42	34	17:52 (2)	16:44	13	15:21 (1)	16:22	41	15:45 (1)
16	05:31		20:59 (8)	06:18		19:26 (4)	07:10		18:43 (3)	08:01		17:17 (2)	07:57		15:05 (1)	08:39		15:05 (1)
	21:50	19	21:18 (8)	21:00	57	20:32 (5)	19:50	23	19:06 (3)	18:40	36	17:53 (2)	16:42	18	15:23 (1)	16:22	40	15:45 (1)
17	05:32		20:59 (8)	06:20		19:24 (4)	07:11		18:42 (3)	08:02		17:16 (2)	07:59		15:04 (1)	08:40		15:05 (1)
	21:49	18	21:17 (8)	20:58	56	20:29 (5)	19:48	25	19:07 (3)	18:38	37	17:53 (2)	16:41	21	15:25 (1)	16:22	40	15:45 (1)
18	05:34		20:59 (8)	06:21		19:24 (4)	07:13		18:39 (3)	08:04		17:15 (2)	08:00		15:02 (1)	08:41		15:05 (1)
	21:48	17	21:16 (8)	20:56	57	20:28 (5)	19:45	28	19:07 (3)	18:36	39	17:54 (2)	16:40	25	15:27 (1)	16:22	41	15:46 (1)
19	05:35		20:58 (8)	06:23		19:23 (4)	07:15		18:38 (3)	08:06		17:13 (2)	08:02		15:02 (1)	08:41		15:06 (1)
	21:47	17	21:15 (8)	20:54	55	20:26 (5)	19:43	30	19:08 (3)	18:34	41	17:54 (2)	16:38	27	15:29 (1)	16:22	40	15:46 (1)
20	05:36		20:59 (8)	06:25		19:21 (4)	07:16		18:38 (3)	08:08		17:13 (2)	08:04		15:01 (1)	08:42		15:06 (1)
	21:46	15	21:14 (8)	20:51	54	20:23 (5)	19:40	31	19:09 (3)	18:32	41	17:54 (2)	16:37	29	15:30 (1)	16:23	40	15:46 (1)
21	05:38		20:59 (8)	06:26		19:21 (4)	07:18		18:36 (3)	08:10		17:12 (2)	08:05		15:00 (1)	08:43		15:07 (1)
	21:44	14	21:13 (8)	20:49	53	20:22 (5)	19:38	33	19:09 (3)	18:29	42	17:54 (2)	16:36	31	15:31 (1)	16:23	40	15:47 (1)
22	05:39		20:59 (8)	06:28		19:19 (4)	07:20		18:36 (3)	08:11		17:12 (2)	08:07		15:00 (1)	08:43		15:07 (1)
	21:43	12	21:11 (8)	20:47	50	20:19 (5)	19:36	33	19:09 (3)	18:27	42	17:54 (2)	16:35	32	15:32 (1)	16:24	40	15:47 (1)
23	05:40		20:59 (8)	06:30		19:19 (4)	07:21		18:36 (3)	08:13		17:12 (2)	08:09		14:59 (1)	08:44		15:08 (1)
	21:42	11	21:10 (8)	20:45	47	20:17 (5)	19:33	31	19:07 (3)	18:25	42	17:54 (2)	16:33	33	15:32 (1)	16:24	40	15:48 (1)
24	05:42		21:00 (8)	06:31		19:18 (4)	07:23		18:34 (3)	08:15		17:12 (2)	08:10		14:59 (1)	08:44		15:08 (1)
	21:40	9	21:09 (8)	20:43	47	20:05 (4)	19:31	30	19:04 (3)	18:23	42	17:54 (2)	16:32	34	15:33 (1)	16:25	40	15:48 (1)
25	05:43		21:00 (8)	06:33		19:17 (4)	07:25		18:34 (3)	07:17		16:12 (2)	08:12		14:59 (1)	08:44		15:08 (1)
	21:39	8	21:08 (8)	20:41	48	20:05 (4)	19:29	27	19:01 (3)	17:21	40	16:52 (2)	16:31	35	15:34 (1)	16:25	41	15:49 (1)
26	05:45		21:00 (8)	06:35		19:17 (4)	07:26		18:35 (3)	07:19		16:12 (2)	08:14		14:59 (1)	08:45		15:10 (1)
	21:38	6	21:06 (8)	20:38	48	20:05 (4)	19:26	24	18:59 (3)	17:19	38	16:50 (2)	16:30	36	15:35 (1)	16:26	40	15:50 (1)
27	05:46		21:01 (8)	06:36		19:16 (4)	07:28		18:34 (3)	07:20		16:12 (2)	08:15		14:59 (1)	08:45		15:10 (1)
	21:36	4	21:05 (8)	20:36	49	20:05 (4)	19:24	22	18:56 (3)	17:17	36	16:48 (2)	16:29	37	15:36 (1)	16:27	40	15:50 (1)
28	05:48		20:23 (5)	06:38		19:16 (4)	07:30		18:35 (3)	07:22		16:13 (2)	08:17		14:58 (1)	08:45		15:10 (1)
	21:35	12	21:03 (8)	20:34	49	20:05 (4)	19:22	19	18:54 (3)	17:15	33	16:46 (2)	16:28	38	15:36 (1)	16:28	41	15:51 (1)
29	05:49		20:21 (5)	06:40		19:15 (4)	07:31		18:35 (3)	07:24		16:13 (2)	08:18		14:59 (1)	08:45		15:11 (1)
	21:33	15	20:36 (5)	20:32	49	20:04 (4)	19:19	17	18:52 (3)	17:13	31	16:44 (2)	16:28	38	15:37 (1)	16:28	40	15:51 (1)
30	05:51		20:19 (5)	06:41		19:16 (4)	07:33		18:35 (3)	07:26		16:14 (2)	08:20		14:59 (1)	08:45		15:11 (1)
	21:31	18	20:37 (5)	20:30	46	20:02 (4)	19:17	14	18:49 (3)	17:11	28	16:42 (2)	16:27	39	15:38 (1)	16:29	41	15:52 (1)
31	05:52		20:18 (5)	06:43		19:15 (4)				07:28		16:14 (2)				08:46		15:12 (1)
	21:30	21	20:39 (5)	20:27	44	19:59 (4)				17:09	26	16:40 (2)				16:30	40	15:52 (1)
Potential sun hours	504			455			381			331			264			241		
Total, worst case		640			1371			741			766			578			1246	
Sun reduction		0.33			0.35			0.34			0.28			0.26			0.22	
Oper. time red.		1.00			1.00			1.00			1.00			1.00			1.00	
Wind dir. red.		0.64			0.61			0.60			0.60			0.62			0.62	
Total reduction		0.21			0.22			0.20			0.17			0.16			0.14	
Total, real		135			297			151			130			93			168	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
Jennings O'Donovan
Finisklin Business Park
F91 RHH9 Sligo
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Calculated:
11/06/2025 09:22/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Real Case - V150 **Shadow receptor:** G - 7

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January		February		March		April		May		June	
1	08:46		15:12 (1)		08:18		07:23		16:48 (2)		07:12	
	16:32	42	15:54 (1)		17:20		18:13	38	17:26 (2)		20:08	19
2	08:45		15:12 (1)		08:16		07:21		16:49 (2)		07:09	
	16:33	43	15:55 (1)		17:22		18:15	36	17:25 (2)		20:10	13
3	08:45		15:13 (1)		08:15		07:19		16:51 (2)		07:07	
	16:34	42	15:55 (1)		17:24		18:17	33	17:24 (2)		20:11	
4	08:45		15:14 (1)		08:13		07:17		16:51 (2)		07:05	
	16:35	42	15:56 (1)		17:26		18:18	30	17:21 (2)		20:13	
5	08:45		15:14 (1)		08:11		07:15		16:53 (2)		07:02	
	16:36	42	15:56 (1)		17:28		18:20	27	17:20 (2)		20:15	4
6	08:44		15:15 (1)		08:10		07:12		16:56 (2)		07:00	
	16:37	42	15:57 (1)		17:30		18:22	21	17:17 (2)		20:17	10
7	08:44		15:15 (1)		08:08		16:59 (2)		07:10		16:58 (2)	
	16:39	42	15:57 (1)		17:32	3	17:02 (2)		18:24	15	17:13 (2)	
8	08:44		15:15 (1)		08:06		16:56 (2)		07:08			
	16:40	42	15:57 (1)		17:34	8	17:04 (2)		18:26			
9	08:43		15:16 (1)		08:04		16:55 (2)		07:05			
	16:41	42	15:58 (1)		17:35	11	17:06 (2)		18:27			
10	08:42		15:16 (1)		08:02		16:53 (2)		07:03			
	16:43	42	15:58 (1)		17:37	15	17:08 (2)		18:29			
11	08:42		15:16 (1)		08:01		16:52 (2)		07:01			
	16:44	42	15:58 (1)		17:39	18	17:10 (2)		18:31			
12	08:41		15:17 (1)		07:59		16:51 (2)		06:59			
	16:46	42	15:59 (1)		17:41	22	17:13 (2)		18:33			
13	08:40		15:17 (1)		07:57		16:50 (2)		06:56			
	16:47	42	15:59 (1)		17:43	25	17:15 (2)		18:35			
14	08:40		15:18 (1)		07:55		16:49 (2)		06:54		18:05 (3)	
	16:49	41	15:59 (1)		17:45	28	17:17 (2)		18:36	6	18:11 (3)	
15	08:39		15:18 (1)		07:53		16:48 (2)		06:52		18:04 (3)	
	16:50	41	15:59 (1)		17:47	31	17:19 (2)		18:38	9	18:13 (3)	
16	08:38		15:19 (1)		07:51		16:48 (2)		06:49		18:01 (3)	
	16:52	40	15:59 (1)		17:49	33	17:21 (2)		18:40	13	18:14 (3)	
17	08:37		15:20 (1)		07:49		16:47 (2)		06:47		18:00 (3)	
	16:54	39	15:59 (1)		17:51	36	17:23 (2)		18:42	16	18:16 (3)	
18	08:36		15:21 (1)		07:47		16:46 (2)		06:45		17:59 (3)	
	16:55	38	15:59 (1)		17:52	38	17:24 (2)		18:43	19	18:18 (3)	
19	08:35		15:22 (1)		07:45		16:46 (2)		06:42		17:58 (3)	
	16:57	38	16:00 (1)		17:54	40	17:26 (2)		18:45	21	18:19 (3)	
20	08:34		15:23 (1)		07:43		16:46 (2)		06:40		17:57 (3)	
	16:59	37	16:00 (1)		17:56	42	17:28 (2)		18:47	24	18:21 (3)	
21	08:33		15:23 (1)		07:41		16:46 (2)		06:38		17:57 (3)	
	17:00	36	15:59 (1)		17:58	44	17:30 (2)		18:49	26	18:23 (3)	
22	08:32		15:24 (1)		07:39		16:46 (2)		06:35		17:56 (3)	
	17:02	35	15:59 (1)		18:00	44	17:30 (2)		18:50	29	18:25 (3)	
23	08:31		15:26 (1)		07:36		16:46 (2)		06:33		17:56 (3)	
	17:04	33	15:59 (1)		18:02	44	17:30 (2)		18:52	31	18:27 (3)	
24	08:29		15:26 (1)		07:34		16:45 (2)		06:31		17:55 (3)	
	17:06	32	15:58 (1)		18:04	44	17:29 (2)		18:54	33	18:28 (3)	
25	08:28		15:28 (1)		07:32		16:46 (2)		06:28		17:55 (3)	
	17:07	29	15:57 (1)		18:06	43	17:29 (2)		18:56	34	18:29 (3)	
26	08:27		15:29 (1)		07:30		16:46 (2)		06:26		17:56 (3)	
	17:09	27	15:56 (1)		18:07	43	17:29 (2)		18:57	33	18:29 (3)	
27	08:25		15:31 (1)		07:28		16:47 (2)		06:23		17:55 (3)	
	17:11	24	15:55 (1)		18:09	41	17:28 (2)		18:59	32	18:27 (3)	
28	08:24		15:33 (1)		07:26		16:48 (2)		06:21		17:56 (3)	
	17:13	20	15:53 (1)		18:11	39	17:27 (2)		19:01	31	18:27 (3)	
29	08:22		15:35 (1)						07:19		18:57 (3)	
	17:15	16	15:51 (1)						20:03	29	19:26 (3)	
30	08:21		15:40 (1)						07:16		18:57 (3)	
	17:17	8	15:48 (1)						20:04	26	19:23 (3)	
31	08:19								07:14		18:59 (3)	
	17:18								20:06	23	19:22 (3)	
Potential sun hours	257		277		367		417		487		501	
Total, worst case		1081		692		635		1077		1056		681
Sun reduction		0.22		0.24		0.28		0.38		0.39		0.35
Oper. time red.		1.00		1.00		1.00		1.00		1.00		1.00
Wind dir. red.		0.62		0.60		0.60		0.60		0.62		0.64
Total reduction		0.13		0.15		0.17		0.23		0.24		0.22
Total, real		145		101		107		248		259		152

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
Jennings O'Donovan
Finisklin Business Park
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padraig / podowd@jodireland.com
Calculated:
11/06/2025 09:22/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Real Case - V150 **Shadow receptor:** G - 7

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	July		August		September		October			November			December		
1	05:17		21:04 (8)	05:54		20:20 (5)	06:45		19:29 (4)	07:35			07:30		16:23 (2)	08:21		14:59 (1)
	22:01	23	21:27 (6)	21:28	33	20:53 (5)	20:25	29	19:58 (4)	19:14			07:07	15	16:38 (2)	16:26	41	15:40 (1)
2	05:17		21:04 (8)	05:55		19:50 (4)	06:46		19:31 (4)	07:36			07:31		16:24 (2)	08:23		14:59 (1)
	22:00	23	21:27 (6)	21:26	45	20:52 (5)	20:23	25	19:56 (4)	19:12			17:05	12	16:36 (2)	16:25	42	15:41 (1)
3	05:18		21:04 (8)	05:57		19:47 (4)	06:48		19:31 (4)	07:38			07:33		16:26 (2)	08:24		14:59 (1)
	22:00	22	21:26 (8)	21:25	52	20:53 (5)	20:20	22	19:53 (4)	19:10			17:04	8	16:34 (2)	16:25	42	15:41 (1)
4	05:19		21:04 (8)	05:59		19:44 (4)	06:50		19:33 (4)	07:40			07:35		16:29 (2)	08:26		15:00 (1)
	22:00	22	21:26 (8)	21:23	58	20:53 (5)	20:18	18	19:51 (4)	19:07			17:02	3	16:32 (2)	16:24	42	15:42 (1)
5	05:20		21:04 (8)	06:00		19:43 (4)	06:51		19:34 (4)	07:42			07:37			08:27		15:00 (1)
	21:59	22	21:26 (8)	21:21	59	20:51 (5)	20:16	14	19:48 (4)	19:05			17:00			16:24	42	15:42 (1)
6	05:20		21:04 (8)	06:02		19:40 (4)	06:53		19:36 (4)	07:43		17:38 (2)	07:39			08:28		15:00 (1)
	21:59	21	21:25 (8)	21:19	61	20:49 (5)	20:13	10	19:46 (4)	19:03	10	17:48 (2)	16:58			16:23	42	15:42 (1)
7	05:21		21:03 (8)	06:03		19:39 (4)	06:55		19:40 (4)	07:45		17:33 (2)	07:41			08:30		15:01 (1)
	21:58	21	21:24 (8)	21:17	63	20:48 (5)	20:11	4	19:44 (4)	19:01	19	17:52 (2)	16:56			16:23	42	15:43 (1)
8	05:22		21:04 (8)	06:05		19:37 (4)	06:56			07:47		17:30 (2)	07:42			08:31		15:01 (1)
	21:57	20	21:24 (8)	21:16	64	20:46 (5)	20:09			18:58	24	17:54 (2)	16:55			16:22	42	15:43 (1)
9	05:23		21:04 (8)	06:07		19:37 (4)	06:58			07:48		17:27 (2)	07:44			08:32		15:01 (1)
	21:57	19	21:23 (8)	21:14	63	20:44 (5)	20:06			18:56	29	17:56 (2)	16:53			16:22	43	15:44 (1)
10	05:24		21:04 (8)	06:08		19:36 (4)	07:00		18:56 (3)	07:50		17:25 (2)	07:46			08:33		15:02 (1)
	21:56	18	21:22 (8)	21:12	63	20:43 (5)	20:04	13	19:09 (3)	18:54	32	17:57 (2)	16:51			16:22	43	15:45 (1)
11	05:25		21:04 (8)	06:10		19:34 (4)	07:01		18:54 (3)	07:52		17:24 (2)	07:48			08:34		15:03 (1)
	21:55	18	21:22 (8)	21:10	64	20:41 (5)	20:02	18	19:12 (3)	18:51	34	17:58 (2)	16:50			16:22	42	15:45 (1)
12	05:26		21:04 (8)	06:12		19:34 (4)	07:03		18:52 (3)	07:54		17:22 (2)	07:50		15:10 (1)	08:35		15:03 (1)
	21:54	17	21:21 (8)	21:08	63	20:39 (5)	19:59	22	19:14 (3)	18:49	36	17:58 (2)	16:48	9	15:19 (1)	16:22	42	15:45 (1)
13	05:28		21:04 (8)	06:13		19:32 (4)	07:05		18:49 (3)	07:55		17:21 (2)	07:51		15:07 (1)	08:36		15:04 (1)
	21:53	16	21:20 (8)	21:06	63	20:37 (5)	19:57	26	19:15 (3)	18:47	38	17:59 (2)	16:47	16	15:23 (1)	16:21	42	15:46 (1)
14	05:29		21:04 (8)	06:15		19:32 (4)	07:06		18:48 (3)	07:57		17:20 (2)	07:53		15:05 (1)	08:37		15:04 (1)
	21:52	15	21:19 (8)	21:04	61	20:36 (5)	19:55	28	19:16 (3)	18:45	40	18:00 (2)	16:45	20	15:25 (1)	16:21	42	15:46 (1)
15	05:30		21:05 (8)	06:16		19:31 (4)	07:08		18:46 (3)	07:59		17:19 (2)	07:55		15:03 (1)	08:38		15:05 (1)
	21:51	14	21:19 (8)	21:02	59	20:33 (5)	19:52	30	19:16 (3)	18:42	42	18:01 (2)	16:44	24	15:27 (1)	16:22	41	15:46 (1)
16	05:31		21:05 (8)	06:18		19:30 (4)	07:10		18:45 (3)	08:01		17:18 (2)	07:57		15:02 (1)	08:39		15:05 (1)
	21:50	13	21:18 (8)	21:00	58	20:32 (5)	19:50	31	19:16 (3)	18:40	43	18:01 (2)	16:42	27	15:29 (1)	16:22	41	15:46 (1)
17	05:32		21:05 (8)	06:20		19:29 (4)	07:11		18:44 (3)	08:02		17:18 (2)	07:59		15:01 (1)	08:40		15:05 (1)
	21:49	12	21:17 (8)	20:58	55	20:29 (5)	19:48	33	19:17 (3)	18:38	43	18:01 (2)	16:41	29	15:30 (1)	16:22	41	15:46 (1)
18	05:34		21:05 (8)	06:21		19:29 (4)	07:13		18:43 (3)	08:04		17:18 (2)	08:00		15:00 (1)	08:41		15:06 (1)
	21:48	11	21:16 (8)	20:56	53	20:28 (5)	19:45	34	19:17 (3)	18:36	43	18:01 (2)	16:40	32	15:32 (1)	16:22	40	15:46 (1)
19	05:35		21:05 (8)	06:23		19:29 (4)	07:15		18:42 (3)	08:06		17:16 (2)	08:02		15:00 (1)	08:41		15:07 (1)
	21:47	10	21:15 (8)	20:54	49	20:18 (4)	19:43	34	19:16 (3)	18:34	45	18:01 (2)	16:38	33	15:33 (1)	16:22	40	15:47 (1)
20	05:36		20:33 (5)	06:25		19:28 (4)	07:16		18:42 (3)	08:08		17:16 (2)	08:04		14:59 (1)	08:42		15:06 (1)
	21:46	15	21:14 (8)	20:51	50	20:18 (4)	19:40	32	19:14 (3)	18:32	45	18:01 (2)	16:37	35	15:34 (1)	16:23	41	15:47 (1)
21	05:38		20:30 (5)	06:26		19:28 (4)	07:18		18:41 (3)	08:10		17:16 (2)	08:05		14:59 (1)	08:43		15:07 (1)
	21:44	19	21:13 (8)	20:49	50	20:18 (4)	19:38	30	19:11 (3)	18:29	44	18:00 (2)	16:36	36	15:35 (1)	16:23	40	15:47 (1)
22	05:39		20:28 (5)	06:28		19:27 (4)	07:20		18:41 (3)	08:11		17:16 (2)	08:07		14:59 (1)	08:43		15:07 (1)
	21:43	20	21:11 (8)	20:47	50	20:17 (4)	19:36	28	19:09 (3)	18:27	42	17:58 (2)	16:35	37	15:36 (1)	16:24	40	15:47 (1)
23	05:40		20:26 (5)	06:30		19:27 (4)	07:21		18:42 (3)	08:13		17:16 (2)	08:09		14:58 (1)	08:44		15:08 (1)
	21:42	22	21:10 (8)	20:45	50	20:17 (4)	19:33	25	19:07 (3)	18:25	40	17:56 (2)	16:33	38	15:36 (1)	16:24	40	15:48 (1)
24	05:42		20:26 (5)	06:31		19:27 (4)	07:23		18:41 (3)	08:15		17:17 (2)	08:10		14:58 (1)	08:44		15:09 (1)
	21:40	22	21:09 (8)	20:43	48	20:15 (4)	19:31	23	19:04 (3)	18:23	37	17:54 (2)	16:32	38	15:36 (1)	16:25	40	15:49 (1)
25	05:43		20:24 (5)	06:33		19:27 (4)	07:25		18:42 (3)	07:17		16:17 (2)	08:12		14:58 (1)	08:44		15:09 (1)
	21:39	24	20:48 (5)	20:41	46	20:13 (4)	19:29	19	19:01 (3)	17:21	35	16:52 (2)	16:31	39	15:37 (1)	16:25	40	15:49 (1)
26	05:45		20:24 (5)	06:35		19:28 (4)	07:26		18:42 (3)	07:19		16:17 (2)	08:14		14:58 (1)	08:45		15:10 (1)
	21:38	25	20:49 (5)	20:38	43	20:11 (4)	19:26	17	18:59 (3)	17:19	33	16:50 (2)	16:30	40	15:38 (1)	16:26	41	15:51 (1)
27	05:46		20:23 (5)	06:36		19:27 (4)	07:28		18:42 (3)	07:20		16:18 (2)	08:15		14:58 (1)	08:45		15:10 (1)
	21:36	27	20:50 (5)	20:36	42	20:09 (4)	19:24	14	18:56 (3)	17:17	30	16:48 (2)	16:29	41	15:39 (1)	16:27	41	15:51 (1)
28	05:48		20:22 (5)	06:38		19:28 (4)	07:30		18:44 (3)	07:22		16:19 (2)	08:17		14:58 (1)	08:45		15:11 (1)
	21:35	28	20:50 (5)	20:34	39	20:07 (4)	19:22	10	18:54 (3)	17:15	27	16:46 (2)	16:28	41	15:39 (1)	16:28	41	15:52 (1)
29	05:49		20:22 (5)	06:40		19:27 (4)	07:31		18:45 (3)	07:24		16:20 (2)	08:18		14:58 (1)	08:45		15:11 (1)
	21:33	29	20:51 (5)	20:32	37	20:04 (4)	19:19	7	18:52 (3)	17:13	24	16:44 (2)	16:28	42	15:40 (1)	16:28	42	15:53 (1)
30	05:51		20:21 (5)	06:41		19:28 (4)	07:33		18:46 (3)	07:26		16:20 (2)	08:20		14:59 (1)	08:45		15:11 (1)
	21:31	31	20:52 (5)	20:30	34	20:02 (4)	19:17	3	18:49 (3)	17:11	22	16:42 (2)	16:27	42	15:41 (1)	16:29	42	15:53 (1)
31	05:52		20:21 (5)	06:43		19:28 (4)				07:28		16:22 (2)				08:46		15:12 (1)
	21:30	32	20:53 (5)	20:27	31	19:59 (4)				17:09	18	16:40 (2)				16:30	42	15:54 (1)
Potential sun hours	504			455			381			331			264			241		
Total, worst case		631			1606			599			875			657			1282	
Sun reduction		0.33			0.35			0.34			0.28			0.26			0.22	
Oper. time red.		1.00			1.00			1.00			1.00			1.00			1.00	
Wind dir. red.		0.63			0.61			0.60			0.60			0.62			0.62	
Total reduction		0.21			0.22			0.20			0.17			0.16			0.14	
Total, real		133			346			122			148			106			173	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
Jennings O'Donovan
Finisklin Business Park
F91 RHH9 Sligo
+353719161416
padraig / podowd@jodireland.com
Calculated:
11/06/2025 09:22/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Real Case - V150 **Shadow receptor:** H - 8

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January		February		March		April		May		June		
1	08:46	15:24 (1)	08:18	15:36 (1)	07:23	17:03 (2)	07:12	19:11 (3)	06:06	19:51 (4)	05:20	20:01 (4)	
	16:32	32	15:56 (1)	17:20	38	16:14 (1)	18:13	43	17:46 (2)	20:08	31	19:42 (3)	21:00	40	20:31 (4)	21:47	62	21:14 (8)
2	08:45		15:24 (1)	08:16	15:38 (1)	07:21	17:03 (2)	07:09	19:10 (3)	06:04	19:50 (4)	05:19	20:02 (4)	
	16:33	33	15:57 (1)	17:22	36	16:14 (1)	18:15	45	17:48 (2)	20:10	33	19:43 (3)	21:02	43	20:33 (4)	21:48	59	21:15 (8)
3	08:45		15:25 (1)	08:15	15:40 (1)	07:19	17:03 (2)	07:07	19:10 (3)	06:02	19:50 (4)	05:18	20:02 (4)	
	16:34	34	15:59 (1)	17:24	32	16:12 (1)	18:17	47	17:50 (2)	20:11	35	19:45 (3)	21:03	44	20:34 (4)	21:49	59	21:15 (8)
4	08:45		15:26 (1)	08:13	15:41 (1)	07:17	17:02 (2)	07:05	19:11 (3)	06:00	19:49 (4)	05:17	20:04 (4)	
	16:35	34	16:00 (1)	17:26	30	16:11 (1)	18:18	48	17:50 (2)	20:13	35	19:46 (3)	21:05	47	20:36 (4)	21:50	57	21:17 (8)
5	08:45		15:25 (1)	08:11	15:43 (1)	07:15	17:02 (2)	07:02	19:10 (3)	05:58	19:50 (4)	05:17	20:04 (4)	
	16:36	36	16:01 (1)	17:28	26	16:09 (1)	18:20	48	17:50 (2)	20:15	34	19:44 (3)	21:07	48	20:38 (4)	21:51	56	21:17 (8)
6	08:44		15:26 (1)	08:10	15:45 (1)	07:12	17:03 (2)	07:00	19:11 (3)	05:56	19:49 (4)	05:16	20:06 (4)	
	16:37	37	16:03 (1)	17:30	22	16:07 (1)	18:22	47	17:50 (2)	20:17	33	19:44 (3)	21:08	50	20:39 (5)	21:52	55	21:19 (8)
7	08:44		15:26 (1)	08:08	15:48 (1)	07:10	17:02 (2)	06:58	19:11 (3)	05:55	19:49 (4)	05:15	20:07 (4)	
	16:39	38	16:04 (1)	17:32	18	16:06 (1)	18:24	47	17:49 (2)	20:18	32	19:43 (3)	21:10	51	20:40 (5)	21:53	53	21:19 (8)
8	08:44		15:26 (1)	08:06	15:53 (1)	07:08	17:02 (2)	06:56	19:12 (3)	05:53	19:48 (4)	05:15	20:08 (4)	
	16:40	39	16:05 (1)	17:34	8	16:01 (1)	18:26	47	17:49 (2)	20:20	30	19:42 (3)	21:12	54	20:42 (5)	21:54	51	21:20 (8)
9	08:43		15:27 (1)	08:04			07:05	17:03 (2)	06:53	19:12 (3)	05:51	19:49 (4)	05:14	20:09 (4)	
	16:41	40	16:07 (1)	17:35			18:27	46	17:49 (2)	20:22	28	19:40 (3)	21:13	55	20:44 (5)	21:55	49	21:21 (8)
10	08:42		15:26 (1)	08:02			07:03	17:03 (2)	06:51	19:14 (3)	05:49	19:48 (4)	05:14	20:11 (4)	
	16:43	42	16:08 (1)	17:37			18:29	44	17:47 (2)	20:24	24	19:38 (3)	21:15	57	20:45 (5)	21:55	48	21:22 (8)
11	08:42		15:26 (1)	08:01			07:01	17:04 (2)	06:49	19:16 (3)	05:48	19:49 (4)	05:13	20:12 (4)	
	16:44	44	16:10 (1)	17:39			18:31	42	17:46 (2)	20:25	21	19:37 (3)	21:17	58	20:47 (5)	21:56	45	21:23 (8)
12	08:41		15:27 (1)	07:59			06:59	17:05 (2)	06:46	19:18 (3)	05:46	19:49 (4)	05:13	20:14 (4)	
	16:46	44	16:11 (1)	17:41			18:33	41	17:46 (2)	20:27	16	19:34 (3)	21:18	59	20:48 (5)	21:57	41	21:23 (8)
13	08:40		15:27 (1)	07:57			06:56	17:05 (2)	06:44	19:21 (3)	05:44	19:49 (4)	05:13	20:15 (4)	
	16:47	46	16:13 (1)	17:43			18:35	39	17:44 (2)	20:29	8	19:29 (3)	21:20	61	20:50 (5)	21:58	37	21:23 (8)
14	08:40		15:27 (1)	07:55			06:54	17:06 (2)	06:42			05:43	19:49 (4)	05:13	20:39 (5)	
	16:49	46	16:13 (1)	17:45			18:36	37	17:43 (2)	20:31			21:21	62	20:51 (5)	21:58	32	21:24 (8)
15	08:39		15:27 (1)	07:53			06:52	17:08 (2)	06:40			05:41	19:50 (4)	05:12	20:40 (5)	
	16:50	47	16:14 (1)	17:47			18:38	33	17:41 (2)	20:32			21:23	63	20:53 (5)	21:59	32	21:25 (8)
16	08:38		15:27 (1)	07:51			06:49	17:09 (2)	06:38			05:39	19:50 (4)	05:12	20:41 (5)	
	16:52	47	16:14 (1)	17:49			18:40	30	17:39 (2)	20:34			21:25	64	20:54 (5)	21:59	31	21:25 (8)
17	08:37		15:28 (1)	07:49		17:22 (2)	06:47	17:11 (2)	06:35			05:38	19:50 (4)	05:12	20:41 (5)	
	16:54	47	16:15 (1)	17:51	1	17:23 (2)	18:42	26	17:37 (2)	20:36			21:26	65	20:55 (5)	22:00	31	21:26 (8)
18	08:36		15:28 (1)	07:47		17:17 (2)	06:45	17:14 (2)	06:33			05:36	19:50 (4)	05:12	20:41 (5)	
	16:55	47	16:15 (1)	17:52	7	17:24 (2)	18:43	20	17:34 (2)	20:37			21:28	66	20:56 (5)	22:00	31	21:26 (8)
19	08:35		15:29 (1)	07:45		17:15 (2)	06:42	17:17 (2)	06:31			05:35	19:51 (4)	05:12	20:42 (5)	
	16:57	47	16:16 (1)	17:54	11	17:26 (2)	18:45	12	17:29 (2)	20:39			21:29	67	20:58 (5)	22:01	30	21:26 (8)
20	08:34		15:29 (1)	07:43		17:13 (2)	06:40			06:29		20:07 (4)	05:34		19:52 (4)	05:12		20:42 (5)
	16:59	47	16:16 (1)	17:56	15	17:28 (2)	18:47			20:41	6	20:13 (4)	21:31	67	20:59 (5)	22:01	30	21:26 (8)
21	08:33		15:29 (1)	07:41		17:11 (2)	06:38			06:27		20:04 (4)	05:32		19:52 (4)	05:12		20:42 (5)
	17:00	47	16:16 (1)	17:58	20	17:31 (2)	18:49			20:43	11	20:15 (4)	21:32	69	21:01 (5)	22:01	30	21:26 (8)
22	08:32		15:30 (1)	07:39		17:10 (2)	06:35			06:24		20:01 (4)	05:31		19:52 (4)	05:13		20:43 (5)
	17:02	46	16:16 (1)	18:00	23	17:33 (2)	18:50			20:44	15	20:16 (4)	21:34	69	21:01 (5)	22:01	30	21:27 (8)
23	08:30		15:31 (1)	07:36		17:09 (2)	06:33	18:22 (3)	06:22			19:59 (4)	05:30		19:53 (4)	05:13		20:43 (5)
	17:04	46	16:17 (1)	18:02	26	17:35 (2)	18:52	5	18:27 (3)	20:46	19	20:18 (4)	21:35	70	21:03 (5)	22:01	30	21:27 (8)
24	08:29		15:31 (1)	07:34		17:07 (2)	06:31	18:19 (3)	06:20			19:58 (4)	05:28		19:54 (4)	05:13		20:42 (5)
	17:06	45	16:16 (1)	18:04	29	17:36 (2)	18:54	9	18:28 (3)	20:48	22	20:20 (4)	21:36	69	21:03 (5)	22:02	31	21:27 (8)
25	08:28		15:32 (1)	07:32		17:06 (2)	06:28	18:17 (3)	06:18			19:56 (4)	05:27		19:55 (4)	05:13		20:43 (5)
	17:07	45	16:17 (1)	18:06	32	17:38 (2)	18:56	13	18:30 (3)	20:50	25	20:21 (4)	21:38	68	21:03 (5)	22:02	31	21:28 (8)
26	08:27		15:32 (1)	07:30		17:06 (2)	06:26	18:16 (3)	06:16			19:55 (4)	05:26		19:55 (4)	05:14		20:43 (5)
	17:09	44	16:16 (1)	18:07	35	17:41 (2)	18:57	16	18:32 (3)	20:51	28	20:23 (4)	21:39	68	21:03 (5)	22:02	30	21:27 (8)
27	08:25		15:33 (1)	07:28		17:05 (2)	06:23	18:14 (3)	06:14			19:54 (4)	05:25		19:56 (4)	05:14		20:43 (5)
	17:11	44	16:17 (1)	18:09	38	17:43 (2)	18:59	19	18:33 (3)	20:53	30	20:24 (4)	21:40	67	21:03 (5)	22:02	32	21:28 (8)
28	08:24		15:33 (1)	07:26		17:05 (2)	06:21	18:14 (3)	06:12			19:53 (4)	05:24		19:57 (4)	05:15		20:43 (5)
	17:13	43	16:16 (1)	18:11	40	17:45 (2)	19:01	21	18:35 (3)	20:55	33	20:26 (4)	21:42	66	21:03 (5)	22:01	31	21:27 (8)
29	08:22		15:34 (1)				07:19	19:13 (3)	06:10			19:52 (4)	05:23		19:58 (4)	05:15		20:21 (4)
	17:15	41	16:15 (1)				20:03	24	19:37 (3)	20:56	35	20:27 (4)	21:43	65	21:03 (5)	22:01	35	21:28 (8)
30	08:21		15:35 (1)				07:16	19:12 (3)	06:08			19:52 (4)	05:22		19:58 (4)	05:16		20:18 (4)
	17:17	40	16:15 (1)				20:04	26	19:38 (3)	20:58	38	20:30 (4)	21:44	64	21:02 (5)	22:01	41	21:27 (8)
31	08:19		15:36 (1)				07:14	19:11 (3)					05:21		20:00 (4)			
	17:18	39	16:15 (1)				20:06	29	19:40 (3)				21:45	63	21:03 (5)			
Potential sun hours	257		277		367		417		487		501		
Total, worst case		1307		487		904		622		1859		1210	
Sun reduction		0.22		0.24		0.28		0.38		0.39		0.35	
Oper. time red.		1.00		1.00		1.00		1.00		1.00		1.00	
Wind dir. red.		0.62		0.61		0.60		0.61		0.63		0.64	
Total reduction		0.13		0.15		0.17		0.23		0.25		0.22	
Total, real		175		72		152		146		460		267	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
Jennings O'Donovan
Finisklin Business Park
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+353719161416
padraig / podowd@jodireland.com

Calculated:
11/06/2025 09:22/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Real Case - V150 **Shadow receptor:** H - 8

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	July		August		September		October		November		December		
1	05:17		20:17 (4)	05:54		19:59 (4)	06:45		19:15 (3)	07:35		17:44 (2)	07:30			08:21		15:09 (1)
	22:01	43	21:27 (8)	21:28	59	20:58 (5)	20:25	21	19:36 (3)	19:14	40	18:24 (2)	17:07			16:26	43	15:52 (1)
2	05:17		20:16 (4)	05:55		19:58 (4)	06:46		19:13 (3)	07:36		17:43 (2)	07:31			08:23		15:10 (1)
	22:00	45	21:27 (8)	21:26	58	20:56 (5)	20:23	24	19:37 (3)	19:12	42	18:25 (2)	17:05			16:25	42	15:52 (1)
3	05:18		20:15 (4)	05:57		19:59 (4)	06:48		19:10 (3)	07:38		17:42 (2)	07:33		15:22 (1)	08:24		15:10 (1)
	22:00	47	21:26 (8)	21:25	56	20:55 (5)	20:20	28	19:38 (3)	19:10	44	18:26 (2)	17:04	10	15:32 (1)	16:25	40	15:50 (1)
4	05:19		20:14 (4)	05:59		19:58 (4)	06:50		19:09 (3)	07:40		17:40 (2)	07:35		15:18 (1)	08:26		15:11 (1)
	22:00	49	21:26 (8)	21:23	55	20:53 (5)	20:18	30	19:39 (3)	19:07	45	18:25 (2)	17:02	18	15:36 (1)	16:24	39	15:50 (1)
5	05:20		20:13 (4)	06:00		19:59 (4)	06:51		19:07 (3)	07:42		17:40 (2)	07:37		15:15 (1)	08:27		15:11 (1)
	21:59	53	21:26 (8)	21:21	52	20:51 (5)	20:16	32	19:39 (3)	19:05	46	18:26 (2)	17:00	23	15:38 (1)	16:24	38	15:49 (1)
6	05:20		20:13 (4)	06:02		19:58 (4)	06:53		19:07 (3)	07:43		17:39 (2)	07:39		15:13 (1)	08:28		15:11 (1)
	21:59	53	21:25 (8)	21:19	51	20:49 (5)	20:13	33	19:40 (3)	19:03	47	18:26 (2)	16:58	27	15:40 (1)	16:23	37	15:48 (1)
7	05:21		20:11 (4)	06:03		19:59 (4)	06:55		19:06 (3)	07:45		17:39 (2)	07:41		15:11 (1)	08:30		15:12 (1)
	21:58	55	21:24 (8)	21:17	49	20:48 (5)	20:11	34	19:40 (3)	19:01	47	18:26 (2)	16:56	31	15:42 (1)	16:23	36	15:48 (1)
8	05:22		20:11 (4)	06:05		19:58 (4)	06:56		19:05 (3)	07:47		17:38 (2)	07:42		15:10 (1)	08:31		15:13 (1)
	21:57	56	21:24 (8)	21:16	48	20:46 (4)	20:09	35	19:40 (3)	18:58	47	18:25 (2)	16:55	33	15:43 (1)	16:22	34	15:47 (1)
9	05:23		20:10 (4)	06:07		19:59 (4)	06:58		19:05 (3)	07:48		17:37 (2)	07:44		15:09 (1)	08:32		15:13 (1)
	21:57	59	21:23 (8)	21:14	45	20:44 (4)	20:06	35	19:40 (3)	18:56	48	18:25 (2)	16:53	36	15:45 (1)	16:22	34	15:47 (1)
10	05:24		20:09 (4)	06:08		19:59 (4)	07:00		19:03 (3)	07:50		17:37 (2)	07:46		15:08 (1)	08:33		15:15 (1)
	21:56	59	21:22 (8)	21:12	44	20:43 (4)	20:04	34	19:37 (3)	18:54	48	18:25 (2)	16:51	38	15:46 (1)	16:22	32	15:47 (1)
11	05:25		20:09 (4)	06:10		19:59 (4)	07:01		19:03 (3)	07:52		17:37 (2)	07:48		15:07 (1)	08:34		15:15 (1)
	21:55	61	21:22 (8)	21:10	42	20:41 (4)	20:02	32	19:35 (3)	18:51	47	18:24 (2)	16:50	39	15:46 (1)	16:22	32	15:47 (1)
12	05:26		20:08 (4)	06:12		20:00 (4)	07:03		19:04 (3)	07:54		17:37 (2)	07:50		15:06 (1)	08:35		15:16 (1)
	21:54	61	21:10 (5)	21:08	39	20:39 (4)	19:59	29	19:33 (3)	18:49	43	18:20 (2)	16:48	40	15:46 (1)	16:22	30	15:46 (1)
13	05:28		20:07 (4)	06:13		20:00 (4)	07:05		19:03 (3)	07:55		17:37 (2)	07:51		15:05 (1)	08:36		15:16 (1)
	21:53	64	21:11 (5)	21:06	37	20:37 (4)	19:57	27	19:30 (3)	18:47	41	18:18 (2)	16:47	42	15:47 (1)	16:22	30	15:46 (1)
14	05:29		20:07 (4)	06:15		20:01 (4)	07:06		19:03 (3)	07:57		17:37 (2)	07:53		15:05 (1)	08:37		15:17 (1)
	21:52	64	21:11 (5)	21:04	35	20:36 (4)	19:55	25	19:28 (3)	18:45	39	18:16 (2)	16:45	43	15:48 (1)	16:21	29	15:46 (1)
15	05:30		20:07 (4)	06:16		20:01 (4)	07:08		19:03 (3)	07:59		17:38 (2)	07:55		15:05 (1)	08:38		15:17 (1)
	21:51	65	21:12 (5)	21:02	32	20:33 (4)	19:52	22	19:25 (3)	18:42	36	18:14 (2)	16:44	44	15:49 (1)	16:22	29	15:46 (1)
16	05:31		20:06 (4)	06:18		20:02 (4)	07:10		19:04 (3)	08:01		17:38 (2)	07:57		15:05 (1)	08:39		15:18 (1)
	21:50	67	21:13 (5)	21:00	30	20:32 (4)	19:50	19	19:23 (3)	18:40	34	18:12 (2)	16:42	44	15:49 (1)	16:22	28	15:46 (1)
17	05:32		20:05 (4)	06:20		20:02 (4)	07:11		19:04 (3)	08:02		17:39 (2)	07:59		15:05 (1)	08:40		15:18 (1)
	21:49	68	21:13 (5)	20:58	27	20:29 (4)	19:48	17	19:21 (3)	18:38	31	18:10 (2)	16:41	45	15:50 (1)	16:22	28	15:46 (1)
18	05:34		20:05 (4)	06:21		20:03 (4)	07:13		19:05 (3)	08:04		17:40 (2)	08:00		15:05 (1)	08:41		15:19 (1)
	21:48	68	21:13 (5)	20:56	25	20:28 (4)	19:45	13	19:18 (3)	18:36	28	18:08 (2)	16:40	45	15:50 (1)	16:22	27	15:46 (1)
19	05:35		20:04 (4)	06:23		20:05 (4)	07:15		19:06 (3)	08:06		17:40 (2)	08:02		15:05 (1)	08:41		15:20 (1)
	21:47	69	21:13 (5)	20:54	21	20:26 (4)	19:43	10	19:16 (3)	18:34	25	18:05 (2)	16:38	46	15:51 (1)	16:22	27	15:47 (1)
20	05:36		20:04 (4)	06:25		20:05 (4)	07:16		19:08 (3)	08:08		17:41 (2)	08:04		15:05 (1)	08:42		15:20 (1)
	21:46	70	21:14 (5)	20:51	18	20:23 (4)	19:40	6	19:14 (3)	18:32	21	18:02 (2)	16:37	46	15:51 (1)	16:23	27	15:47 (1)
21	05:38		20:03 (4)	06:26		20:07 (4)	07:18		19:09 (3)	08:10		17:42 (2)	08:05		15:05 (1)	08:43		15:20 (1)
	21:44	70	21:13 (5)	20:49	15	20:22 (4)	19:38	2	19:11 (3)	18:29	18	18:00 (2)	16:36	47	15:52 (1)	16:23	27	15:47 (1)
22	05:39		20:02 (4)	06:28		20:09 (4)	07:20			08:11		17:44 (2)	08:07		15:05 (1)	08:43		15:20 (1)
	21:43	69	21:11 (5)	20:47	10	20:19 (4)	19:36			18:27	14	17:58 (2)	16:35	47	15:52 (1)	16:24	27	15:47 (1)
23	05:40		20:02 (4)	06:30		20:12 (4)	07:21			08:13		17:46 (2)	08:09		15:05 (1)	08:44		15:21 (1)
	21:42	68	21:10 (5)	20:45	5	20:17 (4)	19:33			18:25	10	17:56 (2)	16:33	47	15:52 (1)	16:24	27	15:48 (1)
24	05:42		20:02 (4)	06:31			07:23		18:04 (2)	08:15		17:48 (2)	08:10		15:05 (1)	08:44		15:22 (1)
	21:40	67	21:09 (5)	20:43			19:31	6	18:10 (2)	18:23	6	17:54 (2)	16:32	47	15:52 (1)	16:25	27	15:49 (1)
25	05:43		20:01 (4)	06:33			07:25		17:58 (2)	07:17			08:12		15:06 (1)	08:44		15:22 (1)
	21:39	67	21:08 (5)	20:41			19:29	18	18:16 (2)	17:21			16:31	47	15:53 (1)	16:25	27	15:49 (1)
26	05:45		20:01 (4)	06:35			07:26		17:55 (2)	07:19			08:14		15:07 (1)	08:45		15:23 (1)
	21:38	66	21:07 (5)	20:38			19:26	24	18:19 (2)	17:19			16:30	46	15:53 (1)	16:26	28	15:51 (1)
27	05:46		20:01 (4)	06:36			07:28		17:51 (2)	07:20			08:15		15:07 (1)	08:45		15:23 (1)
	21:36	64	21:05 (5)	20:36			19:24	29	18:20 (2)	17:17			16:29	47	15:54 (1)	16:27	28	15:51 (1)
28	05:48		20:00 (4)	06:38			07:30		17:49 (2)	07:22			08:17		15:07 (1)	08:45		15:23 (1)
	21:35	63	21:03 (5)	20:34			19:22	33	18:22 (2)	17:15			16:28	46	15:53 (1)	16:28	29	15:52 (1)
29	05:49		20:00 (4)	06:40			07:31		17:48 (2)	07:24			08:18		15:08 (1)	08:45		15:24 (1)
	21:33	63	21:03 (5)	20:32			19:19	35	18:23 (2)	17:13			16:28	46	15:54 (1)	16:28	29	15:53 (1)
30	05:51		19:59 (4)	06:41		19:21 (3)	07:33		17:45 (2)	07:26			08:20		15:09 (1)	08:45		15:24 (1)
	21:31	62	21:01 (5)	20:30	9	19:30 (3)	19:17	38	18:23 (2)	17:11			16:27	44	15:53 (1)	16:29	30	15:54 (1)
31	05:52		20:00 (4)	06:43		19:17 (3)				07:28						08:46		15:24 (1)
	21:30	60	21:00 (5)	20:27	16	19:33 (3)				17:09						16:30	31	15:55 (1)
Potential sun hours	504			455			381			331			264			241		
Total, worst case		1895			878			691			847			1114			972	
Sun reduction		0.33			0.35			0.34			0.28			0.26			0.22	
Oper. time red.		1.00			1.00			1.00			1.00			1.00			1.00	
Wind dir. red.		0.63			0.62			0.61			0.60			0.62			0.62	
Total reduction		0.21			0.22			0.21			0.17			0.16			0.13	
Total, real		396			194			142			144			179			131	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
Jennings O'Donovan
Finisklin Business Park
F91 RHH9 Sligo
+353719161416
padraig / podowd@jodireland.com
Calculated:
11/06/2025 09:22/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Real Case - V150 **Shadow receptor:** I - 9

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January		February		March		April		May		June	
1	08:46		15:47 (1)	08:18		15:46 (1)	07:23		17:32 (2)	07:12		19:31 (3)	06:06		20:26 (4)	05:20		20:12 (4)
	16:32	9	15:56 (1)	17:20	49	16:35 (1)	18:13	14	17:46 (2)	20:08	11	19:42 (3)	21:00	5	20:31 (4)	21:47	62	21:14 (5)
2	08:45		15:47 (1)	08:16		15:47 (1)	07:21		17:31 (2)	07:09		19:29 (3)	06:04		20:23 (4)	05:19		20:12 (4)
	16:33	10	15:57 (1)	17:22	48	16:35 (1)	18:15	17	17:48 (2)	20:10	14	19:43 (3)	21:02	10	20:33 (4)	21:48	63	21:15 (5)
3	08:45		15:47 (1)	08:15		15:47 (1)	07:19		17:29 (2)	07:07		19:28 (3)	06:02		20:21 (4)	05:18		20:12 (4)
	16:34	12	15:59 (1)	17:24	48	16:35 (1)	18:17	22	17:51 (2)	20:11	17	19:45 (3)	21:03	13	20:34 (4)	21:49	63	21:15 (5)
4	08:45		15:47 (1)	08:13		15:47 (1)	07:17		17:27 (2)	07:05		19:27 (3)	06:00		20:19 (4)	05:17		20:13 (4)
	16:35	13	16:00 (1)	17:26	48	16:35 (1)	18:18	25	17:52 (2)	20:13	20	19:47 (3)	21:05	17	20:36 (4)	21:50	64	21:17 (5)
5	08:45		15:47 (1)	08:11		15:48 (1)	07:15		17:26 (2)	07:02		19:25 (3)	05:58		20:19 (4)	05:17		20:13 (4)
	16:36	14	16:01 (1)	17:28	46	16:34 (1)	18:20	28	17:54 (2)	20:15	23	19:48 (3)	21:07	19	20:38 (4)	21:51	64	21:17 (5)
6	08:44		15:47 (1)	08:10		15:48 (1)	07:12		17:25 (2)	07:00		19:25 (3)	05:56		20:17 (4)	05:16		20:14 (4)
	16:37	16	16:03 (1)	17:30	46	16:34 (1)	18:22	31	17:56 (2)	20:17	25	19:50 (3)	21:08	22	20:39 (4)	21:52	65	21:19 (5)
7	08:44		15:46 (1)	08:08		15:50 (1)	07:10		17:23 (2)	06:58		19:25 (3)	05:55		20:16 (4)	05:15		20:14 (4)
	16:39	18	16:04 (1)	17:32	44	16:34 (1)	18:24	34	17:57 (2)	20:18	27	19:52 (3)	21:10	24	20:40 (4)	21:53	65	21:19 (5)
8	08:44		15:46 (1)	08:06		15:51 (1)	07:08		17:22 (2)	06:56		19:24 (3)	05:53		20:14 (4)	05:15		20:15 (4)
	16:40	19	16:05 (1)	17:34	42	16:33 (1)	18:26	37	17:59 (2)	20:20	30	19:54 (3)	21:12	28	20:42 (4)	21:54	64	21:19 (5)
9	08:43		15:46 (1)	08:04		15:52 (1)	07:05		17:22 (2)	06:53		19:23 (3)	05:51		20:14 (4)	05:14		20:15 (4)
	16:41	21	16:07 (1)	17:35	40	16:32 (1)	18:27	40	18:02 (2)	20:22	32	19:55 (3)	21:13	30	20:44 (4)	21:55	64	21:19 (5)
10	08:42		15:46 (1)	08:02		15:53 (1)	07:03		17:21 (2)	06:51		19:23 (3)	05:49		20:13 (4)	05:14		20:15 (4)
	16:43	22	16:08 (1)	17:37	38	16:31 (1)	18:29	42	18:03 (2)	20:24	34	19:57 (3)	21:15	32	20:45 (4)	21:55	64	21:19 (5)
11	08:42		15:45 (1)	08:01		15:54 (1)	07:01		17:20 (2)	06:49		19:23 (3)	05:48		20:13 (4)	05:13		20:16 (4)
	16:44	25	16:10 (1)	17:39	36	16:30 (1)	18:31	45	18:05 (2)	20:25	36	19:59 (3)	21:17	34	20:47 (4)	21:56	64	21:20 (5)
12	08:41		15:45 (1)	07:59		15:55 (1)	06:59		17:20 (2)	06:46		19:24 (3)	05:46		20:12 (4)	05:13		20:17 (4)
	16:46	26	16:11 (1)	17:41	34	16:29 (1)	18:33	47	18:07 (2)	20:27	34	19:58 (3)	21:18	36	20:48 (4)	21:57	63	21:20 (5)
13	08:40		15:45 (1)	07:57		15:57 (1)	06:56		17:19 (2)	06:44		19:23 (3)	05:44		20:12 (4)	05:13		20:16 (4)
	16:47	28	16:13 (1)	17:43	31	16:28 (1)	18:35	49	18:08 (2)	20:29	34	19:57 (3)	21:20	38	20:50 (4)	21:58	63	21:19 (5)
14	08:40		15:45 (1)	07:55		15:59 (1)	06:54		17:19 (2)	06:42		19:24 (3)	05:43		20:11 (4)	05:13		20:17 (4)
	16:49	29	16:14 (1)	17:45	27	16:26 (1)	18:36	49	18:08 (2)	20:31	32	19:56 (3)	21:21	40	20:51 (5)	21:58	63	21:20 (5)
15	08:39		15:45 (1)	07:53		16:02 (1)	06:52		17:19 (2)	06:40		19:24 (3)	05:41		20:11 (4)	05:12		20:17 (4)
	16:50	31	16:16 (1)	17:47	21	16:23 (1)	18:38	50	18:09 (2)	20:32	31	19:55 (3)	21:23	42	20:53 (5)	21:59	63	21:20 (5)
16	08:38		15:45 (1)	07:51		16:06 (1)	06:49		17:19 (2)	06:38		19:25 (3)	05:39		20:10 (4)	05:12		20:17 (4)
	16:52	33	16:18 (1)	17:49	14	16:20 (1)	18:40	48	18:07 (2)	20:34	29	19:54 (3)	21:25	44	20:54 (5)	21:59	63	21:20 (5)
17	08:37		15:45 (1)	07:49			06:47		17:19 (2)	06:35		19:26 (3)	05:38		20:11 (4)	05:12		20:18 (4)
	16:54	35	16:20 (1)	17:51			18:42	48	18:07 (2)	20:36	27	19:53 (3)	21:26	44	20:55 (5)	22:00	63	21:26 (8)
18	08:36		15:45 (1)	07:47			06:45		17:19 (2)	06:33		19:28 (3)	05:36		20:10 (4)	05:12		20:18 (4)
	16:55	37	16:22 (1)	17:52			18:43	48	18:07 (2)	20:37	24	19:52 (3)	21:28	46	20:56 (5)	22:00	63	21:26 (8)
19	08:35		15:45 (1)	07:45			06:42		17:19 (2)	06:31		19:29 (3)	05:35		20:10 (4)	05:12		20:18 (4)
	16:57	39	16:24 (1)	17:54			18:45	47	18:06 (2)	20:39	21	19:50 (3)	21:29	48	20:58 (5)	22:01	63	21:26 (8)
20	08:34		15:45 (1)	07:43			06:40		17:20 (2)	06:29		19:30 (3)	05:34		20:10 (4)	05:12		20:18 (4)
	16:59	41	16:26 (1)	17:56			18:47	45	18:05 (2)	20:41	17	19:47 (3)	21:31	49	20:59 (5)	22:01	63	21:26 (8)
21	08:33		15:44 (1)	07:41			06:38		17:21 (2)	06:27		19:34 (3)	05:32		20:10 (4)	05:12		20:18 (4)
	17:00	43	16:27 (1)	17:58			18:49	43	18:04 (2)	20:43	9	19:43 (3)	21:32	51	21:01 (5)	22:01	63	21:26 (8)
22	08:32		15:45 (1)	07:39			06:35		17:21 (2)	06:24			05:31		20:10 (4)	05:13		20:19 (4)
	17:02	45	16:30 (1)	18:00			18:50	41	18:02 (2)	20:44			21:34	51	21:01 (5)	22:01	63	21:27 (8)
23	08:30		15:45 (1)	07:36			06:33		17:22 (2)	06:22			05:30		20:10 (4)	05:13		20:19 (4)
	17:04	47	16:32 (1)	18:02			18:52	39	18:01 (2)	20:46			21:35	53	21:03 (5)	22:01	63	21:27 (8)
24	08:29		15:44 (1)	07:34			06:31		17:22 (2)	06:20			05:28		20:10 (4)	05:13		20:19 (4)
	17:06	49	16:33 (1)	18:04			18:54	37	17:59 (2)	20:48			21:36	54	21:04 (5)	22:02	63	21:27 (8)
25	08:28		15:45 (1)	07:32			06:28		17:24 (2)	06:18			05:27		20:10 (4)	05:13		20:20 (4)
	17:07	49	16:34 (1)	18:06			18:56	34	17:58 (2)	20:50			21:38	56	21:06 (5)	22:02	63	21:28 (8)
26	08:27		15:45 (1)	07:30			06:26		17:26 (2)	06:16			05:26		20:11 (4)	05:14		20:20 (4)
	17:09	49	16:34 (1)	18:07			18:57	30	17:56 (2)	20:51			21:39	56	21:07 (5)	22:02	62	21:22 (5)
27	08:25		15:45 (1)	07:28		17:39 (2)	06:23		17:27 (2)	06:14			05:25		20:11 (4)	05:14		20:20 (4)
	17:11	50	16:35 (1)	18:09	4	17:43 (2)	18:59	26	17:53 (2)	20:53			21:40	57	21:08 (5)	22:02	63	21:23 (5)
28	08:24		15:45 (1)	07:26		17:36 (2)	06:21		17:30 (2)	06:12			05:24		20:11 (4)	05:15		20:20 (4)
	17:13	50	16:35 (1)	18:11	9	17:45 (2)	19:01	21	17:51 (2)	20:55			21:42	58	21:09 (5)	22:01	63	21:23 (5)
29	08:22		15:45 (1)				07:19		18:34 (2)	06:10			05:23		20:11 (4)	05:15		20:20 (4)
	17:15	50	16:35 (1)				20:03	13	18:47 (2)	20:56			21:43	59	21:10 (5)	22:01	63	21:23 (5)
30	08:21		15:46 (1)				07:16		19:35 (3)	06:08			05:22		20:11 (4)	05:16		20:20 (4)
	17:17	49	16:35 (1)				20:04	3	19:38 (3)	20:58			21:44	60	21:11 (5)	22:01	63	21:23 (5)
31	08:19		15:46 (1)				07:14		19:33 (3)				05:21		20:12 (4)			
	17:18	49	16:35 (1)				20:06	7	19:40 (3)				21:45	61	21:13 (5)			
Potential sun hours	257			277			367			417			487			501		
Total, worst case		1008			625			1060			527			1237			1898	
Sun reduction		0.22			0.24			0.28			0.38			0.39			0.35	
Oper. time red.		1.00			1.00			1.00			1.00			1.00			1.00	
Wind dir. red.		0.61			0.61			0.60			0.61			0.63			0.64	
Total reduction		0.13			0.15			0.17			0.23			0.25			0.22	
Total, real		134			93			176			122			310			419	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

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SHADOW - Calendar

Calculation: 6839 Garrane WF Real Case - V150 **Shadow receptor:** I - 9

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	July		August		September		October		November		December		
1	05:17		20:20 (4)	05:54		20:23 (4)	06:45		19:22 (3)	07:35		17:59 (2)	07:30		15:22 (1)	08:21		15:28 (1)
	22:01	64	21:24 (5)	21:28	35	20:58 (4)	20:25	36	19:58 (3)	19:14	48	18:47 (2)	17:07	39	16:01 (1)	16:26	24	15:52 (1)
2	05:17		20:21 (4)	05:55		20:23 (4)	06:46		19:22 (3)	07:36		17:59 (2)	07:31		15:21 (1)	08:23		15:29 (1)
	22:00	63	21:24 (5)	21:26	33	20:56 (4)	20:23	34	19:56 (3)	19:12	46	18:45 (2)	17:05	41	16:02 (1)	16:25	23	15:52 (1)
3	05:18		20:20 (4)	05:57		20:24 (4)	06:48		19:21 (3)	07:38		17:59 (2)	07:33		15:20 (1)	08:24		15:29 (1)
	22:00	64	21:24 (5)	21:25	31	20:55 (4)	20:20	32	19:53 (3)	19:10	44	18:43 (2)	17:04	43	16:03 (1)	16:25	21	15:50 (1)
4	05:19		20:20 (4)	05:59		20:24 (4)	06:50		19:21 (3)	07:40		17:59 (2)	07:35		15:20 (1)	08:26		15:31 (1)
	22:00	64	21:24 (5)	21:23	29	20:53 (4)	20:18	30	19:51 (3)	19:07	41	18:40 (2)	17:02	44	16:04 (1)	16:24	19	15:50 (1)
5	05:20		20:20 (4)	06:00		20:25 (4)	06:51		19:21 (3)	07:42		17:59 (2)	07:37		15:19 (1)	08:27		15:31 (1)
	21:59	65	21:25 (5)	21:21	26	20:51 (4)	20:16	27	19:48 (3)	19:05	38	18:37 (2)	17:00	45	16:04 (1)	16:24	18	15:49 (1)
6	05:20		20:21 (4)	06:02		20:25 (4)	06:53		19:21 (3)	07:43		18:00 (2)	07:39		15:18 (1)	08:28		15:32 (1)
	21:59	64	21:25 (5)	21:19	24	20:49 (4)	20:13	25	19:46 (3)	19:03	35	18:35 (2)	16:58	47	16:05 (1)	16:23	16	15:48 (1)
7	05:21		20:20 (4)	06:03		20:27 (4)	06:55		19:22 (3)	07:45		18:00 (2)	07:41		15:18 (1)	08:30		15:34 (1)
	21:58	64	21:24 (5)	21:17	21	20:48 (4)	20:11	22	19:44 (3)	19:01	33	18:33 (2)	16:56	47	16:05 (1)	16:23	14	15:48 (1)
8	05:22		20:20 (4)	06:05		20:27 (4)	06:56		19:21 (3)	07:47		18:00 (2)	07:42		15:18 (1)	08:31		15:34 (1)
	21:57	64	21:24 (5)	21:16	19	20:46 (4)	20:09	20	19:41 (3)	18:58	30	18:30 (2)	16:55	48	16:06 (1)	16:22	13	15:47 (1)
9	05:23		20:20 (4)	06:07		20:29 (4)	06:58		19:22 (3)	07:48		18:01 (2)	07:44		15:18 (1)	08:32		15:35 (1)
	21:57	63	21:23 (5)	21:14	15	20:44 (4)	20:06	18	19:40 (3)	18:56	27	18:28 (2)	16:53	48	16:06 (1)	16:22	12	15:47 (1)
10	05:24		20:20 (4)	06:08		20:31 (4)	07:00		19:22 (3)	07:50		18:02 (2)	07:46		15:17 (1)	08:33		15:37 (1)
	21:56	62	21:22 (5)	21:12	12	20:43 (4)	20:04	15	19:37 (3)	18:54	24	18:26 (2)	16:51	50	16:07 (1)	16:22	10	15:47 (1)
11	05:25		20:20 (4)	06:10		20:32 (4)	07:01		19:23 (3)	07:52		18:04 (2)	07:48		15:17 (1)	08:34		15:38 (1)
	21:55	62	21:22 (5)	21:10	9	20:41 (4)	20:02	12	19:35 (3)	18:51	20	18:24 (2)	16:50	50	16:07 (1)	16:22	9	15:47 (1)
12	05:26		20:20 (4)	06:12		20:35 (4)	07:03		19:25 (3)	07:54		18:04 (2)	07:50		15:17 (1)	08:35		15:39 (1)
	21:54	61	21:21 (5)	21:08	4	20:39 (4)	19:59	8	19:33 (3)	18:49	16	18:20 (2)	16:48	49	16:06 (1)	16:22	7	15:46 (1)
13	05:28		20:20 (4)	06:13			07:05		19:26 (3)	07:55		18:06 (2)	07:51		15:17 (1)	08:36		15:40 (1)
	21:53	60	21:20 (5)	21:06			19:57	4	19:30 (3)	18:47	12	18:18 (2)	16:47	49	16:06 (1)	16:22	6	15:46 (1)
14	05:29		20:20 (4)	06:15			07:06		18:25 (2)	07:57		18:09 (2)	07:53		15:17 (1)	08:37		15:41 (1)
	21:52	59	21:19 (5)	21:04			19:55	11	18:36 (2)	18:45	7	18:16 (2)	16:45	50	16:07 (1)	16:22	5	15:46 (1)
15	05:30		20:20 (4)	06:17			07:08		18:20 (2)	07:59		18:13 (2)	07:55		15:17 (1)	08:38		15:42 (1)
	21:51	59	21:19 (5)	21:02			19:52	19	18:39 (2)	18:42	1	18:14 (2)	16:44	50	16:07 (1)	16:22	4	15:46 (1)
16	05:31		20:20 (4)	06:18			07:10		18:17 (2)	08:01			07:57		15:17 (1)	08:39		15:43 (1)
	21:50	58	21:18 (5)	21:00			19:50	25	18:42 (2)	18:40			16:42	50	16:07 (1)	16:22	3	15:46 (1)
17	05:32		20:20 (4)	06:20			07:11		18:15 (2)	08:02			07:59		15:18 (1)	08:40		15:43 (1)
	21:49	57	21:17 (5)	20:58			19:48	29	18:44 (2)	18:38			16:41	49	16:07 (1)	16:22	3	15:46 (1)
18	05:34		20:20 (4)	06:21			07:13		18:12 (2)	08:04			08:00		15:18 (1)	08:41		15:44 (1)
	21:48	56	21:16 (5)	20:56			19:45	33	18:45 (2)	18:36			16:40	49	16:07 (1)	16:22	2	15:46 (1)
19	05:35		20:20 (4)	06:23			07:15		18:10 (2)	08:06			08:02		15:19 (1)	08:41		15:45 (1)
	21:47	54	21:14 (5)	20:54			19:43	36	18:46 (2)	18:34			16:38	47	16:06 (1)	16:22	2	15:47 (1)
20	05:36		20:21 (4)	06:25			07:16		18:09 (2)	08:08			08:04		15:20 (1)	08:42		15:45 (1)
	21:46	53	21:14 (5)	20:51			19:40	39	18:48 (2)	18:32			16:37	45	16:05 (1)	16:23	2	15:47 (1)
21	05:38		20:20 (4)	06:26			07:18		18:06 (2)	08:10			08:05		15:20 (1)	08:43		15:46 (1)
	21:44	53	21:13 (5)	20:49			19:38	42	18:48 (2)	18:29			16:36	43	16:03 (1)	16:23	1	15:47 (1)
22	05:39		20:20 (4)	06:28		19:38 (3)	07:20		18:05 (2)	08:11			08:07		15:21 (1)	08:43		15:46 (1)
	21:43	51	21:11 (5)	20:47	10	19:48 (3)	19:36	44	18:49 (2)	18:27			16:35	41	16:02 (1)	16:24	1	15:47 (1)
23	05:40		20:20 (4)	06:30		19:35 (3)	07:21		18:05 (2)	08:13			08:09		15:21 (1)	08:44		15:47 (1)
	21:42	50	21:10 (5)	20:45	17	19:52 (3)	19:33	44	18:49 (2)	18:25			16:33	39	16:00 (1)	16:24	1	15:48 (1)
24	05:42		20:21 (4)	06:31		19:32 (3)	07:23		18:03 (2)	08:15			08:10		15:22 (1)	08:44		15:47 (1)
	21:40	48	21:09 (5)	20:43	21	19:53 (3)	19:31	46	18:49 (2)	18:23			16:32	37	15:59 (1)	16:25	2	15:49 (1)
25	05:43		20:20 (4)	06:33		19:30 (3)	07:25		18:02 (2)	07:17			08:12		15:23 (1)	08:44		15:47 (1)
	21:39	48	21:08 (5)	20:41	25	19:55 (3)	19:29	47	18:49 (2)	17:21			16:31	35	15:58 (1)	16:25	2	15:49 (1)
26	05:45		20:21 (4)	06:35		19:29 (3)	07:26		18:02 (2)	07:19		15:34 (1)	08:14		15:24 (1)	08:45		15:48 (1)
	21:38	46	21:07 (5)	20:38	27	19:56 (3)	19:26	48	18:50 (2)	17:19	16	15:50 (1)	16:30	33	15:57 (1)	16:26	3	15:51 (1)
27	05:46		20:21 (4)	06:36		19:27 (3)	07:28		18:00 (2)	07:20		15:31 (1)	08:15		15:25 (1)	08:45		15:48 (1)
	21:36	44	21:05 (5)	20:36	29	19:56 (3)	19:24	49	18:49 (2)	17:17	22	15:53 (1)	16:29	31	15:56 (1)	16:27	3	15:51 (1)
28	05:48		20:21 (4)	06:38		19:26 (3)	07:30		18:00 (2)	07:22		15:28 (1)	08:17		15:25 (1)	08:45		15:48 (1)
	21:35	42	21:03 (5)	20:34	31	19:57 (3)	19:22	49	18:49 (2)	17:15	28	15:56 (1)	16:28	30	15:55 (1)	16:28	4	15:52 (1)
29	05:49		20:22 (4)	06:40		19:24 (3)	07:31		18:00 (2)	07:24		15:26 (1)	08:18		15:26 (1)	08:45		15:48 (1)
	21:33	41	21:03 (5)	20:32	33	19:57 (3)	19:19	49	18:49 (2)	17:13	31	15:57 (1)	16:28	28	15:54 (1)	16:28	5	15:53 (1)
30	05:51		20:22 (4)	06:41		19:24 (3)	07:33		17:59 (2)	07:26		15:25 (1)	08:20		15:27 (1)	08:45		15:48 (1)
	21:31	39	21:01 (4)	20:30	34	19:58 (3)	19:17	49	18:48 (2)	17:11	34	15:59 (1)	16:27	26	15:53 (1)	16:29	6	15:54 (1)
31	05:52		20:23 (4)	06:43		19:23 (3)				07:28		15:23 (1)				08:46		15:48 (1)
	21:30	37	21:00 (4)	20:27	34	19:57 (3)				17:09	37	16:00 (1)				16:30	7	15:55 (1)
Potential sun hours	504			455			381			331			264			241		
Total, worst case		1715			519			942			590			1283			248	
Sun reduction		0.33			0.35			0.34			0.28			0.26			0.22	
Oper. time red.		1.00			1.00			1.00			1.00			1.00			1.00	
Wind dir. red.		0.64			0.62			0.60			0.60			0.61			0.61	
Total reduction		0.21			0.22			0.20			0.17			0.16			0.13	
Total, real		362			114			191			100			205			33	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
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Calculated:
11/06/2025 09:22/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Real Case - V150 **Shadow receptor:** J - 10

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January		February		March		April		May		June	
1	08:46		08:18		16:20 (1)		07:12		18:45 (2)		06:06	
	16:32		17:20	29	16:49 (1)		18:13		20:08	40	19:25 (2)	
2	08:45		08:16		16:20 (1)		07:21		18:44 (2)		06:04	
	16:33		17:22	32	16:52 (1)		18:15		20:10	40	19:24 (2)	
3	08:45		08:15		16:19 (1)		07:19		18:46 (2)		06:02	
	16:34		17:24	35	16:54 (1)		18:17		20:11	36	19:22 (2)	
4	08:45		08:13		16:19 (1)		07:17		18:47 (2)		06:00	
	16:35		17:26	37	16:56 (1)		18:18		20:13	34	19:21 (2)	
5	08:45		08:11		16:18 (1)		07:15		18:48 (2)		05:58	
	16:36		17:28	40	16:58 (1)		18:20		20:15	31	19:19 (2)	
6	08:44		08:10		16:17 (1)		07:12		18:49 (2)		05:56	
	16:37		17:30	43	17:00 (1)		18:22		20:17	28	19:17 (2)	
7	08:44		08:08		16:18 (1)		07:10		18:52 (2)		05:55	
	16:39		17:32	44	17:02 (1)		18:24		20:18	27	19:52 (3)	
8	08:44		08:06		16:18 (1)		07:08		18:55 (2)		05:53	
	16:40		17:34	46	17:04 (1)		18:26		20:20	25	19:54 (3)	
9	08:43		08:04		16:17 (1)		07:05		19:00 (2)		05:51	
	16:41		17:35	49	17:06 (1)		18:27		20:22	16	19:55 (3)	
10	08:42		08:02		16:17 (1)		07:03		19:43 (3)		05:49	
	16:43		17:37	50	17:07 (1)		18:29		20:24	14	19:57 (3)	
11	08:42		08:01		16:17 (1)		07:01		18:03 (2)		06:49	
	16:44		17:39	50	17:07 (1)		18:31	2	18:05 (2)		20:25	
12	08:41		07:59		16:17 (1)		06:59		18:00 (2)		06:46	
	16:46		17:41	50	17:07 (1)		18:33	7	18:07 (2)		20:27	
13	08:40		07:57		16:17 (1)		06:56		17:56 (2)		06:44	
	16:47		17:43	50	17:07 (1)		18:35	12	18:08 (2)		20:29	
14	08:40		07:55		16:18 (1)		06:54		17:54 (2)		06:42	
	16:49		17:45	49	17:07 (1)		18:36	17	18:11 (2)		20:31	
15	08:39		07:53		16:18 (1)		06:52		17:53 (2)		06:40	
	16:50		17:47	48	17:06 (1)		18:38	20	18:13 (2)		20:32	
16	08:38		07:51		16:18 (1)		06:49		17:51 (2)		06:38	
	16:52		17:49	48	17:06 (1)		18:40	23	18:14 (2)		20:34	
17	08:37		07:49		16:19 (1)		06:47		17:50 (2)		06:35	
	16:54		17:51	47	17:06 (1)		18:42	26	18:16 (2)		20:36	
18	08:36		07:47		16:18 (1)		06:45		17:49 (2)		06:33	
	16:55		17:52	46	17:04 (1)		18:43	29	18:18 (2)		20:37	
19	08:35		07:45		16:19 (1)		06:42		17:47 (2)		06:31	
	16:57		17:54	45	17:04 (1)		18:45	32	18:19 (2)		20:39	
20	08:34		07:43		16:20 (1)		06:40		17:46 (2)		06:29	
	16:59		17:56	43	17:03 (1)		18:47	35	18:21 (2)		20:41	
21	08:33		07:41		16:21 (1)		06:38		17:46 (2)		06:27	
	17:00		17:58	41	17:02 (1)		18:49	37	18:23 (2)		20:43	
22	08:32		07:39		16:22 (1)		06:35		17:45 (2)		06:24	
	17:02		18:00	40	17:02 (1)		18:50	40	18:25 (2)		20:44	
23	08:30		07:36		16:24 (1)		06:33		17:44 (2)		06:22	
	17:04		18:02	36	17:00 (1)		18:52	43	18:27 (2)		20:46	
24	08:29		16:29 (1)		07:34		16:24 (1)		06:31		17:43 (2)	
	17:06	4	16:33 (1)		18:04	34	16:58 (1)		18:54	45	18:28 (2)	
25	08:28		16:27 (1)		07:32		16:26 (1)		06:28		17:43 (2)	
	17:07	9	16:36 (1)		18:06	31	16:57 (1)		18:56	47	18:30 (2)	
26	08:27		16:26 (1)		07:30		16:28 (1)		06:26		17:43 (2)	
	17:09	11	16:37 (1)		18:07	27	16:55 (1)		18:57	47	18:30 (2)	
27	08:25		16:25 (1)		07:28		16:31 (1)		06:23		17:43 (2)	
	17:11	15	16:40 (1)		18:09	21	16:52 (1)		18:59	46	18:29 (2)	
28	08:24		16:23 (1)		07:26		16:36 (1)		06:21		17:43 (2)	
	17:13	18	16:41 (1)		18:11	12	16:48 (1)		19:01	46	18:29 (2)	
29	08:22		16:22 (1)						07:19		18:43 (2)	
	17:15	21	16:43 (1)						20:03	45	19:28 (2)	
30	08:21		16:22 (1)						07:16		18:43 (2)	
	17:17	24	16:46 (1)						20:04	44	19:27 (2)	
31	08:19		16:21 (1)						07:14		18:44 (2)	
	17:18	26	16:47 (1)						20:06	42	19:26 (2)	
Potential sun hours	257		277		367		417		487		501	
Total, worst case	128		1123		685		728		607		1507	
Sun reduction	0.22		0.24		0.28		0.38		0.39		0.35	
Oper. time red.	1.00		1.00		1.00		1.00		1.00		1.00	
Wind dir. red.	0.59		0.59		0.60		0.60		0.64		0.64	
Total reduction	0.13		0.14		0.17		0.23		0.25		0.22	
Total, real	17		162		115		167		153		333	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
Jennings O'Donovan
Finisklin Business Park
F91 RHH9 Sligo
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padraig / podowd@jodireland.com
Calculated:
11/06/2025 09:22/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Real Case - V150 **Shadow receptor:** J - 10

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	July		August		September		October		November		December	
1	05:17		20:36 (4)	05:54		20:48 (4)	06:45		19:41 (3)	07:35		18:37 (2)	07:30		15:47 (1)	08:21
	22:01	51	21:27 (5)	21:28	10	20:58 (4)	20:25	17	19:58 (3)	19:14	10	18:47 (2)	17:07	49	16:36 (1)	16:26
2	05:17		20:37 (4)	05:55		20:49 (4)	06:46		19:42 (3)	07:36		18:40 (2)	07:31		15:47 (1)	08:23
	22:00	50	21:27 (5)	21:26	7	20:56 (4)	20:23	14	19:56 (3)	19:12	5	18:45 (2)	17:05	49	16:36 (1)	16:25
3	05:18		20:36 (4)	05:57		20:51 (4)	06:48		18:58 (2)	07:38			07:33		15:47 (1)	08:24
	22:00	50	21:26 (5)	21:25	4	20:55 (4)	20:20	15	19:53 (3)	19:10			17:04	47	16:34 (1)	16:25
4	05:19		20:37 (4)	05:59			06:50		18:52 (2)	07:40			07:35		15:48 (1)	08:26
	22:00	49	21:26 (5)	21:23			20:18	25	19:51 (3)	19:07			17:02	44	16:32 (1)	16:24
5	05:20		20:37 (4)	06:00			06:51		18:48 (2)	07:42			07:37		15:48 (1)	08:27
	21:59	49	21:26 (5)	21:21			20:16	27	19:48 (3)	19:05			17:00	42	16:30 (1)	16:24
6	05:20		20:37 (4)	06:02			06:53		18:46 (2)	07:43			07:39		15:49 (1)	08:28
	21:59	48	21:25 (5)	21:19			20:13	27	19:13 (2)	19:03			16:58	39	16:28 (1)	16:23
7	05:21		20:37 (4)	06:03			06:55		18:44 (2)	07:45			07:41		15:49 (1)	08:30
	21:58	47	21:24 (5)	21:17			20:11	31	19:15 (2)	19:01			16:56	37	16:26 (1)	16:23
8	05:22		20:37 (4)	06:05			06:56		18:41 (2)	07:47			07:42		15:50 (1)	08:31
	21:57	47	21:24 (5)	21:16			20:09	34	19:15 (2)	18:58			16:55	34	16:24 (1)	16:22
9	05:23		20:37 (4)	06:07			06:58		18:40 (2)	07:48			07:44		15:51 (1)	08:32
	21:57	46	21:23 (5)	21:14			20:06	37	19:17 (2)	18:56			16:53	32	16:23 (1)	16:22
10	05:24		20:37 (4)	06:08			07:00		18:38 (2)	07:50			07:46		15:52 (1)	08:33
	21:56	45	21:22 (5)	21:12			20:04	39	19:17 (2)	18:54			16:51	29	16:21 (1)	16:22
11	05:25		20:37 (4)	06:10			07:01		18:37 (2)	07:52			07:48		15:53 (1)	08:34
	21:55	45	21:22 (5)	21:10			20:02	41	19:18 (2)	18:51			16:50	26	16:19 (1)	16:22
12	05:26		20:37 (4)	06:12			07:03		18:36 (2)	07:54			07:50		15:53 (1)	08:35
	21:54	44	21:21 (5)	21:08			19:59	42	19:18 (2)	18:49			16:48	23	16:16 (1)	16:22
13	05:28		20:38 (4)	06:13			07:05		18:34 (2)	07:55			07:51		15:54 (1)	08:36
	21:53	42	21:20 (5)	21:06			19:57	44	19:18 (2)	18:47			16:47	21	16:15 (1)	16:22
14	05:29		20:38 (4)	06:15			07:06		18:34 (2)	07:57		17:06 (1)	07:53		15:55 (1)	08:37
	21:52	41	21:19 (5)	21:04			19:55	45	19:19 (2)	18:45	16	17:22 (1)	16:45	18	16:13 (1)	16:22
15	05:30		20:39 (4)	06:17		19:56 (3)	07:08		18:32 (2)	07:59		17:02 (1)	07:55		15:57 (1)	08:38
	21:51	40	21:19 (5)	21:02	9	20:05 (3)	19:52	46	19:18 (2)	18:42	23	17:25 (1)	16:44	15	16:12 (1)	16:22
16	05:31		20:39 (4)	06:18		19:53 (3)	07:10		18:32 (2)	08:01		17:00 (1)	07:57		15:59 (1)	08:39
	21:50	39	21:18 (5)	21:00	15	20:08 (3)	19:50	46	19:18 (2)	18:40	28	17:28 (1)	16:42	11	16:10 (1)	16:22
17	05:32		20:39 (4)	06:20		19:50 (3)	07:11		18:32 (2)	08:02		16:58 (1)	07:59		16:00 (1)	08:40
	21:49	38	21:17 (5)	20:58	20	20:10 (3)	19:48	46	19:18 (2)	18:38	32	17:30 (1)	16:41	9	16:09 (1)	16:22
18	05:34		20:39 (4)	06:21		19:48 (3)	07:13		18:31 (2)	08:04		16:56 (1)	08:00		16:03 (1)	08:41
	21:48	37	21:16 (5)	20:56	23	20:11 (3)	19:45	46	19:17 (2)	18:36	35	17:31 (1)	16:40	4	16:07 (1)	16:22
19	05:35		20:39 (4)	06:23		19:47 (3)	07:15		18:31 (2)	08:06		16:53 (1)	08:02			08:41
	21:47	35	21:14 (5)	20:54	26	20:13 (3)	19:43	45	19:16 (2)	18:34	38	17:31 (1)	16:38			16:22
20	05:36		20:40 (4)	06:25		19:46 (3)	07:16		18:31 (2)	08:08		16:52 (1)	08:04			08:42
	21:46	34	21:14 (5)	20:51	27	20:13 (3)	19:40	43	19:14 (2)	18:32	40	17:32 (1)	16:37			16:23
21	05:38		20:40 (4)	06:26		19:45 (3)	07:18		18:30 (2)	08:10		16:51 (1)	08:05			08:43
	21:44	33	21:13 (5)	20:49	29	20:14 (3)	19:38	41	19:11 (2)	18:29	42	17:33 (1)	16:36			16:23
22	05:39		20:40 (4)	06:28		19:43 (3)	07:20		18:30 (2)	08:11		16:50 (1)	08:07			08:43
	21:43	31	21:11 (5)	20:47	31	20:14 (3)	19:36	39	19:09 (2)	18:27	44	17:34 (1)	16:35			16:24
23	05:40		20:40 (4)	06:30		19:43 (3)	07:21		18:31 (2)	08:13		16:49 (1)	08:09			08:44
	21:42	30	21:10 (5)	20:45	32	20:15 (3)	19:33	36	19:07 (2)	18:25	45	17:34 (1)	16:33			16:24
24	05:42		20:41 (4)	06:31		19:42 (3)	07:23		18:30 (2)	08:15		16:49 (1)	08:10			08:44
	21:40	28	21:09 (4)	20:43	32	20:14 (3)	19:31	34	19:04 (2)	18:23	46	17:35 (1)	16:32			16:25
25	05:43		20:42 (4)	06:33		19:41 (3)	07:25		18:31 (2)	07:17		15:48 (1)	08:12			08:44
	21:39	26	21:08 (4)	20:41	32	20:13 (3)	19:29	30	19:01 (2)	17:21	47	16:35 (1)	16:31			16:25
26	05:45		20:43 (4)	06:35		19:41 (3)	07:26		18:32 (2)	07:19		15:48 (1)	08:14			08:45
	21:38	24	21:07 (4)	20:38	30	20:11 (3)	19:26	27	18:59 (2)	17:19	48	16:36 (1)	16:30			16:26
27	05:46		20:43 (4)	06:36		19:40 (3)	07:28		18:32 (2)	07:20		15:47 (1)	08:15			08:45
	21:36	22	21:05 (4)	20:36	29	20:09 (3)	19:24	24	18:56 (2)	17:17	49	16:36 (1)	16:29			16:27
28	05:48		20:43 (4)	06:38		19:41 (3)	07:30		18:33 (2)	07:22		15:47 (1)	08:17			08:45
	21:35	20	21:03 (4)	20:34	26	20:07 (3)	19:22	21	18:54 (2)	17:15	49	16:36 (1)	16:28			16:28
29	05:49		20:45 (4)	06:40		19:40 (3)	07:31		18:35 (2)	07:24		15:47 (1)	08:18			08:45
	21:33	18	21:03 (4)	20:32	24	20:04 (3)	19:19	17	18:52 (2)	17:13	49	16:36 (1)	16:28			16:28
30	05:51		20:45 (4)	06:41		19:40 (3)	07:33		18:35 (2)	07:26		15:47 (1)	08:20			08:45
	21:31	16	21:01 (4)	20:29	22	20:02 (3)	19:17	14	18:49 (2)	17:11	49	16:36 (1)	16:27			16:29
31	05:52		20:47 (4)	06:43		19:40 (3)				07:28		15:47 (1)				08:46
	21:30	13	21:00 (4)	20:27	19	19:59 (3)				17:09	49	16:36 (1)				16:30
Potential sun hours	504			455			381			331			264			241
Total, worst case		1138			447			993			744			529		
Sun reduction		0.33			0.35			0.34			0.28			0.26		
Oper. time red.		1.00			1.00			1.00			1.00			1.00		
Wind dir. red.		0.64			0.60			0.60			0.59			0.59		
Total reduction		0.21			0.21			0.20			0.17			0.16		
Total, real		241			96			202			124			82		

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
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Calculated:
11/06/2025 09:22/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Real Case - V150 **Shadow receptor:** K - 11

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January			February			March			April			May			June		
1	08:45			08:18		16:34 (1)	07:23			07:12		18:50 (2)	06:06			05:20		20:24 (4)
	16:32			17:20	15	16:49 (1)	18:13			20:08	31	19:21 (2)	21:00			21:47	50	21:14 (5)
2	08:45			08:16		16:33 (1)	07:21			07:09		18:50 (2)	06:04			05:19		20:24 (4)
	16:33			17:22	19	16:52 (1)	18:15			20:10	28	19:18 (2)	21:02			21:48	51	21:15 (5)
3	08:45			08:15		16:32 (1)	07:19			07:07		18:53 (2)	06:02		20:31 (4)	05:18		20:24 (4)
	16:34			17:24	22	16:54 (1)	18:17			20:11	23	19:16 (2)	21:03	3	20:34 (4)	21:49	51	21:15 (5)
4	08:45			08:13		16:31 (1)	07:17			07:05		18:55 (2)	06:00		20:29 (4)	05:17		20:25 (4)
	16:35			17:26	25	16:56 (1)	18:18			20:13	18	19:13 (2)	21:05	6	20:35 (4)	21:50	52	21:17 (5)
5	08:45			08:11		16:31 (1)	07:15			07:02		18:58 (2)	05:58		20:28 (4)	05:17		20:25 (4)
	16:36			17:28	27	16:58 (1)	18:20			20:15	14	19:48 (3)	21:07	10	20:38 (4)	21:51	52	21:17 (5)
6	08:44			08:10		16:30 (1)	07:12			07:00		19:42 (3)	05:56		20:27 (4)	05:16		20:26 (4)
	16:37			17:30	30	17:00 (1)	18:22			20:17	8	19:50 (3)	21:08	12	20:39 (4)	21:52	51	21:17 (5)
7	08:44			08:08		16:30 (1)	07:10			06:58		19:41 (3)	05:55		20:25 (4)	05:15		20:26 (4)
	16:39			17:32	32	17:02 (1)	18:24			20:18	11	19:52 (3)	21:10	15	20:40 (4)	21:53	51	21:17 (5)
8	08:44			08:06		16:30 (1)	07:08			06:56		19:40 (3)	05:53		20:24 (4)	05:15		20:27 (4)
	16:40			17:34	34	17:04 (1)	18:26			20:20	14	19:54 (3)	21:12	18	20:42 (4)	21:54	50	21:17 (5)
9	08:43			08:04		16:29 (1)	07:05			06:53		19:39 (3)	05:51		20:24 (4)	05:14		20:27 (4)
	16:41			17:35	37	17:06 (1)	18:27			20:22	16	19:55 (3)	21:13	20	20:44 (4)	21:55	50	21:17 (5)
10	08:42			08:02		16:29 (1)	07:03			06:51		19:38 (3)	05:49		20:23 (4)	05:14		20:28 (4)
	16:43			17:37	39	17:08 (1)	18:29			20:24	19	19:57 (3)	21:15	22	20:45 (4)	21:55	49	21:17 (5)
11	08:42			08:01		16:29 (1)	07:01		18:01 (2)	06:49		19:38 (3)	05:48		20:23 (4)	05:13		20:29 (4)
	16:44			17:39	41	17:10 (1)	18:31	4	18:05 (2)	20:25	21	19:59 (3)	21:17	24	20:47 (4)	21:56	49	21:23 (8)
12	08:41			07:59		16:29 (1)	06:59		17:59 (2)	06:46		19:37 (3)	05:46		20:22 (4)	05:13		20:30 (4)
	16:46			17:41	44	17:13 (1)	18:33	8	18:07 (2)	20:27	24	20:01 (3)	21:18	26	20:48 (4)	21:57	48	21:18 (5)
13	08:40			07:57		16:29 (1)	06:56		17:56 (2)	06:44		19:36 (3)	05:44		20:22 (4)	05:13		20:29 (4)
	16:47			17:43	45	17:14 (1)	18:35	12	18:08 (2)	20:29	25	20:01 (3)	21:20	28	20:50 (4)	21:58	49	21:23 (8)
14	08:40			07:55		16:29 (1)	06:54		17:54 (2)	06:42		19:36 (3)	05:43		20:21 (4)	05:13		20:30 (4)
	16:49			17:45	45	17:14 (1)	18:36	17	18:11 (2)	20:31	27	20:03 (3)	21:21	30	20:51 (4)	21:58	49	21:24 (8)
15	08:39			07:53		16:29 (1)	06:52		17:53 (2)	06:40		19:37 (3)	05:41		20:21 (4)	05:12		20:30 (4)
	16:50			17:47	45	17:14 (1)	18:38	20	18:13 (2)	20:32	28	20:05 (3)	21:23	32	20:53 (5)	21:59	50	21:25 (8)
16	08:38			07:51		16:29 (1)	06:49		17:51 (2)	06:37		19:37 (3)	05:39		20:20 (4)	05:12		20:31 (4)
	16:52			17:49	44	17:13 (1)	18:40	23	18:14 (2)	20:34	30	20:07 (3)	21:25	34	20:54 (5)	21:59	48	21:25 (8)
17	08:37			07:49		16:30 (1)	06:47		17:50 (2)	06:35		19:37 (3)	05:38		20:21 (4)	05:12		20:31 (4)
	16:54			17:51	43	17:13 (1)	18:42	26	18:16 (2)	20:36	29	20:06 (3)	21:26	34	20:55 (5)	22:00	50	21:26 (8)
18	08:36			07:47		16:29 (1)	06:45		17:50 (2)	06:33		19:38 (3)	05:36		20:20 (4)	05:12		20:31 (4)
	16:55			17:52	43	17:12 (1)	18:43	28	18:18 (2)	20:37	27	20:05 (3)	21:28	36	20:56 (5)	22:00	50	21:26 (8)
19	08:35			07:45		16:30 (1)	06:42		17:48 (2)	06:31		19:39 (3)	05:35		20:20 (4)	05:12		20:32 (4)
	16:57			17:54	41	17:11 (1)	18:45	31	18:19 (2)	20:39	25	20:04 (3)	21:29	38	20:58 (5)	22:01	49	21:26 (8)
20	08:34			07:43		16:30 (1)	06:40		17:48 (2)	06:29		19:39 (3)	05:34		20:21 (4)	05:12		20:32 (4)
	16:59			17:56	41	17:11 (1)	18:47	33	18:21 (2)	20:41	23	20:02 (3)	21:31	38	20:59 (5)	22:01	49	21:26 (8)
21	08:33			07:41		16:31 (1)	06:38		17:48 (2)	06:27		19:40 (3)	05:32		20:21 (4)	05:12		20:32 (4)
	17:00			17:58	39	17:10 (1)	18:49	35	18:23 (2)	20:43	21	20:01 (3)	21:32	40	21:01 (5)	22:01	49	21:26 (8)
22	08:32			07:39		16:32 (1)	06:35		17:47 (2)	06:24		19:42 (3)	05:31		20:20 (4)	05:13		20:33 (4)
	17:02			18:00	37	17:09 (1)	18:50	38	18:25 (2)	20:44	17	19:59 (3)	21:34	41	21:01 (5)	22:01	49	21:27 (8)
23	08:30			07:36		16:34 (1)	06:33		17:47 (2)	06:22		19:44 (3)	05:30		20:20 (4)	05:13		20:33 (4)
	17:04			18:02	34	17:08 (1)	18:52	40	18:27 (2)	20:46	12	19:56 (3)	21:35	43	21:03 (5)	22:01	49	21:27 (8)
24	08:29			07:34		16:34 (1)	06:31		17:46 (2)	06:20			05:28		20:21 (4)	05:13		20:33 (4)
	17:06			18:04	32	17:06 (1)	18:54	42	18:28 (2)	20:48			21:36	43	21:04 (5)	22:02	49	21:27 (8)
25	08:28			07:32		16:36 (1)	06:28		17:46 (2)	06:18			05:27		20:21 (4)	05:13		20:33 (4)
	17:07			18:06	29	17:05 (1)	18:56	42	18:28 (2)	20:50			21:38	45	21:06 (5)	22:02	50	21:28 (8)
26	08:27			07:30		16:38 (1)	06:26		17:46 (2)	06:16			05:26		20:21 (4)	05:14		20:33 (4)
	17:09			18:07	25	17:03 (1)	18:57	41	18:27 (2)	20:51			21:39	46	21:07 (5)	22:02	49	21:27 (8)
27	08:25			07:28		16:41 (1)	06:23		17:46 (2)	06:14			05:25		20:22 (4)	05:14		20:34 (4)
	17:11			18:09	20	17:01 (1)	18:59	40	18:26 (2)	20:53			21:40	46	21:08 (5)	22:02	48	21:28 (8)
28	08:24		16:40 (1)	07:26		16:45 (1)	06:21		17:46 (2)	06:12			05:24		20:22 (4)	05:15		20:33 (4)
	17:13	1	16:41 (1)	18:11	12	16:57 (1)	19:01	39	18:25 (2)	20:55			21:42	47	21:09 (5)	22:01	49	21:27 (8)
29	08:22		16:38 (1)				07:19		18:47 (2)	06:10			05:23		20:22 (4)	05:15		20:33 (4)
	17:15	5	16:43 (1)				20:03	38	19:25 (2)	20:56			21:43	48	21:10 (5)	22:01	50	21:28 (8)
30	08:21		16:37 (1)				07:16		18:47 (2)	06:08			05:22		20:23 (4)	05:16		20:33 (4)
	17:17	9	16:46 (1)				20:04	36	19:23 (2)	20:58			21:44	48	21:11 (5)	22:01	49	21:27 (8)
31	08:19		16:35 (1)				07:14		18:48 (2)				05:21		20:24 (4)			
	17:18	12	16:47 (1)				20:06	34	19:22 (2)				21:45	49	21:13 (5)			
Potential sun hours	257			277			367			417			487			501		
Total, worst case		27			940			627			491			922			1489	
Sun reduction		0.22			0.24			0.28			0.38			0.39			0.35	
Oper. time red.		1.00			1.00			1.00			1.00			1.00			1.00	
Wind dir. red.		0.60			0.60			0.60			0.60			0.64			0.64	
Total reduction		0.13			0.15			0.17			0.23			0.25			0.22	
Total, real		4			137			105			113			231			329	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

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SHADOW - Calendar

Calculation: 6839 Garrane WF Real Case - V150 **Shadow receptor:** K - 11

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	July		August		September		October		November		December	
1	05:17		20:33 (4)	05:54		20:32 (4)	06:45		19:37 (3)	07:35		18:37 (2)	07:30		15:59 (1)	08:21
	22:01	50	21:27 (8)	21:28	26	20:58 (4)	20:25	21	19:58 (3)	19:14	10	18:47 (2)	17:07	39	16:38 (1)	16:26
2	05:17		20:33 (4)	05:55		20:32 (4)	06:46		19:37 (3)	07:36		18:39 (2)	07:31		15:59 (1)	08:23
	22:00	49	21:22 (5)	21:26	24	20:56 (4)	20:23	19	19:56 (3)	19:12	6	18:45 (2)	17:05	37	16:36 (1)	16:25
3	05:18		20:33 (4)	05:57		20:33 (4)	06:48		19:37 (3)	07:38		18:41 (2)	07:33		16:00 (1)	08:24
	22:00	49	21:22 (5)	21:25	22	20:55 (4)	20:20	16	19:53 (3)	19:10	1	18:42 (2)	17:04	34	16:34 (1)	16:25
4	05:19		20:33 (4)	05:59		20:34 (4)	06:50		19:37 (3)	07:40			07:35		16:00 (1)	08:26
	22:00	50	21:23 (5)	21:23	19	20:53 (4)	20:18	14	19:51 (3)	19:07			17:02	32	16:32 (1)	16:24
5	05:20		20:33 (4)	06:00		20:35 (4)	06:51		19:37 (3)	07:42			07:37		16:01 (1)	08:27
	21:59	50	21:23 (5)	21:21	16	20:51 (4)	20:16	11	19:48 (3)	19:05			17:00	29	16:30 (1)	16:24
6	05:20		20:33 (4)	06:02		20:35 (4)	06:53		19:38 (3)	07:43			07:39		16:02 (1)	08:28
	21:59	51	21:24 (5)	21:19	14	20:49 (4)	20:13	8	19:46 (3)	19:03			16:58	26	16:28 (1)	16:23
7	05:21		20:32 (4)	06:03		20:37 (4)	06:55		18:55 (2)	07:45			07:41		16:02 (1)	08:30
	21:58	51	21:23 (5)	21:17	11	20:48 (4)	20:11	13	19:44 (3)	19:01			16:56	24	16:26 (1)	16:23
8	05:22		20:32 (4)	06:05		20:37 (4)	06:56		18:50 (2)	07:47			07:42		16:03 (1)	08:31
	21:57	52	21:24 (5)	21:16	9	20:46 (4)	20:09	17	19:07 (2)	18:58			16:55	21	16:24 (1)	16:22
9	05:23		20:32 (4)	06:07		20:39 (4)	06:58		18:47 (2)	07:48			07:44		16:04 (1)	08:32
	21:57	51	21:23 (5)	21:14	5	20:44 (4)	20:06	23	19:10 (2)	18:56			16:53	19	16:23 (1)	16:22
10	05:24		20:32 (4)	06:08		20:42 (4)	07:00		18:44 (2)	07:50			07:46		16:06 (1)	08:33
	21:56	50	21:22 (5)	21:12	1	20:43 (4)	20:04	27	19:11 (2)	18:54			16:51	15	16:21 (1)	16:22
11	05:25		20:31 (4)	06:10			07:01		18:42 (2)	07:52			07:48		16:07 (1)	08:34
	21:55	51	21:22 (5)	21:10			20:02	31	19:13 (2)	18:51			16:50	12	16:19 (1)	16:22
12	05:26		20:31 (4)	06:12			07:03		18:41 (2)	07:54			07:50		16:08 (1)	08:35
	21:54	50	21:21 (5)	21:08			19:59	33	19:14 (2)	18:49			16:48	8	16:16 (1)	16:22
13	05:28		20:31 (4)	06:13			07:05		18:39 (2)	07:55		17:22 (1)	07:51		16:10 (1)	08:36
	21:53	49	21:20 (5)	21:06			19:57	35	19:14 (2)	18:47	2	17:24 (1)	16:47	5	16:15 (1)	16:22
14	05:29		20:31 (4)	06:15			07:06		18:38 (2)	07:57		17:15 (1)	07:53		16:12 (1)	08:37
	21:52	48	21:19 (5)	21:04			19:55	37	19:15 (2)	18:45	16	17:31 (1)	16:45	1	16:13 (1)	16:21
15	05:30		20:32 (4)	06:16			07:08		18:36 (2)	07:59		17:12 (1)	07:55			08:38
	21:51	47	21:19 (5)	21:02			19:52	39	19:15 (2)	18:42	22	17:34 (1)	16:44			16:22
16	05:31		20:31 (4)	06:18			07:10		18:35 (2)	08:01		17:09 (1)	07:57			08:39
	21:50	47	21:18 (5)	21:00			19:50	40	19:15 (2)	18:40	27	17:36 (1)	16:42			16:22
17	05:32		20:31 (4)	06:20			07:11		18:35 (2)	08:02		17:07 (1)	07:59			08:40
	21:49	46	21:17 (5)	20:58			19:48	41	19:16 (2)	18:38	31	17:38 (1)	16:41			16:22
18	05:34		20:31 (4)	06:21			07:13		18:33 (2)	08:04		17:06 (1)	08:00			08:41
	21:48	45	21:16 (5)	20:56			19:45	42	19:15 (2)	18:36	33	17:39 (1)	16:40			16:22
19	05:35		20:30 (4)	06:23		19:55 (3)	07:15		18:33 (2)	08:06		17:03 (1)	08:02			08:41
	21:47	44	21:14 (5)	20:54	3	19:58 (3)	19:43	42	19:15 (2)	18:34	36	17:39 (1)	16:38			16:22
20	05:36		20:31 (4)	06:25		19:49 (3)	07:16		18:33 (2)	08:08		17:02 (1)	08:04			08:42
	21:46	43	21:14 (5)	20:51	13	20:02 (3)	19:40	41	19:14 (2)	18:32	38	17:40 (1)	16:37			16:23
21	05:38		20:31 (4)	06:26		19:47 (3)	07:18		18:32 (2)	08:10		17:01 (1)	08:05			08:43
	21:44	42	21:13 (5)	20:49	18	20:05 (3)	19:38	39	19:11 (2)	18:29	40	17:41 (1)	16:36			16:23
22	05:39		20:31 (4)	06:28		19:44 (3)	07:20		18:32 (2)	08:11		17:01 (1)	08:07			08:43
	21:43	40	21:11 (5)	20:47	22	20:06 (3)	19:36	37	19:09 (2)	18:27	40	17:41 (1)	16:35			16:24
23	05:40		20:30 (4)	06:30		19:43 (3)	07:21		18:32 (2)	08:13		17:00 (1)	08:09			08:44
	21:42	40	21:10 (5)	20:45	24	20:07 (3)	19:33	35	19:07 (2)	18:25	42	17:42 (1)	16:33			16:24
24	05:42		20:31 (4)	06:31		19:41 (3)	07:23		18:32 (2)	08:15		16:59 (1)	08:10			08:44
	21:40	38	21:09 (5)	20:43	26	20:07 (3)	19:31	32	19:04 (2)	18:23	43	17:42 (1)	16:32			16:25
25	05:43		20:31 (4)	06:33		19:41 (3)	07:25		18:32 (2)	07:17		15:59 (1)	08:12			08:44
	21:39	37	21:08 (5)	20:41	27	20:08 (3)	19:29	29	19:01 (2)	17:21	44	16:43 (1)	16:31			16:25
26	05:45		20:31 (4)	06:35		19:40 (3)	07:26		18:33 (2)	07:19		15:59 (1)	08:14			08:45
	21:38	36	21:07 (5)	20:38	29	20:09 (3)	19:26	26	18:59 (2)	17:19	44	16:43 (1)	16:30			16:26
27	05:46		20:31 (4)	06:36		19:39 (3)	07:28		18:33 (2)	07:20		15:58 (1)	08:15			08:45
	21:36	34	21:05 (5)	20:36	30	20:09 (3)	19:24	23	18:56 (2)	17:17	45	16:43 (1)	16:29			16:27
28	05:48		20:31 (4)	06:38		19:38 (3)	07:30		18:33 (2)	07:22		15:58 (1)	08:17			08:45
	21:35	32	21:03 (5)	20:34	29	20:07 (3)	19:22	21	18:54 (2)	17:15	45	16:43 (1)	16:28			16:28
29	05:49		20:32 (4)	06:40		19:37 (3)	07:31		18:35 (2)	07:24		15:58 (1)	08:18			08:45
	21:33	31	21:03 (5)	20:32	27	20:04 (3)	19:19	17	18:52 (2)	17:13	45	16:43 (1)	16:28			16:28
30	05:51		20:32 (4)	06:41		19:37 (3)	07:33		18:35 (2)	07:26		15:58 (1)	08:20			08:45
	21:31	29	21:01 (4)	20:29	25	20:02 (3)	19:17	14	18:49 (2)	17:11	44	16:42 (1)	16:27			16:29
31	05:52		20:32 (4)	06:43		19:36 (3)				07:28		15:58 (1)				08:46
	21:30	28	21:00 (4)	20:27	23	19:59 (3)				17:09	42	16:40 (1)				16:30
Potential sun hours	504			455			381			331			264			241
Total, worst case		1360			443			823			696			302		
Sun reduction		0.33			0.35			0.34			0.28			0.26		
Oper. time red.		1.00			1.00			1.00			1.00			1.00		
Wind dir. red.		0.64			0.61			0.60			0.60			0.60		
Total reduction		0.21			0.22			0.20			0.17			0.16		
Total, real		287			96			167			117			47		

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

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Calculated:
11/06/2025 09:22/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Real Case - V150 **Shadow receptor:** L - 12

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January	February	March		April		May		June		
1	08:45	08:18	07:23		07:12		18:50 (1)		06:06		19:50 (2)		05:20		
	16:32	17:20	18:13		20:08	31	19:21 (1)		21:00	39	20:31 (3)		21:47		
2	08:45	08:16	07:21		07:09		18:50 (1)		06:04		19:51 (2)		05:19		21:14 (4)
	16:33	17:22	18:15		20:10	29	19:19 (1)		21:02	39	20:33 (3)		21:48	1	21:15 (4)
3	08:45	08:15	07:19		07:07		18:52 (1)		06:02		19:52 (2)		05:18		21:13 (4)
	16:34	17:24	18:17		20:11	25	19:17 (1)		21:03	38	20:34 (3)		21:49	2	21:15 (4)
4	08:45	08:13	07:17		07:05		18:54 (1)		06:00		19:53 (2)		05:17		21:14 (4)
	16:35	17:26	18:18		20:13	21	19:15 (1)		21:05	36	20:35 (3)		21:50	3	21:17 (4)
5	08:45	08:11	07:15		07:02		18:57 (1)		05:58		19:56 (2)		05:17		21:13 (4)
	16:36	17:28	18:20		20:15	13	19:10 (1)		21:07	33	20:38 (3)		21:51	4	21:17 (4)
6	08:44	08:10	07:12		07:00				05:56		20:00 (2)		05:16		21:13 (4)
	16:37	17:30	18:22		20:17				21:08	27	20:39 (3)		21:52	6	21:19 (4)
7	08:44	08:08	07:10		06:58				05:55		20:18 (3)		05:15		21:12 (4)
	16:39	17:32	18:24		20:18				21:10	22	20:40 (3)		21:53	7	21:19 (4)
8	08:44	08:06	07:08		06:56				05:53		20:18 (3)		05:15		21:13 (4)
	16:40	17:34	18:26		20:20				21:12	24	20:42 (3)		21:54	7	21:20 (4)
9	08:43	08:04	07:05		06:53				05:51		20:19 (3)		05:14		21:12 (4)
	16:41	17:35	18:27		20:22				21:13	25	20:44 (3)		21:55	8	21:20 (4)
10	08:42	08:02	07:03		06:51				05:49		20:20 (3)		05:14		21:12 (4)
	16:43	17:37	18:29		20:24				21:15	22	20:42 (3)		21:55	10	21:22 (4)
11	08:42	08:00	07:01		06:49				05:48		20:21 (3)		05:13		21:13 (4)
	16:44	17:39	18:31		20:25				21:17	21	20:42 (3)		21:56	10	21:23 (4)
12	08:41	07:59	06:59	18:01 (1)	06:46		19:58 (2)		05:46		20:21 (3)		05:13		21:13 (4)
	16:46	17:41	18:33	6 18:07 (1)	20:27	3	20:01 (2)		21:18	20	20:41 (3)		21:57	10	21:23 (4)
13	08:40	07:57	06:56	17:58 (1)	06:44		19:55 (2)		05:44		20:23 (3)		05:13		21:12 (4)
	16:47	17:43	18:35	10 18:08 (1)	20:29	6	20:01 (2)		21:20	17	20:40 (3)		21:58	11	21:23 (4)
14	08:40	07:55	06:54	17:56 (1)	06:42		19:53 (2)		05:43		20:24 (3)		05:13		21:13 (4)
	16:49	17:45	18:36	15 18:11 (1)	20:31	10	20:03 (2)		21:21	15	20:39 (3)		21:58	11	21:24 (5)
15	08:39	07:53	06:52	17:55 (1)	06:40		19:52 (2)		05:41		20:26 (3)		05:12		21:13 (4)
	16:50	17:47	18:38	18 18:13 (1)	20:32	13	20:05 (2)		21:23	11	20:37 (3)		21:59	12	21:25 (5)
16	08:38	07:51	06:49	17:52 (1)	06:37		19:51 (2)		05:39		20:28 (3)		05:12		21:13 (4)
	16:52	17:49	18:40	22 18:14 (1)	20:34	16	20:07 (2)		21:25	6	20:34 (3)		21:59	12	21:25 (5)
17	08:37	07:49	06:47	17:52 (1)	06:35		19:50 (2)		05:38				05:12		21:13 (4)
	16:54	17:51	18:42	24 18:16 (1)	20:36	19	20:09 (2)		21:26				22:00	13	21:26 (5)
18	08:36	07:47	06:45	17:51 (1)	06:33		19:49 (2)		05:36				05:12		21:13 (4)
	16:55	17:52	18:43	27 18:18 (1)	20:37	21	20:10 (2)		21:28				22:00	13	21:26 (5)
19	08:35	07:45	06:42	17:49 (1)	06:31		19:49 (2)		05:35				05:12		21:13 (4)
	16:57	17:54	18:45	30 18:19 (1)	20:39	23	20:12 (2)		21:29				22:00	13	21:26 (5)
20	08:34	07:43	06:40	17:49 (1)	06:29		19:47 (2)		05:34				05:12		21:13 (4)
	16:59	17:56	18:47	32 18:21 (1)	20:41	26	20:13 (2)		21:31				22:01	13	21:26 (5)
21	08:33	07:41	06:38	17:48 (1)	06:27		19:47 (2)		05:32				05:12		21:13 (4)
	17:00	17:58	18:49	35 18:23 (1)	20:43	28	20:15 (2)		21:32				22:01	13	21:26 (5)
22	08:32	07:39	06:35	17:47 (1)	06:24		19:47 (2)		05:31				05:13		21:14 (4)
	17:02	18:00	18:50	38 18:25 (1)	20:44	29	20:16 (2)		21:34				22:01	13	21:27 (5)
23	08:30	07:36	06:33	17:47 (1)	06:22		19:46 (2)		05:30				05:13		21:14 (4)
	17:04	18:02	18:52	40 18:27 (1)	20:46	32	20:18 (2)		21:35				22:01	13	21:27 (5)
24	08:29	07:34	06:31	17:46 (1)	06:20		19:46 (2)		05:28				05:13		21:14 (4)
	17:06	18:04	18:54	42 18:28 (1)	20:48	34	20:20 (2)		21:36				22:02	13	21:27 (5)
25	08:28	07:32	06:28	17:46 (1)	06:18		19:46 (2)		05:27				05:13		21:15 (4)
	17:07	18:05	18:56	42 18:28 (1)	20:50	35	20:21 (2)		21:38				22:02	13	21:28 (5)
26	08:27	07:30	06:26	17:47 (1)	06:16		19:47 (2)		05:26				05:14		21:15 (4)
	17:09	18:07	18:57	40 18:27 (1)	20:51	34	20:21 (2)		21:39				22:02	12	21:27 (5)
27	08:25	07:28	06:23	17:46 (1)	06:14		19:47 (2)		05:25				05:14		21:16 (4)
	17:11	18:09	18:59	40 18:26 (1)	20:53	35	20:24 (3)		21:40				22:01	12	21:28 (5)
28	08:24	07:26	06:21	17:47 (1)	06:12		19:47 (2)		05:24				05:15		21:16 (4)
	17:13	18:11	19:01	39 18:26 (1)	20:55	37	20:26 (3)		21:42				22:01	11	21:27 (5)
29	08:22		07:19	18:47 (1)	06:10		19:48 (2)		05:23				05:15		21:16 (4)
	17:15		20:03	38 19:25 (1)	20:56	37	20:27 (3)		21:43				22:01	12	21:28 (5)
30	08:21		07:16	18:47 (1)	06:08		19:49 (2)		05:22				05:16		21:16 (4)
	17:17		20:04	36 19:23 (1)	20:58	39	20:30 (3)		21:44				22:01	11	21:27 (4)
31	08:19		07:14	18:48 (1)					05:21						
	17:18		20:06	34 19:22 (1)					21:45						
Potential sun hours	257	277	367		417		487		501						
Total, worst case				608		596		395		289					
Sun reduction				0.28		0.38		0.39		0.35					
Oper. time red.				1.00		1.00		1.00		1.00					
Wind dir. red.				0.60		0.61		0.62		0.65					
Total reduction				0.17		0.23		0.25		0.22					
Total, real				102		138		97		65					

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
Jennings O'Donovan
Finisklin Business Park
F91 RHH9 Sligo
+353719161416
padraig / podowd@jodireland.com

Calculated:
11/06/2025 09:22/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Real Case - V150 **Shadow receptor:** L - 12

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	July			August			September			October			November	December
1	05:17		21:17 (4)	05:54		20:31 (3)	06:45			07:35		18:39 (1)	07:30	08:21
	22:01	10	21:27 (4)	21:28	21	20:52 (3)	20:25			19:14	8	18:47 (1)	17:07	16:26
2	05:17		21:18 (4)	05:55		20:30 (3)	06:46			07:36		18:42 (1)	07:31	08:23
	22:00	9	21:27 (4)	21:26	22	20:52 (3)	20:23			19:12	3	18:45 (1)	17:05	16:25
3	05:18		21:17 (4)	05:57		20:30 (3)	06:48			07:38			07:33	08:24
	22:00	9	21:26 (4)	21:25	23	20:53 (3)	20:20			19:10			17:04	16:25
4	05:19		21:18 (4)	05:59		20:29 (3)	06:50			07:40			07:35	08:26
	22:00	8	21:26 (4)	21:23	24	20:53 (3)	20:18			19:07			17:02	16:24
5	05:20		21:19 (4)	06:00		20:29 (3)	06:51			07:42			07:37	08:27
	21:59	7	21:26 (4)	21:21	22	20:51 (3)	20:16			19:05			17:00	16:24
6	05:20		21:19 (4)	06:02		20:28 (3)	06:53			07:43			07:39	08:28
	21:59	6	21:25 (4)	21:19	21	20:49 (3)	20:13			19:03			16:58	16:23
7	05:21		21:19 (4)	06:03		20:07 (2)	06:55		18:53 (1)	07:45			07:41	08:30
	21:58	5	21:24 (4)	21:17	30	20:48 (3)	20:11	13	19:06 (1)	19:01			16:56	16:23
8	05:22		21:20 (4)	06:05		20:04 (2)	06:56		18:49 (1)	07:47			07:42	08:31
	21:57	4	21:24 (4)	21:16	35	20:46 (3)	20:09	20	19:09 (1)	18:58			16:55	16:22
9	05:23		21:20 (4)	06:07		20:02 (2)	06:58		18:46 (1)	07:48			07:44	08:32
	21:57	3	21:23 (4)	21:14	37	20:44 (3)	20:06	25	19:11 (1)	18:56			16:53	16:22
10	05:24		21:21 (4)	06:08		20:01 (2)	07:00		18:44 (1)	07:50			07:46	08:33
	21:56	1	21:22 (4)	21:12	38	20:43 (3)	20:04	28	19:12 (1)	18:54			16:51	16:22
11	05:25			06:10		19:59 (2)	07:01		18:42 (1)	07:52			07:48	08:34
	21:55			21:10	39	20:41 (3)	20:02	31	19:13 (1)	18:51			16:50	16:22
12	05:26			06:12		19:58 (2)	07:03		18:41 (1)	07:54			07:50	08:35
	21:54			21:08	39	20:39 (3)	19:59	33	19:14 (1)	18:49			16:48	16:22
13	05:28			06:13		19:56 (2)	07:05		18:39 (1)	07:55			07:51	08:36
	21:53			21:06	39	20:37 (3)	19:57	35	19:14 (1)	18:47			16:47	16:22
14	05:29			06:15		19:56 (2)	07:06		18:38 (1)	07:57			07:53	08:37
	21:52			21:04	38	20:36 (3)	19:55	37	19:15 (1)	18:45			16:45	16:22
15	05:30			06:16		19:55 (2)	07:08		18:36 (1)	07:59			07:55	08:38
	21:51			21:02	36	20:33 (3)	19:52	39	19:15 (1)	18:42			16:44	16:22
16	05:31			06:18		19:54 (2)	07:10		18:36 (1)	08:01			07:57	08:39
	21:50			21:00	36	20:32 (3)	19:50	39	19:15 (1)	18:40			16:42	16:22
17	05:32			06:20		19:53 (2)	07:11		18:35 (1)	08:02			07:58	08:40
	21:49			20:58	34	20:27 (2)	19:48	41	19:16 (1)	18:38			16:41	16:22
18	05:34			06:21		19:53 (2)	07:13		18:34 (1)	08:04			08:00	08:41
	21:48			20:56	34	20:27 (2)	19:45	41	19:15 (1)	18:36			16:40	16:22
19	05:35			06:23		19:52 (2)	07:15		18:34 (1)	08:06			08:02	08:41
	21:47			20:54	33	20:25 (2)	19:43	41	19:15 (1)	18:34			16:38	16:22
20	05:36			06:25		19:52 (2)	07:16		18:34 (1)	08:08			08:04	08:42
	21:46			20:51	31	20:23 (2)	19:40	40	19:14 (1)	18:32			16:37	16:23
21	05:38			06:26		19:52 (2)	07:18		18:33 (1)	08:10			08:05	08:43
	21:44			20:49	30	20:22 (2)	19:38	38	19:11 (1)	18:29			16:36	16:23
22	05:39			06:28		19:52 (2)	07:20		18:33 (1)	08:11			08:07	08:43
	21:43			20:47	27	20:19 (2)	19:36	36	19:09 (1)	18:27			16:35	16:24
23	05:40			06:30		19:52 (2)	07:21		18:33 (1)	08:13			08:09	08:44
	21:42			20:45	25	20:17 (2)	19:33	34	19:07 (1)	18:25			16:33	16:24
24	05:42			06:31		19:51 (2)	07:23		18:33 (1)	08:15			08:10	08:44
	21:40			20:43	24	20:15 (2)	19:31	31	19:04 (1)	18:23			16:32	16:25
25	05:43			06:33		19:52 (2)	07:25		18:33 (1)	07:17			08:12	08:44
	21:39			20:41	21	20:13 (2)	19:29	28	19:01 (1)	17:21			16:31	16:25
26	05:45			06:35		19:53 (2)	07:26		18:34 (1)	07:19			08:14	08:45
	21:38			20:38	18	20:11 (2)	19:26	25	18:59 (1)	17:19			16:30	16:26
27	05:46			06:36		19:53 (2)	07:28		18:34 (1)	07:20			08:15	08:45
	21:36			20:36	16	20:09 (2)	19:24	22	18:56 (1)	17:17			16:29	16:27
28	05:48		20:37 (3)	06:38		19:54 (2)	07:30		18:35 (1)	07:22			08:17	08:45
	21:34	9	20:46 (3)	20:34	13	20:07 (2)	19:22	19	18:54 (1)	17:15			16:28	16:28
29	05:49		20:35 (3)	06:40		19:54 (2)	07:31		18:36 (1)	07:24			08:18	08:45
	21:33	14	20:49 (3)	20:32	10	20:04 (2)	19:19	16	18:52 (1)	17:13			16:28	16:28
30	05:51		20:33 (3)	06:41		19:56 (2)	07:33		18:37 (1)	07:26			08:20	08:45
	21:31	17	20:50 (3)	20:29	6	20:02 (2)	19:17	12	18:49 (1)	17:11			16:27	16:29
31	05:52		20:33 (3)	06:43		19:57 (2)				07:28				08:45
	21:30	18	20:51 (3)	20:27	2	19:59 (2)				17:09				16:30
Potential sun hours	504			455			381			331			265	241
Total, worst case		120			824			724			11			
Sun reduction		0.33			0.35			0.34			0.28			
Oper. time red.		1.00			1.00			1.00			1.00			
Wind dir. red.		0.64			0.61			0.60			0.60			
Total reduction		0.21			0.22			0.20			0.17			
Total, real		25			179			147			2			

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
Jennings O'Donovan
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+353719161416
padraig / podowd@jodireland.com
Calculated:
11/06/2025 09:22/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Real Case - V150 **Shadow receptor:** M - 13

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January	February	March		April		May		June
1	08:45	08:18	07:23		07:12		18:47 (1)	06:06	19:52 (2)	05:20
	16:32	17:20	18:13		20:08	43	19:30 (1)	21:00	39	20:31 (3)	21:47
2	08:45	08:16	07:21		07:09		18:46 (1)	06:04	19:52 (2)	05:19
	16:33	17:22	18:15		20:10	42	19:28 (1)	21:02	41	20:33 (3)	21:48
3	08:45	08:15	07:19		07:07		18:47 (1)	06:02	19:52 (2)	05:18
	16:34	17:24	18:17		20:11	40	19:27 (1)	21:03	42	20:34 (3)	21:49
4	08:45	08:13	07:17		07:05		18:48 (1)	06:00	19:53 (2)	05:17
	16:35	17:26	18:18		20:13	38	19:26 (1)	21:05	42	20:35 (3)	21:50
5	08:45	08:11	07:15		07:02		18:48 (1)	05:58	19:54 (2)	05:17
	16:36	17:28	18:20		20:15	36	19:24 (1)	21:07	44	20:38 (3)	21:51
6	08:44	08:10	07:12		07:00		18:50 (1)	05:56	19:54 (2)	05:16
	16:37	17:30	18:22		20:17	33	19:23 (1)	21:08	45	20:39 (3)	21:52
7	08:44	08:08	07:10		06:58		18:51 (1)	05:55	19:54 (2)	05:15
	16:39	17:32	18:24		20:18	30	19:21 (1)	21:10	46	20:40 (3)	21:53
8	08:44	08:06	07:08		06:56		18:53 (1)	05:53	19:55 (2)	05:15
	16:40	17:34	18:26		20:20	27	19:20 (1)	21:12	47	20:42 (3)	21:54
9	08:43	08:04	07:05		06:53		18:54 (1)	05:51	19:56 (2)	05:14
	16:41	17:35	18:27		20:22	22	19:16 (1)	21:13	48	20:44 (3)	21:55
10	08:42	08:02	07:03		06:51		18:58 (1)	05:49	19:57 (2)	05:14
	16:43	17:37	18:29		20:24	15	19:13 (1)	21:15	47	20:45 (3)	21:55
11	08:42	08:00	07:01		06:49			05:48	19:59 (2)	05:13
	16:44	17:39	18:31		20:25			21:17	46	20:47 (3)	21:56
12	08:41	07:59	06:59		06:46			05:46	20:00 (2)	05:13
	16:46	17:41	18:33		20:27			21:18	44	20:48 (3)	21:57
13	08:40	07:57	06:56	18:07 (1)	06:44			05:44	20:02 (2)	05:13
	16:47	17:43	18:35	1	18:08 (1)	20:29			21:20	42	20:50 (3)	21:58
14	08:40	07:55	06:54	18:03 (1)	06:42			05:43	20:04 (2)	05:13
	16:49	17:45	18:36	8	18:11 (1)	20:31			21:21	39	20:51 (3)	21:58
15	08:39	07:53	06:52	18:00 (1)	06:40			05:41	20:08 (2)	05:12
	16:50	17:47	18:38	13	18:13 (1)	20:32			21:23	31	20:52 (3)	21:59
16	08:38	07:51	06:49	17:57 (1)	06:38		20:05 (2)	05:39	20:26 (3)	05:12
	16:52	17:49	18:40	17	18:14 (1)	20:34	2	20:07 (2)	21:25	25	20:51 (3)	21:59
17	08:37	07:49	06:47	17:56 (1)	06:35		20:03 (2)	05:38	20:27 (3)	05:12
	16:54	17:51	18:42	20	18:16 (1)	20:36	6	20:09 (2)	21:26	24	20:51 (3)	22:00
18	08:36	07:47	06:45	17:54 (1)	06:33		20:01 (2)	05:36	20:27 (3)	05:12
	16:55	17:52	18:43	24	18:18 (1)	20:37	9	20:10 (2)	21:28	23	20:50 (3)	22:00
19	08:35	07:45	06:42	17:52 (1)	06:31		20:00 (2)	05:35	20:28 (3)	05:12
	16:57	17:54	18:45	27	18:19 (1)	20:39	12	20:12 (2)	21:29	21	20:49 (3)	22:00
20	08:34	07:43	06:40	17:51 (1)	06:29		19:57 (2)	05:34	20:29 (3)	05:12
	16:59	17:56	18:47	30	18:21 (1)	20:41	16	20:13 (2)	21:31	20	20:49 (3)	22:01
21	08:33	07:41	06:38	17:51 (1)	06:27		19:56 (2)	05:32	20:31 (3)	05:12
	17:00	17:58	18:49	32	18:23 (1)	20:43	19	20:15 (2)	21:32	17	20:48 (3)	22:01
22	08:32	07:39	06:35	17:49 (1)	06:24		19:55 (2)	05:31	20:31 (3)	05:13
	17:02	18:00	18:50	36	18:25 (1)	20:44	21	20:16 (2)	21:34	15	20:46 (3)	22:01
23	08:30	07:36	06:33	17:49 (1)	06:22		19:54 (2)	05:30	20:33 (3)	05:13
	17:04	18:02	18:52	38	18:27 (1)	20:46	24	20:18 (2)	21:35	12	20:45 (3)	22:01
24	08:29	07:34	06:31	17:47 (1)	06:20		19:54 (2)	05:28	20:35 (3)	05:13
	17:06	18:04	18:54	41	18:28 (1)	20:48	26	20:20 (2)	21:36	8	20:43 (3)	22:02
25	08:28	07:32	06:28	17:47 (1)	06:18		19:53 (2)	05:27		05:13
	17:07	18:06	18:56	43	18:30 (1)	20:50	28	20:21 (2)	21:38			22:02
26	08:27	07:30	06:26	17:47 (1)	06:16		19:53 (2)	05:26		05:14
	17:09	18:07	18:57	45	18:32 (1)	20:51	30	20:23 (2)	21:39			22:02
27	08:25	07:28	06:23	17:46 (1)	06:14		19:52 (2)	05:25		05:14
	17:11	18:09	18:59	46	18:32 (1)	20:53	32	20:24 (2)	21:40			22:02
28	08:24	07:26	06:21	17:46 (1)	06:12		19:52 (2)	05:24		05:15
	17:13	18:11	19:01	46	18:32 (1)	20:55	34	20:26 (2)	21:42			22:01
29	08:22		07:19		18:46 (1)	06:10		19:52 (2)	05:23			05:15
	17:15		20:03	46	19:32 (1)	20:56	35	20:27 (2)	21:43			22:01
30	08:21		07:16		18:46 (1)	06:08		19:53 (2)	05:22			05:16
	17:17		20:04	44	19:30 (1)	20:58	37	20:30 (2)	21:44			22:01
31	08:19		07:14		18:46 (1)				05:21			
	17:18		20:06	44	19:30 (1)				21:45			
Potential sun hours	257	277	367		417			487		501
Total, worst case				601		657			808	
Sun reduction				0.28		0.38			0.39	
Oper. time red.				1.00		1.00			1.00	
Wind dir. red.				0.60		0.61			0.62	
Total reduction				0.17		0.23			0.25	
Total, real				101		153			199	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

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SHADOW - Calendar

Calculation: 6839 Garrane WF Real Case - V150 **Shadow receptor:** M - 13

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	July		August		September		October	November	December
1	05:17		05:54		20:10 (2)	06:45	07:35	07:30	08:21
	22:01		21:28	45	20:58 (3)	20:25	19:14	17:07	16:26
2	05:17		05:55		20:08 (2)	06:46	18:57 (1)	07:36	07:31	08:23
	22:00		21:26	46	20:56 (3)	20:23	15	19:12 (1)	19:12	17:05	16:25
3	05:18		05:57		20:07 (2)	06:48	18:52 (1)	07:38	07:33	08:24
	22:00		21:25	47	20:55 (3)	20:20	22	19:14 (1)	19:10	17:04	16:25
4	05:19		05:59		20:05 (2)	06:50	18:50 (1)	07:40	07:35	08:26
	22:00		21:23	48	20:53 (3)	20:18	27	19:17 (1)	19:07	17:02	16:24
5	05:20		06:00		20:05 (2)	06:51	18:47 (1)	07:42	07:37	08:27
	21:59		21:21	46	20:51 (3)	20:16	30	19:17 (1)	19:05	17:00	16:24
6	05:21		06:02		20:04 (2)	06:53	18:46 (1)	07:43	07:39	08:28
	21:59		21:19	45	20:49 (3)	20:13	33	19:19 (1)	19:03	16:58	16:23
7	05:21		06:03		20:03 (2)	06:55	18:44 (1)	07:45	07:41	08:30
	21:58		21:17	45	20:48 (3)	20:11	36	19:20 (1)	19:01	16:56	16:23
8	05:22		06:05		20:02 (2)	06:56	18:42 (1)	07:47	07:42	08:31
	21:57		21:16	44	20:46 (3)	20:09	38	19:20 (1)	18:58	16:55	16:22
9	05:23		06:07		20:02 (2)	06:58	18:41 (1)	07:48	07:44	08:32
	21:57		21:14	42	20:44 (3)	20:06	40	19:21 (1)	18:56	16:53	16:22
10	05:24		06:08		20:02 (2)	07:00	18:40 (1)	07:50	07:46	08:33
	21:56		21:12	41	20:43 (3)	20:04	41	19:21 (1)	18:54	16:51	16:22
11	05:25		06:10		20:01 (2)	07:01	18:39 (1)	07:52	07:48	08:34
	21:55		21:10	40	20:41 (3)	20:02	43	19:22 (1)	18:51	16:50	16:22
12	05:27		06:12		20:01 (2)	07:03	18:38 (1)	07:54	07:50	08:35
	21:54		21:08	38	20:39 (2)	19:59	44	19:22 (1)	18:49	16:48	16:22
13	05:28		06:13		20:00 (2)	07:05	18:37 (1)	07:55	07:51	08:36
	21:53		21:06	37	20:37 (2)	19:57	45	19:22 (1)	18:47	16:47	16:22
14	05:29		06:15		20:00 (2)	07:06	18:37 (1)	07:57	07:53	08:37
	21:52		21:04	36	20:36 (2)	19:55	45	19:22 (1)	18:45	16:45	16:22
15	05:30		06:17		20:00 (2)	07:08	18:35 (1)	07:59	07:55	08:38
	21:51		21:02	33	20:33 (2)	19:52	46	19:21 (1)	18:42	16:44	16:22
16	05:31		06:18		20:00 (2)	07:10	18:35 (1)	08:01	07:57	08:39
	21:50		21:00	32	20:32 (2)	19:50	46	19:21 (1)	18:40	16:42	16:22
17	05:32		06:20		19:59 (2)	07:11	18:35 (1)	08:02	07:59	08:40
	21:49		20:58	30	20:29 (2)	19:48	46	19:21 (1)	18:38	16:41	16:22
18	05:34		06:21		20:00 (2)	07:13	18:34 (1)	08:04	08:00	08:41
	21:48		20:56	27	20:27 (2)	19:45	44	19:18 (1)	18:36	16:40	16:22
19	05:35		20:47 (3)	06:23		20:00 (2)	07:15	18:35 (1)	08:06	08:02	08:41
	21:47	4	20:51 (3)	20:54	26	20:26 (2)	19:43	41	19:16 (1)	18:34	16:38	16:22
20	05:36		20:44 (3)	06:25		20:00 (2)	07:16	18:35 (1)	08:08	08:04	08:42
	21:46	10	20:54 (3)	20:51	23	20:23 (2)	19:40	39	19:14 (1)	18:32	16:37	16:23
21	05:38		20:43 (3)	06:26		20:01 (2)	07:18	18:34 (1)	08:10	08:05	08:43
	21:44	13	20:56 (3)	20:49	21	20:22 (2)	19:38	37	19:11 (1)	18:29	16:36	16:23
22	05:39		20:41 (3)	06:28		20:01 (2)	07:20	18:35 (1)	08:11	08:07	08:43
	21:43	16	20:57 (3)	20:47	18	20:19 (2)	19:36	34	19:09 (1)	18:27	16:35	16:24
23	05:40		20:40 (3)	06:30		20:02 (2)	07:21	18:36 (1)	08:13	08:09	08:44
	21:42	18	20:58 (3)	20:45	15	20:17 (2)	19:33	31	19:07 (1)	18:25	16:33	16:24
24	05:42		20:39 (3)	06:31		20:02 (2)	07:23	18:36 (1)	08:15	08:10	08:44
	21:40	20	20:59 (3)	20:43	13	20:15 (2)	19:31	28	19:04 (1)	18:23	16:32	16:25
25	05:43		20:38 (3)	06:33		20:04 (2)	07:25	18:37 (1)	07:17	08:12	08:44
	21:39	22	21:00 (3)	20:41	9	20:13 (2)	19:29	24	19:01 (1)	17:21	16:31	16:25
26	05:45		20:38 (3)	06:35		20:06 (2)	07:26	18:38 (1)	07:19	08:14	08:45
	21:38	23	21:01 (3)	20:38	5	20:11 (2)	19:26	21	18:59 (1)	17:19	16:30	16:26
27	05:46		20:37 (3)	06:36		20:07 (2)	07:28	18:38 (1)	07:20	08:15	08:45
	21:36	25	21:02 (3)	20:36	2	20:09 (2)	19:24	18	18:56 (1)	17:17	16:29	16:27
28	05:48		20:36 (3)	06:38			07:30	18:40 (1)	07:22	08:17	08:45
	21:34	26	21:02 (3)	20:34			19:22	14	18:54 (1)	17:15	16:28	16:28
29	05:49		20:17 (2)	06:40			07:31	18:42 (1)	07:24	08:18	08:45
	21:33	36	21:03 (3)	20:32			19:19	10	18:52 (1)	17:13	16:28	16:28
30	05:51		20:13 (2)	06:41			07:33	18:45 (1)	07:26	08:20	08:45
	21:31	40	21:01 (3)	20:29			19:17	4	18:49 (1)	17:11	16:27	16:29
31	05:52		20:12 (2)	06:43					07:28		08:45
	21:30	43	21:00 (3)	20:27					17:09		16:30
Potential sun hours	504		455		381		331	265	241
Total, worst case		296		854		942			
Sun reduction		0.33		0.35		0.34			
Oper. time red.		1.00		1.00		1.00			
Wind dir. red.		0.63		0.62		0.60			
Total reduction		0.21		0.22		0.20			
Total, real		62		188		192			

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
Jennings O'Donovan
Finisklin Business Park
F91 RHH9 Sligo
+353719161416
padraig / podowd@jodireland.com
Calculated:
11/06/2025 09:22/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Real Case - V150 **Shadow receptor:** N - 14

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:45	08:18	07:23	07:12	06:06	19:46 (1)	05:20	20:42 (2)	05:17	20:50 (2)	05:54	20:05 (1)	06:45	07:35	07:30	08:21
	16:32	17:20	18:13	20:08	21:00 40	20:26 (1) 21:47 32	21:14 (2)	22:01 37	21:27 (3)	21:28 22	20:58 (2)	20:25	19:14	17:07		16:26
2	08:45	08:16	07:21	07:09	06:04	19:46 (1)	05:19	20:42 (2)	05:17	20:51 (2)	05:55	20:03 (1)	06:46	07:36	07:31	08:23
	16:33	17:22	18:15	20:10	21:02 39	20:25 (1) 21:48 33	21:15 (3)	22:00 36	21:27 (3)	21:26 23	20:26 (1)	20:23	19:12	17:05		16:25
3	08:45	08:15	07:19	07:07	06:02	19:46 (1)	05:18	20:42 (2)	05:18	20:50 (2)	05:57	20:02 (1)	06:48	07:38	07:33	08:24
	16:34	17:24	18:17	20:11	21:03 38	20:24 (1) 21:49 33	21:15 (3)	22:00 36	21:26 (3)	21:25 26	20:28 (1)	20:20	19:10	17:04		16:25
4	08:45	08:13	07:17	07:05	06:00	19:47 (1)	05:17	20:43 (2)	05:19	20:50 (2)	05:59	20:00 (1)	06:50	07:40	07:35	08:26
	16:35	17:26	18:18	20:13	21:05 36	20:23 (1) 21:50 34	21:17 (3)	22:00 36	21:26 (3)	21:23 29	20:29 (1)	20:18	19:07	17:02		16:24
5	08:45	08:11	07:15	07:02	05:58	19:48 (1)	05:17	20:43 (2)	05:20	20:50 (2)	06:00	20:00 (1)	06:51	07:42	07:37	08:27
	16:36	17:28	18:20	20:15	21:07 35	20:23 (1) 21:51 34	21:17 (3)	21:59 36	21:26 (3)	21:21 30	20:30 (1)	20:16	19:05	17:00		16:24
6	08:44	08:10	07:12	07:00	05:56	19:48 (1)	05:16	20:44 (2)	05:21	20:50 (2)	06:02	19:58 (1)	06:53	07:43	07:39	08:28
	16:37	17:30	18:22	20:17	21:08 34	20:22 (1) 21:52 35	21:19 (3)	21:58 35	21:25 (3)	21:19 33	20:31 (1)	20:13	19:03	16:58		16:23
7	08:44	08:08	07:10	06:58	05:55	19:49 (1)	05:15	20:44 (2)	05:21	20:50 (2)	06:03	19:58 (1)	06:55	07:45	07:40	08:30
	16:39	17:32	18:24	20:18	21:10 32	20:21 (1) 21:53 35	21:19 (3)	21:58 34	21:24 (3)	21:17 34	20:32 (1)	20:11	19:01	16:56		16:23
8	08:43	08:06	07:08	06:56	05:53	19:50 (1)	05:15	20:45 (2)	05:22	20:50 (2)	06:05	19:56 (1)	06:56	07:47	07:42	08:31
	16:40	17:34	18:26	20:20	21:12 30	20:20 (1) 21:54 35	21:20 (3)	21:57 33	21:23 (3)	21:16 36	20:32 (1)	20:09	18:58	16:55		16:22
9	08:43	08:04	07:05	06:53	05:51	19:51 (1)	05:14	20:45 (2)	05:23	20:50 (2)	06:07	19:56 (1)	06:58	07:48	07:44	08:32
	16:41	17:35	18:27	20:22	21:13 28	20:19 (1) 21:55 35	21:20 (3)	21:57 33	21:23 (3)	21:14 37	20:33 (1)	20:06	18:56	16:53		16:22
10	08:42	08:02	07:03	06:51	05:49	19:52 (1)	05:14	20:45 (2)	05:24	20:50 (2)	06:08	19:56 (1)	07:00	07:50	07:46	08:33
	16:43	17:37	18:29	20:24	21:15 25	20:17 (1) 21:55 37	21:22 (3)	21:56 32	21:22 (3)	21:12 38	20:34 (1)	20:04	18:54	16:51		16:22
11	08:42	08:00	07:01	06:49	05:48	19:54 (1)	05:13	20:46 (2)	05:25	20:50 (2)	06:10	19:55 (1)	07:01	07:52	07:48	08:34
	16:44	17:39	18:31	20:25	21:17 22	20:16 (1) 21:56 37	21:23 (3)	21:55 32	21:22 (3)	21:10 39	20:34 (1)	20:02	18:51	16:50		16:22
12	08:41	07:59	06:59	06:46	05:46	19:56 (1)	05:13	20:47 (2)	05:27	20:49 (2)	06:12	19:54 (1)	07:03	07:54	07:50	08:35
	16:46	17:41	18:33	20:27	21:18 21	20:48 (2) 21:57 36	21:23 (3)	21:54 32	21:21 (2)	21:08 40	20:34 (1)	19:59	18:49	16:48		16:22
13	08:40	07:57	06:56	06:44	05:44	19:59 (1)	05:13	20:46 (2)	05:28	20:49 (2)	06:13	19:53 (1)	07:05	07:55	07:51	08:36
	16:47	17:43	18:35	20:29	21:20 18	20:50 (2) 21:58 37	21:23 (3)	21:53 31	21:20 (2)	21:06 41	20:34 (1)	19:57	18:47	16:47		16:22
14	08:40	07:55	06:54	06:42	19:58 (1) 05:43	20:03 (1)	05:13	20:47 (2)	05:29	20:49 (2)	06:15	19:53 (1)	07:06	07:57	07:53	08:37
	16:49	17:45	18:36	20:31 5	20:03 (1) 21:21 12	20:51 (2) 21:58 37	21:24 (3)	21:52 30	21:19 (2)	21:04 41	20:34 (1)	19:55	18:45	16:45		16:22
15	08:39	07:53	06:52	06:40	19:56 (1) 05:41	20:43 (2)	05:12	20:47 (2)	05:30	20:50 (2)	06:17	19:53 (1)	07:08	07:59	07:55	08:38
	16:50	17:47	18:38	20:32 9	20:05 (1) 21:23 10	20:53 (2) 21:59 38	21:25 (3)	21:51 29	21:19 (2)	21:02 40	20:33 (1)	19:52	18:42	16:44		16:22
16	08:38	07:51	06:49	06:38	19:54 (1) 05:39	20:42 (2)	05:12	20:48 (2)	05:31	20:50 (2)	06:18	19:53 (1)	07:10	08:01	07:57	08:39
	16:52	17:49	18:40	20:34 13	20:07 (1) 21:25 12	20:54 (2) 21:59 37	21:25 (3)	21:50 28	21:18 (2)	21:00 39	20:32 (1)	19:50	18:40	16:42		16:22
17	08:37	07:49	06:47	06:35	19:53 (1) 05:38	20:42 (2)	05:12	20:48 (2)	05:32	20:50 (2)	06:20	19:52 (1)	07:11	08:02	07:58	08:40
	16:54	17:51	18:42	20:36 16	20:09 (1) 21:26 13	20:55 (2) 22:00 38	21:26 (3)	21:49 27	21:17 (2)	20:58 37	20:29 (1)	19:48	18:38	16:41		16:22
18	08:36	07:47	06:45	06:33	19:51 (1) 05:36	20:41 (2)	05:12	20:48 (2)	05:34	20:50 (2)	06:21	19:52 (1)	07:13	08:04	08:00	08:41
	16:55	17:52	18:43	20:37 19	20:10 (1) 21:28 15	20:56 (2) 22:00 38	21:26 (3)	21:48 26	21:16 (2)	20:56 35	20:27 (1)	19:45	18:36	16:40		16:22
19	08:35	07:45	06:42	06:31	19:50 (1) 05:35	20:41 (2)	05:12	20:48 (2)	05:35	20:50 (2)	06:23	19:53 (1)	07:15	08:06	08:02	08:41
	16:57	17:54	18:45	20:39 22	20:12 (1) 21:29 17	20:58 (2) 22:00 38	21:26 (3)	21:47 24	21:14 (2)	20:54 33	20:26 (1)	19:43	18:34	16:38		16:22
20	08:34	07:43	06:40	06:29	19:48 (1) 05:34	20:41 (2)	05:12	20:49 (2)	05:36	20:51 (2)	06:25	19:52 (1)	07:16	08:08	08:04	08:42
	16:59	17:56	18:47	20:41 25	20:13 (1) 21:31 18	20:59 (2) 22:01 37	21:26 (3)	21:46 23	21:14 (2)	20:51 31	20:23 (1)	19:40	18:32	16:37		16:23
21	08:33	07:41	06:38	06:27	19:48 (1) 05:32	20:41 (2)	05:12	20:49 (2)	05:38	20:50 (2)	06:26	19:53 (1)	07:18	08:10	08:05	08:43
	17:00	17:58	18:49	20:43 27	20:15 (1) 21:32 20	21:01 (2) 22:01 37	21:26 (3)	21:44 23	21:13 (2)	20:49 29	20:22 (1)	19:38	18:29	16:36		16:23
22	08:32	07:39	06:35	06:24	19:47 (1) 05:31	20:40 (2)	05:13	20:50 (2)	05:39	20:50 (2)	06:28	19:53 (1)	07:20	08:11	08:07	08:43
	17:02	18:00	18:50	20:44 29	20:16 (1) 21:34 21	21:01 (2) 22:01 37	21:27 (3)	21:43 21	21:11 (2)	20:47 26	20:19 (1)	19:36	18:27	16:35		16:24
23	08:30	07:36	06:33	06:22	19:46 (1) 05:30	20:40 (2)	05:13	20:50 (2)	05:40	20:50 (2)	06:30	19:53 (1)	07:21	08:13	08:09	08:44
	17:04	18:02	18:52	20:46 32	20:18 (1) 21:35 23	21:03 (2) 22:01 37	21:27 (3)	21:42 20	21:10 (2)	20:45 24	20:17 (1)	19:33	18:25	16:33		16:24
24	08:29	07:34	06:31	06:20	19:46 (1) 05:28	20:40 (2)	05:13	20:49 (2)	05:42	20:51 (2)	06:31	19:53 (1)	07:23	08:15	08:10	08:44
	17:06	18:04	18:54	20:48 34	20:20 (1) 21:36 24	21:04 (2) 22:02 38	21:27 (3)	21:40 18	21:09 (2)	20:43 22	20:15 (1)	19:31	18:23	16:32		16:25
25	08:28	07:32	06:28	06:18	19:46 (1) 05:27	20:40 (2)	05:14	20:50 (2)	05:43	20:51 (2)	06:33	19:54 (1)	07:25	07:17	08:12	08:44
	17:07	18:06	18:56	20:50 35	20:21 (1) 21:38 26	21:06 (2) 22:02 38	21:28 (3)	21:39 17	21:08 (2)	20:41 19	20:13 (1)	19:29	17:21	16:31		16:25
26	08:27	07:30	06:26	06:16	19:45 (1) 05:26	20:40 (2)	05:14	20:50 (2)	05:45	20:52 (2)	06:35	19:56 (1)	07:26	07:19	08:14	08:45
	17:09	18:07	18:57	20:51 38	20:23 (1) 21:39 27	21:07 (2) 22:02 37	21:27 (3)	21:37 15	21:07 (2)	20:38 15	20:11 (1)	19:26	17:19	16:30		16:26
27	08:25	07:28	06:23	06:14	19:45 (1) 05:25	20:41 (2)	05:14	20:50 (2)	05:46	20:52 (2)	06:36	19:56 (1)	07:28	07:20	08:15	08:45
	17:11	18:09	18:59	20:53 39	20:24 (1) 21:40 27	21:08 (2) 22:01 38	21:28 (3)	21:36 13	21:05 (2)	20:36 13	20:09 (1)	19:24	17:17	16:29		16:27
28	08:24	07:26	06:21	06:12	19:45 (1) 05:24	20:41 (2)	05:15	20:50 (2)	05:48	20:53 (2)	06:38	19:58 (1)	07:30	07:22	08:17	08:45
	17:13	18:11	19:01	20:55 41	20:26 (1) 21:42 28	21:09 (2) 22:01 37	21:27 (3)	21:34 10	21:03 (2)	20:34 9	20:07 (1)	19:22	17:15	16:28		16:28
29	08:22		07:19	06:10	19:45 (1) 05:23	20:41 (2)	05:15	20:50 (2)	05:49	20:54 (2)	06:40	19:59 (1)	07:31	07:24	08:18	08:45
	17:15		20:03	20:56 41	20:26 (1) 21:43 29	21:10 (2) 22:01 38	21:28 (3)	21:33 9	21:03 (2)	20:32 5	20:04 (1)	19:19	17:13	16:28		16:28
30	08:21		07:16	06:08	19:46 (1) 05:22	20:41 (2)	05:16	20:50 (2)	05:51	20:11 (1)	06:41		07:33	07:26	08:20	08:45
	17:17		20:04	20:58 40	20:26 (1) 21:44 30	21:11 (2) 22:01 37	21:27 (3)	21:31 16	21:01 (2)	20:29		19:17	17:11	16:27		16:29
31	08:19		07:14		05:21	20:42 (2)		05:52	20:08 (1)	06:43			07:28			08:45
	17:18		20:06		21:45 31	21:13 (2)		21:30 20	21:00 (2)	20:27			17:09			16:30
Potential sun hours	257	277	367	417	487	501	504	455	381	331	265	241
Total, worst case				465	781	1090	812	846				
Sun reduction				0.38	0.39	0.35	0.33	0.35				
Oper. time red.				1.00	1.00	1.00	1.00	1.00				
Wind dir. red.				0.61	0.63	0.64	0.64	0.61				
Total reduction				0.23	0.25	0.22	0.21	0.22				
Total, real				109	193	241	172	184				

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
Jennings O'Donovan
Finisklin Business Park
F91 RHH9 Sligo
+353719161416
padraig / podowd@jodireland.com
Calculated:
11/06/2025 09:22/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Real Case - V150 **Shadow receptor:** O - 15

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:45 16:32	08:18 17:20	07:23 18:13	07:12 20:08	06:06 21:00 7	20:24 (1) 20:31 (1) 21:47 37	05:20 21:14 (2) 22:01 36	20:21 (1) 21:27 (2) 21:28 33	05:17 20:32 (1) 05:54	20:25 (1) 20:58 (1) 20:25	06:45 19:14	07:35 17:07	07:30 16:26	08:21
2	08:45 16:33	08:16 17:22	07:21 18:15	07:09 20:10	06:04 21:02 11	20:22 (1) 20:33 (1) 21:48 37	05:19 21:15 (2) 22:00 37	20:21 (1) 21:27 (2) 21:26 31	05:17 20:32 (1) 05:55	20:26 (1) 20:57 (1) 20:23	06:46 19:12	07:36 17:05	07:31 16:25	08:23
3	08:45 16:34	08:15 17:24	07:19 18:17	07:07 20:11	06:02 21:03 13	20:21 (1) 20:34 (1) 21:49 36	05:18 22:00 37	20:31 (1) 21:26 (2) 21:25 29	05:57 20:26 (1)	06:48 20:55 (1) 20:20	07:38 19:10	07:33 17:04	08:24 16:25	
4	08:45 16:35	08:13 17:26	07:17 18:18	07:05 20:13	06:00 21:05 16	20:19 (1) 20:35 (1) 21:50 37	05:17 20:23 (1) 05:19 21:17 (2) 22:00 37	20:31 (1) 21:26 (2) 21:23 27	05:59 20:26 (1)	06:50 20:53 (1) 20:18	07:40 19:07	07:35 17:02	08:26 16:24	
5	08:45 16:36	08:11 17:28	07:15 18:20	07:02 20:15	05:58 21:07 19	20:19 (1) 20:38 (1) 21:51 37	05:17 20:23 (1) 05:20 21:17 (2) 21:59 37	20:31 (1) 21:26 (2) 21:21 24	06:00 20:27 (1)	06:51 20:51 (1) 20:16	07:42 19:05	07:37 17:00	08:27 16:24	
6	08:44 16:37	08:10 17:30	07:12 18:22	07:00 20:17	05:56 21:08 21	20:18 (1) 20:39 (1) 21:52 36	05:16 20:25 (1) 05:21 21:19 (2) 21:58 36	20:31 (1) 21:25 (2) 21:19 22	06:02 20:27 (1)	06:53 20:49 (1) 20:13	07:43 19:03	07:39 16:58	08:28 16:23	
7	08:44 16:39	08:08 17:32	07:10 18:24	06:58 20:18	05:55 21:10 23	20:17 (1) 20:40 (1) 21:53 36	05:15 20:25 (1) 05:21 21:19 (2) 21:58 37	20:30 (1) 21:24 (2) 21:17 20	06:03 20:28 (1)	06:55 20:48 (1) 20:11	07:45 19:01	07:40 16:56	08:30 16:23	
8	08:43 16:40	08:06 17:34	07:08 18:26	06:56 20:20	05:53 21:12 25	20:16 (1) 20:41 (1) 21:54 37	05:15 20:26 (1) 05:22 21:20 (2) 21:57 36	20:30 (1) 21:23 (2) 21:16 18	06:05 20:28 (1)	06:56 20:46 (1) 20:09	07:47 18:58	07:42 16:55	08:31 16:22	
9	08:43 16:41	08:04 17:35	07:05 18:27	06:53 20:22	05:51 21:13 28	20:16 (1) 20:44 (1) 21:55 36	05:14 20:26 (1) 05:23 21:20 (2) 21:57 37	20:29 (1) 21:23 (2) 21:14 15	06:07 20:29 (1)	06:58 20:44 (1) 20:06	07:48 18:56	07:44 16:53	08:32 16:22	
10	08:42 16:43	08:02 17:37	07:03 18:29	06:51 20:24	05:49 21:15 30	20:15 (1) 20:45 (1) 21:55 37	05:14 20:27 (1) 05:24 21:22 (2) 21:56 36	20:29 (1) 21:22 (2) 21:12 12	06:08 20:43 (1)	07:00 20:04	07:50 18:54	07:46 16:51	08:33 16:22	
11	08:42 16:44	08:00 17:39	07:01 18:31	06:49 20:25	05:48 21:17 31	20:16 (1) 20:47 (1) 21:56 36	05:13 20:28 (1) 05:25 21:23 (2) 21:55 36	20:29 (1) 21:22 (2) 21:10 10	06:10 20:31 (1)	07:01 20:02	07:52 18:51	07:48 16:50	08:34 16:22	
12	08:41 16:46	07:59 17:41	06:59 18:33	06:46 20:27	05:46 21:18 33	20:15 (1) 20:48 (1) 21:57 35	05:13 20:29 (1) 05:27 21:23 (2) 21:54 36	20:28 (1) 21:21 (2) 21:08 6	06:12 20:39 (1)	07:03 19:59	07:54 18:49	07:50 16:48	08:35 16:22	
13	08:40 16:47	07:57 17:43	06:56 18:35	06:44 20:29	05:44 21:20 35	20:15 (1) 20:50 (1) 21:58 35	05:13 20:29 (1) 05:28 21:23 (2) 21:53 35	20:28 (1) 21:20 (2) 21:06 3	06:13 20:34 (1)	07:05 20:37 (1)	07:55 19:57	07:51 18:47	08:36 16:47	16:22
14	08:40 16:49	07:55 17:45	06:54 18:36	06:42 20:30	05:43 21:21 36	20:15 (1) 20:51 (1) 21:58 34	05:13 20:30 (1) 05:29 21:24 (2) 21:52 34	20:27 (1) 21:01 (1) 21:04	06:15	07:06 19:55	07:57 18:45	07:53 16:45	08:37 16:22	
15	08:39 16:50	07:53 17:47	06:52 18:38	06:40 20:32	05:41 21:23 38	20:15 (1) 20:53 (1) 21:59 34	05:12 20:30 (1) 05:30 21:25 (2) 21:51 35	20:28 (1) 21:03 (1) 21:02	06:17	07:08 19:52	07:59 18:42	07:55 16:44	08:38 16:22	
16	08:38 16:52	07:51 17:49	06:49 18:40	06:38 20:34	05:39 21:25 40	20:14 (1) 20:54 (1) 21:59 33	05:12 20:31 (1) 05:31 21:25 (2) 21:50 36	20:27 (1) 21:03 (1) 21:00	06:18	07:10 19:50	08:01 18:40	07:57 16:42	08:39 16:22	
17	08:37 16:54	07:49 17:51	06:47 18:42	06:35 20:36	05:38 21:26 40	20:15 (1) 20:55 (1) 22:00 34	05:12 20:31 (1) 05:32 21:26 (2) 21:49 37	20:27 (1) 21:04 (1) 20:58	06:20	07:11 19:48	08:02 18:38	07:58 16:41	08:40 16:22	
18	08:36 16:55	07:47 17:52	06:45 18:43	06:33 20:37	05:36 21:28 41	20:14 (1) 20:55 (1) 22:00 33	05:12 20:32 (1) 05:34 21:26 (2) 21:48 37	20:27 (1) 21:04 (1) 20:56	06:21	07:13 19:45	08:04 18:36	08:00 16:40	08:41 16:22	
19	08:35 16:57	07:45 17:54	06:42 18:45	06:31 20:39	05:35 21:29 41	20:15 (1) 20:56 (1) 22:00 33	05:12 20:32 (1) 05:35 21:26 (2) 21:47 38	20:26 (1) 21:04 (1) 20:54	06:23	07:15 19:43	08:06 18:34	08:02 16:38	08:41 16:22	
20	08:34 16:59	07:43 17:56	06:40 18:47	06:29 20:41	05:34 21:31 41	20:15 (1) 20:56 (1) 22:01 33	05:12 20:32 (1) 05:36 21:26 (2) 21:46 38	20:27 (1) 21:05 (1) 20:51	06:25	07:16 19:40	08:08 18:32	08:04 16:37	08:42 16:23	
21	08:33 17:00	07:41 17:58	06:38 18:49	06:27 20:43	05:32 21:32 40	20:16 (1) 20:56 (1) 22:01 32	05:12 20:32 (1) 05:38 21:26 (2) 21:44 39	20:26 (1) 21:05 (1) 20:49	06:26	07:18 19:38	08:10 18:29	08:05 16:36	08:43 16:23	
22	08:32 17:02	07:39 18:00	06:35 18:50	06:24 20:44	05:31 21:34 40	20:15 (1) 20:55 (1) 22:01 32	05:13 20:33 (1) 05:39 21:27 (2) 21:43 39	20:26 (1) 21:05 (1) 20:47	06:28	07:20 19:36	08:11 18:27	08:07 16:35	08:43 16:24	
23	08:30 17:04	07:36 18:02	06:33 18:52	06:22 20:46	05:30 21:35 39	20:16 (1) 20:55 (1) 22:01 33	05:13 20:33 (1) 05:41 21:27 (2) 21:42 40	20:25 (1) 21:05 (1) 20:45	06:30	07:21 19:33	08:13 18:25	08:09 16:33	08:44 16:24	
24	08:29 17:06	07:34 18:04	06:31 18:54	06:20 20:48	05:28 21:36 39	20:16 (1) 20:55 (1) 22:02 33	05:13 20:33 (1) 05:42 21:27 (2) 21:40 40	20:26 (1) 21:06 (1) 20:43	06:31	07:23 19:31	08:15 18:23	08:10 16:32	08:44 16:25	
25	08:28 17:07	07:32 18:06	06:28 18:56	06:18 20:50	05:27 21:38 37	20:17 (1) 20:54 (1) 22:02 33	05:14 20:34 (1) 05:43 21:28 (2) 21:39 41	20:25 (1) 21:06 (1) 20:41	06:33	07:25 19:29	07:17 17:21	08:12 16:31	08:44 16:25	
26	08:27 17:09	07:30 18:07	06:26 18:57	06:16 20:51	05:26 21:39 37	20:17 (1) 20:54 (1) 22:02 33	05:14 20:33 (1) 05:45 21:27 (2) 21:37 41	20:26 (1) 21:07 (1) 20:38	06:35	07:26 19:26	07:19 17:19	08:14 16:30	08:45 16:26	
27	08:25 17:11	07:28 18:09	06:23 18:59	06:14 20:53	05:25 21:40 36	20:18 (1) 20:54 (1) 22:01 33	05:14 20:34 (1) 05:46 21:28 (2) 21:36 40	20:25 (1) 21:05 (1) 20:36	06:36	07:28 19:24	07:20 17:17	08:15 16:29	08:45 16:27	
28	08:24 17:13	07:26 18:11	06:21 19:01	06:12 20:55	05:24 21:42 36	20:18 (1) 20:54 (1) 22:01 34	05:15 20:33 (1) 05:48 21:27 (2) 21:34 38	20:25 (1) 21:03 (1) 20:34	06:38	07:30 19:22	07:22 17:15	08:17 16:28	08:45 16:28	
29	08:22 17:15		07:19 20:03	06:10 20:56	05:23 21:43 34	20:19 (1) 20:53 (1) 22:01 36	05:15 20:33 (1) 05:49 21:28 (2) 21:33 38	20:25 (1) 21:03 (1) 20:32	06:40	07:31 19:19	07:24 17:13	08:18 16:28	08:45 16:28	
30	08:21 17:17		07:16 20:04	06:08 20:58 4	20:26 (1) 20:30 (1) 05:22 21:44 35	20:19 (1) 21:11 (2) 22:01 36	05:16 20:32 (1) 05:51 21:27 (2) 21:31 36	20:25 (1) 21:01 (1) 20:29	06:41	07:33 19:17	07:26 17:11	08:20 16:27	08:45 16:29	
31	08:19 17:18		07:14 20:06		05:21 21:45 35	20:21 (1) 21:13 (2)	05:52 21:30 34	20:26 (1) 21:00 (1) 20:27	06:43		07:28 17:09		08:45 16:30	
Potential sun hours	257	277	367	417	487	501	504	455	381	331	265	241		
Total, worst case				4	977	1041	1154	250						
Sun reduction				0.38	0.39	0.35	0.33	0.35						
Oper. time red.				1.00	1.00	1.00	1.00	1.00						
Wind dir. red.				0.63	0.63	0.64	0.63	0.63						
Total reduction				0.24	0.25	0.22	0.21	0.22						
Total, real				1	244	230	243	56						

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
Jennings O'Donovan
Finisklin Business Park
F91 RHH9 Sligo
+353719161416
padraig / podowd@jodireland.com
Calculated:
11/06/2025 09:22/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Real Case - V150 **Shadow receptor:** P - 16

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:45	08:18	07:23	07:12	06:06	05:20	20:27 (1)	05:17	20:37 (1)	05:54	20:35 (1)	06:45	07:35	07:29	08:21
	16:32	17:20	18:13	20:08	21:00	21:47 34	21:01 (1)	22:01 35	21:27 (2)	21:28 23	20:58 (1)	20:25	19:14	17:07	16:26
2	08:45	08:16	07:21	07:09	06:04	05:19	20:28 (1)	05:17	20:37 (1)	05:55	20:36 (1)	06:46	07:36	07:31	08:23
	16:33	17:22	18:15	20:10	21:02	21:48 32	21:00 (1)	22:00 35	21:27 (2)	21:26 21	20:57 (1)	20:23	19:12	17:05	16:25
3	08:45	08:15	07:19	07:07	06:02	05:18	20:28 (1)	05:18	20:37 (1)	05:57	20:36 (1)	06:48	07:38	07:33	08:24
	16:34	17:24	18:17	20:11	21:03	21:49 33	21:15 (2)	22:00 35	21:26 (2)	21:25 19	20:55 (1)	20:20	19:10	17:04	16:25
4	08:45	08:13	07:17	07:05	06:00	20:32 (1)	05:17	20:29 (1)	05:19	20:37 (1)	05:59	20:37 (1)	06:50	07:40	07:35	08:26
	16:35	17:26	18:18	20:13	21:05 3	20:35 (1)	21:50 34	21:17 (2)	22:00 35	21:26 (2)	21:23 16	20:53 (1)	20:18	19:07	17:02	16:24
5	08:45	08:11	07:15	07:02	05:58	20:31 (1)	05:17	20:29 (1)	05:20	20:37 (1)	06:00	20:38 (1)	06:51	07:42	07:37	08:27
	16:36	17:28	18:20	20:15	21:07 7	20:38 (1)	21:51 34	21:17 (2)	21:59 35	21:26 (2)	21:21 13	20:51 (1)	20:16	19:05	17:00	16:24
6	08:44	08:09	07:12	07:00	05:56	20:30 (1)	05:16	20:30 (1)	05:21	20:37 (1)	06:02	20:38 (1)	06:53	07:43	07:39	08:28
	16:37	17:30	18:22	20:17	21:08 9	20:39 (1)	21:52 35	21:19 (2)	21:58 34	21:25 (2)	21:19 11	20:49 (1)	20:13	19:03	16:58	16:23
7	08:44	08:08	07:10	06:58	05:55	20:28 (1)	05:15	20:30 (1)	05:21	20:36 (1)	06:03	20:40 (1)	06:55	07:45	07:40	08:30
	16:39	17:32	18:24	20:18	21:10 12	20:40 (1)	21:53 35	21:19 (2)	21:58 34	21:24 (2)	21:17 8	20:48 (1)	20:11	19:01	16:56	16:23
8	08:43	08:06	07:08	06:56	05:53	20:27 (1)	05:15	20:31 (1)	05:22	20:36 (1)	06:05	20:40 (1)	06:56	07:47	07:42	08:31
	16:40	17:34	18:26	20:20	21:12 14	20:41 (1)	21:54 35	21:20 (2)	21:57 34	21:23 (2)	21:16 6	20:46 (1)	20:09	18:58	16:55	16:22
9	08:43	08:04	07:05	06:53	05:51	20:27 (1)	05:14	20:31 (1)	05:23	20:35 (1)	06:07	20:43 (1)	06:58	07:48	07:44	08:32
	16:41	17:35	18:27	20:22	21:13 17	20:44 (1)	21:55 35	21:20 (2)	21:57 34	21:23 (2)	21:14 1	20:44 (1)	20:06	18:56	16:53	16:22
10	08:42	08:02	07:03	06:51	05:49	20:26 (1)	05:14	20:32 (1)	05:24	20:35 (1)	06:08		07:00	07:50	07:46	08:33
	16:43	17:37	18:29	20:24	21:15 19	20:45 (1)	21:55 36	21:22 (2)	21:56 33	21:08 (1)	21:12		20:04	18:54	16:51	16:22
11	08:42	08:00	07:01	06:49	05:48	20:26 (1)	05:13	20:33 (1)	05:25	20:35 (1)	06:10		07:01	07:52	07:48	08:34
	16:44	17:39	18:31	20:25	21:17 21	20:47 (1)	21:56 35	21:23 (2)	21:55 33	21:08 (1)	21:10		20:02	18:51	16:50	16:22
12	08:41	07:59	06:59	06:46	05:46	20:25 (1)	05:13	20:34 (1)	05:27	20:35 (1)	06:12		07:03	07:54	07:50	08:35
	16:46	17:41	18:33	20:27	21:18 23	20:48 (1)	21:57 35	21:23 (2)	21:54 34	21:09 (1)	21:08		19:59	18:49	16:48	16:22
13	08:40	07:57	06:56	06:44	05:44	20:25 (1)	05:13	20:33 (1)	05:28	20:34 (1)	06:13		07:05	07:55	07:51	08:36
	16:47	17:43	18:35	20:29	21:20 25	20:50 (1)	21:58 36	21:23 (2)	21:53 35	21:09 (1)	21:06		19:57	18:47	16:47	16:22
14	08:40	07:55	06:54	06:42	05:43	20:24 (1)	05:13	20:34 (1)	05:29	20:34 (1)	06:15		07:06	07:57	07:53	08:37
	16:49	17:45	18:36	20:30	21:21 27	20:51 (1)	21:58 35	21:24 (2)	21:52 35	21:09 (1)	21:04		19:55	18:45	16:45	16:22
15	08:39	07:53	06:52	06:40	05:41	20:24 (1)	05:12	20:35 (1)	05:30	20:35 (1)	06:17		07:08	07:59	07:55	08:38
	16:50	17:47	18:38	20:32	21:23 29	20:53 (1)	21:59 35	21:25 (2)	21:51 36	21:11 (1)	21:02		19:52	18:42	16:44	16:22
16	08:38	07:51	06:49	06:38	05:39	20:23 (1)	05:12	20:35 (1)	05:31	20:35 (1)	06:18		07:10	08:01	07:57	08:39
	16:52	17:49	18:40	20:34	21:25 31	20:54 (1)	21:59 35	21:25 (2)	21:50 36	21:11 (1)	21:00		19:50	18:40	16:42	16:22
17	08:37	07:49	06:47	06:35	05:38	20:24 (1)	05:12	20:36 (1)	05:32	20:34 (1)	06:20		07:11	08:02	07:58	08:40
	16:54	17:51	18:42	20:36	21:26 31	20:55 (1)	22:00 35	21:26 (2)	21:49 37	21:11 (1)	20:58		19:48	18:38	16:41	16:22
18	08:36	07:47	06:45	06:33	05:36	20:23 (1)	05:12	20:36 (1)	05:34	20:34 (1)	06:21		07:13	08:04	08:00	08:41
	16:55	17:52	18:43	20:37	21:28 33	20:56 (1)	22:00 35	21:26 (2)	21:48 37	21:11 (1)	20:56		19:45	18:36	16:40	16:22
19	08:35	07:45	06:42	06:31	05:35	20:23 (1)	05:12	20:36 (1)	05:35	20:34 (1)	06:23		07:15	08:06	08:02	08:41
	16:57	17:54	18:45	20:39	21:29 35	20:58 (1)	22:00 35	21:26 (2)	21:47 37	21:11 (1)	20:54		19:43	18:34	16:38	16:22
20	08:34	07:43	06:40	06:29	05:34	20:24 (1)	05:12	20:36 (1)	05:36	20:34 (1)	06:25		07:16	08:08	08:04	08:42
	16:59	17:56	18:47	20:41	21:31 35	20:59 (1)	22:01 35	21:26 (2)	21:46 38	21:12 (1)	20:51		19:40	18:32	16:37	16:23
21	08:33	07:41	06:38	06:27	05:32	20:24 (1)	05:12	20:36 (1)	05:38	20:34 (1)	06:26		07:18	08:10	08:05	08:43
	17:00	17:58	18:49	20:43	21:32 37	21:01 (1)	22:01 35	21:26 (2)	21:44 38	21:12 (1)	20:49		19:38	18:29	16:36	16:23
22	08:32	07:39	06:35	06:24	05:31	20:23 (1)	05:13	20:37 (1)	05:39	20:34 (1)	06:28		07:20	08:11	08:07	08:43
	17:02	18:00	18:50	20:44	21:34 38	21:01 (1)	22:01 35	21:27 (2)	21:43 37	21:11 (1)	20:47		19:36	18:27	16:35	16:24
23	08:30	07:36	06:33	06:22	05:30	20:24 (1)	05:13	20:37 (1)	05:41	20:33 (1)	06:30		07:21	08:13	08:09	08:44
	17:04	18:02	18:52	20:46	21:35 38	21:02 (1)	22:01 35	21:27 (2)	21:42 37	21:10 (1)	20:45		19:33	18:25	16:33	16:24
24	08:29	07:34	06:31	06:20	05:28	20:24 (1)	05:13	20:37 (1)	05:42	20:34 (1)	06:31		07:23	08:15	08:10	08:44
	17:06	18:04	18:54	20:48	21:36 38	21:02 (1)	22:01 35	21:27 (2)	21:40 35	21:09 (1)	20:43		19:31	18:23	16:32	16:25
25	08:28	07:32	06:28	06:18	05:27	20:24 (1)	05:14	20:38 (1)	05:43	20:34 (1)	06:33		07:25	07:17	08:12	08:44
	17:07	18:06	18:56	20:50	21:38 38	21:02 (1)	22:02 35	21:28 (2)	21:39 34	21:08 (1)	20:41		19:29	17:21	16:31	16:25
26	08:27	07:30	06:26	06:16	05:26	20:25 (1)	05:14	20:37 (1)	05:45	20:34 (1)	06:35		07:26	07:19	08:14	08:45
	17:09	18:07	18:57	20:51	21:39 37	21:02 (1)	22:02 35	21:27 (2)	21:37 33	21:07 (1)	20:38		19:26	17:19	16:30	16:26
27	08:25	07:28	06:23	06:14	05:25	20:25 (1)	05:14	20:38 (1)	05:46	20:34 (1)	06:36		07:28	07:20	08:15	08:45
	17:11	18:09	18:59	20:53	21:40 37	21:02 (1)	22:01 35	21:28 (2)	21:36 31	21:05 (1)	20:36		19:24	17:17	16:29	16:27
28	08:24	07:26	06:21	06:12	05:24	20:25 (1)	05:15	20:37 (1)	05:48	20:34 (1)	06:38		07:30	07:22	08:17	08:45
	17:13	18:11	19:01	20:55	21:42 36	21:01 (1)	22:01 35	21:27 (2)	21:34 29	21:03 (1)	20:34		19:22	17:15	16:28	16:28
29	08:22		07:19	06:10	05:23	20:26 (1)	05:15	20:38 (1)	05:49	20:35 (1)	06:40		07:31	07:24	08:18	08:45
	17:15		20:03	20:56	21:43 35	21:01 (1)	22:01 36	21:28 (2)	21:33 27	21:02 (1)	20:32		19:19	17:13	16:28	16:28
30	08:21		07:16	06:08	05:22	20:26 (1)	05:16	20:37 (1)	05:51	20:34 (1)	06:41		07:33	07:26	08:20	08:45
	17:17		20:04	20:58	21:44 35	21:01 (1)	22:01 36	21:27 (2)	21:31 27	21:01 (1)	20:29		19:17	17:11	16:27	16:29
31	08:19		07:14		05:21	20:27 (1)			05:52	20:35 (1)	06:43			07:28		08:45
	17:18		20:06		21:45 34	21:01 (1)			21:30 25	21:00 (1)	20:27			17:09		16:30
Potential sun hours	257	277	367	417	487	501	504	455	381	331	265	241
Total, worst case					774	1046	1055	118				
Sun reduction					0.39	0.35	0.33	0.35				
Oper. time red.					1.00	1.00	1.00	1.00				
Wind dir. red.					0.64	0.64	0.64	0.64				
Total reduction					0.25	0.22	0.21	0.23				
Total, real					194	232	223	27				

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
Jennings O'Donovan
Finisklin Business Park
F91 RHH9 Sligo
+353719161416
padraig / podowd@jodireland.com
Calculated:
11/06/2025 09:22/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Real Case - V150 **Shadow receptor:** Q - 17

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January	February	March	April	May		June		July		August	September	October	November	December
1	08:45	08:18	07:23	07:12	06:06		05:20		20:42 (1)		05:17	20:48 (1)	05:54	06:45	07:35	07:29	08:21
	16:32	17:20	18:13	20:08	21:00		21:47	32	21:14 (1)	39	22:01	21:27 (1)	21:28	20:25	19:14	17:07	16:26
2	08:45	08:16	07:21	07:09	06:04		05:19		20:41 (1)		05:17	20:48 (1)	05:55	06:46	07:36	07:31	08:23
	16:33	17:22	18:15	20:10	21:02		21:48	34	21:15 (1)	39	22:00	21:27 (1)	21:26	20:23	19:12	17:05	16:25
3	08:45	08:15	07:19	07:07	06:02		05:18		20:41 (1)		05:18	20:48 (1)	05:57	06:48	07:38	07:33	08:24
	16:34	17:24	18:17	20:11	21:03		21:49	34	21:15 (1)	38	22:00	21:26 (1)	21:25	20:20	19:10	17:04	16:25
4	08:45	08:13	07:17	07:05	06:00		05:17		20:42 (1)		05:19	20:48 (1)	05:59	06:50	07:40	07:35	08:26
	16:35	17:26	18:18	20:13	21:05		21:50	35	21:17 (1)	38	22:00	21:26 (1)	21:23	20:18	19:07	17:02	16:24
5	08:45	08:11	07:15	07:02	05:58		05:17		20:42 (1)		05:20	20:48 (1)	06:00	06:51	07:42	07:37	08:27
	16:36	17:28	18:20	20:15	21:07		21:51	35	21:17 (1)	38	21:59	21:26 (1)	21:21	20:16	19:05	17:00	16:24
6	08:44	08:09	07:12	07:00	05:56		05:16		20:42 (1)		05:21	20:49 (1)	06:02	06:53	07:43	07:39	08:28
	16:37	17:30	18:22	20:17	21:08		21:52	37	21:19 (1)	36	21:58	21:25 (1)	21:19	20:13	19:03	16:58	16:23
7	08:44	08:08	07:10	06:58	05:55		05:15		20:42 (1)		05:21	20:48 (1)	06:03	06:55	07:45	07:40	08:30
	16:39	17:32	18:24	20:18	21:10		21:53	37	21:19 (1)	36	21:58	21:24 (1)	21:17	20:11	19:01	16:56	16:23
8	08:43	08:06	07:08	06:56	05:53		05:15		20:43 (1)		05:22	20:48 (1)	06:05	06:56	07:47	07:42	08:31
	16:40	17:34	18:26	20:20	21:12		21:54	37	21:20 (1)	35	21:57	21:23 (1)	21:16	20:09	18:58	16:55	16:22
9	08:43	08:04	07:05	06:53	05:51		05:14		20:42 (1)		05:23	20:49 (1)	06:07	06:58	07:48	07:44	08:32
	16:41	17:35	18:27	20:22	21:13		21:55	38	21:20 (1)	34	21:57	21:23 (1)	21:14	20:06	18:56	16:53	16:22
10	08:42	08:02	07:03	06:51	05:49		05:14		20:43 (1)		05:24	20:49 (1)	06:08	07:00	07:50	07:46	08:33
	16:43	17:37	18:29	20:24	21:15		21:55	39	21:22 (1)	33	21:56	21:22 (1)	21:12	20:04	18:54	16:51	16:22
11	08:42	08:00	07:01	06:49	05:48		05:14		20:43 (1)		05:25	20:49 (1)	06:10	07:01	07:52	07:48	08:34
	16:44	17:39	18:31	20:25	21:17		21:56	40	21:23 (1)	33	21:55	21:22 (1)	21:10	20:02	18:51	16:50	16:22
12	08:41	07:59	06:59	06:46	05:46		05:13		20:44 (1)		05:27	20:49 (1)	06:12	07:03	07:54	07:50	08:35
	16:46	17:41	18:33	20:27	21:18		21:57	39	21:23 (1)	32	21:54	21:21 (1)	21:08	19:59	18:49	16:48	16:22
13	08:40	07:57	06:56	06:44	05:44		05:13		20:43 (1)		05:28	20:49 (1)	06:13	07:05	07:55	07:51	08:36
	16:47	17:43	18:35	20:29	21:20		21:58	40	21:23 (1)	31	21:53	21:20 (1)	21:06	19:57	18:47	16:47	16:22
14	08:40	07:55	06:54	06:42	05:43	20:50 (1)	05:13		20:44 (1)		05:29	20:50 (1)	06:15	07:06	07:57	07:53	08:37
	16:49	17:45	18:36	20:30	21:21	1 20:51 (1)	21:58	39	21:23 (1)	29	21:52	21:19 (1)	21:04	19:55	18:45	16:45	16:22
15	08:39	07:53	06:52	06:40	05:41	20:49 (1)	05:12		20:44 (1)		05:30	20:51 (1)	06:17	07:08	07:59	07:55	08:38
	16:50	17:47	18:38	20:32	21:23	4 20:53 (1)	21:59	39	21:23 (1)	28	21:51	21:19 (1)	21:02	19:52	18:42	16:44	16:22
16	08:38	07:51	06:49	06:38	05:39	20:47 (1)	05:12		20:44 (1)		05:31	20:51 (1)	06:18	07:10	08:01	07:57	08:39
	16:52	17:49	18:40	20:34	21:25	7 20:54 (1)	21:59	39	21:23 (1)	27	21:50	21:18 (1)	21:00	19:50	18:40	16:42	16:22
17	08:37	07:49	06:47	06:35	05:38	20:46 (1)	05:12		20:45 (1)		05:32	20:51 (1)	06:20	07:11	08:02	07:58	08:40
	16:54	17:51	18:42	20:36	21:26	9 20:55 (1)	22:00	39	21:24 (1)	26	21:49	21:17 (1)	20:58	19:48	18:38	16:41	16:22
18	08:36	07:47	06:45	06:33	05:36	20:45 (1)	05:12		20:45 (1)		05:34	20:51 (1)	06:21	07:13	08:04	08:00	08:41
	16:55	17:52	18:43	20:37	21:28	11 20:56 (1)	22:00	39	21:24 (1)	25	21:48	21:16 (1)	20:56	19:45	18:36	16:40	16:22
19	08:35	07:45	06:42	06:31	05:35	20:44 (1)	05:12		20:45 (1)		05:35	20:51 (1)	06:23	07:15	08:06	08:02	08:41
	16:57	17:54	18:45	20:39	21:29	14 20:58 (1)	22:00	39	21:24 (1)	23	21:47	21:14 (1)	20:54	19:43	18:34	16:38	16:22
20	08:34	07:43	06:40	06:29	05:34	20:44 (1)	05:12		20:45 (1)		05:36	20:53 (1)	06:25	07:16	08:08	08:04	08:42
	16:59	17:56	18:47	20:41	21:31	15 20:59 (1)	22:01	39	21:24 (1)	21	21:46	21:14 (1)	20:51	19:40	18:32	16:37	16:23
21	08:33	07:41	06:38	06:27	05:32	20:44 (1)	05:12		20:46 (1)		05:38	20:53 (1)	06:26	07:18	08:10	08:05	08:43
	17:00	17:58	18:49	20:43	21:32	17 21:01 (1)	22:01	39	21:25 (1)	20	21:44	21:13 (1)	20:49	19:38	18:29	16:36	16:23
22	08:32	07:39	06:35	06:24	05:31	20:42 (1)	05:13		20:46 (1)		05:39	20:53 (1)	06:28	07:20	08:11	08:07	08:43
	17:02	18:00	18:50	20:44	21:34	19 21:01 (1)	22:01	39	21:25 (1)	18	21:43	21:11 (1)	20:47	19:36	18:27	16:35	16:24
23	08:30	07:36	06:33	06:22	05:30	20:42 (1)	05:13		20:46 (1)		05:41	20:53 (1)	06:30	07:21	08:13	08:09	08:44
	17:04	18:02	18:52	20:46	21:35	21 21:03 (1)	22:01	39	21:25 (1)	17	21:42	21:10 (1)	20:45	19:33	18:25	16:33	16:24
24	08:29	07:34	06:31	06:20	05:28	20:42 (1)	05:13		20:46 (1)		05:42	20:55 (1)	06:31	07:23	08:15	08:10	08:44
	17:06	18:04	18:54	20:48	21:36	22 21:04 (1)	22:01	39	21:25 (1)	14	21:40	21:09 (1)	20:43	19:31	18:23	16:32	16:25
25	08:28	07:32	06:28	06:18	05:27	20:42 (1)	05:14		20:47 (1)		05:43	20:55 (1)	06:33	07:25	07:17	08:12	08:44
	17:07	18:06	18:56	20:50	21:38	24 21:06 (1)	22:02	39	21:26 (1)	13	21:39	21:08 (1)	20:41	19:29	17:21	16:31	16:25
26	08:27	07:30	06:26	06:16	05:26	20:42 (1)	05:14		20:47 (1)		05:45	20:57 (1)	06:35	07:26	07:19	08:14	08:45
	17:09	18:07	18:57	20:51	21:39	25 21:07 (1)	22:02	38	21:25 (1)	10	21:37	21:07 (1)	20:38	19:26	17:19	16:30	16:26
27	08:25	07:28	06:23	06:14	05:25	20:42 (1)	05:14		20:47 (1)		05:46	20:57 (1)	06:36	07:28	07:20	08:15	08:45
	17:11	18:09	18:59	20:53	21:40	26 21:08 (1)	22:01	39	21:26 (1)	8	21:36	21:05 (1)	20:36	19:24	17:17	16:29	16:27
28	08:24	07:26	06:21	06:12	05:24	20:41 (1)	05:15		20:47 (1)		05:48	20:58 (1)	06:38	07:30	07:22	08:17	08:45
	17:13	18:11	19:01	20:55	21:42	28 21:09 (1)	22:01	39	21:26 (1)	5	21:34	21:03 (1)	20:34	19:22	17:15	16:28	16:28
29	08:22		07:19	06:10	05:23	20:41 (1)	05:15		20:48 (1)		05:49	21:00 (1)	06:40	07:31	07:24	08:18	08:45
	17:15		20:03	20:56	21:43	29 21:10 (1)	22:01	39	21:27 (1)	2	21:33	21:02 (1)	20:32	19:19	17:13	16:28	16:28
30	08:21		07:16	06:08	05:22	20:41 (1)	05:16		20:47 (1)		05:51		06:41	07:33	07:26	08:20	08:45
	17:17		20:04	20:58	21:44	30 21:11 (1)	22:01	39	21:26 (1)		21:31		20:29	19:17	17:11	16:27	16:29
31	08:19		07:14		05:21	20:42 (1)					05:52		06:43		07:28		08:45
	17:18		20:06		21:45	31 21:13 (1)					21:30		20:27		17:09		16:30
Potential sun hours	257	277	367	417	487		501		504		455	381	331	265	241		
Total, worst case						333		1139		748							
Sun reduction						0.39		0.35		0.33							
Oper. time red.						1.00		1.00		1.00							
Wind dir. red.						0.64		0.64		0.64							
Total reduction						0.25		0.22		0.21							
Total, real						84		252		158							

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
Jennings O'Donovan
Finisklin Business Park
F91 RHH9 Sligo
+353719161416
padraig / podowd@jodireland.com
Calculated:
11/06/2025 09:22/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Real Case - V150 **Shadow receptor:** R - 18

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:45	08:18	07:23	07:12	06:06	05:20	20:38 (1)	05:17	20:45 (1)	05:54	20:53 (1)	06:45	07:35	07:29	08:21
	16:32	17:20	18:13	20:08	21:00	21:47 36	21:14 (1)	22:01 33	21:18 (1)	21:28 5	20:58 (1)	20:25	19:14	17:07	16:26
2	08:45	08:16	07:21	07:09	06:04	05:19	20:38 (1)	05:17	20:46 (1)	05:55	20:55 (1)	06:46	07:36	07:31	08:23
	16:33	17:22	18:15	20:10	21:02	21:48 35	21:13 (1)	22:00 33	21:19 (1)	21:26 2	20:57 (1)	20:23	19:12	17:05	16:25
3	08:45	08:15	07:19	07:07	06:02	05:18	20:38 (1)	05:18	20:45 (1)	05:57		06:48	07:38	07:33	08:24
	16:34	17:24	18:17	20:11	21:03	21:49 35	21:13 (1)	22:00 34	21:19 (1)	21:25		20:20	19:10	17:04	16:25
4	08:45	08:13	07:17	07:05	06:00	05:17	20:39 (1)	05:19	20:45 (1)	05:59		06:50	07:40	07:35	08:26
	16:35	17:26	18:18	20:13	21:05	21:50 35	21:14 (1)	22:00 34	21:19 (1)	21:23		20:18	19:07	17:02	16:24
5	08:45	08:11	07:14	07:02	05:58	05:17	20:38 (1)	05:20	20:45 (1)	06:00		06:51	07:42	07:37	08:27
	16:36	17:28	18:20	20:15	21:07	21:51 35	21:13 (1)	21:59 35	21:20 (1)	21:21		20:16	19:05	17:00	16:24
6	08:44	08:09	07:12	07:00	05:56	05:16	20:39 (1)	05:21	20:46 (1)	06:02		06:53	07:43	07:39	08:28
	16:37	17:30	18:22	20:17	21:08	21:52 35	21:14 (1)	21:58 34	21:20 (1)	21:19		20:13	19:03	16:58	16:23
7	08:44	08:08	07:10	06:58	05:55	05:15	20:39 (1)	05:21	20:45 (1)	06:03		06:55	07:45	07:40	08:30
	16:39	17:32	18:24	20:18	21:10	21:53 35	21:14 (1)	21:58 35	21:20 (1)	21:17		20:11	19:01	16:56	16:23
8	08:43	08:06	07:08	06:56	05:53	05:15	20:40 (1)	05:22	20:45 (1)	06:05		06:56	07:47	07:42	08:31
	16:40	17:34	18:26	20:20	21:12	21:54 34	21:14 (1)	21:57 35	21:20 (1)	21:16		20:09	18:58	16:55	16:22
9	08:43	08:04	07:05	06:53	05:51	05:14	20:40 (1)	05:23	20:45 (1)	06:07		06:58	07:48	07:44	08:32
	16:41	17:35	18:27	20:22	21:13	21:55 33	21:13 (1)	21:57 36	21:21 (1)	21:14		20:06	18:56	16:53	16:22
10	08:42	08:02	07:03	06:51	05:49	05:14	20:40 (1)	05:24	20:45 (1)	06:08		07:00	07:50	07:46	08:33
	16:43	17:37	18:29	20:24	21:15	21:55 34	21:14 (1)	21:56 36	21:21 (1)	21:12		20:04	18:54	16:51	16:22
11	08:42	08:00	07:01	06:49	05:48	20:44 (1) 05:13	20:41 (1)	05:25	20:45 (1)	06:10		07:01	07:52	07:48	08:34
	16:44	17:39	18:31	20:25	21:17 3	20:47 (1) 21:56 33	21:14 (1)	21:55 36	21:21 (1)	21:10		20:02	18:51	16:50	16:22
12	08:41	07:59	06:59	06:46	05:46	20:42 (1) 05:13	20:42 (1)	05:27	20:45 (1)	06:12		07:03	07:54	07:50	08:35
	16:46	17:41	18:33	20:27	21:18 6	20:48 (1) 21:57 33	21:15 (1)	21:54 36	21:21 (1)	21:08		19:59	18:49	16:48	16:22
13	08:40	07:57	06:56	06:44	05:44	20:42 (1) 05:13	20:41 (1)	05:28	20:45 (1)	06:13		07:05	07:55	07:51	08:36
	16:47	17:43	18:35	20:29	21:20 8	20:50 (1) 21:57 33	21:14 (1)	21:53 35	21:20 (1)	21:06		19:57	18:47	16:47	16:22
14	08:40	07:55	06:54	06:42	05:43	20:40 (1) 05:13	20:42 (1)	05:29	20:45 (1)	06:15		07:06	07:57	07:53	08:37
	16:49	17:45	18:36	20:30	21:21 11	20:51 (1) 21:58 32	21:14 (1)	21:52 34	21:19 (1)	21:04		19:55	18:45	16:45	16:22
15	08:39	07:53	06:52	06:40	05:41	20:40 (1) 05:12	20:42 (1)	05:30	20:46 (1)	06:17		07:08	07:59	07:55	08:38
	16:50	17:47	18:38	20:32	21:23 13	20:53 (1) 21:59 33	21:25 (2)	21:51 33	21:19 (1)	21:02		19:52	18:42	16:44	16:22
16	08:38	07:51	06:49	06:38	05:39	20:39 (1) 05:12	20:42 (1)	05:31	20:46 (1)	06:18		07:10	08:01	07:57	08:39
	16:52	17:49	18:40	20:34	21:25 15	20:54 (1) 21:59 33	21:25 (2)	21:50 32	21:18 (1)	21:00		19:50	18:40	16:42	16:22
17	08:37	07:49	06:47	06:35	05:38	20:38 (1) 05:12	20:43 (1)	05:32	20:46 (1)	06:20		07:11	08:02	07:58	08:40
	16:54	17:51	18:42	20:36	21:26 17	20:55 (1) 22:00 34	21:26 (2)	21:49 31	21:17 (1)	20:58		19:48	18:38	16:41	16:22
18	08:36	07:47	06:45	06:33	05:36	20:37 (1) 05:12	20:43 (1)	05:34	20:46 (1)	06:21		07:13	08:04	08:00	08:41
	16:55	17:52	18:43	20:37	21:28 19	20:56 (1) 22:00 33	21:26 (2)	21:48 30	21:16 (1)	20:56		19:45	18:36	16:40	16:22
19	08:35	07:45	06:42	06:31	05:35	20:37 (1) 05:12	20:43 (1)	05:35	20:46 (1)	06:23		07:15	08:06	08:02	08:41
	16:57	17:54	18:45	20:39	21:29 21	20:58 (1) 22:00 33	21:26 (2)	21:47 28	21:14 (1)	20:54		19:43	18:34	16:38	16:22
20	08:34	07:43	06:40	06:29	05:34	20:37 (1) 05:12	20:43 (1)	05:36	20:47 (1)	06:25		07:16	08:08	08:04	08:42
	16:59	17:56	18:47	20:41	21:31 22	20:59 (1) 22:01 33	21:26 (2)	21:46 27	21:14 (1)	20:51		19:40	18:32	16:37	16:23
21	08:33	07:41	06:38	06:27	05:32	20:37 (1) 05:12	20:43 (1)	05:38	20:47 (1)	06:26		07:18	08:10	08:05	08:43
	17:00	17:58	18:49	20:43	21:32 24	21:01 (1) 22:01 33	21:26 (2)	21:44 26	21:13 (1)	20:49		19:38	18:29	16:36	16:23
22	08:32	07:39	06:35	06:24	05:31	20:36 (1) 05:13	20:44 (1)	05:39	20:47 (1)	06:28		07:20	08:11	08:07	08:43
	17:02	18:00	18:50	20:44	21:34 25	21:01 (1) 22:01 33	21:27 (2)	21:43 24	21:11 (1)	20:47		19:36	18:27	16:35	16:24
23	08:30	07:36	06:33	06:22	05:30	20:36 (1) 05:13	20:44 (1)	05:41	20:47 (1)	06:30		07:21	08:13	08:09	08:44
	17:04	18:02	18:52	20:46	21:35 27	21:03 (1) 22:01 33	21:27 (2)	21:42 23	21:10 (1)	20:45		19:33	18:25	16:33	16:24
24	08:29	07:34	06:31	06:20	05:28	20:36 (1) 05:13	20:44 (1)	05:42	20:48 (1)	06:31		07:23	08:15	08:10	08:44
	17:06	18:04	18:54	20:48	21:36 28	21:04 (1) 22:01 33	21:27 (2)	21:40 21	21:09 (1)	20:43		19:31	18:23	16:32	16:25
25	08:28	07:32	06:28	06:18	05:27	20:36 (1) 05:14	20:45 (1)	05:43	20:48 (1)	06:33		07:25	07:17	08:12	08:44
	17:07	18:06	18:56	20:50	21:38 30	21:06 (1) 22:02 33	21:28 (2)	21:39 20	21:08 (1)	20:41		19:29	17:21	16:31	16:25
26	08:27	07:30	06:26	06:16	05:26	20:36 (1) 05:14	20:44 (1)	05:45	20:49 (1)	06:35		07:26	07:19	08:14	08:45
	17:09	18:07	18:57	20:51	21:39 31	21:07 (1) 22:02 33	21:27 (2)	21:37 18	21:07 (1)	20:38		19:26	17:19	16:30	16:26
27	08:25	07:28	06:23	06:14	05:25	20:37 (1) 05:14	20:45 (1)	05:46	20:49 (1)	06:36		07:28	07:20	08:15	08:45
	17:11	18:09	18:59	20:53	21:40 31	21:08 (1) 22:01 33	21:28 (2)	21:36 16	21:05 (1)	20:36		19:24	17:17	16:29	16:27
28	08:24	07:26	06:21	06:12	05:24	20:37 (1) 05:15	20:45 (1)	05:48	20:49 (1)	06:38		07:30	07:22	08:17	08:45
	17:13	18:11	19:01	20:55	21:42 32	21:09 (1) 22:01 32	21:17 (1)	21:34 14	21:03 (1)	20:34		19:22	17:15	16:28	16:28
29	08:22		07:19	06:10	05:23	20:37 (1) 05:15	20:45 (1)	05:49	20:51 (1)	06:40		07:31	07:24	08:18	08:45
	17:15		20:03	20:56	21:43 33	21:10 (1) 22:01 33	21:18 (1)	21:33 11	21:02 (1)	20:32		19:19	17:13	16:28	16:28
30	08:21		07:16	06:08	05:22	20:37 (1) 05:16	20:45 (1)	05:51	20:51 (1)	06:41		07:33	07:26	08:20	08:45
	17:17		20:04	20:58	21:44 34	21:11 (1) 22:01 33	21:18 (1)	21:31 10	21:01 (1)	20:29		19:17	17:11	16:27	16:29
31	08:19		07:14		05:21	20:38 (1)		05:52	20:53 (1)	06:43			07:28		08:45
	17:18		20:06		21:45 35	21:13 (1)		21:30 7	21:00 (1)	20:27			17:09		16:30
Potential sun hours	257	277	367	417	487	501	504	455	381	331	265	241
Total, worst case					465	1006	857	7				
Sun reduction					0.39	0.35	0.33	0.35				
Oper. time red.					1.00	1.00	1.00	1.00				
Wind dir. red.					0.64	0.64	0.64	0.64				
Total reduction					0.25	0.22	0.21	0.23				
Total, real					117	223	181	2				

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
Jennings O'Donovan
Finisklin Business Park
F91 RHH9 Sligo
+353719161416
padraig / podowd@jodireland.com

Calculated:
11/06/2025 09:22/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Real Case - V150 **Shadow receptor:** S - 19

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:45	08:18	07:23	07:12	06:06	05:20	05:17	05:54	06:45	07:35	07:30	08:21
	16:32	17:20	18:13	20:08	21:00	21:47	22:01	21:28	20:25	19:14	17:07	16:26
2	08:45	08:16	07:21	07:09	06:04	05:19	05:17	05:56	06:46	07:36	07:31	08:23
	16:33	17:22	18:15	20:10	21:02	21:48	22:00	21:26	20:23	19:12	17:05	16:25
3	08:45	08:15	07:19	07:07	06:02	05:18	05:18	05:57	06:48	07:38	07:33	08:24
	16:34	17:24	18:17	20:11	21:03	21:49	22:00	21:25	20:20	19:10	17:04	16:25
4	08:45	08:13	07:17	07:05	06:00	05:17	05:19	05:59	06:50	07:40	07:35	08:26
	16:35	17:26	18:18	20:13	21:05	21:50	22:00	21:23	20:18	19:07	17:02	16:24
5	08:45	08:11	07:15	07:03	05:58	05:17	05:20	06:00	06:51	07:42	07:37	08:27
	16:36	17:28	18:20	20:15	21:07	21:51	21:59	21:21	20:16	19:05	17:00	16:24
6	08:44	08:10	07:12	07:00	05:56	05:16	05:21	06:02	06:53	07:43	07:39	08:28
	16:38	17:30	18:22	20:17	21:08	21:52	21:58	21:19	20:13	19:03	16:58	16:23
7	08:44	08:08	07:10	06:58	05:55	05:15	05:21	06:03	06:55	07:45	07:40	08:30
	16:39	17:32	18:24	20:18	21:10	21:53	21:58	21:17	20:11	19:01	16:57	16:23
8	08:43	08:06	07:08	06:56	05:53	05:15	05:22	06:05	06:56	07:47	07:42	08:31
	16:40	17:34	18:26	20:20	21:12	21:54	21:57	21:16	20:09	18:58	16:55	16:22
9	08:43	08:04	07:05	06:53	05:51	05:14	05:23	06:07	06:58	07:48	07:44	08:32
	16:42	17:35	18:27	20:22	21:13	21:55	21:57	21:14	20:06	18:56	16:53	16:22
10	08:42	08:02	07:03	06:51	05:49	05:14	05:24	06:08	07:00	07:50	07:46	08:33
	16:43	17:37	18:29	20:24	21:15	21:55	21:56	21:12	20:04	18:54	16:51	16:22
11	08:42	08:00	07:01	06:49	05:48	05:14	05:25	06:10	07:01	07:52	07:48	08:34
	16:44	17:39	18:31	20:25	21:17	21:56	21:55	21:10	20:02	18:51	16:50	16:22
12	08:41	07:59	06:59	06:46	05:46	05:13	05:27	06:12	07:03	07:54	07:50	08:35
	16:46	17:41	18:33	20:27	21:18	21:57	21:54	21:08	19:59	18:49	16:48	16:22
13	08:40	07:57	06:56	06:44	05:44	05:13	05:28	06:13	07:05	07:55	07:51	08:36
	16:47	17:43	18:35	20:29	21:20	21:58	21:53	21:06	19:57	18:47	16:47	16:22
14	08:40	07:55	06:54	06:42	05:43	05:13	05:29	06:15	07:06	07:57	07:53	08:37
	16:49	17:45	18:36	20:31	21:21	21:58	21:52	21:04	19:55	18:45	16:45	16:22
15	08:39	07:53	06:52	06:40	05:41	05:12	05:30	06:17	07:08	07:59	07:55	08:38
	16:50	17:47	18:38	20:32	21:23	21:59	21:51	21:02	19:52	18:42	16:44	16:22
16	08:38	07:51	06:49	06:38	05:40	05:12	05:31	06:18	07:10	08:01	07:57	08:39
	16:52	17:49	18:40	20:34	21:25	21:59	21:50	21:00	19:50	18:40	16:42	16:22
17	08:37	07:49	06:47	06:35	05:38	05:12	05:33	06:20	07:11	08:02	07:58	08:40
	16:54	17:51	18:42	20:36	21:26	22:00	21:49	20:58	19:48	18:38	16:41	16:22
18	08:36	07:47	06:45	06:33	05:36	05:12	05:34	06:21	07:13	08:04	08:00	08:41
	16:55	17:52	18:43	20:37	21:28	22:00	21:48	20:56	19:45	18:36	16:40	16:22
19	08:35	07:45	06:42	06:31	05:35	05:12	05:35	06:23	07:15	08:06	08:02	08:41
	16:57	17:54	18:45	20:39	21:29	22:00	21:47	20:54	19:43	18:34	16:38	16:22
20	08:34	07:43	06:40	06:29	05:34	05:12	05:36	06:25	07:16	08:08	08:04	08:42
	16:59	17:56	18:47	20:41	21:31	22:01	21:46	20:51	19:40	18:32	16:37	16:23
21	08:33	07:41	06:38	06:27	05:32	05:12	05:38	06:26	07:18	08:10	08:05	08:43
	17:00	17:58	18:49	20:43	21:32	22:01	21:44	20:49	19:38	18:29	16:36	16:23
22	08:32	07:39	06:35	06:24	05:31	05:13	05:39	06:28	07:20	08:11	08:07	08:43
	17:02	18:00	18:50	20:44	21:34	22:01	21:43	20:47	19:36	18:27	16:35	16:24
23	08:30	07:36	06:33	06:22	05:30	05:13	05:41	06:30	07:21	08:13	08:09	08:44
	17:04	18:02	18:52	20:46	21:35	22:01	21:42	20:45	19:33	18:25	16:33	16:24
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	17:06	18:04	18:54	20:48	21:36	22:01	21:40	20:43	19:31	18:23	16:32	16:25
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26	08:27	07:30	06:26	06:16	05:26	05:14	05:45	06:35	07:26	07:19	08:14	08:45
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	17:17		20:04	20:58	21:44	22:01	21:31	20:29	19:17	17:11	16:27	16:29
31	08:19		07:14		05:21		05:52	06:43		07:28		08:45
	17:18		20:06		21:45		21:30	20:27		17:09		16:30
Potential sun hours	257	277	367	417	487	501	504	455	381	331	265	241
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

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+353719161416
padraig / podowd@jodireland.com

Calculated:
11/06/2025 09:22/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Real Case - V150 **Shadow receptor:** T - 20

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:46	08:18	07:24	07:12	06:06	05:20	05:17	05:54	06:45	07:35	07:30	08:21
	16:32	17:20	18:13	20:08	21:00	21:47	22:01	21:28	20:25	19:15	17:07	16:26
2	08:45	08:16	07:21	07:10	06:04	05:19	05:17	05:56	06:46	07:36	07:31	08:23
	16:33	17:22	18:15	20:10	21:02	21:48	22:00	21:26	20:23	19:12	17:06	16:26
3	08:45	08:15	07:19	07:07	06:02	05:18	05:18	05:57	06:48	07:38	07:33	08:24
	16:34	17:24	18:17	20:11	21:03	21:49	22:00	21:25	20:20	19:10	17:04	16:25
4	08:45	08:13	07:17	07:05	06:00	05:17	05:19	05:59	06:50	07:40	07:35	08:26
	16:35	17:26	18:18	20:13	21:05	21:50	22:00	21:23	20:18	19:08	17:02	16:24
5	08:45	08:11	07:15	07:03	05:58	05:17	05:20	06:00	06:51	07:42	07:37	08:27
	16:36	17:28	18:20	20:15	21:07	21:51	21:59	21:21	20:16	19:05	17:00	16:24
6	08:44	08:10	07:12	07:00	05:57	05:16	05:21	06:02	06:53	07:43	07:39	08:28
	16:38	17:30	18:22	20:17	21:08	21:52	21:59	21:19	20:13	19:03	16:58	16:23
7	08:44	08:08	07:10	06:58	05:55	05:16	05:22	06:04	06:55	07:45	07:41	08:30
	16:39	17:32	18:24	20:18	21:10	21:53	21:58	21:18	20:11	19:01	16:57	16:23
8	08:44	08:06	07:08	06:56	05:53	05:15	05:22	06:05	06:56	07:47	07:42	08:31
	16:40	17:34	18:26	20:20	21:12	21:54	21:57	21:16	20:09	18:58	16:55	16:23
9	08:43	08:04	07:06	06:53	05:51	05:14	05:23	06:07	06:58	07:48	07:44	08:32
	16:42	17:36	18:28	20:22	21:13	21:55	21:57	21:14	20:06	18:56	16:53	16:22
10	08:43	08:02	07:03	06:51	05:49	05:14	05:24	06:08	07:00	07:50	07:46	08:33
	16:43	17:37	18:29	20:24	21:15	21:55	21:56	21:12	20:04	18:54	16:52	16:22
11	08:42	08:01	07:01	06:49	05:48	05:14	05:26	06:10	07:01	07:52	07:48	08:34
	16:44	17:39	18:31	20:25	21:17	21:56	21:55	21:10	20:02	18:52	16:50	16:22
12	08:41	07:59	06:59	06:47	05:46	05:13	05:27	06:12	07:03	07:54	07:50	08:35
	16:46	17:41	18:33	20:27	21:18	21:57	21:54	21:08	19:59	18:49	16:48	16:22
13	08:40	07:57	06:56	06:44	05:44	05:13	05:28	06:13	07:05	07:55	07:51	08:36
	16:47	17:43	18:35	20:29	21:20	21:58	21:53	21:06	19:57	18:47	16:47	16:22
14	08:40	07:55	06:54	06:42	05:43	05:13	05:29	06:15	07:06	07:57	07:53	08:37
	16:49	17:45	18:36	20:31	21:21	21:58	21:52	21:04	19:55	18:45	16:45	16:22
15	08:39	07:53	06:52	06:40	05:41	05:13	05:30	06:17	07:08	07:59	07:55	08:38
	16:51	17:47	18:38	20:32	21:23	21:59	21:51	21:02	19:52	18:43	16:44	16:22
16	08:38	07:51	06:49	06:38	05:40	05:12	05:31	06:18	07:10	08:01	07:57	08:39
	16:52	17:49	18:40	20:34	21:25	21:59	21:50	21:00	19:50	18:40	16:42	16:22
17	08:37	07:49	06:47	06:35	05:38	05:12	05:33	06:20	07:11	08:02	07:59	08:40
	16:54	17:51	18:42	20:36	21:26	22:00	21:49	20:58	19:48	18:38	16:41	16:22
18	08:36	07:47	06:45	06:33	05:37	05:12	05:34	06:22	07:13	08:04	08:00	08:41
	16:55	17:53	18:44	20:38	21:28	22:00	21:48	20:56	19:45	18:36	16:40	16:22
19	08:35	07:45	06:42	06:31	05:35	05:12	05:35	06:23	07:15	08:06	08:02	08:41
	16:57	17:54	18:45	20:39	21:29	22:01	21:47	20:54	19:43	18:34	16:38	16:23
20	08:34	07:43	06:40	06:29	05:34	05:12	05:36	06:25	07:16	08:08	08:04	08:42
	16:59	17:56	18:47	20:41	21:31	22:01	21:46	20:52	19:41	18:32	16:37	16:23
21	08:33	07:41	06:38	06:27	05:32	05:13	05:38	06:27	07:18	08:10	08:05	08:43
	17:01	17:58	18:49	20:43	21:32	22:01	21:44	20:49	19:38	18:30	16:36	16:23
22	08:32	07:39	06:35	06:25	05:31	05:13	05:39	06:28	07:20	08:11	08:07	08:43
	17:02	18:00	18:51	20:44	21:34	22:01	21:43	20:47	19:36	18:27	16:35	16:24
23	08:31	07:37	06:33	06:22	05:30	05:13	05:41	06:30	07:21	08:13	08:09	08:44
	17:04	18:02	18:52	20:46	21:35	22:01	21:42	20:45	19:33	18:25	16:34	16:24
24	08:29	07:34	06:31	06:20	05:28	05:13	05:42	06:32	07:23	08:15	08:11	08:44
	17:06	18:04	18:54	20:48	21:36	22:02	21:40	20:43	19:31	18:23	16:32	16:25
25	08:28	07:32	06:28	06:18	05:27	05:14	05:43	06:33	07:25	07:17	08:12	08:45
	17:08	18:06	18:56	20:50	21:38	22:02	21:39	20:41	19:29	17:21	16:31	16:25
26	08:27	07:30	06:26	06:16	05:26	05:14	05:45	06:35	07:26	07:19	08:14	08:45
	17:09	18:07	18:58	20:51	21:39	22:02	21:38	20:39	19:26	17:19	16:30	16:26
27	08:25	07:28	06:24	06:14	05:25	05:14	05:46	06:36	07:28	07:20	08:15	08:45
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28	08:24	07:26	06:21	06:12	05:24	05:15	05:48	06:38	07:30	07:22	08:17	08:45
	17:13	18:11	19:01	20:55	21:42	22:01	21:35	20:34	19:22	17:15	16:29	16:28
29	08:22		07:19	06:10	05:23	05:16	05:49	06:40	07:31	07:24	08:18	08:45
	17:15		20:03	20:57	21:43	22:01	21:33	20:32	19:19	17:13	16:28	16:29
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	17:17		20:05	20:58	21:44	22:01	21:31	20:30	19:17	17:11	16:27	16:30
31	08:19		07:14		05:21		05:52	06:43		07:28		08:46
	17:19		20:06		21:45		21:30	20:27		17:09		16:30
Potential sun hours	257	277	367	417	487	501	504	455	381	331	265	241
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

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padraig / podowd@jodireland.com

Calculated:
11/06/2025 09:22/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Real Case - V150 **Shadow receptor:** U - 21

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:46	08:18	07:24	07:12	06:06	05:20	05:17	05:54	06:45	07:35	07:30	08:21
	16:32	17:20	18:13	20:08	21:00	21:47	22:01	21:28	20:25	19:15	17:07	16:26
2	08:45	08:16	07:21	07:10	06:04	05:19	05:17	05:56	06:46	07:36	07:31	08:23
	16:33	17:22	18:15	20:10	21:02	21:48	22:00	21:26	20:23	19:12	17:06	16:26
3	08:45	08:15	07:19	07:07	06:02	05:18	05:18	05:57	06:48	07:38	07:33	08:24
	16:34	17:24	18:17	20:11	21:03	21:49	22:00	21:25	20:20	19:10	17:04	16:25
4	08:45	08:13	07:17	07:05	06:00	05:17	05:19	05:59	06:50	07:40	07:35	08:26
	16:35	17:26	18:18	20:13	21:05	21:50	22:00	21:23	20:18	19:08	17:02	16:24
5	08:45	08:11	07:15	07:03	05:58	05:17	05:20	06:00	06:51	07:42	07:37	08:27
	16:36	17:28	18:20	20:15	21:07	21:51	21:59	21:21	20:16	19:05	17:00	16:24
6	08:44	08:10	07:12	07:00	05:57	05:16	05:21	06:02	06:53	07:43	07:39	08:28
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	16:42	17:36	18:28	20:22	21:13	21:55	21:57	21:14	20:06	18:56	16:53	16:22
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	16:43	17:37	18:29	20:24	21:15	21:55	21:56	21:12	20:04	18:54	16:52	16:22
11	08:42	08:01	07:01	06:49	05:48	05:14	05:26	06:10	07:01	07:52	07:48	08:34
	16:44	17:39	18:31	20:25	21:17	21:56	21:55	21:10	20:02	18:52	16:50	16:22
12	08:41	07:59	06:59	06:47	05:46	05:13	05:27	06:12	07:03	07:54	07:50	08:35
	16:46	17:41	18:33	20:27	21:18	21:57	21:54	21:08	19:59	18:49	16:48	16:22
13	08:40	07:57	06:56	06:44	05:44	05:13	05:28	06:13	07:05	07:55	07:51	08:36
	16:47	17:43	18:35	20:29	21:20	21:58	21:53	21:06	19:57	18:47	16:47	16:22
14	08:40	07:55	06:54	06:42	05:43	05:13	05:29	06:15	07:06	07:57	07:53	08:37
	16:49	17:45	18:36	20:31	21:21	21:58	21:52	21:04	19:55	18:45	16:45	16:22
15	08:39	07:53	06:52	06:40	05:41	05:13	05:30	06:17	07:08	07:59	07:55	08:38
	16:51	17:47	18:38	20:32	21:23	21:59	21:51	21:02	19:52	18:43	16:44	16:22
16	08:38	07:51	06:49	06:38	05:40	05:12	05:31	06:18	07:10	08:01	07:57	08:39
	16:52	17:49	18:40	20:34	21:25	21:59	21:50	21:00	19:50	18:40	16:42	16:22
17	08:37	07:49	06:47	06:35	05:38	05:12	05:33	06:20	07:11	08:02	07:59	08:40
	16:54	17:51	18:42	20:36	21:26	22:00	21:49	20:58	19:48	18:38	16:41	16:22
18	08:36	07:47	06:45	06:33	05:37	05:12	05:34	06:22	07:13	08:04	08:00	08:41
	16:55	17:53	18:44	20:38	21:28	22:00	21:48	20:56	19:45	18:36	16:40	16:22
19	08:35	07:45	06:42	06:31	05:35	05:12	05:35	06:23	07:15	08:06	08:02	08:41
	16:57	17:54	18:45	20:39	21:29	22:01	21:47	20:54	19:43	18:34	16:38	16:23
20	08:34	07:43	06:40	06:29	05:34	05:12	05:36	06:25	07:16	08:08	08:04	08:42
	16:59	17:56	18:47	20:41	21:31	22:01	21:46	20:52	19:41	18:32	16:37	16:23
21	08:33	07:41	06:38	06:27	05:32	05:13	05:38	06:27	07:18	08:10	08:05	08:43
	17:01	17:58	18:49	20:43	21:32	22:01	21:44	20:49	19:38	18:30	16:36	16:23
22	08:32	07:39	06:35	06:25	05:31	05:13	05:39	06:28	07:20	08:11	08:07	08:43
	17:02	18:00	18:51	20:44	21:34	22:01	21:43	20:47	19:36	18:27	16:35	16:24
23	08:31	07:37	06:33	06:22	05:30	05:13	05:41	06:30	07:21	08:13	08:09	08:44
	17:04	18:02	18:52	20:46	21:35	22:01	21:42	20:45	19:33	18:25	16:34	16:24
24	08:29	07:34	06:31	06:20	05:28	05:13	05:42	06:32	07:23	08:15	08:11	08:44
	17:06	18:04	18:54	20:48	21:36	22:02	21:40	20:43	19:31	18:23	16:32	16:25
25	08:28	07:32	06:28	06:18	05:27	05:14	05:43	06:33	07:25	07:17	08:12	08:45
	17:08	18:06	18:56	20:50	21:38	22:02	21:39	20:41	19:29	17:21	16:31	16:25
26	08:27	07:30	06:26	06:16	05:26	05:14	05:45	06:35	07:26	07:19	08:14	08:45
	17:09	18:07	18:58	20:51	21:39	22:02	21:38	20:39	19:26	17:19	16:30	16:26
27	08:25	07:28	06:24	06:14	05:25	05:14	05:46	06:36	07:28	07:20	08:15	08:45
	17:11	18:09	18:59	20:53	21:41	22:02	21:36	20:36	19:24	17:17	16:29	16:27
28	08:24	07:26	06:21	06:12	05:24	05:15	05:48	06:38	07:30	07:22	08:17	08:45
	17:13	18:11	19:01	20:55	21:42	22:01	21:35	20:34	19:22	17:15	16:29	16:28
29	08:22		07:19	06:10	05:23	05:16	05:49	06:40	07:31	07:24	08:18	08:45
	17:15		20:03	20:57	21:43	22:01	21:33	20:32	19:19	17:13	16:28	16:29
30	08:21		07:17	06:08	05:22	05:16	05:51	06:41	07:33	07:26	08:20	08:46
	17:17		20:05	20:58	21:44	22:01	21:31	20:30	19:17	17:11	16:27	16:30
31	08:19		07:14		05:21		05:52	06:43		07:28		08:46
	17:19		20:06		21:45		21:30	20:27		17:09		16:30
Potential sun hours	257	277	367	417	487	501	504	455	381	331	265	241
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
Jennings O'Donovan
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+353719161416
padraig / podowd@jodireland.com
Calculated:
11/06/2025 09:22/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Real Case - V150 **Shadow receptor:** V - 22

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January	February	March	April	May	June		July		August	September	October	November	December
1	08:46	08:18	07:24	07:12	06:06	05:20		05:17	05:48 (1)	05:54	06:45	07:35	07:30	08:21
	16:32	17:20	18:13	20:08	21:00	21:47		22:01	5 05:53 (1)	21:28	20:25	19:15	17:07	16:26
2	08:45	08:16	07:21	07:10	06:04	05:19		05:17	05:49 (1)	05:56	06:46	07:36	07:31	08:23
	16:33	17:22	18:15	20:10	21:02	21:48		22:00	4 05:53 (1)	21:26	20:23	19:12	17:06	16:26
3	08:45	08:15	07:19	07:07	06:02	05:18		05:18	05:49 (1)	05:57	06:48	07:38	07:33	08:24
	16:34	17:24	18:17	20:11	21:03	21:49		22:00	3 05:52 (1)	21:25	20:20	19:10	17:04	16:25
4	08:45	08:13	07:17	07:05	06:00	05:17		05:19	05:50 (1)	05:59	06:50	07:40	07:35	08:26
	16:35	17:26	18:18	20:13	21:05	21:50		22:00	2 05:52 (1)	21:23	20:18	19:08	17:02	16:24
5	08:45	08:11	07:15	07:03	05:58	05:17		05:20		06:00	06:51	07:42	07:37	08:27
	16:36	17:28	18:20	20:15	21:07	21:51		21:59		21:21	20:16	19:05	17:00	16:24
6	08:44	08:10	07:12	07:00	05:57	05:16		05:21		06:02	06:53	07:43	07:39	08:28
	16:38	17:30	18:22	20:17	21:08	21:52		21:59		21:19	20:13	19:03	16:58	16:23
7	08:44	08:08	07:10	06:58	05:55	05:16		05:22		06:04	06:55	07:45	07:41	08:30
	16:39	17:32	18:24	20:18	21:10	21:53		21:58		21:18	20:11	19:01	16:57	16:23
8	08:44	08:06	07:08	06:56	05:53	05:15	05:45 (1)	05:22		06:05	06:56	07:47	07:42	08:31
	16:40	17:34	18:26	20:20	21:12	21:54	1 05:46 (1)	21:57		21:16	20:09	18:58	16:55	16:23
9	08:43	08:04	07:06	06:53	05:51	05:14	05:45 (1)	05:23		06:07	06:58	07:48	07:44	08:32
	16:42	17:36	18:28	20:22	21:13	21:55	2 05:47 (1)	21:57		21:14	20:06	18:56	16:53	16:22
10	08:43	08:02	07:03	06:51	05:49	05:14	05:44 (1)	05:24		06:08	07:00	07:50	07:46	08:33
	16:43	17:37	18:29	20:24	21:15	21:55	3 05:47 (1)	21:56		21:12	20:04	18:54	16:52	16:22
11	08:42	08:01	07:01	06:49	05:48	05:14	05:44 (1)	05:26		06:10	07:01	07:52	07:48	08:34
	16:44	17:39	18:31	20:25	21:17	21:56	4 05:48 (1)	21:55		21:10	20:02	18:52	16:50	16:22
12	08:41	07:59	06:59	06:47	05:46	05:13	05:44 (1)	05:27		06:12	07:03	07:54	07:50	08:35
	16:46	17:41	18:33	20:27	21:18	21:57	5 05:49 (1)	21:54		21:08	19:59	18:49	16:48	16:22
13	08:41	07:57	06:56	06:44	05:44	05:13	05:43 (1)	05:28		06:13	07:05	07:55	07:51	08:36
	16:47	17:43	18:35	20:29	21:20	21:58	6 05:49 (1)	21:53		21:06	19:57	18:47	16:47	16:22
14	08:40	07:55	06:54	06:42	05:43	05:13	05:43 (1)	05:29		06:15	07:06	07:57	07:53	08:37
	16:49	17:45	18:36	20:31	21:21	21:58	7 05:50 (1)	21:52		21:04	19:55	18:45	16:45	16:22
15	08:39	07:53	06:52	06:40	05:41	05:13	05:43 (1)	05:30		06:17	07:08	07:59	07:55	08:38
	16:51	17:47	18:38	20:32	21:23	21:59	7 05:50 (1)	21:51		21:02	19:52	18:43	16:44	16:22
16	08:38	07:51	06:49	06:38	05:40	05:12	05:43 (1)	05:31		06:18	07:10	08:01	07:57	08:39
	16:52	17:49	18:40	20:34	21:25	21:59	8 05:51 (1)	21:50		21:00	19:50	18:40	16:42	16:22
17	08:37	07:49	06:47	06:35	05:38	05:12	05:43 (1)	05:33		06:20	07:11	08:02	07:59	08:40
	16:54	17:51	18:42	20:36	21:26	22:00	8 05:51 (1)	21:49		20:58	19:48	18:38	16:41	16:22
18	08:36	07:47	06:45	06:33	05:37	05:12	05:43 (1)	05:34		06:22	07:13	08:04	08:00	08:41
	16:55	17:53	18:44	20:38	21:28	22:00	8 05:51 (1)	21:48		20:56	19:45	18:36	16:40	16:22
19	08:35	07:45	06:42	06:31	05:35	05:12	05:43 (1)	05:35		06:23	07:15	08:06	08:02	08:41
	16:57	17:54	18:45	20:39	21:29	22:01	8 05:51 (1)	21:47		20:54	19:43	18:34	16:38	16:23
20	08:34	07:43	06:40	06:29	05:34	05:12	05:43 (1)	05:36		06:25	07:16	08:08	08:04	08:42
	16:59	17:56	18:47	20:41	21:31	22:01	9 05:52 (1)	21:46		20:52	19:41	18:32	16:37	16:23
21	08:33	07:41	06:38	06:27	05:32	05:13	05:44 (1)	05:38		06:27	07:18	08:10	08:05	08:43
	17:01	17:58	18:49	20:43	21:32	22:01	9 05:53 (1)	21:44		20:49	19:38	18:30	16:36	16:23
22	08:32	07:39	06:35	06:25	05:31	05:13	05:44 (1)	05:39		06:28	07:20	08:11	08:07	08:43
	17:02	18:00	18:51	20:44	21:34	22:01	9 05:53 (1)	21:43		20:47	19:36	18:27	16:35	16:24
23	08:31	07:37	06:33	06:22	05:30	05:13	05:44 (1)	05:41		06:30	07:21	08:13	08:09	08:44
	17:04	18:02	18:52	20:46	21:35	22:01	9 05:53 (1)	21:42		20:45	19:33	18:25	16:34	16:24
24	08:29	07:34	06:31	06:20	05:28	05:13	05:44 (1)	05:42		06:32	07:23	08:15	08:11	08:44
	17:06	18:04	18:54	20:48	21:36	22:02	8 05:52 (1)	21:40		20:43	19:31	18:23	16:32	16:25
25	08:28	07:32	06:28	06:18	05:27	05:14	05:45 (1)	05:43		06:33	07:25	07:17	08:12	08:45
	17:08	18:06	18:56	20:50	21:38	22:02	8 05:53 (1)	21:39		20:41	19:29	17:21	16:31	16:25
26	08:27	07:30	06:26	06:16	05:26	05:14	05:45 (1)	05:45		06:35	07:26	07:19	08:14	08:45
	17:09	18:07	18:58	20:51	21:39	22:02	8 05:53 (1)	21:38		20:39	19:26	17:19	16:30	16:26
27	08:25	07:28	06:24	06:14	05:25	05:14	05:46 (1)	05:46		06:36	07:28	07:20	08:15	08:45
	17:11	18:09	18:59	20:53	21:41	22:02	7 05:53 (1)	21:36		20:36	19:24	17:17	16:29	16:27
28	08:24	07:26	06:21	06:12	05:24	05:15	05:46 (1)	05:48		06:38	07:30	07:22	08:17	08:45
	17:13	18:11	19:01	20:55	21:42	22:01	7 05:53 (1)	21:35		20:34	19:22	17:15	16:29	16:28
29	08:22		07:19	06:10	05:23	05:16	05:47 (1)	05:49		06:40	07:31	07:24	08:18	08:45
	17:15		20:03	20:57	21:43	22:01	6 05:53 (1)	21:33		20:32	19:19	17:13	16:28	16:29
30	08:21		07:17	06:08	05:22	05:16	05:47 (1)	05:51		06:41	07:33	07:26	08:20	08:46
	17:17		20:05	20:58	21:44	22:01	5 05:52 (1)	21:31		20:30	19:17	17:11	16:27	16:30
31	08:19		07:14		05:21			05:52		06:43		07:28		08:46
	17:19		20:06		21:45			21:30		20:27		17:09		16:30
Potential sun hours	257	277	367	417	487	501		504		455	381	331	265	241
Total, worst case						152		14						
Sun reduction						0.35		0.33						
Oper. time red.						1.00		1.00						
Wind dir. red.						0.61		0.61						
Total reduction						0.21		0.20						
Total, real						32		3						

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

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padraig / podowd@jodireland.com
Calculated:
11/06/2025 09:22/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Real Case - V150 **Shadow receptor:** W - 23

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:46	08:18	07:24	07:12	06:06	05:20	05:49 (1)	05:17	05:48 (1)	05:54	06:45	07:35	07:30	08:21
	16:32	17:20	18:13	20:08	21:00	21:47	5 05:54 (1)	22:01	16 06:04 (1)	21:28	20:25	19:15	17:07	16:26
2	08:45	08:16	07:21	07:10	06:04	05:19	05:48 (1)	05:17	05:49 (1)	05:56	06:46	07:36	07:31	08:23
	16:33	17:22	18:15	20:10	21:02	21:48	6 05:54 (1)	22:00	16 06:05 (1)	21:26	20:23	19:12	17:06	16:26
3	08:45	08:15	07:19	07:07	06:02	05:18	05:48 (1)	05:18	05:49 (1)	05:57	06:48	07:38	07:33	08:24
	16:34	17:24	18:17	20:11	21:03	21:49	8 05:56 (1)	22:00	15 06:04 (1)	21:25	20:20	19:10	17:04	16:25
4	08:45	08:13	07:17	07:05	06:00	05:17	05:47 (1)	05:19	05:50 (1)	05:59	06:50	07:40	07:35	08:26
	16:35	17:26	18:18	20:13	21:05	21:50	9 05:56 (1)	22:00	14 06:04 (1)	21:23	20:18	19:08	17:02	16:24
5	08:45	08:11	07:15	07:03	05:58	05:17	05:46 (1)	05:20	05:51 (1)	06:00	06:51	07:42	07:37	08:27
	16:36	17:28	18:20	20:15	21:07	21:51	10 05:56 (1)	21:59	13 06:04 (1)	21:21	20:16	19:05	17:00	16:24
6	08:44	08:10	07:12	07:00	05:57	05:16	05:46 (1)	05:21	05:52 (1)	06:02	06:53	07:43	07:39	08:28
	16:38	17:30	18:22	20:17	21:08	21:52	12 05:58 (1)	21:59	12 06:04 (1)	21:19	20:13	19:03	16:58	16:23
7	08:44	08:08	07:10	06:58	05:55	05:16	05:45 (1)	05:22	05:53 (1)	06:04	06:55	07:45	07:41	08:30
	16:39	17:32	18:24	20:18	21:10	21:53	13 05:58 (1)	21:58	11 06:04 (1)	21:18	20:11	19:01	16:57	16:23
8	08:44	08:06	07:08	06:56	05:53	05:15	05:45 (1)	05:22	05:53 (1)	06:05	06:56	07:47	07:42	08:31
	16:40	17:34	18:26	20:20	21:12	21:54	14 05:59 (1)	21:57	10 06:03 (1)	21:16	20:09	18:58	16:55	16:23
9	08:43	08:04	07:06	06:53	05:51	05:14	05:45 (1)	05:23	05:54 (1)	06:07	06:58	07:48	07:44	08:32
	16:42	17:36	18:28	20:22	21:13	21:55	14 05:59 (1)	21:57	9 06:03 (1)	21:14	20:07	18:56	16:53	16:22
10	08:43	08:02	07:03	06:51	05:49	05:14	05:44 (1)	05:24	05:55 (1)	06:08	07:00	07:50	07:46	08:33
	16:43	17:37	18:29	20:24	21:15	21:55	15 05:59 (1)	21:56	7 06:02 (1)	21:12	20:04	18:54	16:52	16:22
11	08:42	08:01	07:01	06:49	05:48	05:14	05:44 (1)	05:26	05:56 (1)	06:10	07:01	07:52	07:48	08:34
	16:44	17:39	18:31	20:25	21:17	21:56	16 06:00 (1)	21:55	6 06:02 (1)	21:10	20:02	18:52	16:50	16:22
12	08:41	07:59	06:59	06:47	05:46	05:13	05:44 (1)	05:27	05:57 (1)	06:12	07:03	07:54	07:50	08:35
	16:46	17:41	18:33	20:27	21:18	21:57	17 06:01 (1)	21:54	4 06:01 (1)	21:08	19:59	18:49	16:48	16:22
13	08:41	07:57	06:56	06:44	05:44	05:13	05:43 (1)	05:28	05:58 (1)	06:13	07:05	07:55	07:51	08:36
	16:47	17:43	18:35	20:29	21:20	21:58	17 06:00 (1)	21:53	2 06:00 (1)	21:06	19:57	18:47	16:47	16:22
14	08:40	07:55	06:54	06:42	05:43	05:13	05:43 (1)	05:29		06:15	07:06	07:57	07:53	08:37
	16:49	17:45	18:36	20:31	21:21	21:58	18 06:01 (1)	21:52		21:04	19:55	18:45	16:45	16:22
15	08:39	07:53	06:52	06:40	05:41	05:13	05:43 (1)	05:30		06:17	07:08	07:59	07:55	08:38
	16:51	17:47	18:38	20:32	21:23	21:59	18 06:01 (1)	21:51		21:02	19:52	18:43	16:44	16:22
16	08:38	07:51	06:49	06:38	05:40	05:12	05:43 (1)	05:31		06:18	07:10	08:01	07:57	08:39
	16:52	17:49	18:40	20:34	21:25	21:59	18 06:01 (1)	21:50		21:00	19:50	18:40	16:42	16:22
17	08:37	07:49	06:47	06:35	05:38	05:12	05:43 (1)	05:33		06:20	07:11	08:02	07:59	08:40
	16:54	17:51	18:42	20:36	21:26	22:00	19 06:02 (1)	21:49		20:58	19:48	18:38	16:41	16:22
18	08:36	07:47	06:45	06:33	05:37	05:12	05:43 (1)	05:34		06:22	07:13	08:04	08:00	08:41
	16:55	17:53	18:44	20:38	21:28	22:00	19 06:02 (1)	21:48		20:56	19:45	18:36	16:40	16:22
19	08:35	07:45	06:42	06:31	05:35	05:12	05:43 (1)	05:35		06:23	07:15	08:06	08:02	08:41
	16:57	17:54	18:45	20:39	21:29	22:01	19 06:02 (1)	21:47		20:54	19:43	18:34	16:38	16:23
20	08:34	07:43	06:40	06:29	05:34	05:12	05:43 (1)	05:36		06:25	07:16	08:08	08:04	08:42
	16:59	17:56	18:47	20:41	21:31	22:01	19 06:02 (1)	21:46		20:52	19:41	18:32	16:37	16:23
21	08:33	07:41	06:38	06:27	05:32	05:13	05:44 (1)	05:38		06:27	07:18	08:10	08:05	08:43
	17:01	17:58	18:49	20:43	21:32	22:01	19 06:03 (1)	21:44		20:49	19:38	18:30	16:36	16:23
22	08:32	07:39	06:35	06:25	05:31	05:13	05:44 (1)	05:39		06:28	07:20	08:11	08:07	08:43
	17:02	18:00	18:51	20:44	21:34	22:01	19 06:03 (1)	21:43		20:47	19:36	18:27	16:35	16:24
23	08:31	07:37	06:33	06:22	05:30	05:13	05:44 (1)	05:41		06:30	07:21	08:13	08:09	08:44
	17:04	18:02	18:52	20:46	21:35	22:01	19 06:03 (1)	21:42		20:45	19:33	18:25	16:34	16:24
24	08:29	07:34	06:31	06:20	05:28	05:13	05:44 (1)	05:42		06:32	07:23	08:15	08:11	08:44
	17:06	18:04	18:54	20:48	21:36	22:02	19 06:03 (1)	21:40		20:43	19:31	18:23	16:32	16:25
25	08:28	07:32	06:28	06:18	05:27	05:14	05:45 (1)	05:43		06:33	07:25	07:17	08:12	08:45
	17:08	18:06	18:56	20:50	21:38	22:02	19 06:04 (1)	21:39		20:41	19:29	17:21	16:31	16:25
26	08:27	07:30	06:26	06:16	05:26	05:14	05:45 (1)	05:45		06:35	07:26	07:19	08:14	08:45
	17:09	18:07	18:58	20:51	21:39	22:02	19 06:04 (1)	21:38		20:39	19:26	17:19	16:30	16:26
27	08:25	07:28	06:24	06:14	05:25	05:14	05:46 (1)	05:46		06:36	07:28	07:20	08:15	08:45
	17:11	18:09	18:59	20:53	21:41	22:02	18 06:04 (1)	21:36		20:36	19:24	17:17	16:29	16:27
28	08:24	07:26	06:21	06:12	05:24	05:15	05:46 (1)	05:48		06:38	07:30	07:22	08:17	08:45
	17:13	18:11	19:01	20:55	21:42	22:01	18 06:04 (1)	21:35		20:34	19:22	17:15	16:29	16:28
29	08:22		07:19	06:10	05:23	05:16	05:47 (1)	05:49		06:40	07:31	07:24	08:18	08:45
	17:15		20:03	20:57	21:43	22:01	17 06:04 (1)	21:33		20:32	19:19	17:13	16:28	16:29
30	08:21		07:17	06:08	05:22	05:51 (1)	05:16	05:47 (1)	05:51		06:41	07:33	07:26	08:20	08:46
	17:17		20:05	20:58	21:44	1 05:52 (1)	22:01	17 06:04 (1)	21:31		20:30	19:17	17:11	16:27	16:30
31	08:19		07:14		05:21	05:50 (1)			05:52		06:43		07:28		08:46
	17:19		20:06		21:46	3 05:53 (1)			21:30		20:27		17:09		16:30
Potential sun hours	257	277	367	417	487		501		504		455	381	331	265	241
Total, worst case					4		470		135						
Sun reduction					0.39		0.35		0.33						
Oper. time red.					1.00		1.00		1.00						
Wind dir. red.					0.60		0.60		0.60						
Total reduction					0.24		0.21		0.20						
Total, real					1		98		27						

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
Jennings O'Donovan
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+353719161416
padraig / podowd@jodireland.com
Calculated:
11/06/2025 09:22/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Real Case - V150 **Shadow receptor:** X - 24

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January	February	March	April			May			June		
1	08:46	08:18	07:24	07:12			06:06			05:20		05:49 (2)
	16:32	17:20	18:13	20:08			21:00			21:47	35	06:24 (2)
2	08:45	08:16	07:21	07:10			06:04			05:19		05:48 (2)
	16:33	17:22	18:15	20:10			21:02			21:48	36	06:24 (2)
3	08:45	08:15	07:19	07:07			06:02			05:18		05:48 (2)
	16:34	17:24	18:17	20:11			21:03			21:49	37	06:25 (2)
4	08:45	08:13	07:17	07:05		07:28 (1)	06:00			05:17		05:47 (2)
	16:35	17:26	18:18	20:13	5	07:33 (1)	21:05			21:50	38	06:25 (2)
5	08:45	08:11	07:15	07:03		07:26 (1)	05:58			05:17		05:46 (2)
	16:36	17:28	18:20	20:15	10	07:36 (1)	21:07			21:51	39	06:25 (2)
6	08:44	08:10	07:12	07:00		07:23 (1)	05:57			05:16		05:46 (2)
	16:38	17:30	18:22	20:17	13	07:36 (1)	21:08			21:52	39	06:25 (2)
7	08:44	08:08	07:10	06:58		07:21 (1)	05:55			05:15		05:45 (2)
	16:39	17:32	18:24	20:18	16	07:37 (1)	21:10			21:53	40	06:25 (2)
8	08:44	08:06	07:08	06:56		07:19 (1)	05:53			05:15		05:45 (2)
	16:40	17:34	18:26	20:20	19	07:38 (1)	21:12			21:54	41	06:26 (2)
9	08:43	08:04	07:06	06:53		07:16 (1)	05:51			05:14		05:45 (2)
	16:42	17:36	18:28	20:22	22	07:38 (1)	21:13			21:55	41	06:26 (2)
10	08:43	08:02	07:03	06:51		07:14 (1)	05:49			05:14		05:45 (2)
	16:43	17:37	18:29	20:24	25	07:39 (1)	21:15			21:55	41	06:26 (2)
11	08:42	08:01	07:01	06:49		07:12 (1)	05:48			05:14		05:45 (2)
	16:44	17:39	18:31	20:25	27	07:39 (1)	21:17			21:56	41	06:26 (2)
12	08:41	07:59	06:59	06:47		07:10 (1)	05:46			05:13		05:46 (2)
	16:46	17:41	18:33	20:27	30	07:40 (1)	21:18			21:57	41	06:27 (2)
13	08:41	07:57	06:56	06:44		07:08 (1)	05:44		06:11 (2)	05:13		05:45 (2)
	16:47	17:43	18:35	20:29	32	07:40 (1)	21:20	1	06:12 (2)	21:58	41	06:26 (2)
14	08:40	07:55	06:54	06:42		07:05 (1)	05:43		06:09 (2)	05:13		05:45 (2)
	16:49	17:45	18:36	20:31	34	07:39 (1)	21:22	4	06:13 (2)	21:58	41	06:26 (2)
15	08:39	07:53	06:52	06:40		07:03 (1)	05:41		06:08 (2)	05:13		05:46 (2)
	16:51	17:47	18:38	20:32	36	07:39 (1)	21:23	7	06:15 (2)	21:59	41	06:27 (2)
16	08:38	07:51	06:49	06:38		07:01 (1)	05:40		06:06 (2)	05:12		05:46 (2)
	16:52	17:49	18:40	20:34	38	07:39 (1)	21:25	10	06:16 (2)	21:59	41	06:27 (2)
17	08:37	07:49	06:47	06:35		07:01 (1)	05:38		06:05 (2)	05:12		05:46 (2)
	16:54	17:51	18:42	20:36	37	07:38 (1)	21:26	12	06:17 (2)	22:00	41	06:27 (2)
18	08:36	07:47	06:45	06:33		07:01 (1)	05:37		06:04 (2)	05:12		05:47 (2)
	16:55	17:53	18:44	20:38	37	07:38 (1)	21:28	14	06:18 (2)	22:00	40	06:27 (2)
19	08:35	07:45	06:42	06:31		07:02 (1)	05:35		06:02 (2)	05:12		05:47 (2)
	16:57	17:54	18:45	20:39	35	07:37 (1)	21:29	17	06:19 (2)	22:01	40	06:27 (2)
20	08:34	07:43	06:40	06:29		07:02 (1)	05:34		06:01 (2)	05:12		05:47 (2)
	16:59	17:56	18:47	20:41	35	07:37 (1)	21:31	18	06:19 (2)	22:01	40	06:27 (2)
21	08:33	07:41	06:38	06:27		07:02 (1)	05:32		06:00 (2)	05:13		05:48 (2)
	17:00	17:58	18:49	20:43	33	07:35 (1)	21:32	20	06:20 (2)	22:01	40	06:28 (2)
22	08:32	07:39	06:35	06:25		07:02 (1)	05:31		05:59 (2)	05:13		05:48 (2)
	17:02	18:00	18:51	20:44	32	07:34 (1)	21:34	22	06:21 (2)	22:01	40	06:28 (2)
23	08:31	07:37	06:33	06:22		07:03 (1)	05:30		05:57 (2)	05:13		05:48 (2)
	17:04	18:02	18:52	20:46	30	07:33 (1)	21:35	24	06:21 (2)	22:02	40	06:28 (2)
24	08:29	07:34	06:31	06:20		07:04 (1)	05:28		05:56 (2)	05:13		05:48 (2)
	17:06	18:04	18:54	20:48	27	07:31 (1)	21:36	25	06:21 (2)	22:02	40	06:28 (2)
25	08:28	07:32	06:28	06:18		07:05 (1)	05:27		05:55 (2)	05:14		05:48 (2)
	17:08	18:06	18:56	20:50	24	07:29 (1)	21:38	27	06:22 (2)	22:02	41	06:29 (2)
26	08:27	07:30	06:26	06:16		07:07 (1)	05:26		05:54 (2)	05:14		05:48 (2)
	17:09	18:07	18:58	20:51	20	07:27 (1)	21:39	28	06:22 (2)	22:02	41	06:29 (2)
27	08:25	07:28	06:24	06:14		07:09 (1)	05:25		05:53 (2)	05:14		05:49 (2)
	17:11	18:09	18:59	20:53	16	07:25 (1)	21:41	30	06:23 (2)	22:02	41	06:30 (2)
28	08:24	07:26	06:21	06:12		07:12 (1)	05:24		05:52 (2)	05:15		05:49 (2)
	17:13	18:11	19:01	20:55	9	07:21 (1)	21:42	31	06:23 (2)	22:01	40	06:29 (2)
29	08:22		07:19	06:10			05:23		05:51 (2)	05:15		05:49 (2)
	17:15		20:03	20:57			21:43	32	06:23 (2)	22:01	41	06:30 (2)
30	08:21		07:17	06:08			05:22		05:51 (2)	05:16		05:49 (2)
	17:17		20:05	20:58			21:44	33	06:24 (2)	22:01	41	06:30 (2)
31	08:19		07:14				05:21		05:50 (2)			
	17:19		20:06				21:46	34	06:24 (2)			
Potential sun hours	257	277	367	417			487			501		
Total, worst case					642			389			1199	
Sun reduction					0.38			0.39			0.35	
Oper. time red.					1.00			1.00			1.00	
Wind dir. red.					0.60			0.60			0.60	
Total reduction					0.23			0.24			0.21	
Total, real					146			92			249	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
Jennings O'Donovan
Finisklin Business Park
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+353719161416
padraig / podowd@jodireland.com
Calculated:
11/06/2025 09:22/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Real Case - V150 **Shadow receptor:** X - 24

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	July		August		September		October	November	December
1	05:17		05:49 (2)	05:54		06:45	07:11 (1)	07:35	07:30	08:21
	22:01	41	06:30 (2)	21:28		20:25	27	07:38 (1)	19:15	17:07	16:26
2	05:17		05:50 (2)	05:56		06:46		07:13 (1)	07:36	07:31	08:23
	22:00	41	06:31 (2)	21:26		20:23	25	07:38 (1)	19:12	17:06	16:26
3	05:18		05:49 (2)	05:57		06:48		07:14 (1)	07:38	07:33	08:24
	22:00	41	06:30 (2)	21:25		20:20	22	07:36 (1)	19:10	17:04	16:25
4	05:19		05:50 (2)	05:59		06:50		07:16 (1)	07:40	07:35	08:26
	22:00	41	06:31 (2)	21:23		20:18	19	07:35 (1)	19:08	17:02	16:24
5	05:20		05:51 (2)	06:00		06:51		07:17 (1)	07:42	07:37	08:27
	21:59	40	06:31 (2)	21:21		20:16	16	07:33 (1)	19:05	17:00	16:24
6	05:21		05:52 (2)	06:02		06:53		07:19 (1)	07:43	07:39	08:28
	21:59	40	06:32 (2)	21:19		20:14	13	07:32 (1)	19:03	16:58	16:23
7	05:22		05:53 (2)	06:04		06:55		07:21 (1)	07:45	07:41	08:30
	21:58	39	06:32 (2)	21:18		20:11	10	07:31 (1)	19:01	16:57	16:23
8	05:22		05:53 (2)	06:05		06:56		07:22 (1)	07:47	07:42	08:31
	21:57	38	06:31 (2)	21:16		20:09	6	07:28 (1)	18:58	16:55	16:23
9	05:23		05:54 (2)	06:07		06:58		07:24 (1)	07:49	07:44	08:32
	21:57	37	06:31 (2)	21:14		20:07	1	07:25 (1)	18:56	16:53	16:22
10	05:24		05:55 (2)	06:08		07:00			07:50	07:46	08:33
	21:56	37	06:32 (2)	21:12		20:04			18:54	16:52	16:22
11	05:26		05:56 (2)	06:10		07:01			07:52	07:48	08:34
	21:55	36	06:32 (2)	21:10		20:02			18:52	16:50	16:22
12	05:27		05:57 (2)	06:12		07:03			07:54	07:50	08:35
	21:54	35	06:32 (2)	21:08		19:59			18:49	16:48	16:22
13	05:28		05:58 (2)	06:13		07:05			07:55	07:51	08:36
	21:53	34	06:32 (2)	21:06		19:57			18:47	16:47	16:22
14	05:29		06:00 (2)	06:15		07:06			07:57	07:53	08:37
	21:52	33	06:33 (2)	21:04		19:55			18:45	16:45	16:22
15	05:30		06:01 (2)	06:17	07:19 (1)	07:08			07:59	07:55	08:38
	21:51	31	06:32 (2)	21:02	11	07:30 (1)	19:52			18:43	16:44	16:22
16	05:31		06:02 (2)	06:18	07:16 (1)	07:10			08:01	07:57	08:39
	21:50	30	06:32 (2)	21:00	17	07:33 (1)	19:50			18:40	16:42	16:22
17	05:33		06:03 (2)	06:20	07:13 (1)	07:11			08:03	07:59	08:40
	21:49	29	06:32 (2)	20:58	21	07:34 (1)	19:48			18:38	16:41	16:22
18	05:34		06:04 (2)	06:22	07:12 (1)	07:13			08:04	08:00	08:41
	21:48	28	06:32 (2)	20:56	24	07:36 (1)	19:45			18:36	16:40	16:22
19	05:35		06:05 (2)	06:23	07:11 (1)	07:15			08:06	08:02	08:41
	21:47	26	06:31 (2)	20:54	27	07:38 (1)	19:43			18:34	16:38	16:22
20	05:36		06:07 (2)	06:25	07:09 (1)	07:16			08:08	08:04	08:42
	21:46	25	06:32 (2)	20:52	29	07:38 (1)	19:41			18:32	16:37	16:23
21	05:38		06:08 (2)	06:27	07:08 (1)	07:18			08:10	08:06	08:43
	21:44	23	06:31 (2)	20:49	32	07:40 (1)	19:38			18:30	16:36	16:23
22	05:39		06:09 (2)	06:28	07:06 (1)	07:20			08:11	08:07	08:43
	21:43	21	06:30 (2)	20:47	34	07:40 (1)	19:36			18:27	16:35	16:24
23	05:41		06:11 (2)	06:30	07:06 (1)	07:21			08:13	08:09	08:44
	21:42	20	06:31 (2)	20:45	34	07:40 (1)	19:33			18:25	16:34	16:24
24	05:42		06:12 (2)	06:32	07:04 (1)	07:23			08:15	08:11	08:44
	21:40	18	06:30 (2)	20:43	36	07:40 (1)	19:31			18:23	16:32	16:25
25	05:43		06:13 (2)	06:33	07:04 (1)	07:25			07:17	08:12	08:45
	21:39	16	06:29 (2)	20:41	37	07:41 (1)	19:29			17:21	16:31	16:25
26	05:45		06:15 (2)	06:35	07:04 (1)	07:26			07:19	08:14	08:45
	21:38	13	06:28 (2)	20:39	37	07:41 (1)	19:26			17:19	16:30	16:26
27	05:46		06:16 (2)	06:36	07:03 (1)	07:28			07:20	08:15	08:45
	21:36	11	06:27 (2)	20:36	38	07:41 (1)	19:24			17:17	16:29	16:27
28	05:48		06:17 (2)	06:38	07:05 (1)	07:30			07:22	08:17	08:45
	21:35	9	06:26 (2)	20:34	36	07:41 (1)	19:22			17:15	16:29	16:28
29	05:49		06:19 (2)	06:40	07:06 (1)	07:31			07:24	08:19	08:45
	21:33	6	06:25 (2)	20:32	34	07:40 (1)	19:19			17:13	16:28	16:29
30	05:51		06:20 (2)	06:41	07:08 (1)	07:33			07:26	08:20	08:46
	21:31	3	06:23 (2)	20:30	32	07:40 (1)	19:17			17:11	16:27	16:29
31	05:52			06:43	07:10 (1)				07:28			08:46
	21:30			20:27	30	07:40 (1)				17:09		16:30
Potential sun hours	504			455			381			331	265	241
Total, worst case		842			509			139				
Sun reduction		0.33			0.35			0.34				
Oper. time red.		1.00			1.00			1.00				
Wind dir. red.		0.60			0.60			0.60				
Total reduction		0.20			0.21			0.20				
Total, real		167			107			28				

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
Jennings O'Donovan
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padraig / podowd@jodireland.com
Calculated:
11/06/2025 09:22/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Real Case - V150 **Shadow receptor:** Y - 25

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January		February		March		April		May		June	
1	08:46		08:18		07:24		07:12		07:35 (1)		06:06	
	16:32		17:20		18:13		20:08	29	08:04 (1)		21:00	9
2	08:45		08:16		07:21		07:10		07:32 (1)		06:04	
	16:33		17:22		18:15		20:10	32	08:04 (1)		21:02	12
3	08:45		08:15		07:19		07:07		07:30 (1)		06:02	
	16:34		17:24		18:17		20:11	34	08:04 (1)		21:03	15
4	08:45		08:13		07:17		07:05		07:28 (1)		06:00	
	16:35		17:26		18:18		20:13	36	08:04 (1)		21:05	18
5	08:45		08:11		07:15		07:03		07:27 (1)		05:58	
	16:36		17:28		18:20		20:15	37	08:04 (1)		21:07	21
6	08:44		08:10		07:12		07:00		07:26 (1)		05:57	
	16:38		17:30		18:22		20:17	36	08:02 (1)		21:08	23
7	08:44		08:08		07:10		06:58		07:26 (1)		05:55	
	16:39		17:32		18:24		20:18	36	08:02 (1)		21:10	25
8	08:44		08:06		07:08		06:56		07:27 (1)		05:53	
	16:40		17:34		18:26		20:20	34	08:01 (1)		21:12	27
9	08:43		08:04		07:06		06:53		07:26 (1)		05:51	
	16:42		17:36		18:28		20:22	34	08:00 (1)		21:13	29
10	08:43		08:02		07:03		06:51		07:27 (1)		05:49	
	16:43		17:37		18:29		20:24	32	07:59 (1)		21:15	31
11	08:42		08:01		07:01		06:49		07:28 (1)		05:48	
	16:44		17:39		18:31		20:25	29	07:57 (1)		21:17	33
12	08:41		07:59		06:59		06:47		07:29 (1)		05:46	
	16:46		17:41		18:33		20:27	27	07:56 (1)		21:18	35
13	08:41		07:57		06:56		06:44		07:31 (1)		05:44	
	16:47		17:43		18:35		20:29	23	07:54 (1)		21:20	37
14	08:40		07:55		06:54		06:42		07:32 (1)		05:43	
	16:49		17:45		18:36		20:31	19	07:51 (1)		21:22	38
15	08:39		07:53		06:52		06:40		07:34 (1)		05:41	
	16:51		17:47		18:38		20:32	14	07:48 (1)		21:23	40
16	08:38		07:51		06:49		06:38				05:40	
	16:52		17:49		18:40		20:34				21:25	41
17	08:37		07:49		06:47		06:35				05:38	
	16:54		17:51		18:42		20:36				21:26	41
18	08:36		07:47		06:45		06:33				05:37	
	16:55		17:53		18:44		20:38				21:28	42
19	08:35		07:45		06:42		06:31				05:35	
	16:57		17:54		18:45		20:39				21:29	41
20	08:34		07:43		06:40		06:29				05:34	
	16:59		17:56		18:47		20:41				21:31	41
21	08:33		07:41		06:38		06:27				05:32	
	17:00		17:58		18:49		20:43				21:32	41
22	08:32		07:39		06:35		06:25				05:31	
	17:02		18:00		18:51		20:44				21:34	40
23	08:31		07:37		06:33		06:22				05:30	
	17:04		18:02		18:52		20:46				21:35	40
24	08:29		07:34		06:31		06:54 (1)		06:20		05:28	
	17:06		18:04		18:54	4	06:58 (1)		20:48		21:36	39
25	08:28		07:32		06:28		06:51 (1)		06:18		05:27	
	17:08		18:06		18:56	8	06:59 (1)		20:50		21:38	39
26	08:27		07:30		06:26		06:49 (1)		06:16		05:26	
	17:09		18:07		18:58	12	07:01 (1)		20:51		21:39	38
27	08:25		07:28		06:24		06:46 (1)		06:14		05:25	
	17:11		18:09		18:59	15	07:01 (1)		20:53		21:41	37
28	08:24		07:26		06:21		06:44 (1)		06:12		05:24	
	17:13		18:11		19:01	19	07:03 (1)		20:55		21:42	36
29	08:22				07:19		07:42 (1)		06:10		05:23	
	17:15				20:03	22	08:04 (1)		20:57	2	06:37 (2)		21:43	36
30	08:21				07:17		07:39 (1)		06:08		06:33 (2)		05:22	
	17:17				20:05	24	08:03 (1)		20:58	6	06:39 (2)		21:44	34
31	08:19				07:14		07:37 (1)						05:21	
	17:19				20:06	27	08:04 (1)						21:46	34
Potential sun hours	257		277		367		417		487		501	
Total, worst case					131			460		1013		668
Sun reduction					0.28			0.38		0.39		0.35
Oper. time red.					1.00			1.00		1.00		1.00
Wind dir. red.					0.61			0.61		0.60		0.60
Total reduction					0.17			0.23		0.24		0.21
Total, real					22			106		241		140

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

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SHADOW - Calendar

Calculation: 6839 Garrane WF Real Case - V150 **Shadow receptor:** Y - 25

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	July		August		September		October	November	December
1	05:17		06:22 (2)	05:54		06:23 (2)	06:45		07:27 (1)	07:35	07:30	08:22
	22:01	23	06:45 (2)	21:28	34	06:57 (2)	20:25	29	07:56 (1)	19:15	17:07	16:26
2	05:17		06:22 (2)	05:56		06:25 (2)	06:46		07:26 (1)	07:36	07:31	08:23
	22:00	24	06:46 (2)	21:26	32	06:57 (2)	20:23	32	07:58 (1)	19:12	17:06	16:26
3	05:18		06:21 (2)	05:57		06:26 (2)	06:48		07:24 (1)	07:38	07:33	08:24
	22:00	25	06:46 (2)	21:25	31	06:57 (2)	20:20	34	07:58 (1)	19:10	17:04	16:25
4	05:19		06:21 (2)	05:59		06:28 (2)	06:50		07:24 (1)	07:40	07:35	08:26
	22:00	26	06:47 (2)	21:23	29	06:57 (2)	20:18	34	07:58 (1)	19:08	17:02	16:24
5	05:20		06:21 (2)	06:00		06:29 (2)	06:51		07:22 (1)	07:42	07:37	08:27
	21:59	27	06:48 (2)	21:21	27	06:56 (2)	20:16	36	07:58 (1)	19:05	17:00	16:24
6	05:21		06:21 (2)	06:02		06:31 (2)	06:53		07:22 (1)	07:43	07:39	08:28
	21:59	27	06:48 (2)	21:19	24	06:55 (2)	20:14	36	07:58 (1)	19:03	16:58	16:23
7	05:22		06:21 (2)	06:04		06:32 (2)	06:55		07:22 (1)	07:45	07:41	08:30
	21:58	28	06:49 (2)	21:18	22	06:54 (2)	20:11	37	07:59 (1)	19:01	16:57	16:23
8	05:22		06:20 (2)	06:05		06:34 (2)	06:56		07:22 (1)	07:47	07:42	08:31
	21:57	29	06:49 (2)	21:16	20	06:54 (2)	20:09	36	07:58 (1)	18:58	16:55	16:23
9	05:23		06:19 (2)	06:07		06:35 (2)	06:58		07:24 (1)	07:49	07:44	08:32
	21:57	31	06:50 (2)	21:14	17	06:52 (2)	20:07	34	07:58 (1)	18:56	16:53	16:22
10	05:24		06:19 (2)	06:08		06:37 (2)	07:00		07:25 (1)	07:50	07:46	08:33
	21:56	31	06:50 (2)	21:12	15	06:52 (2)	20:04	32	07:57 (1)	18:54	16:52	16:22
11	05:26		06:19 (2)	06:10		06:38 (2)	07:01		07:27 (1)	07:52	07:48	08:34
	21:55	32	06:51 (2)	21:10	12	06:50 (2)	20:02	30	07:57 (1)	18:52	16:50	16:22
12	05:27		06:19 (2)	06:12		06:40 (2)	07:03		07:29 (1)	07:54	07:50	08:35
	21:54	33	06:52 (2)	21:08	8	06:48 (2)	19:59	27	07:56 (1)	18:49	16:48	16:22
13	05:28		06:18 (2)	06:13		06:41 (2)	07:05		07:30 (1)	07:55	07:51	08:36
	21:53	34	06:52 (2)	21:06	5	06:46 (2)	19:57	25	07:55 (1)	18:47	16:47	16:22
14	05:29		06:19 (2)	06:15			07:06		07:32 (1)	07:57	07:53	08:37
	21:52	35	06:54 (2)	21:04			19:55	22	07:54 (1)	18:45	16:45	16:22
15	05:30		06:18 (2)	06:17			07:08		07:34 (1)	07:59	07:55	08:38
	21:51	36	06:54 (2)	21:02			19:52	19	07:53 (1)	18:43	16:44	16:22
16	05:31		06:18 (2)	06:18			07:10		07:35 (1)	08:01	07:57	08:39
	21:50	37	06:55 (2)	21:00			19:50	16	07:51 (1)	18:40	16:42	16:22
17	05:33		06:18 (2)	06:20			07:11		07:37 (1)	08:03	07:59	08:40
	21:49	37	06:55 (2)	20:58			19:48	13	07:50 (1)	18:38	16:41	16:22
18	05:34		06:17 (2)	06:22			07:13		07:38 (1)	08:04	08:00	08:41
	21:48	38	06:55 (2)	20:56			19:45	9	07:47 (1)	18:36	16:40	16:22
19	05:35		06:17 (2)	06:23			07:15		07:40 (1)	08:06	08:02	08:41
	21:47	38	06:55 (2)	20:54			19:43	5	07:45 (1)	18:34	16:38	16:22
20	05:36		06:17 (2)	06:25			07:16			08:08	08:04	08:42
	21:46	40	06:57 (2)	20:52			19:41			18:32	16:37	16:23
21	05:38		06:17 (2)	06:27			07:18			08:10	08:06	08:43
	21:44	40	06:57 (2)	20:49			19:38			18:30	16:36	16:23
22	05:39		06:16 (2)	06:28			07:20			08:11	08:07	08:43
	21:43	41	06:57 (2)	20:47			19:36			18:27	16:35	16:24
23	05:41		06:17 (2)	06:30			07:21			08:13	08:09	08:44
	21:42	41	06:58 (2)	20:45			19:33			18:25	16:34	16:24
24	05:42		06:16 (2)	06:32			07:23			08:15	08:11	08:44
	21:40	42	06:58 (2)	20:43			19:31			18:23	16:32	16:25
25	05:43		06:16 (2)	06:33			07:25			07:17	08:12	08:45
	21:39	41	06:57 (2)	20:41			19:29			17:21	16:31	16:25
26	05:45		06:16 (2)	06:35			07:26			07:19	08:14	08:45
	21:38	42	06:58 (2)	20:39			19:26			17:19	16:30	16:26
27	05:46		06:16 (2)	06:36		07:41 (1)	07:28			07:20	08:15	08:45
	21:36	42	06:58 (2)	20:36	4	07:45 (1)	19:24			17:17	16:29	16:27
28	05:48		06:17 (2)	06:38		07:36 (1)	07:30			07:22	08:17	08:45
	21:35	40	06:57 (2)	20:34	14	07:50 (1)	19:22			17:15	16:29	16:28
29	05:49		06:19 (2)	06:40		07:32 (1)	07:31			07:24	08:19	08:45
	21:33	39	06:58 (2)	20:32	20	07:52 (1)	19:19			17:13	16:28	16:29
30	05:51		06:20 (2)	06:41		07:31 (1)	07:33			07:26	08:20	08:46
	21:31	38	06:58 (2)	20:30	23	07:54 (1)	19:17			17:11	16:27	16:29
31	05:52		06:22 (2)	06:43		07:29 (1)				07:28		08:46
	21:30	36	06:58 (2)	20:27	27	07:56 (1)				17:09		16:30
Potential sun hours	504			455			381			331	265	241
Total, worst case		1073			364			506				
Sun reduction		0.33			0.35			0.34				
Oper. time red.		1.00			1.00			1.00				
Wind dir. red.		0.60			0.60			0.61				
Total reduction		0.20			0.21			0.20				
Total, real		215			78			104				

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
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Calculated:
11/06/2025 09:22/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Real Case - V150 **Shadow receptor:** Z - 26

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January	February	March		April		May		June		
1	08:46	08:18	07:24		07:12		07:35 (1)		06:06		06:31 (2)		05:20		06:26 (2)
	16:32	17:20	18:13		20:08	33	08:08 (1)		21:00	20	06:51 (2)		21:47	16	06:42 (2)
2	08:45	08:16	07:21		07:10		07:32 (1)		06:04		06:29 (2)		05:19		06:28 (2)
	16:33	17:22	18:15		20:10	35	08:07 (1)		21:02	23	06:52 (2)		21:48	13	06:41 (2)
3	08:45	08:15	07:19		07:07		07:31 (1)		06:02		06:27 (2)		05:18		06:30 (2)
	16:34	17:24	18:17		20:11	35	08:06 (1)		21:03	25	06:52 (2)		21:49	9	06:39 (2)
4	08:45	08:13	07:17		07:05		07:31 (1)		06:00		06:25 (2)		05:17		06:34 (2)
	16:35	17:26	18:18		20:13	35	08:06 (1)		21:05	27	06:52 (2)		21:50	2	06:36 (2)
5	08:45	08:11	07:15		07:03		07:32 (1)		05:58		06:24 (2)		05:17		
	16:36	17:28	18:20		20:15	34	08:06 (1)		21:07	29	06:53 (2)		21:51		
6	08:44	08:10	07:12		07:00		07:32 (1)		05:57		06:22 (2)		05:16		
	16:38	17:30	18:22		20:17	32	08:04 (1)		21:08	31	06:53 (2)		21:52		
7	08:44	08:08	07:10		06:58		07:32 (1)		05:55		06:20 (2)		05:15		
	16:39	17:32	18:24		20:18	31	08:03 (1)		21:10	33	06:53 (2)		21:53		
8	08:44	08:06	07:08		06:56		07:33 (1)		05:53		06:19 (2)		05:15		
	16:40	17:34	18:26		20:20	29	08:02 (1)		21:12	35	06:54 (2)		21:54		
9	08:43	08:04	07:06		06:53		07:33 (1)		05:51		06:17 (2)		05:14		
	16:42	17:36	18:28		20:22	27	08:00 (1)		21:13	37	06:54 (2)		21:55		
10	08:43	08:02	07:03		06:51		07:35 (1)		05:49		06:15 (2)		05:14		
	16:43	17:37	18:29		20:24	23	07:58 (1)		21:15	38	06:53 (2)		21:55		
11	08:42	08:01	07:01		06:49		07:37 (1)		05:48		06:14 (2)		05:14		
	16:44	17:39	18:31		20:25	19	07:56 (1)		21:17	40	06:54 (2)		21:56		
12	08:41	07:59	06:59		06:47		07:39 (1)		05:46		06:13 (2)		05:13		
	16:46	17:41	18:33		20:27	14	07:53 (1)		21:18	40	06:53 (2)		21:57		
13	08:41	07:57	06:56		06:44				05:44		06:14 (2)		05:13		
	16:47	17:43	18:35		20:29				21:20	40	06:54 (2)		21:58		
14	08:40	07:55	06:54		06:42				05:43		06:13 (2)		05:13		
	16:49	17:45	18:36		20:31				21:22	40	06:53 (2)		21:58		
15	08:39	07:53	06:52		06:40				05:41		06:14 (2)		05:13		
	16:51	17:47	18:38		20:32				21:23	39	06:53 (2)		21:59		
16	08:38	07:51	06:49		06:38				05:40		06:14 (2)		05:12		
	16:52	17:49	18:40		20:34				21:25	38	06:52 (2)		21:59		
17	08:37	07:49	06:47		06:35				05:38		06:14 (2)		05:12		
	16:54	17:51	18:42		20:36				21:26	38	06:52 (2)		22:00		
18	08:36	07:47	06:45		06:33				05:37		06:15 (2)		05:12		
	16:55	17:53	18:44		20:38				21:28	37	06:52 (2)		22:00		
19	08:35	07:45	06:42		06:31				05:35		06:15 (2)		05:12		
	16:57	17:54	18:45		20:39				21:29	36	06:51 (2)		22:01		
20	08:34	07:43	06:40		06:29				05:34		06:16 (2)		05:12		
	16:59	17:56	18:47		20:41				21:31	35	06:51 (2)		22:01		
21	08:33	07:41	06:38		06:27				05:32		06:16 (2)		05:13		
	17:00	17:58	18:49		20:43				21:32	35	06:51 (2)		22:01		
22	08:32	07:39	06:35	06:58 (1)	06:25				05:31		06:17 (2)		05:13		
	17:02	18:00	18:51	3 07:01 (1)	20:44				21:34	33	06:50 (2)		22:01		
23	08:31	07:37	06:33	06:56 (1)	06:22				05:30		06:17 (2)		05:13		
	17:04	18:02	18:52	7 07:03 (1)	20:46				21:35	32	06:49 (2)		22:02		
24	08:29	07:34	06:31	06:54 (1)	06:20				05:28		06:18 (2)		05:13		
	17:06	18:04	18:54	11 07:05 (1)	20:48				21:36	30	06:48 (2)		22:02		
25	08:28	07:32	06:28	06:51 (1)	06:18				05:27		06:19 (2)		05:14		
	17:08	18:06	18:56	15 07:06 (1)	20:50				21:38	29	06:48 (2)		22:02		
26	08:27	07:30	06:26	06:49 (1)	06:16		06:40 (2)		05:26		06:19 (2)		05:14		
	17:09	18:07	18:58	18 07:07 (1)	20:51	5	06:45 (2)		21:39	28	06:47 (2)		22:02		
27	08:25	07:28	06:24	06:46 (1)	06:14		06:38 (2)		05:25		06:20 (2)		05:14		
	17:11	18:09	18:59	21 07:07 (1)	20:53	9	06:47 (2)		21:41	26	06:46 (2)		22:02		
28	08:24	07:26	06:21	06:44 (1)	06:12		06:36 (2)		05:24		06:21 (2)		05:15		
	17:13	18:11	19:01	23 07:07 (1)	20:55	12	06:48 (2)		21:42	25	06:46 (2)		22:01		
29	08:22		07:19	07:42 (1)	06:10		06:35 (2)		05:23		06:22 (2)		05:15		
	17:15		20:03	26 08:08 (1)	20:57	15	06:50 (2)		21:43	23	06:45 (2)		22:01		
30	08:21		07:17	07:39 (1)	06:08		06:33 (2)		05:22		06:24 (2)		05:16		
	17:17		20:05	28 08:07 (1)	20:58	18	06:51 (2)		21:44	21	06:45 (2)		22:01		
31	08:19		07:14	07:37 (1)					05:21		06:25 (2)				
	17:19		20:06	31 08:08 (1)					21:46	18	06:43 (2)				
Potential sun hours	257	277	367		417				487				501		
Total, worst case				183		406				981				40	
Sun reduction				0.28		0.38				0.39				0.35	
Oper. time red.				1.00		1.00				1.00				1.00	
Wind dir. red.				0.61		0.61				0.60				0.60	
Total reduction				0.17		0.23				0.24				0.21	
Total, real				31		94				234				8	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

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padraig / podowd@jodireland.com
Calculated:
11/06/2025 09:22/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Real Case - V150 **Shadow receptor:** Z - 26

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	July		August		September		October	November	December
1	05:17		05:54		06:23 (2)	06:45	07:36 (1)	07:35	07:30	08:22
	22:01		21:28	41	07:04 (2)	20:25	19	07:55 (1)	19:15	17:07	16:26
2	05:17		05:56		06:25 (2)	06:46		07:34 (1)	07:36	07:31	08:23
	22:00		21:26	39	07:04 (2)	20:23	23	07:57 (1)	19:12	17:06	16:26
3	05:18		05:57		06:26 (2)	06:48		07:31 (1)	07:38	07:33	08:24
	22:00		21:25	38	07:04 (2)	20:20	27	07:58 (1)	19:10	17:04	16:25
4	05:19		05:59		06:28 (2)	06:50		07:30 (1)	07:40	07:35	08:26
	22:00		21:23	36	07:04 (2)	20:18	29	07:59 (1)	19:08	17:02	16:24
5	05:20		06:00		06:29 (2)	06:51		07:28 (1)	07:42	07:37	08:27
	21:59		21:21	34	07:03 (2)	20:16	31	07:59 (1)	19:05	17:00	16:24
6	05:21		06:02		06:31 (2)	06:53		07:28 (1)	07:43	07:39	08:28
	21:59		21:19	33	07:04 (2)	20:14	32	08:00 (1)	19:03	16:58	16:23
7	05:22		06:04		06:32 (2)	06:55		07:27 (1)	07:45	07:41	08:30
	21:58		21:18	31	07:03 (2)	20:11	34	08:01 (1)	19:01	16:57	16:23
8	05:22		06:05		06:34 (2)	06:56		07:26 (1)	07:47	07:42	08:31
	21:57		21:16	29	07:03 (2)	20:09	34	08:00 (1)	18:58	16:55	16:23
9	05:23	06:38 (2)	06:07		06:35 (2)	06:58		07:25 (1)	07:49	07:44	08:32
	21:57	7	06:45 (2)	21:14	27	07:02 (2)	20:07	36	08:01 (1)	18:56	16:53	16:22
10	05:24	06:36 (2)	06:08		06:37 (2)	07:00		07:25 (1)	07:50	07:46	08:33
	21:56	11	06:47 (2)	21:12	24	07:01 (2)	20:04	35	08:00 (1)	18:54	16:52	16:22
11	05:26	06:34 (2)	06:10		06:38 (2)	07:01		07:27 (1)	07:52	07:48	08:34
	21:55	15	06:49 (2)	21:10	22	07:00 (2)	20:02	33	08:00 (1)	18:52	16:50	16:22
12	05:27	06:33 (2)	06:12		06:40 (2)	07:03		07:29 (1)	07:54	07:50	08:35
	21:54	17	06:50 (2)	21:08	20	07:00 (2)	19:59	31	08:00 (1)	18:49	16:48	16:22
13	05:28	06:32 (2)	06:13		06:41 (2)	07:05		07:30 (1)	07:55	07:51	08:36
	21:53	20	06:52 (2)	21:06	17	06:58 (2)	19:57	29	07:59 (1)	18:47	16:47	16:22
14	05:29	06:32 (2)	06:15		06:43 (2)	07:06		07:32 (1)	07:57	07:53	08:37
	21:52	22	06:54 (2)	21:04	14	06:57 (2)	19:55	26	07:58 (1)	18:45	16:45	16:22
15	05:30	06:31 (2)	06:17		06:44 (2)	07:08		07:34 (1)	07:59	07:55	08:38
	21:51	24	06:55 (2)	21:02	11	06:55 (2)	19:52	24	07:58 (1)	18:43	16:44	16:22
16	05:31	06:30 (2)	06:18		06:46 (2)	07:10		07:35 (1)	08:01	07:57	08:39
	21:50	26	06:56 (2)	21:00	8	06:54 (2)	19:50	21	07:56 (1)	18:40	16:42	16:22
17	05:33	06:29 (2)	06:20		06:47 (2)	07:11		07:37 (1)	08:03	07:59	08:40
	21:49	27	06:56 (2)	20:58	4	06:51 (2)	19:48	18	07:55 (1)	18:38	16:41	16:22
18	05:34	06:28 (2)	06:22				07:13		07:38 (1)	08:04	08:00	08:41
	21:48	29	06:57 (2)	20:56			19:45	15	07:53 (1)	18:36	16:40	16:22
19	05:35	06:28 (2)	06:23				07:15		07:40 (1)	08:06	08:02	08:41
	21:47	30	06:58 (2)	20:54			19:43	12	07:52 (1)	18:34	16:38	16:22
20	05:36	06:28 (2)	06:25				07:16		07:42 (1)	08:08	08:04	08:42
	21:46	31	06:59 (2)	20:52			19:41	8	07:50 (1)	18:32	16:37	16:23
21	05:38	06:27 (2)	06:27				07:18		07:43 (1)	08:10	08:06	08:43
	21:44	33	07:00 (2)	20:49			19:38	4	07:47 (1)	18:30	16:36	16:23
22	05:39	06:26 (2)	06:28				07:20			08:11	08:07	08:43
	21:43	34	07:00 (2)	20:47			19:36			18:27	16:35	16:24
23	05:41	06:26 (2)	06:30				07:21			08:13	08:09	08:44
	21:42	35	07:01 (2)	20:45			19:33			18:25	16:34	16:24
24	05:42	06:26 (2)	06:32				07:23			08:15	08:11	08:44
	21:40	36	07:02 (2)	20:43			19:31			18:23	16:32	16:25
25	05:43	06:25 (2)	06:33				07:25			07:17	08:12	08:45
	21:39	37	07:02 (2)	20:41			19:29			17:21	16:31	16:25
26	05:45	06:25 (2)	06:35				07:26			07:19	08:14	08:45
	21:38	38	07:03 (2)	20:39			19:26			17:19	16:30	16:26
27	05:46	06:24 (2)	06:36				07:28			07:20	08:15	08:45
	21:36	39	07:03 (2)	20:36			19:24			17:17	16:29	16:27
28	05:48	06:24 (2)	06:38				07:30			07:22	08:17	08:45
	21:35	39	07:03 (2)	20:34			19:22			17:15	16:29	16:28
29	05:49	06:24 (2)	06:40				07:31			07:24	08:19	08:45
	21:33	40	07:04 (2)	20:32			19:19			17:13	16:28	16:29
30	05:51	06:23 (2)	06:41		07:44 (1)	07:33			07:26	08:20	08:46
	21:31	40	07:03 (2)	20:30	4	07:48 (1)	19:17			17:11	16:27	16:29
31	05:52	06:24 (2)	06:43		07:39 (1)				07:28			08:46
	21:30	40	07:04 (2)	20:27	14	07:53 (1)				17:09		16:30
Potential sun hours	504		455			381			331	265		241
Total, worst case		670		446			521					
Sun reduction		0.33		0.35			0.34					
Oper. time red.		1.00		1.00			1.00					
Wind dir. red.		0.60		0.60			0.61					
Total reduction		0.20		0.21			0.21					
Total, real		134		95			107					

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
Jennings O'Donovan
Finisklin Business Park
F91 RHH9 Sligo
+353719161416
padraig / podowd@jodireland.com
Calculated:
11/06/2025 09:22/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Real Case - V150 **Shadow receptor:** AA - 27

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January	February	March			April			May			June
1	08:46	08:18	07:24			07:12		07:35 (1)	06:06		06:31 (2)	05:20
	16:32	17:20	18:13			20:08	25	08:00 (1)	21:00	17	06:48 (2)	21:47
2	08:45	08:16	07:21			07:10		07:32 (1)	06:04		06:29 (2)	05:19
	16:33	17:22	18:15			20:10	27	07:59 (1)	21:02	20	06:49 (2)	21:48
3	08:45	08:15	07:19			07:07		07:30 (1)	06:02		06:27 (2)	05:18
	16:34	17:24	18:17			20:11	29	07:59 (1)	21:03	22	06:49 (2)	21:49
4	08:45	08:13	07:17			07:05		07:28 (1)	06:00		06:25 (2)	05:17
	16:35	17:26	18:18			20:13	31	07:59 (1)	21:05	24	06:49 (2)	21:50
5	08:45	08:11	07:15			07:03		07:26 (1)	05:58		06:24 (2)	05:17
	16:36	17:28	18:20			20:15	33	07:59 (1)	21:07	26	06:50 (2)	21:51
6	08:44	08:10	07:12			07:00		07:25 (1)	05:57		06:22 (2)	05:16
	16:38	17:30	18:22			20:17	32	07:57 (1)	21:08	28	06:50 (2)	21:52
7	08:44	08:08	07:10			06:58		07:26 (1)	05:55		06:20 (2)	05:15
	16:39	17:32	18:24			20:18	31	07:57 (1)	21:10	30	06:50 (2)	21:53
8	08:44	08:06	07:08			06:56		07:27 (1)	05:53		06:19 (2)	05:15
	16:40	17:34	18:26			20:20	29	07:56 (1)	21:12	32	06:51 (2)	21:54
9	08:43	08:04	07:06			06:53		07:26 (1)	05:51		06:17 (2)	05:14
	16:42	17:36	18:28			20:22	28	07:54 (1)	21:13	33	06:50 (2)	21:55
10	08:43	08:02	07:03			06:51		07:28 (1)	05:49		06:15 (2)	05:14
	16:43	17:37	18:29			20:24	25	07:53 (1)	21:15	35	06:50 (2)	21:55
11	08:42	08:01	07:01			06:49		07:29 (1)	05:48		06:14 (2)	05:14
	16:44	17:39	18:31			20:25	22	07:51 (1)	21:17	36	06:50 (2)	21:56
12	08:41	07:59	06:59			06:47		07:31 (1)	05:46		06:13 (2)	05:13
	16:46	17:41	18:33			20:27	18	07:49 (1)	21:18	37	06:50 (2)	21:57
13	08:41	07:57	06:56			06:44		07:33 (1)	05:44		06:14 (2)	05:13
	16:47	17:43	18:35			20:29	14	07:47 (1)	21:20	36	06:50 (2)	21:58
14	08:40	07:55	06:54			06:42		07:38 (1)	05:43		06:13 (2)	05:13
	16:49	17:45	18:36			20:31	2	07:40 (1)	21:22	36	06:49 (2)	21:58
15	08:39	07:53	06:52			06:40			05:41		06:14 (2)	05:13
	16:51	17:47	18:38			20:32			21:23	35	06:49 (2)	21:59
16	08:38	07:51	06:49			06:38			05:40		06:14 (2)	05:12
	16:52	17:49	18:40			20:34			21:25	34	06:48 (2)	21:59
17	08:37	07:49	06:47			06:35			05:38		06:15 (2)	05:12
	16:54	17:51	18:42			20:36			21:26	33	06:48 (2)	22:00
18	08:36	07:47	06:45			06:33			05:37		06:16 (2)	05:12
	16:55	17:53	18:44			20:38			21:28	32	06:48 (2)	22:00
19	08:35	07:45	06:42			06:31			05:35		06:16 (2)	05:12
	16:57	17:54	18:45			20:39			21:29	31	06:47 (2)	22:01
20	08:34	07:43	06:40			06:29			05:34		06:17 (2)	05:12
	16:59	17:56	18:47			20:41			21:31	29	06:46 (2)	22:01
21	08:33	07:41	06:38			06:27			05:32		06:18 (2)	05:13
	17:00	17:58	18:49			20:43			21:32	28	06:46 (2)	22:01
22	08:32	07:39	06:35			06:25			05:31		06:19 (2)	05:13
	17:02	18:00	18:51			20:44			21:34	26	06:45 (2)	22:01
23	08:31	07:37	06:33			06:22			05:30		06:19 (2)	05:13
	17:04	18:02	18:52			20:46			21:35	25	06:44 (2)	22:02
24	08:29	07:34	06:31			06:20			05:28		06:20 (2)	05:13
	17:06	18:04	18:54			20:48			21:36	23	06:43 (2)	22:02
25	08:28	07:32	06:28		06:51 (1)	06:18			05:27		06:21 (2)	05:14
	17:08	18:06	18:56	3	06:54 (1)	20:50			21:38	21	06:42 (2)	22:02
26	08:27	07:30	06:26		06:49 (1)	06:16		06:40 (2)	05:26		06:22 (2)	05:14
	17:09	18:07	18:58	7	06:56 (1)	20:51	2	06:42 (2)	21:39	19	06:41 (2)	22:02
27	08:25	07:28	06:24		06:46 (1)	06:14		06:38 (2)	05:25		06:24 (2)	05:14
	17:11	18:09	18:59	11	06:57 (1)	20:53	6	06:44 (2)	21:41	16	06:40 (2)	22:02
28	08:24	07:26	06:21		06:44 (1)	06:12		06:36 (2)	05:24		06:25 (2)	05:15
	17:13	18:11	19:01	14	06:58 (1)	20:55	9	06:45 (2)	21:42	13	06:38 (2)	22:01
29	08:22		07:19		07:42 (1)	06:10		06:35 (2)	05:23		06:28 (2)	05:15
	17:15		20:03	17	07:59 (1)	20:57	12	06:47 (2)	21:43	8	06:36 (2)	22:01
30	08:21		07:17		07:39 (1)	06:08		06:33 (2)	05:22			05:16
	17:17		20:05	20	07:59 (1)	20:58	15	06:48 (2)	21:44			22:01
31	08:19		07:14		07:37 (1)				05:21			
	17:19		20:06	22	07:59 (1)				21:46			
Potential sun hours	257	277	367			417			487			501
Total, worst case				94			390			785		
Sun reduction				0.28			0.38			0.39		
Oper. time red.				1.00			1.00			1.00		
Wind dir. red.				0.61			0.61			0.60		
Total reduction				0.17			0.23			0.24		
Total, real				16			90			187		

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
Jennings O'Donovan
Finisklin Business Park
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+353719161416
padraig / podowd@jodireland.com
Calculated:
11/06/2025 09:22/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Real Case - V150 **Shadow receptor:** AA - 27

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	July		August		September		October	November	December
1	05:17		05:54		06:23 (2)	06:45	07:28 (1)	07:35	07:30	08:22
	22:01		21:28	37	07:00 (2)	20:25	22	07:50 (1)	19:15	17:07	16:26
2	05:17		05:56		06:25 (2)	06:46	07:26 (1)	07:36	07:31	08:23
	22:00		21:26	36	07:01 (2)	20:23	26	07:52 (1)	19:12	17:06	16:26
3	05:18		05:57		06:26 (2)	06:48	07:24 (1)	07:38	07:33	08:24
	22:00		21:25	34	07:00 (2)	20:20	28	07:52 (1)	19:10	17:04	16:25
4	05:19		05:59		06:28 (2)	06:50	07:24 (1)	07:40	07:35	08:26
	22:00		21:23	33	07:01 (2)	20:18	29	07:53 (1)	19:08	17:02	16:24
5	05:20		06:00		06:29 (2)	06:51	07:22 (1)	07:42	07:37	08:27
	21:59		21:21	31	07:00 (2)	20:16	31	07:53 (1)	19:05	17:00	16:24
6	05:21		06:02		06:31 (2)	06:53	07:21 (1)	07:43	07:39	08:28
	21:59		21:19	29	07:00 (2)	20:14	32	07:53 (1)	19:03	16:58	16:23
7	05:22		06:04		06:32 (2)	06:55	07:21 (1)	07:45	07:41	08:30
	21:58		21:18	28	07:00 (2)	20:11	33	07:54 (1)	19:01	16:57	16:23
8	05:22		06:05		06:34 (2)	06:56	07:22 (1)	07:47	07:42	08:31
	21:57		21:16	26	07:00 (2)	20:09	31	07:53 (1)	18:58	16:55	16:23
9	05:23		06:07		06:35 (2)	06:58	07:24 (1)	07:49	07:44	08:32
	21:57		21:14	24	06:59 (2)	20:07	29	07:53 (1)	18:56	16:53	16:22
10	05:24		06:08		06:37 (2)	07:00	07:25 (1)	07:50	07:46	08:33
	21:56		21:12	21	06:58 (2)	20:04	27	07:52 (1)	18:54	16:52	16:22
11	05:26		06:10		06:38 (2)	07:01	07:27 (1)	07:52	07:48	08:34
	21:55		21:10	19	06:57 (2)	20:02	25	07:52 (1)	18:52	16:50	16:22
12	05:27		06:12		06:40 (2)	07:03	07:29 (1)	07:54	07:50	08:35
	21:54		21:08	17	06:57 (2)	19:59	23	07:52 (1)	18:49	16:48	16:22
13	05:28		06:13		06:41 (2)	07:05	07:30 (1)	07:55	07:51	08:36
	21:53		21:06	14	06:55 (2)	19:57	20	07:50 (1)	18:47	16:47	16:22
14	05:29	06:39 (2)	06:15		06:43 (2)	07:06	07:32 (1)	07:57	07:53	08:37
	21:52	4	06:43 (2)	21:04	11	06:54 (2)	19:55	18	07:50 (1)	18:45	16:45	16:22
15	05:30	06:36 (2)	06:17		06:44 (2)	07:08	07:34 (1)	07:59	07:55	08:38
	21:51	10	06:46 (2)	21:02	8	06:52 (2)	19:52	15	07:49 (1)	18:43	16:44	16:22
16	05:31	06:34 (2)	06:18		06:46 (2)	07:10	07:35 (1)	08:01	07:57	08:39
	21:50	14	06:48 (2)	21:00	5	06:51 (2)	19:50	12	07:47 (1)	18:40	16:42	16:22
17	05:33	06:32 (2)	06:20		06:47 (2)	07:11	07:37 (1)	08:03	07:59	08:40
	21:49	18	06:50 (2)	20:58	1	06:48 (2)	19:48	8	07:45 (1)	18:38	16:41	16:22
18	05:34	06:31 (2)	06:22			07:13	07:38 (1)	08:04	08:00	08:41
	21:48	20	06:51 (2)	20:56			19:45	4	07:42 (1)	18:36	16:40	16:22
19	05:35	06:30 (2)	06:23			07:15	08:06	08:02	08:41
	21:47	22	06:52 (2)	20:54			19:43	18:34	16:38	16:22
20	05:36	06:30 (2)	06:25			07:16	08:08	08:04	08:42
	21:46	24	06:54 (2)	20:52			19:41	18:32	16:37	16:23
21	05:38	06:29 (2)	06:27			07:18	08:10	08:06	08:43
	21:44	25	06:54 (2)	20:49			19:38	18:30	16:36	16:23
22	05:39	06:28 (2)	06:28			07:20	08:11	08:07	08:43
	21:43	27	06:55 (2)	20:47			19:36	18:27	16:35	16:24
23	05:41	06:28 (2)	06:30			07:21	08:13	08:09	08:44
	21:42	29	06:57 (2)	20:45			19:33	18:25	16:34	16:24
24	05:42	06:27 (2)	06:32			07:23	08:15	08:11	08:44
	21:40	30	06:57 (2)	20:43			19:31	18:23	16:32	16:25
25	05:43	06:26 (2)	06:33			07:25	07:17	08:12	08:45
	21:39	31	06:57 (2)	20:41			19:29	17:21	16:31	16:25
26	05:45	06:26 (2)	06:35			07:26	07:19	08:14	08:45
	21:38	32	06:58 (2)	20:39			19:26	17:19	16:30	16:26
27	05:46	06:25 (2)	06:37			07:28	07:20	08:15	08:45
	21:36	34	06:59 (2)	20:36			19:24	17:17	16:29	16:27
28	05:48	06:24 (2)	06:38			07:30	07:22	08:17	08:45
	21:35	35	06:59 (2)	20:34			19:22	17:15	16:29	16:28
29	05:49	06:24 (2)	06:40		07:38 (1)	07:31	07:24	08:19	08:45
	21:33	36	07:00 (2)	20:32	4	07:42 (1)	19:19	17:13	16:28	16:29
30	05:51	06:24 (2)	06:41		07:33 (1)	07:33	07:26	08:20	08:46
	21:31	36	07:00 (2)	20:30	14	07:47 (1)	19:17	17:11	16:27	16:29
31	05:52	06:24 (2)	06:43		07:30 (1)		07:28		08:46
	21:30	36	07:00 (2)	20:27	19	07:49 (1)		17:09		16:30
Potential sun hours	504		455			381		331	265	241
Total, worst case		463		411			413			
Sun reduction		0.33		0.35			0.34			
Oper. time red.		1.00		1.00			1.00			
Wind dir. red.		0.60		0.60			0.61			
Total reduction		0.20		0.21			0.20			
Total, real		93		88			85			

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
Jennings O'Donovan
Finisklin Business Park
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+353719161416
padraig / podowd@jodireland.com
Calculated:
11/06/2025 09:22/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Real Case - V150 **Shadow receptor:** AB - 28

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January	February	March		April		May		June		
1	08:46	08:18	07:24		07:12		08:09 (1)		06:06		06:31 (2)		05:20		06:09 (2)
	16:32	17:20	18:13		20:08	37	08:46 (1)		21:00	34	07:05 (2)		21:47	64	07:13 (2)
2	08:45	08:16	07:21		07:10		08:10 (1)		06:04		06:29 (2)		05:19		06:09 (2)
	16:33	17:22	18:15		20:10	33	08:43 (1)		21:02	37	07:06 (2)		21:48	64	07:13 (2)
3	08:45	08:15	07:19		07:07		08:12 (1)		06:02		06:27 (2)		05:18		06:10 (2)
	16:34	17:24	18:17		20:11	29	08:41 (1)		21:03	39	07:06 (2)		21:49	63	07:13 (2)
4	08:45	08:13	07:17		07:05		08:14 (1)		06:00		06:25 (2)		05:17		06:10 (2)
	16:35	17:26	18:18		20:13	25	08:39 (1)		21:05	42	07:07 (2)		21:50	63	07:13 (2)
5	08:45	08:11	07:15	07:38 (1)	07:03		08:17 (1)		05:58		06:24 (2)		05:17		06:10 (2)
	16:36	17:28	18:20	5 07:43 (1)	20:15	18	08:35 (1)		21:07	44	07:08 (2)		21:51	63	07:13 (2)
6	08:44	08:10	07:12	07:36 (1)	07:00		08:22 (1)		05:57		06:22 (2)		05:16		06:11 (2)
	16:38	17:30	18:22	11 07:47 (1)	20:17	6	08:28 (1)		21:08	47	07:09 (2)		21:52	62	07:13 (2)
7	08:44	08:08	07:10	07:34 (1)	06:58				05:55		06:20 (2)		05:15		06:11 (2)
	16:39	17:32	18:24	16 07:50 (1)	20:18				21:10	49	07:09 (2)		21:53	62	07:13 (2)
8	08:44	08:06	07:08	07:31 (1)	06:56				05:53		06:18 (2)		05:15		06:12 (2)
	16:40	17:34	18:26	20 07:51 (1)	20:20				21:12	51	07:09 (2)		21:54	61	07:13 (2)
9	08:43	08:04	07:06	07:29 (1)	06:53				05:51		06:17 (2)		05:14		06:11 (2)
	16:42	17:35	18:28	24 07:53 (1)	20:22				21:13	53	07:10 (2)		21:55	62	07:13 (2)
10	08:43	08:02	07:03	07:27 (1)	06:51				05:49		06:15 (2)		05:14		06:12 (2)
	16:43	17:37	18:29	27 07:54 (1)	20:24				21:15	55	07:10 (2)		21:55	61	07:13 (2)
11	08:42	08:01	07:01	07:24 (1)	06:49				05:48		06:14 (2)		05:14		06:13 (2)
	16:44	17:39	18:31	31 07:55 (1)	20:25				21:17	57	07:11 (2)		21:56	60	07:13 (2)
12	08:41	07:59	06:59	07:22 (1)	06:47				05:46		06:12 (2)		05:13		06:13 (2)
	16:46	17:41	18:33	34 07:56 (1)	20:27				21:18	59	07:11 (2)		21:57	61	07:14 (2)
13	08:41	07:57	06:56	07:19 (1)	06:44				05:44		06:11 (2)		05:13		06:13 (2)
	16:47	17:43	18:35	37 07:56 (1)	20:29				21:20	61	07:12 (2)		21:58	60	07:13 (2)
14	08:40	07:55	06:54	07:17 (1)	06:42				05:43		06:09 (2)		05:13		06:13 (2)
	16:49	17:45	18:36	40 07:57 (1)	20:31				21:22	63	07:12 (2)		21:58	60	07:13 (2)
15	08:39	07:53	06:52	07:15 (1)	06:40				05:41		06:08 (2)		05:12		06:13 (2)
	16:51	17:47	18:38	42 07:57 (1)	20:32				21:23	64	07:12 (2)		21:59	60	07:13 (2)
16	08:38	07:51	06:49	07:12 (1)	06:38				05:40		06:08 (2)		05:12		06:14 (2)
	16:52	17:49	18:40	45 07:57 (1)	20:34				21:25	64	07:12 (2)		21:59	60	07:14 (2)
17	08:37	07:49	06:47	07:10 (1)	06:35				05:38		06:08 (2)		05:12		06:14 (2)
	16:54	17:51	18:42	48 07:58 (1)	20:36				21:26	65	07:13 (2)		22:00	60	07:14 (2)
18	08:36	07:47	06:45	07:08 (1)	06:33				05:37		06:08 (2)		05:12		06:14 (2)
	16:55	17:53	18:44	50 07:58 (1)	20:38				21:28	65	07:13 (2)		22:00	60	07:14 (2)
19	08:35	07:45	06:42	07:06 (1)	06:31				05:35		06:07 (2)		05:12		06:14 (2)
	16:57	17:54	18:45	51 07:57 (1)	20:39				21:29	65	07:12 (2)		22:01	60	07:14 (2)
20	08:34	07:43	06:40	07:06 (1)	06:29				05:34		06:07 (2)		05:12		06:15 (2)
	16:59	17:56	18:47	51 07:57 (1)	20:41				21:31	66	07:13 (2)		22:01	59	07:14 (2)
21	08:33	07:41	06:38	07:06 (1)	06:27				05:32		06:08 (2)		05:13		06:16 (2)
	17:00	17:58	18:49	51 07:57 (1)	20:43				21:32	65	07:13 (2)		22:01	59	07:15 (2)
22	08:32	07:39	06:35	07:05 (1)	06:25				05:31		06:08 (2)		05:13		06:16 (2)
	17:02	18:00	18:51	51 07:56 (1)	20:44				21:34	65	07:13 (2)		22:01	59	07:15 (2)
23	08:31	07:37	06:33	07:05 (1)	06:22				05:30		06:07 (2)		05:13		06:16 (2)
	17:04	18:02	18:52	51 07:56 (1)	20:46				21:35	65	07:12 (2)		22:02	59	07:15 (2)
24	08:29	07:34	06:31	07:05 (1)	06:20		06:44 (2)		05:28		06:07 (2)		05:13		06:15 (2)
	17:06	18:04	18:54	51 07:56 (1)	20:48	7	06:51 (2)		21:36	66	07:13 (2)		22:02	60	07:15 (2)
25	08:28	07:32	06:28	07:05 (1)	06:18		06:42 (2)		05:27		06:08 (2)		05:14		06:16 (2)
	17:08	18:06	18:56	49 07:54 (1)	20:50	12	06:54 (2)		21:38	65	07:13 (2)		22:02	60	07:16 (2)
26	08:27	07:30	06:26	07:05 (1)	06:16		06:40 (2)		05:26		06:08 (2)		05:14		06:16 (2)
	17:09	18:07	18:58	49 07:54 (1)	20:51	17	06:57 (2)		21:39	65	07:13 (2)		22:02	60	07:16 (2)
27	08:25	07:28	06:24	07:05 (1)	06:14		06:38 (2)		05:25		06:08 (2)		05:14		06:17 (2)
	17:11	18:09	18:59	47 07:52 (1)	20:53	21	06:59 (2)		21:41	65	07:13 (2)		22:02	59	07:16 (2)
28	08:24	07:26	06:21	07:06 (1)	06:12		06:36 (2)		05:24		06:08 (2)		05:15		06:16 (2)
	17:13	18:11	19:01	46 07:52 (1)	20:55	24	07:00 (2)		21:42	65	07:13 (2)		22:01	60	07:16 (2)
29	08:22		07:19	08:07 (1)	06:10		06:35 (2)		05:23		06:08 (2)		05:15		06:17 (2)
	17:15		20:03	44 08:51 (1)	20:57	28	07:03 (2)		21:43	65	07:13 (2)		22:01	60	07:17 (2)
30	08:21		07:17	08:07 (1)	06:08		06:33 (2)		05:22		06:09 (2)		05:16		06:16 (2)
	17:17		20:05	42 08:49 (1)	20:58	31	07:04 (2)		21:44	64	07:13 (2)		22:01	61	07:17 (2)
31	08:19		07:14	08:08 (1)					05:21		06:09 (2)				
	17:19		20:06	39 08:47 (1)					21:46	64	07:13 (2)				
Potential sun hours	257	277	367		417				487				501		
Total, worst case				1052		288				1794				1822	
Sun reduction				0.28		0.38				0.39				0.35	
Oper. time red.				1.00		1.00				1.00				1.00	
Wind dir. red.				0.60		0.60				0.60				0.60	
Total reduction				0.17		0.23				0.24				0.21	
Total, real				177		66				427				382	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
Jennings O'Donovan
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Calculated:
11/06/2025 09:22/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Real Case - V150 **Shadow receptor:** AB - 28

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	July		August		September		October		November	December
1	05:17		06:17 (2)	05:54		06:23 (2)	06:45		07:35	08:00 (1)	07:30	08:21
	22:01	60	07:17 (2)	21:28	59	07:22 (2)	20:25		19:15	35	08:35 (1)	17:07	16:26
2	05:17		06:17 (2)	05:56		06:25 (2)	06:46		07:36		08:02 (1)	07:31	08:23
	22:00	61	07:18 (2)	21:26	57	07:22 (2)	20:23		19:12	32	08:34 (1)	17:06	16:25
3	05:18		06:17 (2)	05:57		06:26 (2)	06:48		07:38		08:04 (1)	07:33	08:24
	22:00	61	07:18 (2)	21:25	55	07:21 (2)	20:20		19:10	29	08:33 (1)	17:04	16:25
4	05:19		06:17 (2)	05:59		06:28 (2)	06:50		07:40		08:05 (1)	07:35	08:26
	22:00	61	07:18 (2)	21:23	53	07:21 (2)	20:18		19:08	25	08:30 (1)	17:02	16:24
5	05:20		06:17 (2)	06:00		06:29 (2)	06:51		07:42		08:07 (1)	07:37	08:27
	21:59	62	07:19 (2)	21:21	51	07:20 (2)	20:16		19:05	22	08:29 (1)	17:00	16:24
6	05:21		06:17 (2)	06:02		06:31 (2)	06:53	08:18 (1)	07:43		08:09 (1)	07:39	08:28
	21:59	62	07:19 (2)	21:19	48	07:19 (2)	20:13	6	08:24 (1)	18	08:27 (1)	16:58	16:23
7	05:21		06:18 (2)	06:04		06:32 (2)	06:55		08:12 (1)		07:45	08:11 (1)	07:41	08:30
	21:58	62	07:20 (2)	21:18	46	07:18 (2)	20:11	18	08:30 (1)	14	19:01	08:25 (1)	16:57	16:23
8	05:22		06:17 (2)	06:05		06:34 (2)	06:56		08:08 (1)		07:47	08:12 (1)	07:42	08:31
	21:57	62	07:19 (2)	21:16	44	07:18 (2)	20:09	25	08:33 (1)	8	18:58	08:20 (1)	16:55	16:23
9	05:23		06:17 (2)	06:07		06:35 (2)	06:58		08:06 (1)		07:48	08:14 (1)	07:44	08:32
	21:57	63	07:20 (2)	21:14	41	07:16 (2)	20:06	29	08:35 (1)	1	18:56	08:15 (1)	16:53	16:22
10	05:24		06:17 (2)	06:08		06:37 (2)	07:00		08:03 (1)		07:50		07:46	08:33
	21:56	63	07:20 (2)	21:12	39	07:16 (2)	20:04	33	08:36 (1)		18:54		16:52	16:22
11	05:25		06:17 (2)	06:10		06:38 (2)	07:01		08:02 (1)		07:52		07:48	08:34
	21:55	63	07:20 (2)	21:10	36	07:14 (2)	20:02	36	08:38 (1)		18:51		16:50	16:22
12	05:27		06:17 (2)	06:12		06:40 (2)	07:03		08:00 (1)		07:54		07:50	08:35
	21:54	64	07:21 (2)	21:08	33	07:13 (2)	19:59	39	08:39 (1)		18:49		16:48	16:22
13	05:28		06:17 (2)	06:13		06:41 (2)	07:05		07:58 (1)		07:55		07:51	08:36
	21:53	64	07:21 (2)	21:06	30	07:11 (2)	19:57	42	08:40 (1)		18:47		16:47	16:22
14	05:29		06:18 (2)	06:15		06:43 (2)	07:06		07:57 (1)		07:57		07:53	08:37
	21:52	64	07:22 (2)	21:04	27	07:10 (2)	19:55	44	08:41 (1)		18:45		16:45	16:22
15	05:30		06:18 (2)	06:17		06:44 (2)	07:08		07:55 (1)		07:59		07:55	08:38
	21:51	64	07:22 (2)	21:02	24	07:08 (2)	19:52	46	08:41 (1)		18:43		16:44	16:22
16	05:31		06:18 (2)	06:18		06:46 (2)	07:10		07:54 (1)		08:01		07:57	08:39
	21:50	64	07:22 (2)	21:00	20	07:06 (2)	19:50	48	08:42 (1)		18:40		16:42	16:22
17	05:33		06:17 (2)	06:20		06:47 (2)	07:11		07:54 (1)		08:02		07:59	08:40
	21:49	65	07:22 (2)	20:58	16	07:03 (2)	19:48	48	08:42 (1)		18:38		16:41	16:22
18	05:34		06:17 (2)	06:22		06:49 (2)	07:13		07:52 (1)		08:04		08:00	08:41
	21:48	65	07:22 (2)	20:56	11	07:00 (2)	19:45	50	08:42 (1)		18:36		16:40	16:22
19	05:35		06:17 (2)	06:23		06:51 (2)	07:15		07:52 (1)		08:06		08:02	08:41
	21:47	65	07:22 (2)	20:54	5	06:56 (2)	19:43	50	08:42 (1)		18:34		16:38	16:22
20	05:36		06:18 (2)	06:25			07:16		07:52 (1)		08:08		08:04	08:42
	21:46	65	07:23 (2)	20:52			19:41	51	08:43 (1)		18:32		16:37	16:23
21	05:38		06:18 (2)	06:27			07:18		07:50 (1)		08:10		08:06	08:43
	21:44	65	07:23 (2)	20:49			19:38	52	08:42 (1)		18:30		16:36	16:23
22	05:39		06:17 (2)	06:28			07:20		07:50 (1)		08:11		08:07	08:43
	21:43	66	07:23 (2)	20:47			19:36	52	08:42 (1)		18:27		16:35	16:24
23	05:41		06:18 (2)	06:30			07:21		07:50 (1)		08:13		08:09	08:44
	21:42	65	07:23 (2)	20:45			19:33	52	08:42 (1)		18:25		16:34	16:24
24	05:42		06:18 (2)	06:31			07:23		07:49 (1)		08:15		08:11	08:44
	21:40	65	07:23 (2)	20:43			19:31	52	08:41 (1)		18:23		16:32	16:25
25	05:43		06:18 (2)	06:33			07:25		07:50 (1)		07:17		08:12	08:45
	21:39	65	07:23 (2)	20:41			19:29	51	08:41 (1)		17:21		16:31	16:25
26	05:45		06:18 (2)	06:35			07:26		07:52 (1)		07:19		08:14	08:45
	21:38	65	07:23 (2)	20:39			19:26	48	08:40 (1)		17:19		16:30	16:26
27	05:46		06:18 (2)	06:36			07:28		07:53 (1)		07:20		08:15	08:45
	21:36	65	07:23 (2)	20:36			19:24	46	08:39 (1)		17:17		16:29	16:27
28	05:48		06:18 (2)	06:38			07:30		07:55 (1)		07:22		08:17	08:45
	21:35	64	07:22 (2)	20:34			19:22	43	08:38 (1)		17:15		16:29	16:28
29	05:49		06:19 (2)	06:40			07:31		07:57 (1)		07:24		08:18	08:45
	21:33	64	07:23 (2)	20:32			19:19	41	08:38 (1)		17:13		16:28	16:29
30	05:51		06:20 (2)	06:41			07:33		07:58 (1)		07:26		08:20	08:46
	21:31	62	07:22 (2)	20:30			19:17	38	08:36 (1)		17:11		16:27	16:29
31	05:52		06:22 (2)	06:43							07:28			08:46
	21:30	60	07:22 (2)	20:27							17:09			16:30
Potential sun hours	504			455			381				331			264	241
Total, worst case		1966			695			1040				184			
Sun reduction		0.33			0.35			0.34				0.28			
Oper. time red.		1.00			1.00			1.00				1.00			
Wind dir. red.		0.60			0.60			0.60				0.60			
Total reduction		0.20			0.21			0.20				0.17			
Total, real		394			149			212				31			

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

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Calculated:
11/06/2025 09:22/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Real Case - V150 **Shadow receptor:** AC - 29

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January	February	March		April		May		June
1	08:46	08:18	07:24		07:12		07:55 (1)	06:06	06:32 (2) 05:20
	16:32	17:20	18:13		20:08	25	08:20 (1)	21:00 42	07:14 (2) 21:47
2	08:45	08:16	07:21		07:10		07:56 (1)	06:04	06:32 (2) 05:19
	16:33	17:22	18:15		20:10	21	08:17 (1)	21:02 42	07:14 (2) 21:48
3	08:45	08:15	07:19		07:07		07:58 (1)	06:02	06:32 (2) 05:18
	16:34	17:24	18:17		20:11	17	08:15 (1)	21:03 41	07:13 (2) 21:49
4	08:45	08:13	07:17		07:05		08:01 (1)	06:00	06:32 (2) 05:17
	16:35	17:26	18:18		20:13	11	08:12 (1)	21:05 41	07:13 (2) 21:50
5	08:45	08:11	07:15		07:03			05:58	06:33 (2) 05:17
	16:36	17:28	18:20		20:15			21:07 40	07:13 (2) 21:51
6	08:44	08:10	07:12		07:00			05:57	06:33 (2) 05:16
	16:38	17:30	18:22		20:17			21:08 39	07:12 (2) 21:52
7	08:44	08:08	07:10		06:58			05:55	06:33 (2) 05:15
	16:39	17:32	18:24		20:18			21:10 38	07:11 (2) 21:53
8	08:44	08:06	07:08		06:56			05:53	06:34 (2) 05:15
	16:40	17:34	18:26		20:20			21:12 37	07:11 (2) 21:54
9	08:43	08:04	07:06		06:53			05:51	06:34 (2) 05:14
	16:42	17:36	18:28		20:22			21:13 36	07:10 (2) 21:55
10	08:43	08:02	07:03		06:51			05:49	06:35 (2) 05:14
	16:43	17:37	18:29		20:24			21:15 34	07:09 (2) 21:55
11	08:42	08:01	07:01		06:49			05:48	06:36 (2) 05:14
	16:44	17:39	18:31		20:25			21:17 33	07:09 (2) 21:56
12	08:41	07:59	06:59		06:47			05:46	06:36 (2) 05:13
	16:46	17:41	18:33		20:27			21:18 31	07:07 (2) 21:57
13	08:41	07:57	06:56		06:44			05:44	06:38 (2) 05:13
	16:47	17:43	18:35		20:29			21:20 29	07:07 (2) 21:58
14	08:40	07:55	06:54	07:17 (1)	06:42			05:43	06:39 (2) 05:13
	16:49	17:45	18:36 5	07:22 (1)	20:31			21:22 26	07:05 (2) 21:58
15	08:39	07:53	06:52	07:15 (1)	06:40			05:41	06:40 (2) 05:13
	16:51	17:47	18:38 9	07:24 (1)	20:32			21:23 24	07:04 (2) 21:59
16	08:38	07:51	06:49	07:12 (1)	06:38		07:01 (2)	05:40	06:41 (2) 05:12
	16:52	17:49	18:40 13	07:25 (1)	20:34	4	07:05 (2)	21:25 21	07:02 (2) 21:59
17	08:37	07:49	06:47	07:10 (1)	06:35		06:59 (2)	05:38	06:43 (2) 05:12
	16:54	17:51	18:42 16	07:26 (1)	20:36	8	07:07 (2)	21:26 18	07:01 (2) 22:00
18	08:36	07:47	06:45	07:08 (1)	06:33		06:57 (2)	05:37	06:46 (2) 05:12
	16:55	17:53	18:44 20	07:28 (1)	20:38	12	07:09 (2)	21:28 12	06:58 (2) 22:00
19	08:35	07:45	06:42	07:05 (1)	06:31		06:55 (2)	05:35	06:50 (2) 05:12
	16:57	17:54	18:45 22	07:27 (1)	20:39	15	07:10 (2)	21:29 3	06:53 (2) 22:01
20	08:34	07:43	06:40	07:03 (1)	06:29		06:53 (2)	05:34	05:12
	16:59	17:56	18:47 25	07:28 (1)	20:41	19	07:12 (2)	21:31	22:01
21	08:33	07:41	06:38	07:01 (1)	06:27		06:50 (2)	05:32	05:13
	17:00	17:58	18:49 28	07:29 (1)	20:43	22	07:12 (2)	21:32	22:01
22	08:32	07:39	06:35	06:58 (1)	06:25		06:48 (2)	05:31	05:13
	17:02	18:00	18:51 30	07:28 (1)	20:44	24	07:12 (2)	21:34	22:01
23	08:31	07:37	06:33	06:56 (1)	06:22		06:46 (2)	05:30	05:13
	17:04	18:02	18:52 32	07:28 (1)	20:46	27	07:13 (2)	21:35	22:02
24	08:29	07:34	06:31	06:54 (1)	06:20		06:44 (2)	05:28	05:13
	17:06	18:04	18:54 35	07:29 (1)	20:48	29	07:13 (2)	21:36	22:02
25	08:28	07:32	06:28	06:52 (1)	06:18		06:42 (2)	05:27	05:14
	17:08	18:06	18:56 35	07:27 (1)	20:50	32	07:14 (2)	21:38	22:02
26	08:27	07:30	06:26	06:52 (1)	06:16		06:40 (2)	05:26	05:14
	17:09	18:07	18:58 35	07:27 (1)	20:51	34	07:14 (2)	21:39	22:02
27	08:25	07:28	06:24	06:51 (1)	06:14		06:38 (2)	05:25	05:14
	17:11	18:09	18:59 35	07:26 (1)	20:53	36	07:14 (2)	21:41	22:02
28	08:24	07:26	06:21	06:52 (1)	06:12		06:36 (2)	05:24	05:15
	17:13	18:11	19:01 33	07:25 (1)	20:55	38	07:14 (2)	21:42	22:01
29	08:22		07:19	07:52 (1)	06:10		06:35 (2)	05:23	05:15
	17:15		20:03 33	08:25 (1)	20:57	40	07:15 (2)	21:43	22:01
30	08:21		07:17	07:52 (1)	06:08		06:33 (2)	05:22	05:16
	17:17		20:05 31	08:23 (1)	20:58	42	07:15 (2)	21:44	22:01
31	08:19		07:14	07:54 (1)				05:21	
	17:19		20:06 28	08:22 (1)				21:46	
Potential sun hours	257	277	367		417		487		501
Total, worst case			465		456		587		
Sun reduction			0.28		0.38		0.39		
Oper. time red.			1.00		1.00		1.00		
Wind dir. red.			0.61		0.60		0.60		
Total reduction			0.17		0.23		0.24		
Total, real			79		104		139		

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
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padraig / podowd@jodireland.com
Calculated:
11/06/2025 09:22/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Real Case - V150 **Shadow receptor:** AC - 29

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	July		August		September		October	November	December
1	05:17		05:54		06:47 (2)	06:45	07:35	07:30	08:22
	22:01		21:28	31	07:18 (2)	20:25	19:15	17:07	16:26
2	05:17		05:56		06:46 (2)	06:46	07:36	07:31	08:23
	22:00		21:26	33	07:19 (2)	20:23	19:12	17:06	16:26
3	05:18		05:57		06:45 (2)	06:48	07:38	07:33	08:24
	22:00		21:25	35	07:20 (2)	20:20	19:10	17:04	16:25
4	05:19		05:59		06:45 (2)	06:50	07:40	07:35	08:26
	22:00		21:23	36	07:21 (2)	20:18	19:08	17:02	16:24
5	05:20		06:00		06:44 (2)	06:51	07:42	07:37	08:27
	21:59		21:21	37	07:21 (2)	20:16	19:05	17:00	16:24
6	05:21		06:02		06:43 (2)	06:53	07:43	07:39	08:28
	21:59		21:19	39	07:22 (2)	20:14	19:03	16:58	16:23
7	05:22		06:04		06:42 (2)	06:55	07:45	07:41	08:30
	21:58		21:18	40	07:22 (2)	20:11	19:01	16:57	16:23
8	05:22		06:05		06:42 (2)	06:56	07:56 (1)	07:47	07:42	08:31
	21:57		21:16	41	07:23 (2)	20:09	9	08:05 (1)	18:58	16:55	16:23
9	05:23		06:07		06:41 (2)	06:58	07:52 (1)	07:49	07:44	08:32
	21:57		21:14	41	07:22 (2)	20:07	17	08:09 (1)	18:56	16:53	16:22
10	05:24		06:08		06:42 (2)	07:00	07:49 (1)	07:50	07:46	08:33
	21:56		21:12	41	07:23 (2)	20:04	21	08:10 (1)	18:54	16:52	16:22
11	05:26		06:10		06:41 (2)	07:01	07:47 (1)	07:52	07:48	08:34
	21:55		21:10	41	07:22 (2)	20:02	25	08:12 (1)	18:52	16:50	16:22
12	05:27		06:12		06:41 (2)	07:03	07:46 (1)	07:54	07:50	08:35
	21:54		21:08	42	07:23 (2)	19:59	28	08:14 (1)	18:49	16:48	16:22
13	05:28		06:13		06:41 (2)	07:05	07:44 (1)	07:55	07:51	08:36
	21:53		21:06	41	07:22 (2)	19:57	30	08:14 (1)	18:47	16:47	16:22
14	05:29		06:15		06:43 (2)	07:06	07:43 (1)	07:57	07:53	08:37
	21:52		21:04	39	07:22 (2)	19:55	32	08:15 (1)	18:45	16:45	16:22
15	05:30		06:17		06:44 (2)	07:08	07:42 (1)	07:59	07:55	08:38
	21:51		21:02	37	07:21 (2)	19:52	34	08:16 (1)	18:43	16:44	16:22
16	05:31		06:18		06:46 (2)	07:10	07:41 (1)	08:01	07:57	08:39
	21:50		21:00	35	07:21 (2)	19:50	34	08:15 (1)	18:40	16:42	16:22
17	05:33		06:20		06:47 (2)	07:11	07:40 (1)	08:03	07:59	08:40
	21:49		20:58	33	07:20 (2)	19:48	36	08:16 (1)	18:38	16:41	16:22
18	05:34		06:22		06:49 (2)	07:13	07:39 (1)	08:04	08:00	08:41
	21:48		20:56	31	07:20 (2)	19:45	36	08:15 (1)	18:36	16:40	16:22
19	05:35		06:23		06:51 (2)	07:15	07:40 (1)	08:06	08:02	08:41
	21:47		20:54	29	07:20 (2)	19:43	35	08:15 (1)	18:34	16:38	16:22
20	05:36		06:25		06:52 (2)	07:16	07:42 (1)	08:08	08:04	08:42
	21:46		20:52	26	07:18 (2)	19:41	33	08:15 (1)	18:32	16:37	16:23
21	05:38		06:27		06:54 (2)	07:18	07:43 (1)	08:10	08:06	08:43
	21:44		20:49	24	07:18 (2)	19:38	31	08:14 (1)	18:30	16:36	16:23
22	05:39		06:28		06:55 (2)	07:20	07:45 (1)	08:11	08:07	08:43
	21:43		20:47	21	07:16 (2)	19:36	28	08:13 (1)	18:27	16:35	16:24
23	05:41		06:30		06:57 (2)	07:21	07:47 (1)	08:13	08:09	08:44
	21:42		20:45	18	07:15 (2)	19:33	26	08:13 (1)	18:25	16:34	16:24
24	05:42		06:32		06:58 (2)	07:23	07:48 (1)	08:15	08:11	08:44
	21:40		20:43	15	07:13 (2)	19:31	23	08:11 (1)	18:23	16:32	16:25
25	05:43	06:58 (2)	06:33		07:00 (2)	07:25	07:50 (1)	07:17	08:12	08:45
	21:39	8	07:06 (2)	20:41	12	07:12 (2)	19:29	20	08:10 (1)	17:21	16:31	16:25
26	05:45	06:55 (2)	06:35		07:02 (2)	07:26	07:52 (1)	07:19	08:14	08:45
	21:38	15	07:10 (2)	20:39	8	07:10 (2)	19:26	17	08:09 (1)	17:19	16:30	16:26
27	05:46	06:53 (2)	06:36		07:03 (2)	07:28	07:53 (1)	07:20	08:15	08:45
	21:36	19	07:12 (2)	20:36	3	07:06 (2)	19:24	14	08:07 (1)	17:17	16:29	16:27
28	05:48	06:51 (2)	06:38			07:30	07:55 (1)	07:22	08:17	08:45
	21:35	22	07:13 (2)	20:34		19:22	11	08:06 (1)	17:15	16:29	16:28
29	05:49	06:50 (2)	06:40			07:31	07:57 (1)	07:24	08:19	08:45
	21:33	25	07:15 (2)	20:32		19:19	6	08:03 (1)	17:13	16:28	16:29
30	05:51	06:48 (2)	06:41			07:33	07:58 (1)	07:26	08:20	08:46
	21:31	28	07:16 (2)	20:30		19:17	2	08:00 (1)	17:11	16:27	16:29
31	05:52	06:48 (2)	06:43					07:28		08:46
	21:30	30	07:18 (2)	20:27				17:09		16:30
Potential sun hours	504		455		381		331	265	241
Total, worst case		147		829		548			
Sun reduction		0.33		0.35		0.34			
Oper. time red.		1.00		1.00		1.00			
Wind dir. red.		0.60		0.60		0.61			
Total reduction		0.20		0.21		0.21			
Total, real		29		176		113			

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

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SHADOW - Calendar

Calculation: 6839 Garrane WF Real Case - V150 **Shadow receptor:** AD - 30

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January		February		March		April		May		June	
1	08:46		08:18		08:45 (1)		07:24		07:52 (2)		07:12	
	16:32		17:20	11	08:56 (1)		18:13	32	08:24 (2)		20:08	45
2	08:46		08:16		08:43 (1)		07:21		07:52 (2)		07:10	
	16:33		17:22	13	08:56 (1)		18:15	31	08:23 (2)		20:10	45
3	08:45		08:15		08:41 (1)		07:19		07:53 (2)		07:07	
	16:34		17:24	16	08:57 (1)		18:17	30	08:23 (2)		20:12	43
4	08:45		08:13		08:39 (1)		07:17		07:54 (2)		07:05	
	16:35		17:26	18	08:57 (1)		18:18	28	08:22 (2)		20:13	38
5	08:45		08:11		08:37 (1)		07:15		07:38 (3)		07:03	
	16:36		17:28	20	08:57 (1)		18:20	30	08:20 (2)		20:15	25
6	08:45		08:10		08:36 (1)		07:12		07:36 (3)		07:00	
	16:38		17:30	22	08:58 (1)		18:22	33	08:18 (2)		20:17	27
7	08:44		08:08		08:34 (1)		07:10		07:34 (3)		06:58	
	16:39		17:32	24	08:58 (1)		18:24	34	08:16 (2)		20:18	30
8	08:44		08:06		08:32 (1)		07:08		07:31 (3)		06:56	
	16:40		17:34	26	08:58 (1)		18:26	31	08:12 (2)		20:20	32
9	08:43		08:04		08:31 (1)		07:06		07:29 (3)		06:53	
	16:42		17:35	27	08:58 (1)		18:28	24	07:53 (3)		20:22	34
10	08:43		08:02		08:32 (1)		07:03		07:27 (3)		06:51	
	16:43		17:37	25	08:57 (1)		18:29	28	07:55 (3)		20:24	34
11	08:42		08:01		08:33 (1)		07:01		07:24 (3)		06:49	
	16:44		17:39	24	08:57 (1)		18:31	31	07:55 (3)		20:25	34
12	08:41		07:59		08:34 (1)		06:59		07:22 (3)		06:47	
	16:46		17:41	22	08:56 (1)		18:33	34	07:56 (3)		20:27	34
13	08:41		07:57		08:35 (1)		06:56		07:20 (3)		06:44	
	16:47		17:43	20	08:55 (1)		18:35	37	07:57 (3)		20:29	32
14	08:40		07:55		08:36 (1)		06:54		07:17 (3)		06:42	
	16:49		17:45	17	08:53 (1)		18:36	40	07:57 (3)		20:31	31
15	08:39		07:53		08:38 (1)		06:52		07:15 (3)		06:40	
	16:51		17:47	13	08:51 (1)		18:38	43	07:58 (3)		20:32	29
16	08:38		07:51		08:16 (2)		06:49		07:12 (3)		06:38	
	16:52		17:49	6	08:47 (1)		18:40	45	07:57 (3)		20:34	27
17	08:37		07:49		08:14 (2)		06:47		07:10 (3)		06:35	
	16:54		17:51	6	08:20 (2)		18:42	48	07:58 (3)		20:36	25
18	08:36		07:47		08:12 (2)		06:45		07:09 (3)		06:33	
	16:55		17:53	10	08:22 (2)		18:44	49	07:58 (3)		20:38	21
19	08:35		07:45		08:09 (2)		06:42		07:08 (3)		06:31	
	16:57		17:54	13	08:22 (2)		18:45	49	07:57 (3)		20:39	16
20	08:34		07:43		08:07 (2)		06:40		07:08 (3)		06:29	
	16:59		17:56	16	08:23 (2)		18:47	50	07:58 (3)		20:41	10
21	08:33		07:41		08:05 (2)		06:38		07:08 (3)		06:27	
	17:00		17:58	19	08:24 (2)		18:49	50	07:58 (3)		20:43	
22	08:32		07:39		08:03 (2)		06:35		07:08 (3)		06:25	
	17:02		18:00	22	08:25 (2)		18:51	48	07:56 (3)		20:45	
23	08:31		07:37		08:01 (2)		06:33		07:08 (3)		06:22	
	17:04		18:02	24	08:25 (2)		18:52	48	07:56 (3)		20:46	
24	08:29		07:34		07:59 (2)		06:31		07:08 (3)		06:20	
	17:06		18:04	27	08:26 (2)		18:54	48	07:56 (3)		20:48	
25	08:28		07:32		07:56 (2)		06:28		07:08 (3)		06:18	
	17:08		18:06	29	08:25 (2)		18:56	46	07:54 (3)		20:50	
26	08:27		07:30		07:54 (2)		06:26		07:08 (3)		06:16	
	17:09		18:07	31	08:25 (2)		18:58	46	07:54 (3)		20:51	
27	08:25		07:28		07:52 (2)		06:24		07:08 (3)		06:14	
	17:11		18:09	33	08:25 (2)		18:59	44	07:52 (3)		20:53	
28	08:24		07:26		07:52 (2)		06:21		07:09 (3)		06:12	
	17:13		18:11	33	08:25 (2)		19:01	42	07:51 (3)		20:55	2
29	08:22	08:50 (1)					07:19		07:42 (4)		06:10	
	17:15	3 08:53 (1)					20:03	41	08:50 (3)		20:57	6
30	08:21	08:48 (1)					07:17		07:39 (4)		06:08	
	17:17	6 08:54 (1)					20:05	44	08:48 (3)		20:58	9
31	08:19	08:46 (1)					07:14		07:37 (4)			
	17:19	8 08:54 (1)					20:06	46	08:47 (3)			
Potential sun hours	257		277		367		417		487		501	
Total, worst case	17		567		1230		629		1120		1196	
Sun reduction	0.22		0.24		0.28		0.38		0.39		0.35	
Oper. time red.	1.00		1.00		1.00		1.00		1.00		1.00	
Wind dir. red.	0.64		0.63		0.61		0.60		0.60		0.60	
Total reduction	0.14		0.15		0.17		0.23		0.24		0.21	
Total, real	2		87		208		144		267		251	

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Table layout: For each day in each month the following matrix apply

Licensed user:
Jennings O'Donovan
Finisklin Business Park
F91 RHH9 Sligo
+353719161416
padraig / podowd@jodireland.com
Calculated:
11/06/2025 09:22/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Real Case - V150 **Shadow receptor:** AD - 30

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	July		August		September		October		November		December	
1	05:17		06:13 (5)	05:54	06:23 (5)	06:45	07:14 (4)	07:35	08:00 (3)	07:30	08:02 (1)	08:22
	22:01	40	06:53 (5)	21:28 34	06:57 (5)	20:25 34	07:48 (4)	19:15 36	08:36 (3)	17:07 25	08:27 (1)	16:26
2	05:17		06:13 (5)	05:56	06:25 (5)	06:46	07:14 (4)	07:37	08:02 (3)	07:31	08:01 (1)	08:23
	22:01	41	06:54 (5)	21:26 32	06:57 (5)	20:23 34	07:48 (4)	19:12 32	08:34 (3)	17:06 26	08:27 (1)	16:25
3	05:18		06:13 (5)	05:57	06:26 (5)	06:48	07:14 (4)	07:38	08:04 (3)	07:33	08:02 (1)	08:24
	22:00	40	06:53 (5)	21:25 30	06:56 (5)	20:20 34	07:48 (4)	19:10 29	08:33 (3)	17:04 26	08:28 (1)	16:25
4	05:19		06:13 (5)	05:59	06:28 (5)	06:50	07:16 (4)	07:40	08:05 (3)	07:35	08:04 (1)	08:26
	22:00	41	06:54 (5)	21:23 27	06:55 (5)	20:18 32	07:48 (4)	19:08 26	08:31 (3)	17:02 24	08:28 (1)	16:24
5	05:20		06:13 (5)	06:00	06:29 (5)	06:51	07:17 (4)	07:42	08:07 (3)	07:37	08:06 (1)	08:27
	21:59	42	06:55 (5)	21:21 25	06:54 (5)	20:16 30	07:47 (4)	19:05 28	08:46 (2)	17:00 22	08:28 (1)	16:24
6	05:21		06:13 (5)	06:02	06:31 (5)	06:53	07:19 (4)	07:43	08:09 (3)	07:39	08:08 (1)	08:28
	21:59	42	06:55 (5)	21:19 24	06:55 (6)	20:14 27	07:46 (4)	19:03 33	08:51 (2)	16:58 20	08:28 (1)	16:23
7	05:21		06:13 (5)	06:04	06:32 (5)	06:55	07:21 (4)	07:45	08:11 (3)	07:41	08:10 (1)	08:30
	21:58	43	06:56 (5)	21:18 22	06:54 (6)	20:11 25	07:46 (4)	19:01 34	08:53 (2)	16:57 18	08:28 (1)	16:23
8	05:22		06:13 (5)	06:05	06:34 (5)	06:56	07:22 (4)	07:47	08:12 (3)	07:42	08:12 (1)	08:31
	21:57	42	06:55 (5)	21:16 20	06:54 (6)	20:09 39	08:30 (3)	18:58 32	08:54 (2)	16:55 16	08:28 (1)	16:23
9	05:23		06:13 (5)	06:07	06:35 (5)	06:58	07:24 (4)	07:49	08:29 (2)	07:44	08:14 (1)	08:32
	21:57	43	06:56 (5)	21:14 18	06:53 (6)	20:07 42	08:33 (3)	18:56 26	08:55 (2)	16:53 13	08:27 (1)	16:22
10	05:24		06:13 (5)	06:08	06:37 (5)	07:00	07:25 (4)	07:50	08:28 (2)	07:46	08:16 (1)	08:33
	21:56	43	06:56 (5)	21:12 16	06:53 (6)	20:04 45	08:35 (3)	18:54 28	08:56 (2)	16:52 11	08:27 (1)	16:22
11	05:25		06:13 (5)	06:10	06:38 (5)	07:01	07:27 (4)	07:52	08:27 (2)	07:48	08:18 (1)	08:34
	21:55	43	06:56 (5)	21:10 13	06:51 (6)	20:02 46	08:37 (3)	18:52 30	08:57 (2)	16:50 8	08:26 (1)	16:22
12	05:27		06:12 (5)	06:12	06:40 (6)	07:03	07:29 (4)	07:54	08:26 (2)	07:50	08:20 (1)	08:35
	21:54	45	06:57 (5)	21:08 11	06:51 (6)	19:59 45	08:39 (3)	18:49 32	08:58 (2)	16:48 6	08:26 (1)	16:22
13	05:28		06:12 (5)	06:13	06:41 (6)	07:05	07:30 (4)	07:55	08:25 (2)	07:52	08:22 (1)	08:36
	21:53	45	06:57 (5)	21:06 8	06:49 (6)	19:57 43	08:39 (3)	18:47 32	08:57 (2)	16:47 3	08:25 (1)	16:22
14	05:29		06:13 (5)	06:15	06:43 (6)	07:06	07:32 (4)	07:57	08:24 (2)	07:53		08:37
	21:52	45	06:58 (5)	21:04 5	06:48 (6)	19:55 42	08:40 (3)	18:45 33	08:57 (2)	16:45		16:22
15	05:30		06:13 (5)	06:17	06:44 (6)	07:08	07:59 (3)	07:59	08:25 (2)	07:55		08:38
	21:51	45	06:58 (5)	21:02 1	06:45 (6)	19:52 42	08:41 (3)	18:43 32	08:57 (2)	16:44		16:22
16	05:31		06:13 (5)	06:18		07:10	07:58 (3)	08:01	08:27 (2)	07:57		08:39
	21:50	46	06:59 (5)	21:00		19:50 43	08:41 (3)	18:40 30	08:57 (2)	16:42		16:22
17	05:33		06:13 (5)	06:20		07:11	07:57 (3)	08:03	08:29 (2)	07:59		08:40
	21:49	46	06:59 (5)	20:58		19:48 45	08:42 (3)	18:38 28	08:57 (2)	16:41		16:22
18	05:34		06:13 (5)	06:22		07:13	07:55 (3)	08:04	08:31 (2)	08:00		08:41
	21:48	46	06:59 (5)	20:56		19:45 47	08:42 (3)	18:36 26	08:57 (2)	16:40		16:22
19	05:35		06:12 (5)	06:23		07:15	07:55 (3)	08:06	08:33 (2)	08:02		08:41
	21:47	47	06:59 (5)	20:54		19:43 47	08:42 (3)	18:34 24	08:57 (2)	16:38		16:22
20	05:36		06:13 (5)	06:25		07:16	07:54 (3)	08:08	08:34 (2)	08:04		08:42
	21:46	46	06:59 (5)	20:52		19:41 49	08:43 (3)	18:32 21	08:55 (2)	16:37		16:23
21	05:38		06:13 (5)	06:27		07:18	07:53 (3)	08:10	08:36 (2)	08:06		08:43
	21:45	46	06:59 (5)	20:49		19:38 49	08:42 (3)	18:30 18	08:54 (2)	16:36		16:23
22	05:39		06:13 (5)	06:28		07:20	07:53 (3)	08:11	08:38 (2)	08:07		08:43
	21:43	46	06:59 (5)	20:47		19:36 49	08:42 (3)	18:27 15	08:53 (2)	16:35		16:24
23	05:41		06:13 (5)	06:30	07:28 (4)	07:21	07:53 (3)	08:13	08:40 (2)	08:09		08:44
	21:42	47	07:00 (5)	20:45 11	07:39 (4)	19:33 49	08:42 (3)	18:25 12	08:52 (2)	16:34		16:24
24	05:42		06:13 (5)	06:32	07:24 (4)	07:23	07:52 (3)	08:15	08:42 (2)	08:11		08:44
	21:41	46	06:59 (5)	20:43 18	07:42 (4)	19:31 49	08:41 (3)	18:23 9	08:51 (2)	16:32		16:25
25	05:43		06:13 (5)	06:33	07:22 (4)	07:25	07:52 (3)	07:17	07:44 (2)	08:12		08:45
	21:39	46	06:59 (5)	20:41 22	07:44 (4)	19:29 49	08:41 (3)	17:21 5	07:49 (2)	16:31		16:25
26	05:45		06:15 (5)	06:35	07:21 (4)	07:26	07:52 (3)	07:19	07:46 (2)	08:14		08:45
	21:38	44	06:59 (5)	20:39 25	07:46 (4)	19:26 49	08:41 (3)	17:19 8	08:18 (1)	16:30		16:26
27	05:46		06:16 (5)	06:36	07:19 (4)	07:28	07:53 (3)	07:21	08:07 (1)	08:15		08:45
	21:36	43	06:59 (5)	20:36 27	07:46 (4)	19:24 46	08:39 (3)	17:17 14	08:21 (1)	16:29		16:27
28	05:48		06:17 (5)	06:38	07:18 (4)	07:30	07:55 (3)	07:22	08:05 (1)	08:17		08:45
	21:35	41	06:58 (5)	20:34 29	07:47 (4)	19:22 44	08:39 (3)	17:15 18	08:23 (1)	16:29		16:28
29	05:49		06:19 (5)	06:40	07:16 (4)	07:31	07:57 (3)	07:24	08:04 (1)	08:19		08:46
	21:33	40	06:59 (5)	20:32 31	07:47 (4)	19:19 41	08:38 (3)	17:13 20	08:24 (1)	16:28		16:29
30	05:51		06:20 (5)	06:41	07:16 (4)	07:33	07:58 (3)	07:26	08:03 (1)	08:20		08:46
	21:31	38	06:58 (5)	20:30 32	07:48 (4)	19:17 38	08:36 (3)	17:11 22	08:25 (1)	16:27		16:29
31	05:52		06:22 (5)	06:43	07:15 (4)			07:28	08:02 (1)			08:46
	21:30	36	06:58 (5)	20:27 34	07:49 (4)			17:09 24	08:26 (1)			16:30
Potential sun hours	504			455		381		331		264		241
Total, worst case		1344		515		1254		757		218		
Sun reduction		0.33		0.35		0.34		0.28		0.26		
Oper. time red.		1.00		1.00		1.00		1.00		1.00		
Wind dir. red.		0.60		0.60		0.60		0.62		0.64		
Total reduction		0.20		0.21		0.20		0.18		0.17		
Total, real		269		110		256		133		36		

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
Jennings O'Donovan
Finisklin Business Park
F91 RHH9 Sligo
+353719161416
padraig / podowd@jodireland.com
Calculated:
11/06/2025 09:22/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Real Case - V150 **Shadow receptor:** AE - 31

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January		February		March		April		May		June	
1	08:46		08:18		08:45 (1)		07:24		07:47 (3)		07:12	
	16:32		17:20	19	09:04 (1)		18:13	36	08:23 (3)		20:08	14
2	08:46		08:16		08:43 (1)		07:21		07:45 (3)		07:10	
	16:33		17:22	20	09:03 (1)		18:15	39	08:24 (3)		20:10	6
3	08:45		08:15		08:41 (1)		07:19		07:44 (3)		07:07	
	16:34		17:24	22	09:03 (1)		18:17	40	08:24 (3)		20:12	
4	08:45		08:13		08:41 (1)		07:17		07:44 (3)		07:05	
	16:35		17:26	21	09:02 (1)		18:18	40	08:24 (3)		20:13	
5	08:45		08:11		08:42 (1)		07:15		07:43 (3)		07:03	
	16:36		17:28	19	09:01 (1)		18:20	39	08:22 (3)		20:15	
6	08:45		08:10		08:44 (1)		07:12		07:44 (3)		07:00	
	16:38		17:30	17	09:01 (1)		18:22	38	08:22 (3)		20:17	
7	08:44		08:08		08:46 (1)		07:10		07:44 (3)		06:58	
	16:39		17:32	13	08:59 (1)		18:24	38	08:22 (3)		20:18	2
8	08:44		08:06		08:32 (2)		07:08		07:44 (3)		06:56	
	16:40		17:34	11	08:57 (1)		18:26	36	08:20 (3)		20:20	7
9	08:43		08:04		08:30 (2)		07:06		07:45 (3)		06:53	
	16:42		17:36	5	08:35 (2)		18:28	34	08:19 (3)		20:22	11
10	08:43		08:02		08:28 (2)		07:03		07:46 (3)		06:51	
	16:43		17:37	8	08:36 (2)		18:29	32	08:18 (3)		20:24	15
11	08:42		08:01		08:26 (2)		07:01		07:47 (3)		06:49	
	16:44		17:39	11	08:37 (2)		18:31	29	08:16 (3)		20:25	18
12	08:41		07:59		08:24 (2)		06:59		07:48 (3)		06:47	
	16:46		17:41	14	08:38 (2)		18:33	26	08:14 (3)		20:27	21
13	08:41		07:57		08:22 (2)		06:56		07:50 (3)		06:44	
	16:47		17:43	16	08:38 (2)		18:35	22	08:12 (3)		20:29	24
14	08:40		07:55		08:20 (2)		06:54		07:52 (3)		06:42	
	16:49		17:45	18	08:38 (2)		18:36	17	08:09 (3)		20:31	27
15	08:39		07:53		08:18 (2)		06:52		07:57 (3)		06:40	
	16:51		17:47	21	08:39 (2)		18:38	6	08:03 (3)		20:32	29
16	08:38		07:51		08:16 (2)		06:49		07:12 (4)		06:38	
	16:52		17:49	23	08:39 (2)		18:40	4	07:16 (4)		20:34	32
17	08:37		07:49		08:14 (2)		06:47		07:10 (4)		06:35	
	16:54		17:51	25	08:39 (2)		18:42	8	07:18 (4)		20:36	34
18	08:36		07:47		08:12 (2)		06:45		07:08 (4)		06:33	
	16:55		17:53	26	08:38 (2)		18:44	11	07:19 (4)		20:38	36
19	08:35		07:45		08:09 (3)		06:42		07:05 (4)		06:31	
	16:57		17:54	28	08:37 (2)		18:45	14	07:19 (4)		20:39	38
20	08:34		07:43		08:07 (3)		06:40		07:03 (4)		06:29	
	16:59		17:56	29	08:36 (2)		18:47	17	07:20 (4)		20:41	40
21	08:33		07:41		08:05 (3)		06:38		07:01 (4)		06:27	
	17:00		17:58	31	08:36 (2)		18:49	20	07:21 (4)		20:43	42
22	08:32		07:39		08:03 (3)		06:35		06:58 (4)		06:25	
	17:02		18:00	32	08:35 (2)		18:51	22	07:20 (4)		20:45	43
23	08:31		07:37		08:01 (3)		06:33		06:56 (4)		06:22	
	17:04		18:02	32	08:33 (2)		18:52	24	07:20 (4)		20:46	43
24	08:29		08:57 (1)		07:34		07:59 (3)		06:31		06:54 (4)	
	17:06	3	09:00 (1)		18:04	32	08:31 (2)		18:54	26	07:20 (4)	
25	08:28		08:56 (1)		07:32		07:56 (3)		06:28		06:51 (4)	
	17:08	5	09:01 (1)		18:06	31	08:27 (2)		18:56	28	07:19 (4)	
26	08:27		08:54 (1)		07:30		07:54 (3)		06:26		06:49 (4)	
	17:09	7	09:01 (1)		18:07	29	08:23 (3)		18:58	30	07:19 (4)	
27	08:25		08:53 (1)		07:28		07:52 (3)		06:24		06:49 (4)	
	17:11	9	09:02 (1)		18:09	32	08:24 (3)		18:59	28	07:17 (4)	
28	08:24		08:51 (1)		07:26		07:50 (3)		06:21		06:49 (4)	
	17:13	11	09:02 (1)		18:11	34	08:24 (3)		19:01	27	07:16 (4)	
29	08:23		08:50 (1)						07:19		07:50 (4)	
	17:15	13	09:03 (1)						20:03	25	08:15 (4)	
30	08:21		08:48 (1)						07:17		07:51 (4)	
	17:17	15	09:03 (1)						20:05	22	08:13 (4)	
31	08:19		08:46 (1)						07:14		07:52 (4)	
	17:19	17	09:03 (1)						20:06	19	08:11 (4)	
Potential sun hours	257		277		367		417		487		501	
Total, worst case		80		619		797		739		391		723
Sun reduction		0.22		0.24		0.28		0.38		0.39		0.35
Oper. time red.		1.00		1.00		1.00		1.00		1.00		1.00
Wind dir. red.		0.64		0.63		0.62		0.59		0.60		0.60
Total reduction		0.14		0.15		0.17		0.23		0.24		0.21
Total, real		11		95		137		167		92		150

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
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padraig / podowd@jodireland.com

Calculated:
11/06/2025 09:22/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Real Case - V150 **Shadow receptor:** AE - 31

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	July		August		September		October		November		December	
1	05:17		05:56 (7)	05:54		06:45		07:11 (5)	07:35		08:28 (3)	07:30		07:58 (2)	08:22
	22:01	24	06:20 (7)	21:28		20:25	18	07:29 (5)	19:15	24	08:52 (3)	17:07	8	08:06 (2)	16:26
2	05:17		05:56 (7)	05:56		06:46		07:13 (5)	07:37		08:26 (3)	07:31		08:00 (2)	08:23
	22:01	25	06:21 (7)	21:27		20:23	15	07:28 (5)	19:12	28	08:54 (3)	17:06	5	08:05 (2)	16:25
3	05:18		05:56 (7)	05:57		06:48		07:14 (5)	07:38		08:25 (3)	07:33		08:02 (2)	08:24
	22:00	25	06:21 (7)	21:25		20:20	11	07:25 (5)	19:10	31	08:56 (3)	17:04	11	08:27 (1)	16:25
4	05:19		05:56 (7)	05:59		06:50		07:16 (5)	07:40		08:22 (3)	07:35		08:15 (1)	08:26
	22:00	25	06:21 (7)	21:23		20:18	7	07:23 (5)	19:08	34	08:56 (3)	17:02	14	08:29 (1)	16:24
5	05:20		05:56 (7)	06:00		06:51		07:17 (5)	07:42		08:21 (3)	07:37		08:14 (1)	08:27
	21:59	26	06:22 (7)	21:21		20:16	3	07:20 (5)	19:05	36	08:57 (3)	17:00	17	08:31 (1)	16:24
6	05:21		05:56 (7)	06:02		06:53			07:43		08:21 (3)	07:39		08:13 (1)	08:28
	21:59	27	06:23 (7)	21:19		20:14			19:03	36	08:57 (3)	16:58	19	08:32 (1)	16:23
7	05:21		05:56 (7)	06:04		06:55			07:45		08:20 (3)	07:41		08:12 (1)	08:30
	21:58	27	06:23 (7)	21:18		20:11			19:01	38	08:58 (3)	16:57	21	08:33 (1)	16:23
8	05:22		05:55 (7)	06:05	07:13 (5)	06:56			07:47		08:18 (3)	07:42		08:12 (1)	08:31
	21:57	28	06:23 (7)	21:16	12 07:25 (5)	20:09			18:58	39	08:57 (3)	16:55	22	08:34 (1)	16:23
9	05:23		05:55 (7)	06:07	07:09 (5)	06:58			07:49		08:18 (3)	07:44		08:14 (1)	08:32
	21:57	28	06:23 (7)	21:14	18 07:27 (5)	20:07			18:56	40	08:58 (3)	16:53	20	08:34 (1)	16:22
10	05:24		05:55 (7)	06:08	07:08 (5)	07:00		07:52 (4)	07:50		08:18 (3)	07:46		08:16 (1)	08:33
	21:56	28	06:23 (7)	21:12	22 07:30 (5)	20:04	4	07:56 (4)	18:54	40	08:58 (3)	16:52	19	08:35 (1)	16:22
11	05:25		05:56 (7)	06:10	07:05 (5)	07:01		07:47 (4)	07:52		08:18 (3)	07:48		08:18 (1)	08:34
	21:55	28	06:24 (7)	21:10	26 07:31 (5)	20:02	14	08:01 (4)	18:52	40	08:58 (3)	16:50	17	08:35 (1)	16:22
12	05:27		05:57 (7)	06:12	07:04 (5)	07:03		07:45 (4)	07:54		08:20 (3)	07:50		08:20 (1)	08:35
	21:54	27	06:24 (7)	21:08	29 07:33 (5)	19:59	18	08:03 (4)	18:49	38	08:58 (3)	16:48	15	08:35 (1)	16:22
13	05:28		05:58 (7)	06:13	07:02 (5)	07:05		07:42 (4)	07:55		08:21 (3)	07:52		08:22 (1)	08:36
	21:53	26	06:24 (7)	21:06	31 07:33 (5)	19:57	22	08:04 (4)	18:47	36	08:57 (3)	16:47	13	08:35 (1)	16:22
14	05:29		06:00 (7)	06:15	07:02 (5)	07:06		07:41 (4)	07:57		08:23 (3)	07:53		08:24 (1)	08:37
	21:52	25	06:25 (7)	21:04	32 07:34 (5)	19:55	25	08:06 (4)	18:45	33	08:56 (3)	16:45	11	08:35 (1)	16:22
15	05:30		06:01 (7)	06:17	06:59 (6)	07:08		07:40 (4)	07:59		08:25 (3)	07:55		08:25 (1)	08:38
	21:51	24	06:25 (7)	21:02	36 07:35 (5)	19:52	27	08:07 (4)	18:43	31	08:56 (3)	16:44	9	08:34 (1)	16:22
16	05:31		06:02 (7)	06:18	06:58 (6)	07:10		07:38 (4)	08:01		08:27 (3)	07:57		08:27 (1)	08:39
	21:50	23	06:25 (7)	21:00	38 07:36 (5)	19:50	28	08:06 (4)	18:40	28	08:55 (3)	16:42	7	08:34 (1)	16:22
17	05:33		06:03 (7)	06:20	06:56 (6)	07:11		07:38 (4)	08:03		08:29 (3)	07:59		08:29 (1)	08:40
	21:49	22	06:25 (7)	20:58	40 07:36 (5)	19:48	29	08:07 (4)	18:38	32	09:01 (2)	16:41	5	08:34 (1)	16:22
18	05:34		06:04 (7)	06:22	06:55 (6)	07:13		07:38 (4)	08:04		08:31 (3)	08:00		08:31 (1)	08:41
	21:48	21	06:25 (7)	20:56	41 07:36 (5)	19:45	28	08:06 (4)	18:36	32	09:03 (2)	16:40	3	08:34 (1)	16:22
19	05:35		06:05 (7)	06:23	06:55 (6)	07:15		07:40 (4)	08:06		08:33 (3)	08:02			08:42
	21:47	20	06:25 (7)	20:54	42 07:37 (5)	19:43	27	08:07 (4)	18:34	32	09:05 (2)	16:38			16:22
20	05:36		06:07 (7)	06:25	06:53 (6)	07:16		07:42 (4)	08:08		08:34 (3)	08:04			08:42
	21:46	19	06:26 (7)	20:52	44 07:37 (5)	19:41	25	08:07 (4)	18:32	31	09:05 (2)	16:37			16:23
21	05:38		06:08 (7)	06:27	06:54 (6)	07:18		07:43 (4)	08:10		08:36 (3)	08:06			08:43
	21:45	17	06:25 (7)	20:49	43 07:37 (5)	19:38	23	08:06 (4)	18:30	30	09:06 (2)	16:36			16:23
22	05:39		06:09 (7)	06:28	06:55 (6)	07:20		07:45 (4)	08:11		08:38 (3)	08:07			08:43
	21:43	16	06:25 (7)	20:47	41 07:36 (5)	19:36	20	08:05 (4)	18:27	29	09:07 (2)	16:35			16:24
23	05:41		06:11 (7)	06:30	06:57 (5)	07:21		07:47 (4)	08:13		08:40 (2)	08:09			08:44
	21:42	15	06:26 (7)	20:45	40 07:37 (5)	19:33	18	08:05 (4)	18:25	28	09:08 (2)	16:34			16:24
24	05:42		06:12 (7)	06:32	06:58 (5)	07:23		07:48 (4)	08:15		08:42 (2)	08:11			08:44
	21:41	13	06:25 (7)	20:43	38 07:36 (5)	19:31	15	08:03 (4)	18:23	26	09:08 (2)	16:32			16:25
25	05:43		06:13 (7)	06:33	07:00 (5)	07:25		07:50 (4)	07:17		07:44 (2)	08:12			08:45
	21:39	11	06:24 (7)	20:41	36 07:36 (5)	19:29	12	08:02 (4)	17:21	24	08:08 (2)	16:31			16:25
26	05:45		06:15 (7)	06:35	07:02 (5)	07:26		07:52 (4)	07:19		07:46 (2)	08:14			08:45
	21:38	9	06:24 (7)	20:39	34 07:36 (5)	19:26	9	08:01 (4)	17:19	22	08:08 (2)	16:30			16:26
27	05:46		06:16 (7)	06:36	07:03 (5)	07:28		07:53 (4)	07:21		07:48 (2)	08:15			08:45
	21:36	7	06:23 (7)	20:36	31 07:34 (5)	19:24	6	07:59 (4)	17:17	20	08:08 (2)	16:29			16:27
28	05:48		06:17 (7)	06:38	07:05 (5)	07:30		07:55 (4)	07:22		07:50 (2)	08:17			08:45
	21:35	5	06:22 (7)	20:34	29 07:34 (5)	19:22	2	07:57 (4)	17:15	18	08:08 (2)	16:29			16:28
29	05:49		06:19 (7)	06:40	07:06 (5)	07:31		08:34 (3)	07:24		07:52 (2)	08:19			08:46
	21:33	3	06:22 (7)	20:32	27 07:33 (5)	19:19	14	08:48 (3)	17:13	16	08:08 (2)	16:28			16:29
30	05:51			06:41	07:08 (5)	07:33		08:30 (3)	07:26		07:54 (2)	08:20			08:46
	21:31			20:30	24 07:32 (5)	19:17	20	08:50 (3)	17:11	13	08:07 (2)	16:27			16:29
31	05:52			06:43	07:10 (5)				07:28		07:56 (2)				08:46
	21:30			20:27	21 07:31 (5)				17:09	10	08:06 (2)				16:30
Potential sun hours	504			455		381			331			264			241
Total, worst case		594			775		440			915			236		
Sun reduction		0.33			0.35		0.34			0.28			0.26		
Oper. time red.		1.00			1.00		1.00			1.00			1.00		
Wind dir. red.		0.60			0.59		0.61			0.63			0.64		
Total reduction		0.20			0.21		0.21			0.18			0.17		
Total, real		118			162		90			162			39		

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

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SHADOW - Calendar

Calculation: 6839 Garrane WF Real Case - V150 **Shadow receptor:** AF - 32

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January		February		March		April		May	June
1	08:46		09:30 (3)	08:18		08:45 (5)	07:24		07:54 (8)	07:12		07:37 (9)	06:06	05:20
	16:32	17	09:47 (3)	17:20	24	09:09 (5)	18:13	45	08:39 (8)	20:08	34	08:11 (9)	21:00	21:47
2	08:46		09:30 (3)	08:16		08:43 (5)	07:21		07:54 (8)	07:10		07:36 (9)	06:04	05:19
	16:33	16	09:46 (3)	17:22	26	09:09 (5)	18:15	44	08:38 (8)	20:10	34	08:10 (9)	21:02	21:48
3	08:45		09:31 (3)	08:15		08:41 (5)	07:19		07:55 (8)	07:07		07:37 (9)	06:02	05:18
	16:34	15	09:46 (3)	17:24	28	09:09 (5)	18:17	43	08:38 (8)	20:12	32	08:09 (9)	21:03	21:49
4	08:45		09:33 (3)	08:13		08:41 (5)	07:17		07:41 (7)	07:05		07:37 (9)	06:00	05:17
	16:35	14	09:47 (3)	17:26	27	09:08 (5)	18:18	44	08:37 (8)	20:13	32	08:09 (9)	21:05	21:50
5	08:45		09:33 (3)	08:11		08:42 (5)	07:15		07:38 (7)	07:03		07:38 (9)	05:58	05:17
	16:36	13	09:46 (3)	17:28	27	09:09 (5)	18:20	46	08:36 (8)	20:15	30	08:08 (9)	21:07	21:51
6	08:45		09:35 (3)	08:10		08:43 (5)	07:12		07:36 (7)	07:00		07:38 (9)	05:57	05:16
	16:38	11	09:46 (3)	17:30	25	09:08 (5)	18:22	47	08:35 (8)	20:17	27	08:05 (9)	21:09	21:52
7	08:44		09:36 (3)	08:08		08:43 (5)	07:10		07:34 (7)	06:58		07:40 (9)	05:55	05:15
	16:39	8	09:44 (3)	17:32	24	09:07 (5)	18:24	48	08:34 (8)	20:18	24	08:04 (9)	21:10	21:53
8	08:44		09:40 (3)	08:06		08:44 (5)	07:08		07:31 (7)	06:56		07:41 (9)	05:53	05:15
	16:40	3	09:43 (3)	17:34	22	09:06 (5)	18:26	49	08:32 (8)	20:20	21	08:02 (9)	21:12	21:54
9	08:43			08:04		08:46 (5)	07:06		07:29 (7)	06:53		07:43 (9)	05:51	05:14
	16:42			17:35	18	09:04 (5)	18:28	47	08:30 (8)	20:22	15	07:58 (9)	21:14	21:55
10	08:43			08:03		08:48 (5)	07:03		07:27 (7)	06:51		07:47 (9)	05:49	05:14
	16:43			17:37	14	09:02 (5)	18:29	47	08:29 (8)	20:24	7	07:54 (9)	21:15	21:56
11	08:42			08:01		08:51 (5)	07:01		07:24 (7)	06:49			05:48	05:14
	16:44			17:39	9	09:00 (5)	18:31	44	08:25 (8)	20:25			21:17	21:56
12	08:41			07:59		08:24 (8)	06:59		07:22 (7)	06:47			05:46	05:13
	16:46			17:41	2	08:26 (8)	18:33	39	08:22 (8)	20:27			21:18	21:57
13	08:41			07:57		08:22 (8)	06:56		07:20 (7)	06:44			05:44	05:13
	16:47			17:43	7	08:29 (8)	18:35	30	08:17 (8)	20:29			21:20	21:58
14	08:40			07:55		08:20 (8)	06:54		07:18 (7)	06:42			05:43	05:13
	16:49			17:45	11	08:31 (8)	18:36	25	07:43 (7)	20:31			21:22	21:58
15	08:39			07:53		08:18 (8)	06:52		07:19 (7)	06:40			05:41	05:12
	16:50			17:47	15	08:33 (8)	18:38	23	07:42 (7)	20:32			21:23	21:59
16	08:38			07:51		08:16 (8)	06:49		07:19 (7)	06:38			05:40	05:12
	16:52			17:49	19	08:35 (8)	18:40	21	07:40 (7)	20:34			21:25	21:59
17	08:37			07:49		08:14 (8)	06:47		07:21 (7)	06:35			05:38	05:12
	16:54			17:51	22	08:36 (8)	18:42	17	07:38 (7)	20:36			21:26	22:00
18	08:36			07:47		08:12 (8)	06:45		07:23 (7)	06:33			05:36	05:12
	16:55			17:53	25	08:37 (8)	18:44	13	07:36 (7)	20:38			21:28	22:00
19	08:35			07:45		08:09 (8)	06:42			06:31			05:35	05:12
	16:57			17:54	28	08:37 (8)	18:45			20:39			21:29	22:01
20	08:34		09:03 (4)	07:43		08:07 (8)	06:40		07:03 (9)	06:29			05:34	05:12
	16:59	2	09:05 (4)	17:56	31	08:38 (8)	18:47	4	07:07 (9)	20:41			21:31	22:01
21	08:33		09:01 (4)	07:41		08:05 (8)	06:38		07:01 (9)	06:27			05:32	05:12
	17:00	4	09:05 (4)	17:58	34	08:39 (8)	18:49	8	07:09 (9)	20:43			21:32	22:01
22	08:32		09:00 (5)	07:39		08:03 (8)	06:35		06:58 (9)	06:25			05:31	05:13
	17:02	6	09:06 (4)	18:00	36	08:39 (8)	18:51	12	07:10 (9)	20:45			21:34	22:01
23	08:31		08:59 (5)	07:37		08:01 (8)	06:33		06:56 (9)	06:22			05:30	05:13
	17:04	8	09:07 (4)	18:02	39	08:40 (8)	18:52	15	07:11 (9)	20:46			21:35	22:02
24	08:29		08:57 (5)	07:34		07:59 (8)	06:31		06:54 (9)	06:20			05:28	05:13
	17:06	10	09:07 (4)	18:04	41	08:40 (8)	18:54	18	07:12 (9)	20:48			21:37	22:02
25	08:28		08:56 (5)	07:32		07:56 (8)	06:28		06:51 (9)	06:18			05:27	05:14
	17:08	11	09:07 (4)	18:06	43	08:39 (8)	18:56	21	07:12 (9)	20:50			21:38	22:02
26	08:27		08:54 (5)	07:30		07:54 (8)	06:26		06:49 (9)	06:16			05:26	05:14
	17:09	13	09:07 (4)	18:07	46	08:40 (8)	18:58	24	07:13 (9)	20:51			21:39	22:02
27	08:25		08:53 (5)	07:28		07:54 (8)	06:24		06:47 (9)	06:14			05:25	05:14
	17:11	15	09:08 (4)	18:09	46	08:40 (8)	18:59	26	07:13 (9)	20:53			21:41	22:02
28	08:24		08:51 (5)	07:26		07:54 (8)	06:21		06:44 (9)	06:12			05:24	05:15
	17:13	16	09:07 (5)	18:11	46	08:40 (8)	19:01	29	07:13 (9)	20:55			21:42	22:02
29	08:23		08:50 (5)				07:19		07:42 (9)	06:10			05:23	05:15
	17:15	18	09:08 (5)				20:03	31	08:13 (9)	20:57			21:43	22:01
30	08:21		08:48 (5)				07:17		07:39 (9)	06:08			05:22	05:16
	17:17	20	09:08 (5)				20:05	33	08:12 (9)	20:58			21:44	22:01
31	08:20		08:46 (5)				07:14		07:37 (9)				05:21	
	17:18	22	09:08 (5)				20:06	35	08:12 (9)				21:46	
Potential sun hours	257			277			367			417			487	501
Total, worst case		242			735			928			256			
Sun reduction		0.22			0.24			0.28			0.38			
Oper. time red.		1.00			1.00			1.00			1.00			
Wind dir. red.		0.65			0.64			0.62			0.61			
Total reduction		0.14			0.15			0.17			0.23			
Total, real		34			113			159			59			

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
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Calculated:
11/06/2025 09:22/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Real Case - V150 **Shadow receptor:** AF - 32

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	July	August	September		October		November		December		
1	05:17	05:54	06:45		07:35		08:00 (7)	07:30	08:17 (5)	08:22	
	22:01	21:28	20:25		19:15	36	08:59 (8)	17:07	16	08:33 (5)	16:26	
2	05:17	05:56	06:46		07:46 (9)	07:37		08:02 (7)	07:32		08:15 (5)	08:23	
	22:01	21:27	20:23	7	07:53 (9)	19:12	42	09:03 (8)	17:06	19	08:34 (5)	16:25	
3	05:18	05:57	06:48		07:41 (9)	07:38		08:04 (7)	07:33		08:14 (5)	08:24	
	22:00	21:25	20:21	15	07:56 (9)	19:10	45	09:06 (8)	17:04	22	08:36 (5)	16:25	
4	05:19	05:59	06:50		07:38 (9)	07:40		08:05 (7)	07:35		08:13 (5)	08:26	09:24 (3)
	22:00	21:23	20:18	21	07:59 (9)	19:08	47	09:07 (8)	17:02	24	08:37 (5)	16:24	3	09:27 (3)
5	05:20	06:00	06:51		07:36 (9)	07:42		08:07 (7)	07:37		08:12 (5)	08:27		09:21 (3)
	21:59	21:21	20:16	24	08:00 (9)	19:05	48	09:08 (8)	17:00	26	08:38 (5)	16:24	8	09:29 (3)
6	05:21	06:02	06:53		07:34 (9)	07:43		08:09 (7)	07:39		08:12 (5)	08:29		09:21 (3)
	21:59	21:19	20:14	27	08:01 (9)	19:03	48	09:09 (8)	16:58	26	08:38 (5)	16:23	11	09:32 (3)
7	05:21	06:04	06:55		07:33 (9)	07:45		08:11 (7)	07:41		08:11 (5)	08:30		09:20 (3)
	21:58	21:18	20:11	30	08:03 (9)	19:01	48	09:11 (8)	16:57	28	08:39 (5)	16:23	13	09:33 (3)
8	05:22	06:05	06:56		07:31 (9)	07:47		08:12 (7)	07:43		08:12 (5)	08:31		09:20 (3)
	21:57	21:16	20:09	32	08:03 (9)	18:58	46	09:10 (8)	16:55	27	08:39 (5)	16:22	14	09:34 (3)
9	05:23	06:07	06:58		07:31 (9)	07:49		08:14 (7)	07:44		08:14 (5)	08:32		09:20 (3)
	21:57	21:14	20:07	32	08:03 (9)	18:56	45	09:11 (8)	16:53	26	08:40 (5)	16:22	15	09:35 (3)
10	05:24	06:08	07:00		07:29 (9)	07:50		08:29 (8)	07:46		08:16 (5)	08:33		09:20 (3)
	21:56	21:12	20:04	34	08:03 (9)	18:54	43	09:12 (8)	16:52	24	08:40 (5)	16:22	16	09:36 (3)
11	05:25	06:10	07:01		07:29 (9)	07:52		08:29 (8)	07:48		08:18 (5)	08:34		09:20 (3)
	21:55	21:10	20:02	35	08:04 (9)	18:52	43	09:12 (8)	16:50	22	08:40 (5)	16:22	17	09:37 (3)
12	05:27	06:12	07:03		07:29 (9)	07:54		08:28 (8)	07:50		08:20 (5)	08:36		09:20 (3)
	21:54	21:08	20:00	35	08:04 (9)	18:49	45	09:13 (8)	16:48	20	08:40 (5)	16:22	18	09:38 (3)
13	05:28	06:13	07:05		07:30 (9)	07:56		08:27 (8)	07:52		08:22 (5)	08:37		09:20 (3)
	21:53	21:06	19:57	33	08:03 (9)	18:47	45	09:12 (8)	16:47	18	08:40 (5)	16:22	18	09:38 (3)
14	05:29	06:15	07:06		07:32 (9)	07:57		08:27 (8)	07:53		08:24 (5)	08:38		09:20 (3)
	21:53	21:04	19:55	31	08:03 (9)	18:45	45	09:12 (8)	16:45	16	08:40 (5)	16:22	19	09:39 (3)
15	05:30	06:17	07:08		07:34 (9)	07:59		08:26 (8)	07:55		08:26 (5)	08:38		09:21 (3)
	21:52	21:02	19:52	29	08:03 (9)	18:43	46	09:12 (8)	16:44	15	08:41 (4)	16:22	19	09:40 (3)
16	05:31	06:18	07:10		07:35 (9)	08:01		08:27 (8)	07:57		08:27 (5)	08:39		09:21 (3)
	21:50	21:00	19:50	27	08:02 (9)	18:40	45	09:12 (8)	16:42	13	08:40 (4)	16:22	20	09:41 (3)
17	05:32	06:20	07:11		07:37 (9)	08:03		08:29 (8)	07:59		08:29 (5)	08:40		09:21 (3)
	21:49	20:58	19:48	24	08:01 (9)	18:38	43	09:12 (8)	16:41	11	08:40 (4)	16:22	20	09:41 (3)
18	05:34	06:22	07:13		07:38 (9)	08:04		08:31 (8)	08:00		08:31 (5)	08:41		09:21 (3)
	21:48	20:56	19:45	22	08:00 (9)	18:36	40	09:11 (8)	16:40	10	08:41 (4)	16:22	20	09:41 (3)
19	05:35	06:23	07:15		07:40 (9)	08:06		08:33 (8)	08:02		08:33 (5)	08:42		09:22 (3)
	21:47	20:54	19:43	19	07:59 (9)	18:34	38	09:11 (8)	16:38	8	08:41 (4)	16:22	20	09:42 (3)
20	05:36	06:25	07:16		07:42 (9)	08:08		08:34 (8)	08:04		08:35 (5)	08:42		09:23 (3)
	21:46	20:52	19:41	16	07:58 (9)	18:32	35	09:09 (8)	16:37	6	08:41 (4)	16:23	20	09:43 (3)
21	05:38	06:27	07:18		07:43 (9)	08:10		08:36 (8)	08:06		08:37 (4)	08:43		09:23 (3)
	21:45	20:50	19:38	13	07:56 (9)	18:30	33	09:09 (8)	16:36	4	08:41 (4)	16:23	20	09:43 (3)
22	05:39	06:28	07:20		07:45 (9)	08:11		08:38 (8)	08:07		08:39 (4)	08:43		09:24 (3)
	21:43	20:47	19:36	9	07:54 (9)	18:27	30	09:08 (8)	16:35	2	08:41 (4)	16:24	20	09:44 (3)
23	05:41	06:30	07:21		07:47 (9)	08:13		08:40 (8)	08:09			08:44		09:24 (3)
	21:42	20:45	19:33	5	07:52 (9)	18:25	27	09:07 (8)	16:34			16:24	20	09:44 (3)
24	05:42	06:31	07:23		07:48 (9)	08:15		08:42 (8)	08:11			08:44		09:24 (3)
	21:41	20:43	19:31	1	07:49 (9)	18:23	24	09:06 (8)	16:32			16:25	20	09:44 (3)
25	05:43	06:33	07:25		08:07 (7)	07:17		07:44 (8)	08:12			08:45		09:25 (3)
	21:39	20:41	19:29	10	08:17 (7)	17:21	21	08:05 (8)	16:31			16:25	20	09:45 (3)
26	05:45	06:35	07:26		08:04 (7)	07:19		07:46 (8)	08:14			08:45		09:25 (3)
	21:38	20:39	19:26	16	08:20 (7)	17:19	18	08:04 (8)	16:30			16:26	20	09:45 (3)
27	05:46	06:36	07:28		08:01 (7)	07:21		07:48 (8)	08:16			08:45		09:26 (3)
	21:36	20:36	19:24	20	08:21 (7)	17:17	14	08:02 (8)	16:29			16:27	19	09:45 (3)
28	05:48	06:38	07:30		08:00 (7)	07:22		07:50 (8)	08:17			08:45		09:26 (3)
	21:35	20:34	19:22	22	08:22 (7)	17:15	10	08:00 (8)	16:29			16:28	20	09:46 (3)
29	05:49	06:40	07:31		07:59 (7)	07:24		07:52 (8)	08:19			08:46		09:27 (3)
	21:33	20:32	19:19	24	08:23 (7)	17:13	6	07:58 (8)	16:28			16:29	19	09:46 (3)
30	05:51	06:41	07:33		07:58 (7)	07:26		07:54 (8)	08:20			08:46		09:28 (3)
	21:32	20:30	19:17	25	08:23 (7)	17:11	1	07:55 (8)	16:27			16:29	18	09:46 (3)
31	05:52	06:43				07:28		08:19 (5)				08:46		09:29 (3)
	21:30	20:27				17:09	11	08:30 (5)				16:30	18	09:47 (3)
Potential sun hours	504	455	381			331			264			241		
Total, worst case				638			1068			383			485	
Sun reduction				0.34			0.28			0.26			0.22	
Oper. time red.				1.00			1.00			1.00			1.00	
Wind dir. red.				0.61			0.63			0.64			0.67	
Total reduction				0.21			0.18			0.17			0.15	
Total, real				131			189			64			71	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
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Calculated:
11/06/2025 09:22/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Real Case - V150 **Shadow receptor:** AG - 33

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January		February		March		April	May	June
1	08:46	09:45 (8)	08:18		08:45 (7)	07:24	07:59 (9)	07:12	06:06	05:20
	16:32	53 10:38 (8)	17:20	4	08:49 (7)	18:13	48 08:47 (9)	20:08	21:00	21:47
2	08:46	09:45 (8)	08:16		08:43 (7)	07:21	08:00 (9)	07:10	06:04	05:19
	16:33	53 10:38 (8)	17:22	7	08:50 (7)	18:15	47 08:47 (9)	20:10	21:02	21:48
3	08:45	09:46 (8)	08:15		08:41 (7)	07:19	08:01 (9)	07:07	06:02	05:18
	16:34	53 10:39 (8)	17:24	10	08:51 (7)	18:17	45 08:46 (9)	20:12	21:03	21:49
4	08:45	09:47 (8)	08:13		08:39 (7)	07:17	08:01 (9)	07:05	06:00	05:17
	16:35	52 10:39 (8)	17:26	13	08:52 (7)	18:18	45 08:46 (9)	20:13	21:05	21:50
5	08:45	09:47 (8)	08:11		08:37 (7)	07:15	08:01 (9)	07:03	05:58	05:17
	16:36	52 10:39 (8)	17:28	15	08:52 (7)	18:20	43 08:44 (9)	20:15	21:07	21:51
6	08:45	09:16 (6)	08:10		08:36 (7)	07:12	08:02 (9)	07:00	05:56	05:16
	16:37	53 10:40 (8)	17:30	18	08:54 (7)	18:22	41 08:43 (9)	20:17	21:09	21:52
7	08:44	09:15 (6)	08:08		08:34 (7)	07:10	08:03 (9)	06:58	05:55	05:15
	16:39	54 10:40 (8)	17:32	20	08:54 (7)	18:24	39 08:42 (9)	20:18	21:10	21:53
8	08:44	09:15 (6)	08:06		08:32 (7)	07:08	08:04 (9)	06:56	05:53	05:15
	16:40	55 10:40 (8)	17:34	23	08:55 (7)	18:26	36 08:40 (9)	20:20	21:12	21:54
9	08:43	09:14 (6)	08:04		08:30 (7)	07:06	08:05 (9)	06:53	05:51	05:14
	16:41	56 10:40 (8)	17:35	25	08:55 (7)	18:28	33 08:38 (9)	20:22	21:14	21:55
10	08:43	09:13 (6)	08:03		08:28 (7)	07:03	08:07 (9)	06:51	05:49	05:14
	16:43	57 10:40 (8)	17:37	27	08:55 (7)	18:29	29 08:36 (9)	20:24	21:15	21:56
11	08:42	09:12 (6)	08:01		08:26 (7)	07:01	08:09 (9)	06:49	05:48	05:13
	16:44	58 10:40 (8)	17:39	29	08:55 (7)	18:31	24 08:33 (9)	20:25	21:17	21:56
12	08:41	09:11 (6)	07:59		08:24 (7)	06:59	08:12 (9)	06:47	05:46	05:13
	16:46	59 10:40 (8)	17:41	31	08:55 (7)	18:33	17 08:29 (9)	20:27	21:18	21:57
13	08:41	09:11 (6)	07:57		08:22 (7)	06:56	08:20 (9)	06:44	05:44	05:13
	16:47	60 10:41 (8)	17:43	33	08:55 (7)	18:35	2 08:22 (9)	20:29	21:20	21:58
14	08:40	09:10 (6)	07:55		08:20 (9)	06:54		06:42	05:43	05:13
	16:49	61 10:41 (8)	17:45	35	08:55 (7)	18:36		20:31	21:22	21:58
15	08:39	09:09 (6)	07:53		08:18 (9)	06:52		06:40	05:41	05:12
	16:50	61 10:41 (8)	17:47	36	08:54 (7)	18:38		20:32	21:23	21:59
16	08:38	09:08 (6)	07:51		08:16 (9)	06:49		06:38	05:39	05:12
	16:52	62 10:41 (8)	17:49	38	08:54 (7)	18:40		20:34	21:25	21:59
17	08:37	09:06 (6)	07:49		08:14 (9)	06:47		06:35	05:38	05:12
	16:54	62 10:40 (8)	17:51	39	08:53 (7)	18:42		20:36	21:26	22:00
18	08:36	09:05 (6)	07:47		08:12 (9)	06:45		06:33	05:36	05:12
	16:55	63 10:40 (8)	17:53	40	08:52 (7)	18:44		20:38	21:28	22:00
19	08:35	09:04 (6)	07:45		08:09 (9)	06:42		06:31	05:35	05:12
	16:57	62 10:39 (8)	17:54	41	08:50 (7)	18:45		20:39	21:29	22:01
20	08:34	09:03 (6)	07:43		08:07 (9)	06:40		06:29	05:34	05:12
	16:59	63 10:39 (8)	17:56	41	08:48 (7)	18:47		20:41	21:31	22:01
21	08:33	09:01 (6)	07:41		08:05 (9)	06:38		06:27	05:32	05:12
	17:00	62 10:38 (8)	17:58	43	08:48 (9)	18:49		20:43	21:32	22:01
22	08:32	09:00 (6)	07:39		08:03 (9)	06:35		06:25	05:31	05:13
	17:02	62 10:37 (8)	18:00	46	08:49 (9)	18:51		20:45	21:34	22:01
23	08:31	09:00 (6)	07:37		08:01 (9)	06:33		06:22	05:30	05:13
	17:04	60 10:37 (8)	18:02	48	08:49 (9)	18:52		20:46	21:35	22:02
24	08:29	09:00 (6)	07:34		08:00 (9)	06:31		06:20	05:28	05:13
	17:06	56 10:35 (8)	18:04	49	08:49 (9)	18:54		20:48	21:37	22:02
25	08:28	09:01 (6)	07:32		07:59 (9)	06:28		06:18	05:27	05:13
	17:07	53 10:34 (8)	18:06	50	08:49 (9)	18:56		20:50	21:38	22:02
26	08:27	09:02 (6)	07:30		08:00 (9)	06:26		06:16	05:26	05:14
	17:09	47 10:32 (8)	18:07	49	08:49 (9)	18:58		20:51	21:39	22:02
27	08:25	09:03 (6)	07:28		08:00 (9)	06:24		06:14	05:25	05:14
	17:11	40 10:30 (8)	18:09	49	08:49 (9)	18:59		20:53	21:41	22:02
28	08:24	09:04 (6)	07:26		08:00 (9)	06:21		06:12	05:24	05:15
	17:13	32 10:27 (8)	18:11	48	08:48 (9)	19:01		20:55	21:42	22:02
29	08:23	09:06 (6)				07:19		06:10	05:23	05:15
	17:15	16 09:22 (6)				20:03		20:57	21:43	22:01
30	08:21	09:08 (6)				07:17		06:08	05:22	05:16
	17:17	11 09:19 (6)				20:05		20:58	21:44	22:01
31	08:20	09:12 (6)				07:14			05:21	
	17:18	3 09:15 (6)				20:06			21:46	
Potential sun hours	257		277		367		417	487	502	
Total, worst case		1591		907		449				
Sun reduction		0.22		0.24		0.28				
Oper. time red.		1.00		1.00		1.00				
Wind dir. red.		0.66		0.64		0.63				
Total reduction		0.14		0.15		0.18				
Total, real		229		140		79				

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

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SHADOW - Calendar

Calculation: 6839 Garrane WF Real Case - V150 **Shadow receptor:** AG - 33

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	July		August		September		October			November			December		
1	05:17		05:54		06:45		07:35		08:53 (9)	07:30		07:58 (7)	08:22		08:54 (6)
	22:01		21:28		20:25		19:15	13	09:06 (9)	17:07	27	08:25 (7)	16:26	58	10:22 (8)
2	05:17		05:56		06:46		07:37		08:49 (9)	07:32		08:00 (7)	08:23		08:56 (6)
	22:01		21:27		20:23		19:12	21	09:10 (9)	17:05	25	08:25 (7)	16:25	57	10:23 (8)
3	05:18		05:57		06:48		07:38		08:46 (9)	07:33		08:02 (7)	08:24		08:57 (6)
	22:00		21:25		20:20		19:10	27	09:13 (9)	17:04	22	08:24 (7)	16:25	55	10:23 (8)
4	05:19		05:59		06:50		07:40		08:43 (9)	07:35		08:04 (7)	08:26		08:59 (6)
	22:00		21:23		20:18		19:08	31	09:14 (9)	17:02	20	08:24 (7)	16:24	56	10:25 (8)
5	05:20		06:00		06:51		07:42		08:42 (9)	07:37		08:06 (7)	08:27		09:00 (6)
	21:59		21:21		20:16		19:05	34	09:16 (9)	17:00	17	08:23 (7)	16:24	54	10:25 (8)
6	05:21		06:02		06:53		07:43		08:40 (9)	07:39		08:08 (7)	08:29		09:02 (6)
	21:59		21:19		20:14		19:03	37	09:17 (9)	16:58	15	08:23 (7)	16:23	53	10:26 (8)
7	05:21		06:03		06:55		07:45		08:39 (9)	07:41		08:10 (7)	08:30		09:34 (8)
	21:58		21:18		20:11		19:01	39	09:18 (9)	16:57	12	08:22 (7)	16:23	52	10:26 (8)
8	05:22		06:05		06:56		07:47		08:37 (9)	07:42		08:12 (7)	08:31		09:34 (8)
	21:57		21:16		20:09		18:58	42	09:19 (9)	16:55	9	08:21 (7)	16:22	52	10:26 (8)
9	05:23		06:07		06:58		07:49		08:36 (9)	07:44		08:14 (7)	08:32		09:35 (8)
	21:57		21:14		20:07		18:56	43	09:19 (9)	16:53	7	08:21 (7)	16:22	53	10:28 (8)
10	05:24		06:08		07:00		07:50		08:35 (9)	07:46		08:16 (7)	08:33		09:35 (8)
	21:56		21:12		20:04		18:54	45	09:20 (9)	16:51	3	08:19 (7)	16:22	53	10:28 (8)
11	05:25		06:10		07:01		07:52		08:34 (9)	07:48		08:43 (6)	08:34		09:35 (8)
	21:55		21:10		20:02		18:52	47	09:21 (9)	16:50	5	08:48 (6)	16:22	53	10:28 (8)
12	05:27		06:12		07:03		07:54		08:34 (9)	07:50		08:40 (6)	08:36		09:35 (8)
	21:54		21:08		19:59		18:49	47	09:21 (9)	16:48	11	08:51 (6)	16:22	54	10:29 (8)
13	05:28		06:13		07:05		07:55		08:32 (9)	07:52		08:38 (6)	08:37		09:36 (8)
	21:53		21:06		19:57		18:47	48	09:20 (9)	16:47	15	08:53 (6)	16:22	53	10:29 (8)
14	05:29		06:15		07:06		07:57		08:32 (9)	07:53		08:37 (6)	08:37		09:36 (8)
	21:53		21:04		19:55		18:45	49	09:21 (9)	16:45	33	10:00 (8)	16:22	54	10:30 (8)
15	05:30		06:17		07:08		07:59		08:32 (9)	07:55		08:36 (6)	08:38		09:37 (8)
	21:52		21:02		19:52		18:43	49	09:21 (9)	16:44	42	10:04 (8)	16:22	53	10:30 (8)
16	05:31		06:18		07:10		08:01		08:32 (9)	07:57		08:34 (6)	08:39		09:37 (8)
	21:50		21:00		19:50		18:40	49	09:21 (9)	16:42	48	10:05 (8)	16:22	54	10:31 (8)
17	05:32		06:20		07:11		08:03		08:32 (9)	07:59		08:34 (6)	08:40		09:38 (8)
	21:49		20:58		19:48		18:38	49	09:21 (9)	16:41	52	10:07 (8)	16:22	54	10:32 (8)
18	05:34		06:22		07:13		08:04		08:32 (9)	08:00		08:34 (6)	08:41		09:38 (8)
	21:48		20:56		19:45		18:36	49	09:21 (9)	16:40	56	10:09 (8)	16:22	53	10:31 (8)
19	05:35		06:23		07:15		08:06		08:33 (9)	08:02		08:34 (6)	08:42		09:38 (8)
	21:47		20:54		19:43		18:34	47	09:20 (9)	16:38	60	10:11 (8)	16:22	54	10:32 (8)
20	05:36		06:25		07:16		08:08		08:34 (9)	08:04		08:35 (6)	08:42		09:38 (4)
	21:46		20:52		19:41		18:32	45	09:19 (9)	16:37	62	10:12 (8)	16:23	55	10:33 (8)
21	05:38		06:26		07:18		08:10		08:36 (9)	08:06		08:37 (6)	08:43		09:38 (4)
	21:45		20:49		19:38		18:30	43	09:19 (9)	16:36	62	10:14 (8)	16:23	55	10:33 (8)
22	05:39		06:28		07:20		08:11		08:38 (9)	08:07		08:39 (6)	08:43		09:39 (4)
	21:43		20:47		19:36		18:27	41	09:19 (7)	16:35	63	10:15 (8)	16:24	55	10:34 (8)
23	05:41		06:30		07:21		08:13		08:40 (9)	08:09		08:41 (6)	08:44		09:39 (4)
	21:42		20:45		19:33		18:25	41	09:21 (7)	16:33	62	10:16 (8)	16:24	55	10:34 (8)
24	05:42		06:31		07:23		08:15		08:42 (9)	08:11		08:42 (6)	08:44		09:40 (8)
	21:41		20:43		19:31		18:23	40	09:22 (7)	16:32	63	10:17 (8)	16:25	54	10:34 (8)
25	05:43		06:33		07:25		07:17		07:44 (9)	08:12		08:44 (6)	08:45		09:41 (4)
	21:39		20:41		19:29		17:21	39	08:23 (7)	16:31	62	10:18 (8)	16:25	54	10:35 (8)
26	05:45		06:35		07:26		07:19		07:46 (9)	08:14		08:46 (6)	08:45		09:42 (8)
	21:38		20:39		19:26		17:19	37	08:23 (7)	16:30	62	10:19 (8)	16:26	53	10:35 (8)
27	05:46		06:36		07:28		07:21		07:48 (9)	08:15		08:48 (6)	08:45		09:42 (8)
	21:36		20:36		19:24		17:17	36	08:24 (7)	16:29	61	10:20 (8)	16:27	54	10:36 (8)
28	05:48		06:38		07:30		07:22		07:50 (9)	08:17		08:49 (6)	08:45		09:43 (8)
	21:35		20:34		19:22		17:15	34	08:24 (7)	16:29	61	10:20 (8)	16:28	53	10:36 (8)
29	05:49		06:40		07:31		07:24		07:52 (7)	08:19		08:51 (6)	08:46		09:43 (8)
	21:33		20:32		19:19		17:13	33	08:25 (7)	16:28	59	10:21 (8)	16:28	54	10:37 (8)
30	05:51		06:41		07:33		07:26		07:54 (7)	08:20		08:53 (6)	08:46		09:44 (8)
	21:32		20:30		19:17		17:11	31	08:25 (7)	16:27	59	10:22 (8)	16:29	53	10:37 (8)
31	05:52		06:43				07:28		07:56 (7)				08:46		09:44 (8)
	21:30		20:27				17:09	29	08:25 (7)				16:30	54	10:38 (8)
Potential sun hours	504		455		381		331			264			241		
Total, worst case								1215			1155			1674	
Sun reduction								0.28			0.26			0.22	
Oper. time red.								1.00			1.00			1.00	
Wind dir. red.								0.63			0.66			0.66	
Total reduction								0.18			0.17			0.15	
Total, real								217			198			243	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

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Calculated:
11/06/2025 09:22/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Real Case - V150 **Shadow receptor:** AH - 34

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January		February		March		April	May	June
1	08:46		09:18 (6)	08:18		08:45 (7)	07:24	08:14 (9)	07:12	06:06	05:20
	16:32	54	10:49 (8)	17:20	16	09:01 (7)	18:13	42	08:56 (9)	20:08	21:00	21:47
2	08:46		09:17 (6)	08:16		08:43 (7)	07:21	08:15 (9)	07:10	06:04	05:19
	16:33	55	10:49 (8)	17:22	18	09:01 (7)	18:15	40	08:55 (9)	20:10	21:02	21:48
3	08:45		09:17 (6)	08:15		08:41 (7)	07:19	08:16 (9)	07:07	06:02	05:18
	16:34	54	10:49 (8)	17:24	21	09:02 (7)	18:17	38	08:54 (9)	20:12	21:03	21:49
4	08:45		09:17 (6)	08:13		08:39 (7)	07:17	08:18 (9)	07:05	06:00	05:17
	16:35	56	10:50 (8)	17:26	23	09:02 (7)	18:18	34	08:52 (9)	20:13	21:05	21:50
5	08:45		09:16 (6)	08:11		08:37 (7)	07:15	08:19 (9)	07:03	05:58	05:17
	16:36	56	10:49 (8)	17:28	25	09:02 (7)	18:20	30	08:49 (9)	20:15	21:07	21:51
6	08:45		09:16 (6)	08:10		08:36 (7)	07:12	08:21 (9)	07:00	05:56	05:16
	16:37	57	10:50 (8)	17:30	27	09:03 (7)	18:22	26	08:47 (9)	20:17	21:09	21:52
7	08:44		09:15 (6)	08:08		08:34 (7)	07:10	08:24 (9)	06:58	05:55	05:15
	16:39	57	10:50 (8)	17:32	29	09:03 (7)	18:24	20	08:44 (9)	20:18	21:10	21:53
8	08:44		09:15 (6)	08:06		08:32 (7)	07:08	08:27 (9)	06:56	05:53	05:15
	16:40	57	10:50 (8)	17:34	31	09:03 (7)	18:26	12	08:39 (9)	20:20	21:12	21:54
9	08:43		09:14 (6)	08:04		08:30 (7)	07:06		06:53	05:51	05:14
	16:41	58	10:50 (8)	17:35	33	09:03 (7)	18:28		20:22	21:14	21:55
10	08:43		09:13 (6)	08:03		08:28 (9)	07:03		06:51	05:49	05:14
	16:43	59	10:50 (8)	17:37	35	09:03 (7)	18:29		20:24	21:15	21:56
11	08:42		09:12 (6)	08:01		08:26 (9)	07:01		06:49	05:48	05:13
	16:44	58	10:49 (8)	17:39	36	09:02 (7)	18:31		20:25	21:17	21:56
12	08:41		09:11 (6)	07:59		08:24 (9)	06:59		06:47	05:46	05:13
	16:46	59	10:49 (8)	17:41	38	09:02 (7)	18:33		20:27	21:18	21:57
13	08:41		09:11 (6)	07:57		08:22 (9)	06:56		06:44	05:44	05:13
	16:47	60	10:50 (8)	17:43	39	09:01 (7)	18:35		20:29	21:20	21:58
14	08:40		09:10 (6)	07:55		08:20 (9)	06:54		06:42	05:43	05:13
	16:49	59	10:49 (8)	17:45	40	09:00 (7)	18:36		20:31	21:22	21:58
15	08:39		09:09 (6)	07:53		08:18 (9)	06:52		06:40	05:41	05:12
	16:50	59	10:49 (8)	17:47	43	09:01 (9)	18:38		20:32	21:23	21:59
16	08:38		09:08 (6)	07:51		08:16 (9)	06:49		06:38	05:39	05:12
	16:52	58	10:48 (8)	17:49	45	09:01 (9)	18:40		20:34	21:25	21:59
17	08:37		09:06 (6)	07:49		08:14 (9)	06:47		06:35	05:38	05:12
	16:54	58	10:47 (8)	17:51	48	09:02 (9)	18:42		20:36	21:26	22:00
18	08:36		09:05 (6)	07:47		08:12 (9)	06:45		06:33	05:36	05:12
	16:55	56	10:46 (8)	17:52	50	09:02 (9)	18:44		20:38	21:28	22:00
19	08:35		09:05 (6)	07:45		08:11 (9)	06:42		06:31	05:35	05:12
	16:57	53	10:45 (8)	17:54	50	09:01 (9)	18:45		20:39	21:29	22:01
20	08:34		09:06 (6)	07:43		08:11 (9)	06:40		06:29	05:34	05:12
	16:59	50	10:44 (8)	17:56	50	09:01 (9)	18:47		20:41	21:31	22:01
21	08:33		09:06 (6)	07:41		08:11 (9)	06:38		06:27	05:32	05:12
	17:00	46	10:42 (8)	17:58	50	09:01 (9)	18:49		20:43	21:32	22:01
22	08:32		09:07 (6)	07:39		08:12 (9)	06:35		06:25	05:31	05:13
	17:02	40	10:40 (8)	18:00	49	09:01 (9)	18:51		20:45	21:34	22:01
23	08:31		09:08 (6)	07:37		08:12 (9)	06:33		06:22	05:30	05:13
	17:04	30	10:36 (8)	18:02	49	09:01 (9)	18:52		20:46	21:35	22:02
24	08:29		09:09 (6)	07:34		08:12 (9)	06:31		06:20	05:28	05:13
	17:06	19	09:28 (6)	18:04	49	09:01 (9)	18:54		20:48	21:37	22:02
25	08:28		09:11 (6)	07:32		08:12 (9)	06:28		06:18	05:27	05:13
	17:07	17	09:28 (6)	18:06	47	08:59 (9)	18:56		20:50	21:38	22:02
26	08:27		09:12 (6)	07:30		08:12 (9)	06:26		06:16	05:26	05:14
	17:09	14	09:26 (6)	18:07	47	08:59 (9)	18:58		20:51	21:39	22:02
27	08:25		08:53 (7)	07:28		08:13 (9)	06:24		06:14	05:25	05:14
	17:11	12	09:25 (6)	18:09	45	08:58 (9)	18:59		20:53	21:41	22:02
28	08:24		08:51 (7)	07:26		08:14 (9)	06:21		06:12	05:24	05:15
	17:13	5	08:56 (7)	18:11	44	08:58 (9)	19:01		20:55	21:42	22:02
29	08:23		08:50 (7)				07:19		06:10	05:23	05:15
	17:15	8	08:58 (7)				20:03		20:57	21:43	22:01
30	08:21		08:48 (7)				07:17		06:08	05:22	05:16
	17:17	11	08:59 (7)				20:05		20:58	21:44	22:01
31	08:20		08:46 (7)				07:14			05:21	
	17:18	13	08:59 (7)				20:06			21:46	
Potential sun hours	257			277			367		417	487	502
Total, worst case		1348			1077			242			
Sun reduction		0.22			0.24			0.28			
Oper. time red.		1.00			1.00			1.00			
Wind dir. red.		0.67			0.64			0.64			
Total reduction		0.14			0.15			0.18			
Total, real		195			167			43			

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
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SHADOW - Calendar

Calculation: 6839 Garrane WF Real Case - V150 **Shadow receptor:** AH - 34

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	July	August	September	October		November		December	
1	05:17	05:54	06:45	07:35		07:30		07:58 (9)	08:22		08:54 (6)
	22:01	21:28	20:25	19:15		17:07	34	08:32 (7)	16:26	58	10:31 (8)
2	05:17	05:56	06:46	07:37		07:32		08:00 (7)	08:23		08:56 (6)
	22:01	21:27	20:23	19:12		17:05	33	08:33 (7)	16:25	59	10:33 (8)
3	05:18	05:57	06:48	07:38		07:33		08:02 (7)	08:24		08:57 (6)
	22:00	21:25	20:20	19:10		17:04	31	08:33 (7)	16:25	57	10:33 (8)
4	05:19	05:59	06:50	07:40		07:35		08:04 (7)	08:26		08:59 (6)
	22:00	21:23	20:18	19:08		17:02	29	08:33 (7)	16:24	57	10:34 (8)
5	05:20	06:00	06:51	07:42	09:08 (9)	07:37		08:06 (7)	08:27		09:00 (6)
	21:59	21:21	20:16	19:05	4 09:12 (9)	17:00	27	08:33 (7)	16:24	57	10:35 (8)
6	05:21	06:02	06:53	07:43	09:01 (9)	07:39		08:08 (7)	08:29		09:02 (6)
	21:59	21:19	20:14	19:03	18 09:19 (9)	16:58	25	08:33 (7)	16:23	57	10:36 (8)
7	05:21	06:03	06:55	07:45	08:58 (9)	07:41		08:10 (7)	08:30		09:03 (6)
	21:58	21:18	20:11	19:01	24 09:22 (9)	16:57	23	08:33 (7)	16:23	56	10:36 (8)
8	05:22	06:05	06:56	07:47	08:55 (9)	07:42		08:12 (7)	08:31		09:04 (6)
	21:57	21:16	20:09	18:58	28 09:23 (9)	16:55	20	08:32 (7)	16:22	56	10:37 (8)
9	05:23	06:07	06:58	07:49	08:53 (9)	07:44		08:14 (7)	08:32		09:06 (6)
	21:57	21:14	20:07	18:56	32 09:25 (9)	16:53	18	08:32 (7)	16:22	55	10:38 (8)
10	05:24	06:08	07:00	07:50	08:51 (9)	07:46		08:16 (7)	08:33		09:07 (6)
	21:56	21:12	20:04	18:54	36 09:27 (9)	16:51	16	08:32 (7)	16:22	55	10:39 (8)
11	05:25	06:10	07:01	07:52	08:50 (9)	07:48		08:18 (7)	08:34		09:08 (6)
	21:55	21:10	20:02	18:52	38 09:28 (9)	16:50	13	08:31 (7)	16:22	54	10:39 (8)
12	05:27	06:12	07:03	07:54	08:49 (9)	07:50		08:20 (7)	08:36		09:09 (6)
	21:54	21:08	19:59	18:49	40 09:29 (9)	16:48	10	08:30 (7)	16:22	54	10:40 (8)
13	05:28	06:13	07:05	07:55	08:47 (9)	07:52		08:22 (7)	08:37		09:10 (6)
	21:53	21:06	19:57	18:47	42 09:29 (9)	16:47	8	08:30 (7)	16:22	52	10:40 (8)
14	05:29	06:15	07:06	07:57	08:46 (9)	07:53		08:24 (7)	08:37		09:11 (6)
	21:53	21:04	19:55	18:45	44 09:30 (9)	16:45	5	08:29 (7)	16:22	52	10:41 (8)
15	05:30	06:17	07:08	07:59	08:45 (9)	07:55		08:26 (7)	08:38		09:12 (6)
	21:52	21:02	19:52	18:43	46 09:31 (9)	16:44	12	08:58 (6)	16:22	51	10:41 (8)
16	05:31	06:18	07:10	08:01	08:44 (9)	07:57		08:45 (6)	08:39		09:13 (6)
	21:50	21:00	19:50	18:40	47 09:31 (9)	16:42	14	08:59 (6)	16:22	51	10:42 (8)
17	05:32	06:20	07:11	08:03	08:44 (9)	07:59		08:44 (6)	08:40		09:14 (6)
	21:49	20:58	19:48	18:38	48 09:32 (9)	16:41	17	09:01 (6)	16:22	51	10:43 (8)
18	05:34	06:22	07:13	08:04	08:43 (9)	08:00		08:43 (6)	08:41		09:52 (8)
	21:48	20:56	19:45	18:36	49 09:32 (9)	16:40	19	09:02 (6)	16:22	51	10:43 (8)
19	05:35	06:23	07:15	08:06	08:43 (9)	08:02		08:42 (6)	08:42		09:53 (8)
	21:47	20:54	19:43	18:34	49 09:32 (9)	16:38	30	10:10 (8)	16:22	50	10:43 (8)
20	05:36	06:25	07:16	08:08	08:42 (9)	08:04		08:42 (6)	08:42		09:54 (8)
	21:46	20:52	19:41	18:32	50 09:32 (9)	16:37	40	10:15 (8)	16:23	50	10:44 (8)
21	05:38	06:26	07:18	08:10	08:42 (9)	08:06		08:42 (6)	08:43		09:54 (8)
	21:45	20:49	19:38	18:30	50 09:32 (9)	16:36	46	10:18 (8)	16:23	50	10:44 (8)
22	05:39	06:28	07:20	08:11	08:42 (9)	08:07		08:42 (6)	08:43		09:55 (8)
	21:43	20:47	19:36	18:27	50 09:32 (9)	16:35	50	10:20 (8)	16:24	50	10:45 (8)
23	05:41	06:30	07:21	08:13	08:42 (9)	08:09		08:42 (6)	08:44		09:55 (8)
	21:42	20:45	19:33	18:25	49 09:31 (9)	16:33	53	10:22 (8)	16:24	50	10:45 (8)
24	05:42	06:31	07:23	08:15	08:42 (9)	08:11		08:42 (6)	08:44		09:55 (8)
	21:41	20:43	19:31	18:23	49 09:31 (9)	16:32	56	10:23 (8)	16:25	50	10:45 (8)
25	05:43	06:33	07:25	07:17	07:44 (9)	08:12		08:44 (6)	08:45		09:56 (8)
	21:39	20:41	19:29	17:21	47 08:31 (9)	16:31	58	10:25 (8)	16:25	50	10:46 (8)
26	05:45	06:35	07:26	07:19	07:46 (9)	08:14		08:46 (6)	08:45		09:18 (6)
	21:38	20:39	19:26	17:19	45 08:31 (9)	16:30	58	10:26 (8)	16:26	51	10:47 (8)
27	05:46	06:36	07:28	07:21	07:48 (9)	08:15		08:48 (6)	08:45		09:18 (6)
	21:36	20:36	19:24	17:17	42 08:30 (9)	16:29	58	10:28 (8)	16:27	51	10:47 (8)
28	05:48	06:38	07:30	07:22	07:50 (9)	08:17		08:49 (6)	08:45		09:18 (6)
	21:35	20:34	19:22	17:15	40 08:30 (7)	16:28	59	10:28 (8)	16:28	51	10:47 (8)
29	05:49	06:40	07:31	07:24	07:52 (9)	08:19		08:51 (6)	08:46		09:18 (6)
	21:33	20:32	19:19	17:13	39 08:31 (7)	16:28	60	10:30 (8)	16:28	52	10:48 (8)
30	05:51	06:41	07:33	07:26	07:54 (9)	08:20		08:53 (6)	08:46		09:18 (6)
	21:32	20:30	19:17	17:11	38 08:32 (7)	16:27	58	10:31 (8)	16:29	52	10:48 (8)
31	05:52	06:43		07:28	07:56 (9)				08:46		09:18 (6)
	21:30	20:27		17:09	36 08:32 (7)				16:30	53	10:48 (8)
Potential sun hours	504	455	381	331		264			241		
Total, worst case					1080		980			1643	
Sun reduction					0.28		0.26			0.22	
Oper. time red.					1.00		1.00			1.00	
Wind dir. red.					0.64		0.66			0.67	
Total reduction					0.18		0.17			0.15	
Total, real					194		168			241	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
Jennings O'Donovan
Finisklin Business Park
F91 RHH9 Sligo
+353719161416
padraig / podowd@jodireland.com
Calculated:
11/06/2025 09:22/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Real Case - V150 **Shadow receptor:** AI - 35

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January		February		March	April	May	June	July	August	September	October	November	December
1	08:46		09:18 (7)	08:18		09:16 (9)	07:24	07:12	06:06	05:20	05:17	05:54	06:45	07:35	07:30	08:58 (9)	08:22	08:54 (7)
	16:32	34	09:52 (6)	17:20	45	10:01 (9)	18:13	20:08	21:00	21:47	22:01	21:28	20:25	19:15	17:07	20	09:18 (9)	16:26	44	09:38 (9)
2	08:46		09:17 (7)	08:16		09:17 (9)	07:21	07:10	06:04	05:19	05:17	05:55	06:46	07:36	07:32		08:56 (9)	08:23		08:56 (7)
	16:33	34	09:51 (6)	17:22	43	10:00 (9)	18:15	20:10	21:02	21:48	22:01	21:27	20:23	19:12	17:05	25	09:21 (9)	16:25	43	09:39 (9)
3	08:45		09:17 (7)	08:15		09:17 (9)	07:19	07:07	06:02	05:18	05:18	05:57	06:48	07:38	07:33		08:54 (9)	08:24		08:57 (7)
	16:34	34	09:51 (9)	17:24	42	09:59 (9)	18:17	20:12	21:03	21:49	22:00	21:25	20:20	19:10	17:04	29	09:23 (9)	16:25	41	09:38 (9)
4	08:45		09:17 (7)	08:13		09:18 (9)	07:17	07:05	06:00	05:17	05:19	05:59	06:50	07:40	07:35		08:52 (9)	08:26		08:59 (7)
	16:35	35	09:52 (9)	17:26	40	09:58 (9)	18:18	20:13	21:05	21:50	22:00	21:23	20:18	19:08	17:02	33	09:25 (9)	16:24	40	09:39 (9)
5	08:45		09:16 (7)	08:11		09:19 (9)	07:15	07:03	05:58	05:17	05:20	06:00	06:51	07:42	07:37		08:51 (9)	08:27		09:00 (7)
	16:36	36	09:52 (9)	17:28	38	09:57 (9)	18:20	20:15	21:07	21:51	21:59	21:21	20:16	19:05	17:00	35	09:26 (9)	16:24	39	09:39 (9)
6	08:45		09:16 (7)	08:10		09:21 (9)	07:12	07:00	05:56	05:16	05:20	06:02	06:53	07:43	07:39		08:50 (9)	08:29		09:02 (7)
	16:37	37	09:53 (9)	17:30	36	09:57 (9)	18:22	20:17	21:09	21:52	21:59	21:19	20:14	19:03	16:58	38	09:28 (9)	16:23	38	09:40 (9)
7	08:44		09:15 (7)	08:08		09:23 (9)	07:10	06:58	05:55	05:15	05:21	06:03	06:55	07:45	07:41		08:49 (9)	08:30		09:03 (7)
	16:39	39	09:54 (9)	17:32	32	09:55 (9)	18:24	20:18	21:10	21:53	21:58	21:18	20:11	19:01	16:57	40	09:29 (9)	16:23	36	09:39 (9)
8	08:44		09:15 (7)	08:06		09:24 (9)	07:08	06:56	05:53	05:15	05:22	06:05	06:56	07:47	07:42		08:48 (9)	08:31		09:04 (7)
	16:40	40	09:55 (9)	17:34	29	09:53 (9)	18:26	20:20	21:12	21:54	21:57	21:16	20:09	18:58	16:55	42	09:30 (9)	16:22	35	09:39 (9)
9	08:43		09:14 (7)	08:04		09:26 (9)	07:06	06:53	05:51	05:14	05:23	06:07	06:58	07:49	07:44		08:47 (9)	08:32		09:06 (7)
	16:41	41	09:55 (9)	17:35	25	09:51 (9)	18:28	20:22	21:14	21:55	21:57	21:14	20:07	18:56	16:53	44	09:31 (9)	16:22	34	09:40 (9)
10	08:43		09:13 (7)	08:03		09:29 (9)	07:03	06:51	05:49	05:14	05:24	06:08	07:00	07:50	07:46		08:47 (9)	08:33		09:07 (7)
	16:43	43	09:56 (9)	17:37	19	09:48 (9)	18:29	20:24	21:15	21:56	21:56	21:12	20:04	18:54	16:51	45	09:32 (9)	16:22	34	09:41 (6)
11	08:42		09:12 (7)	08:01		09:34 (9)	07:01	06:49	05:48	05:13	05:25	06:10	07:01	07:52	07:48		08:46 (9)	08:34		09:08 (7)
	16:44	44	09:56 (9)	17:39	9	09:43 (9)	18:31	20:25	21:17	21:56	21:55	21:10	20:02	18:51	16:50	47	09:33 (9)	16:22	34	09:42 (6)
12	08:41		09:11 (7)	07:59			06:59	06:47	05:46	05:13	05:26	06:12	07:03	07:54	07:50		08:46 (9)	08:36		09:09 (7)
	16:46	46	09:57 (9)	17:41			18:33	20:27	21:18	21:57	21:54	21:08	19:59	18:49	16:48	47	09:33 (9)	16:22	34	09:43 (6)
13	08:41		09:11 (7)	07:57			06:56	06:44	05:44	05:13	05:28	06:13	07:05	07:55	07:52		08:46 (9)	08:37		09:10 (7)
	16:47	47	09:58 (9)	17:43			18:35	20:29	21:20	21:58	21:53	21:06	19:57	18:47	16:47	48	09:34 (9)	16:22	34	09:44 (6)
14	08:40		09:10 (7)	07:55			06:54	06:42	05:43	05:13	05:29	06:15	07:06	07:57	07:53		08:46 (9)	08:37		09:11 (7)
	16:49	49	09:59 (9)	17:45			18:36	20:31	21:22	21:58	21:53	21:04	19:55	18:45	16:45	48	09:34 (9)	16:22	33	09:44 (6)
15	08:39		09:09 (7)	07:53			06:52	06:40	05:41	05:12	05:30	06:17	07:08	07:59	07:55		08:46 (9)	08:38		09:12 (7)
	16:50	50	09:59 (9)	17:47			18:38	20:32	21:23	21:59	21:52	21:02	19:52	18:43	16:44	49	09:35 (9)	16:22	33	09:45 (6)
16	08:38		09:08 (7)	07:51			06:49	06:38	05:39	05:12	05:31	06:18	07:10	08:01	07:57		08:45 (9)	08:39		09:13 (7)
	16:52	52	10:00 (9)	17:49			18:40	20:34	21:25	21:59	21:50	21:00	19:50	18:40	16:42	50	09:35 (9)	16:22	33	09:46 (6)
17	08:37		09:06 (7)	07:49			06:47	06:35	05:38	05:12	05:32	06:20	07:11	08:03	07:59		08:45 (7)	08:40		09:14 (7)
	16:54	53	09:59 (9)	17:51			18:42	20:36	21:26	22:00	21:49	20:58	19:48	18:38	16:41	50	09:35 (9)	16:22	33	09:47 (6)
18	08:36		09:07 (7)	07:47			06:45	06:33	05:36	05:12	05:34	06:21	07:13	08:04	08:00		08:45 (7)	08:41		09:14 (7)
	16:55	53	10:00 (9)	17:52			18:44	20:38	21:28	22:00	21:48	20:56	19:45	18:36	16:40	50	09:35 (9)	16:22	33	09:47 (6)
19	08:35		09:08 (7)	07:45			06:42	06:31	05:35	05:12	05:35	06:23	07:15	08:06	08:02		08:44 (7)	08:42		09:15 (7)
	16:57	53	10:01 (9)	17:54			18:45	20:39	21:29	22:01	21:47	20:54	19:43	18:34	16:38	52	09:36 (9)	16:22	33	09:48 (6)
20	08:34		09:08 (7)	07:43			06:40	06:29	05:34	05:12	05:36	06:25	07:16	08:08	08:04		08:44 (7)	08:42		09:16 (7)
	16:59	53	10:01 (9)	17:56			18:47	20:41	21:31	22:01	21:46	20:52	19:41	18:32	16:37	52	09:36 (9)	16:23	33	09:49 (6)
21	08:33		09:08 (7)	07:41			06:38	06:27	05:32	05:12	05:38	06:26	07:18	08:10	08:06		08:44 (7)	08:43		09:16 (7)
	17:00	53	10:01 (9)	17:58			18:49	20:43	21:32	22:01	21:45	20:49	19:38	18:30	16:36	53	09:37 (9)	16:23	33	09:49 (6)
22	08:32		09:09 (7)	07:39			06:35	06:24	05:31	05:13	05:39	06:28	07:20	08:11	08:07		08:44 (7)	08:43		09:17 (7)
	17:02	52	10:01 (9)	18:00			18:51	20:45	21:34	22:01	21:43	20:47	19:36	18:27	16:35	53	09:37 (9)	16:24	33	09:50 (6)
23	08:31		09:10 (7)	07:37			06:33	06:22	05:30	05:13	05:40	06:30	07:21	08:13	08:09		08:45 (7)	08:44		09:17 (7)
	17:04	52	10:02 (9)	18:02			18:52	20:46	21:35	22:02	21:42	20:45	19:33	18:25	16:33	53	09:38 (9)	16:24	33	09:50 (6)
24	08:29		09:11 (7)	07:34			06:31	06:20	05:28	05:13	05:42	06:31	07:23	08:15	08:11		08:44 (7)	08:44		09:17 (7)
	17:06	51	10:02 (9)	18:04			18:54	20:48	21:37	22:02	21:41	20:43	19:31	18:23	16:32	53	09:37 (9)	16:25	33	09:50 (6)
25	08:28		09:12 (7)	07:32			06:28	06:18	05:27	05:13	05:43	06:33	07:25	07:17	08:12		08:44 (7)	08:45		09:18 (7)
	17:07	50	10:02 (9)	18:06			18:56	20:50	21:38	22:02	21:39	20:41	19:29	17:21	16:31	53	09:37 (9)	16:25	33	09:51 (6)
26	08:27		09:12 (9)	07:30			06:26	06:16	05:26	05:14	05:45	06:35	07:26	07:19	08:14		08:46 (7)	08:45		09:18 (7)
	17:09	50	10:02 (9)	18:07			18:58	20:51	21:39	22:02	21:38	20:39	19:26	17:19	16:30	52	09:38 (9)	16:26	33	09:51 (6)
27	08:25		09:13 (9)	07:28			06:24	06:14	05:25	05:14	05:46	06:36	07:28	07:21	08:15		08:48 (7)	08:45		09:18 (7)
	17:11	49	10:02 (9)	18:09			18:59	20:53	21:41	22:02	21:36	20:36	19:24	17:17	16:29	50	09:38 (9)	16:27	33	09:51 (6)
28	08:24		09:13 (9)	07:26			06:21	06:12	05:24	05:15	05:48	06:38	07:30	07:22	08:17		08:49 (7)	08:45		09:18 (7)
	17:13	49	10:02 (9)	18:11			19:01	20:55	21:42	22:02	21:35	20:34	19:22	17:15	16:28	49	09:38 (9)	16:28	33	09:51 (6)
29	08:23		09:14 (9)				07:19	06:10	05:23	05:15	05:49	06:40	07:31	07:24	08:19		08:51 (7)	08:46		09:18 (7)
	17:15	48	10:02 (9)				20:03	20:57	21:43	22:01	21:33	20:32	19:19	17:13	16:28	47	09:38 (9)	16:28	33	09:51 (6)
30	08:21		09:14 (9)				07:17	06:08	05:22	05:16	05:51	06:41	07:33	07:26	08:20		08:53 (7)	08:46		09:18 (7)
	17:17	47	10:01 (9)				20:05	20:58	21:44	22:01	21:32	20:30	19:17	17:11	16:27	46	09:39 (9)	16:29	33	09:51 (6)
31	08:20		09:15 (9)				07:14		05:21		05:52	06:43		07:28	09:02 (9)			08:46		09:18 (7)
	17:18	46	10:01 (9)				20:06		21:46		21:30	20:27		17:09	12 09:14 (9)			16:30	34	09:52 (6)
Potential sun hours	257		277		367	417	487	502	504	455	381	331	12		264			241		
Total, worst case	1420		358										1353		1081					
Sun reduction	0.22		0.24										0.26		0.22					
Oper. time red.	1.00		1.00										1.00		1.00					
Wind dir. red.	0.66		0.66										0.66		0.66					
Total reduction	0.14		0.16										0.17		0.15					
Total, real	205		58										234		157					

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

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SHADOW - Calendar

Calculation: 6839 Garrane WF Real Case - V150 **Shadow receptor:** AJ - 36

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:46	08:18	07:24	07:12	06:06	05:20	05:17	05:54	06:45	07:35	07:30	08:22
	16:32	17:20	18:13	20:08	21:00	21:47	22:01	21:28	20:25	19:15	17:07	16:26
2	08:46	08:16	07:21	07:10	06:04	05:19	05:17	05:55	06:46	07:37	07:32	08:23
	16:33	17:22	18:15	20:10	21:02	21:48	22:01	21:27	20:23	19:12	17:05	16:25
3	08:45	08:15	07:19	07:07	06:02	05:18	05:18	05:57	06:48	07:38	07:33	08:25
	16:34	17:24	18:17	20:12	21:03	21:49	22:00	21:25	20:20	19:10	17:04	16:25
4	08:45	08:13	07:17	07:05	06:00	05:17	05:19	05:59	06:50	07:40	07:35	08:26
	16:35	17:26	18:18	20:13	21:05	21:50	22:00	21:23	20:18	19:08	17:02	16:24
5	08:45	08:11	07:15	07:03	05:58	05:17	05:20	06:00	06:51	07:42	07:37	08:27
	16:36	17:28	18:20	20:15	21:07	21:51	21:59	21:21	20:16	19:05	17:00	16:24
6	08:45	08:10	07:12	07:00	05:56	05:16	05:20	06:02	06:53	07:43	07:39	08:29
	16:37	17:30	18:22	20:17	21:09	21:52	21:59	21:19	20:14	19:03	16:58	16:23
7	08:44	08:08	07:10	06:58	05:55	05:15	05:21	06:03	06:55	07:45	07:41	08:30
	16:39	17:32	18:24	20:18	21:10	21:53	21:58	21:18	20:11	19:01	16:56	16:23
8	08:44	08:06	07:08	06:56	05:53	05:15	05:22	06:05	06:56	07:47	07:43	08:31
	16:40	17:34	18:26	20:20	21:12	21:54	21:58	21:16	20:09	18:58	16:55	16:22
9	08:43	08:04	07:06	06:53	05:51	05:14	05:23	06:07	06:58	07:49	07:44	08:32
	16:41	17:35	18:28	20:22	21:14	21:55	21:57	21:14	20:07	18:56	16:53	16:22
10	08:43	08:03	07:03	06:51	05:49	05:14	05:24	06:08	07:00	07:50	07:46	08:33
	16:43	17:37	18:29	20:24	21:15	21:56	21:56	21:12	20:04	18:54	16:51	16:22
11	08:42	08:01	07:01	06:49	05:48	05:13	05:25	06:10	07:01	07:52	07:48	08:34
	16:44	17:39	18:31	20:25	21:17	21:56	21:55	21:10	20:02	18:51	16:50	16:22
12	08:41	07:59	06:59	06:47	05:46	05:13	05:26	06:12	07:03	07:54	07:50	08:36
	16:46	17:41	18:33	20:27	21:18	21:57	21:54	21:08	19:59	18:49	16:48	16:22
13	08:41	07:57	06:56	06:44	05:44	05:13	05:28	06:13	07:05	07:56	07:52	08:37
	16:47	17:43	18:35	20:29	21:20	21:58	21:53	21:06	19:57	18:47	16:47	16:21
14	08:40	07:55	06:54	06:42	05:43	05:13	05:29	06:15	07:06	07:57	07:53	08:38
	16:49	17:45	18:36	20:31	21:22	21:58	21:53	21:04	19:55	18:45	16:45	16:21
15	08:39	07:53	06:52	06:40	05:41	05:12	05:30	06:17	07:08	07:59	07:55	08:38
	16:50	17:47	18:38	20:32	21:23	21:59	21:52	21:02	19:52	18:43	16:44	16:22
16	08:38	07:51	06:49	06:38	05:39	05:12	05:31	06:18	07:10	08:01	07:57	08:39
	16:52	17:49	18:40	20:34	21:25	21:59	21:51	21:00	19:50	18:40	16:42	16:22
17	08:37	07:49	06:47	06:35	05:38	05:12	05:32	06:20	07:11	08:03	07:59	08:40
	16:54	17:51	18:42	20:36	21:26	22:00	21:49	20:58	19:48	18:38	16:41	16:22
18	08:36	07:47	06:45	06:33	05:36	05:12	05:34	06:21	07:13	08:04	08:00	08:41
	16:55	17:52	18:44	20:38	21:28	22:00	21:48	20:56	19:45	18:36	16:40	16:22
19	08:35	07:45	06:42	06:31	05:35	05:12	05:35	06:23	07:15	08:06	08:02	08:42
	16:57	17:54	18:45	20:39	21:29	22:01	21:47	20:54	19:43	18:34	16:38	16:22
20	08:34	07:43	06:40	06:29	05:34	05:12	05:36	06:25	07:16	08:08	08:04	08:42
	16:59	17:56	18:47	20:41	21:31	22:01	21:46	20:52	19:41	18:32	16:37	16:23
21	08:33	07:41	06:38	06:27	05:32	05:12	05:38	06:26	07:18	08:10	08:06	08:43
	17:00	17:58	18:49	20:43	21:32	22:01	21:45	20:50	19:38	18:30	16:36	16:23
22	08:32	07:39	06:35	06:24	05:31	05:13	05:39	06:28	07:20	08:11	08:07	08:43
	17:02	18:00	18:51	20:45	21:34	22:02	21:43	20:47	19:36	18:27	16:35	16:24
23	08:31	07:37	06:33	06:22	05:30	05:13	05:40	06:30	07:21	08:13	08:09	08:44
	17:04	18:02	18:52	20:46	21:35	22:02	21:42	20:45	19:33	18:25	16:33	16:24
24	08:29	07:34	06:31	06:20	05:28	05:13	05:42	06:31	07:23	08:15	08:11	08:44
	17:06	18:04	18:54	20:48	21:37	22:02	21:41	20:43	19:31	18:23	16:32	16:25
25	08:28	07:32	06:28	06:18	05:27	05:13	05:43	06:33	07:25	07:17	08:12	08:45
	17:07	18:06	18:56	20:50	21:38	22:02	21:39	20:41	19:29	17:21	16:31	16:25
26	08:27	07:30	06:26	06:16	05:26	05:14	05:45	06:35	07:26	07:19	08:14	08:45
	17:09	18:07	18:58	20:51	21:39	22:02	21:38	20:39	19:26	17:19	16:30	16:26
27	08:25	07:28	06:24	06:14	05:25	05:14	05:46	06:36	07:28	07:21	08:16	08:45
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	17:13	18:11	19:01	20:55	21:42	22:02	21:35	20:34	19:22	17:15	16:28	16:28
29	08:23		07:19	06:10	05:23	05:15	05:49	06:40	07:31	07:24	08:19	08:46
	17:15		20:03	20:57	21:43	22:01	21:33	20:32	19:19	17:13	16:28	16:28
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	17:17		20:05	20:58	21:44	22:01	21:32	20:30	19:17	17:11	16:27	16:29
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	17:18		20:06		21:46		21:30	20:27		17:09		16:30
Potential sun hours	257	277	367	417	487	502	504	455	381	331	264	241
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

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Calculated:
11/06/2025 09:22/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Real Case - V150 **Shadow receptor:** AK - 37

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
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	16:32	17:20	18:13	20:08	21:00	21:47	22:01	21:28	20:25	19:15	17:07	16:26
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	16:33	17:22	18:15	20:10	21:02	21:48	22:01	21:27	20:23	19:12	17:05	16:25
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	16:34	17:24	18:17	20:12	21:03	21:49	22:00	21:25	20:21	19:10	17:04	16:25
4	08:45	08:13	07:17	07:05	06:00	05:17	05:19	05:59	06:50	07:40	07:35	08:26
	16:35	17:26	18:18	20:13	21:05	21:50	22:00	21:23	20:18	19:08	17:02	16:24
5	08:45	08:11	07:15	07:03	05:58	05:17	05:20	06:00	06:51	07:42	07:37	08:27
	16:36	17:28	18:20	20:15	21:07	21:51	21:59	21:21	20:16	19:05	17:00	16:24
6	08:45	08:10	07:12	07:00	05:56	05:16	05:20	06:02	06:53	07:43	07:39	08:29
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	16:41	17:35	18:28	20:22	21:14	21:55	21:57	21:14	20:07	18:56	16:53	16:22
10	08:43	08:03	07:03	06:51	05:49	05:14	05:24	06:08	07:00	07:50	07:46	08:33
	16:43	17:37	18:29	20:24	21:15	21:56	21:56	21:12	20:04	18:54	16:51	16:22
11	08:42	08:01	07:01	06:49	05:48	05:13	05:25	06:10	07:01	07:52	07:48	08:35
	16:44	17:39	18:31	20:25	21:17	21:56	21:55	21:10	20:02	18:51	16:50	16:22
12	08:41	07:59	06:59	06:47	05:46	05:13	05:26	06:12	07:03	07:54	07:50	08:36
	16:46	17:41	18:33	20:27	21:18	21:57	21:54	21:08	19:59	18:49	16:48	16:22
13	08:41	07:57	06:56	06:44	05:44	05:13	05:28	06:13	07:05	07:56	07:52	08:37
	16:47	17:43	18:35	20:29	21:20	21:58	21:53	21:06	19:57	18:47	16:47	16:21
14	08:40	07:55	06:54	06:42	05:43	05:13	05:29	06:15	07:06	07:57	07:53	08:38
	16:49	17:45	18:36	20:31	21:22	21:58	21:53	21:04	19:55	18:45	16:45	16:21
15	08:39	07:53	06:52	06:40	05:41	05:12	05:30	06:17	07:08	07:59	07:55	08:38
	16:50	17:47	18:38	20:32	21:23	21:59	21:52	21:02	19:52	18:43	16:44	16:22
16	08:38	07:51	06:49	06:38	05:39	05:12	05:31	06:18	07:10	08:01	07:57	08:39
	16:52	17:49	18:40	20:34	21:25	22:00	21:51	21:00	19:50	18:40	16:42	16:22
17	08:37	07:49	06:47	06:35	05:38	05:12	05:32	06:20	07:11	08:03	07:59	08:40
	16:54	17:51	18:42	20:36	21:26	22:00	21:49	20:58	19:48	18:38	16:41	16:22
18	08:36	07:47	06:45	06:33	05:36	05:12	05:34	06:21	07:13	08:04	08:00	08:41
	16:55	17:52	18:44	20:38	21:28	22:00	21:48	20:56	19:45	18:36	16:40	16:22
19	08:35	07:45	06:42	06:31	05:35	05:12	05:35	06:23	07:15	08:06	08:02	08:42
	16:57	17:54	18:45	20:39	21:29	22:01	21:47	20:54	19:43	18:34	16:38	16:22
20	08:34	07:43	06:40	06:29	05:34	05:12	05:36	06:25	07:16	08:08	08:04	08:42
	16:59	17:56	18:47	20:41	21:31	22:01	21:46	20:52	19:41	18:32	16:37	16:23
21	08:33	07:41	06:38	06:27	05:32	05:12	05:38	06:26	07:18	08:10	08:06	08:43
	17:00	17:58	18:49	20:43	21:32	22:01	21:45	20:50	19:38	18:30	16:36	16:23
22	08:32	07:39	06:35	06:24	05:31	05:13	05:39	06:28	07:20	08:11	08:07	08:43
	17:02	18:00	18:51	20:45	21:34	22:02	21:43	20:47	19:36	18:27	16:35	16:24
23	08:31	07:37	06:33	06:22	05:30	05:13	05:40	06:30	07:21	08:13	08:09	08:44
	17:04	18:02	18:52	20:46	21:35	22:02	21:42	20:45	19:33	18:25	16:33	16:24
24	08:29	07:34	06:31	06:20	05:28	05:13	05:42	06:31	07:23	08:15	08:11	08:44
	17:06	18:04	18:54	20:48	21:37	22:02	21:41	20:43	19:31	18:23	16:32	16:25
25	08:28	07:32	06:28	06:18	05:27	05:13	05:43	06:33	07:25	07:17	08:12	08:45
	17:07	18:06	18:56	20:50	21:38	22:02	21:39	20:41	19:29	17:21	16:31	16:25
26	08:27	07:30	06:26	06:16	05:26	05:14	05:45	06:35	07:26	07:19	08:14	08:45
	17:09	18:07	18:58	20:51	21:39	22:02	21:38	20:39	19:26	17:19	16:30	16:26
27	08:25	07:28	06:24	06:14	05:25	05:14	05:46	06:36	07:28	07:21	08:16	08:45
	17:11	18:09	18:59	20:53	21:41	22:02	21:36	20:36	19:24	17:17	16:29	16:27
28	08:24	07:26	06:21	06:12	05:24	05:15	05:48	06:38	07:30	07:22	08:17	08:45
	17:13	18:11	19:01	20:55	21:42	22:02	21:35	20:34	19:22	17:15	16:28	16:28
29	08:23		07:19	06:10	05:23	05:15	05:49	06:40	07:31	07:24	08:19	08:46
	17:15		20:03	20:57	21:43	22:01	21:33	20:32	19:19	17:13	16:28	16:28
30	08:21		07:17	06:08	05:22	05:16	05:51	06:41	07:33	07:26	08:20	08:46
	17:17		20:05	20:58	21:44	22:01	21:32	20:30	19:17	17:11	16:27	16:29
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	17:18		20:06		21:46		21:30	20:27		17:09		16:30
Potential sun hours	257	277	367	417	487	502	504	455	381	331	264	241
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
Jennings O'Donovan
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+353719161416
padraig / podowd@jodireland.com

Calculated:
11/06/2025 09:22/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Real Case - V150 **Shadow receptor:** AL - 38

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:46	08:18	07:24	07:12	06:06	05:20	05:17	05:54	06:45	07:35	07:30	08:22
	16:32	17:20	18:13	20:08	21:00	21:47	22:01	21:28	20:25	19:15	17:07	16:26
2	08:46	08:16	07:21	07:10	06:04	05:19	05:17	05:55	06:46	07:37	07:32	08:23
	16:33	17:22	18:15	20:10	21:02	21:48	22:01	21:27	20:23	19:12	17:05	16:25
3	08:45	08:15	07:19	07:07	06:02	05:18	05:18	05:57	06:48	07:38	07:33	08:25
	16:34	17:24	18:17	20:12	21:03	21:49	22:00	21:25	20:21	19:10	17:04	16:25
4	08:45	08:13	07:17	07:05	06:00	05:17	05:19	05:59	06:50	07:40	07:35	08:26
	16:35	17:26	18:18	20:13	21:05	21:50	22:00	21:23	20:18	19:08	17:02	16:24
5	08:45	08:11	07:15	07:03	05:58	05:17	05:20	06:00	06:51	07:42	07:37	08:27
	16:36	17:28	18:20	20:15	21:07	21:51	21:59	21:21	20:16	19:05	17:00	16:24
6	08:45	08:10	07:12	07:00	05:56	05:16	05:20	06:02	06:53	07:43	07:39	08:29
	16:37	17:30	18:22	20:17	21:09	21:52	21:59	21:19	20:14	19:03	16:58	16:23
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	16:39	17:32	18:24	20:18	21:10	21:53	21:58	21:18	20:11	19:01	16:56	16:23
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	16:49	17:45	18:36	20:31	21:22	21:58	21:53	21:04	19:55	18:45	16:45	16:21
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	16:52	17:49	18:40	20:34	21:25	22:00	21:51	21:00	19:50	18:40	16:42	16:22
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	16:54	17:51	18:42	20:36	21:26	22:00	21:49	20:58	19:48	18:38	16:41	16:22
18	08:36	07:47	06:45	06:33	05:36	05:12	05:34	06:21	07:13	08:04	08:00	08:41
	16:55	17:52	18:44	20:38	21:28	22:00	21:48	20:56	19:45	18:36	16:40	16:22
19	08:35	07:45	06:42	06:31	05:35	05:12	05:35	06:23	07:15	08:06	08:02	08:42
	16:57	17:54	18:45	20:39	21:29	22:01	21:47	20:54	19:43	18:34	16:38	16:22
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	16:59	17:56	18:47	20:41	21:31	22:01	21:46	20:52	19:41	18:32	16:37	16:23
21	08:33	07:41	06:38	06:27	05:32	05:12	05:38	06:26	07:18	08:10	08:06	08:43
	17:00	17:58	18:49	20:43	21:32	22:01	21:45	20:50	19:38	18:30	16:36	16:23
22	08:32	07:39	06:35	06:24	05:31	05:13	05:39	06:28	07:20	08:11	08:07	08:43
	17:02	18:00	18:51	20:45	21:34	22:02	21:43	20:47	19:36	18:27	16:35	16:24
23	08:31	07:37	06:33	06:22	05:30	05:13	05:40	06:30	07:21	08:13	08:09	08:44
	17:04	18:02	18:52	20:46	21:35	22:02	21:42	20:45	19:33	18:25	16:33	16:24
24	08:29	07:34	06:31	06:20	05:28	05:13	05:42	06:31	07:23	08:15	08:11	08:44
	17:06	18:04	18:54	20:48	21:37	22:02	21:41	20:43	19:31	18:23	16:32	16:25
25	08:28	07:32	06:28	06:18	05:27	05:13	05:43	06:33	07:25	07:17	08:12	08:45
	17:07	18:06	18:56	20:50	21:38	22:02	21:39	20:41	19:29	17:21	16:31	16:25
26	08:27	07:30	06:26	06:16	05:26	05:14	05:45	06:35	07:26	07:19	08:14	08:45
	17:09	18:07	18:58	20:51	21:39	22:02	21:38	20:39	19:26	17:19	16:30	16:26
27	08:25	07:28	06:24	06:14	05:25	05:14	05:46	06:36	07:28	07:21	08:16	08:45
	17:11	18:09	18:59	20:53	21:41	22:02	21:36	20:36	19:24	17:17	16:29	16:27
28	08:24	07:26	06:21	06:12	05:24	05:15	05:48	06:38	07:30	07:22	08:17	08:45
	17:13	18:11	19:01	20:55	21:42	22:02	21:35	20:34	19:22	17:15	16:28	16:28
29	08:23		07:19	06:10	05:23	05:15	05:49	06:40	07:31	07:24	08:19	08:46
	17:15		20:03	20:57	21:43	22:01	21:33	20:32	19:19	17:13	16:28	16:28
30	08:21		07:17	06:08	05:22	05:16	05:51	06:41	07:33	07:26	08:20	08:46
	17:17		20:05	20:58	21:44	22:01	21:32	20:30	19:17	17:11	16:27	16:29
31	08:20		07:14		05:21		05:52	06:43		07:28		08:46
	17:18		20:06		21:46		21:30	20:27		17:09		16:30
Potential sun hours	257	277	367	417	487	502	504	455	381	331	264	241
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
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Finisklin Business Park
F91 RHH9 Sligo
+353719161416
padraig / podowd@jodireland.com

Calculated:
11/06/2025 09:22/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Real Case - V150 **Shadow receptor:** AM - 39

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:46	08:18	07:24	07:12	06:06	05:20	05:17	05:54	06:45	07:35	07:30	08:22
	16:32	17:20	18:13	20:08	21:00	21:47	22:01	21:28	20:25	19:15	17:07	16:26
2	08:46	08:16	07:21	07:10	06:04	05:19	05:17	05:55	06:46	07:37	07:32	08:23
	16:33	17:22	18:15	20:10	21:02	21:48	22:01	21:27	20:23	19:12	17:05	16:25
3	08:45	08:15	07:19	07:07	06:02	05:18	05:18	05:57	06:48	07:38	07:33	08:25
	16:34	17:24	18:17	20:12	21:03	21:49	22:00	21:25	20:21	19:10	17:04	16:25
4	08:45	08:13	07:17	07:05	06:00	05:17	05:19	05:59	06:50	07:40	07:35	08:26
	16:35	17:26	18:18	20:13	21:05	21:50	22:00	21:23	20:18	19:08	17:02	16:24
5	08:45	08:11	07:15	07:03	05:58	05:17	05:20	06:00	06:51	07:42	07:37	08:27
	16:36	17:28	18:20	20:15	21:07	21:51	21:59	21:21	20:16	19:05	17:00	16:24
6	08:45	08:10	07:12	07:00	05:56	05:16	05:20	06:02	06:53	07:43	07:39	08:29
	16:37	17:30	18:22	20:17	21:09	21:52	21:59	21:20	20:14	19:03	16:58	16:23
7	08:44	08:08	07:10	06:58	05:55	05:15	05:21	06:03	06:55	07:45	07:41	08:30
	16:39	17:32	18:24	20:19	21:10	21:53	21:58	21:18	20:11	19:01	16:57	16:23
8	08:44	08:06	07:08	06:56	05:53	05:15	05:22	06:05	06:56	07:47	07:43	08:31
	16:40	17:34	18:26	20:20	21:12	21:54	21:58	21:16	20:09	18:58	16:55	16:22
9	08:43	08:04	07:06	06:53	05:51	05:14	05:23	06:07	06:58	07:49	07:44	08:32
	16:41	17:35	18:28	20:22	21:14	21:55	21:57	21:14	20:07	18:56	16:53	16:22
10	08:43	08:03	07:03	06:51	05:49	05:14	05:24	06:08	07:00	07:50	07:46	08:33
	16:43	17:37	18:29	20:24	21:15	21:56	21:56	21:12	20:04	18:54	16:51	16:22
11	08:42	08:01	07:01	06:49	05:48	05:13	05:25	06:10	07:01	07:52	07:48	08:35
	16:44	17:39	18:31	20:25	21:17	21:56	21:55	21:10	20:02	18:52	16:50	16:22
12	08:41	07:59	06:59	06:47	05:46	05:13	05:26	06:12	07:03	07:54	07:50	08:36
	16:46	17:41	18:33	20:27	21:18	21:57	21:54	21:08	20:00	18:49	16:48	16:22
13	08:41	07:57	06:56	06:44	05:44	05:13	05:28	06:13	07:05	07:56	07:52	08:37
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	16:49	17:45	18:36	20:31	21:22	21:58	21:53	21:04	19:55	18:45	16:45	16:21
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	16:50	17:47	18:38	20:32	21:23	21:59	21:52	21:02	19:52	18:43	16:44	16:22
16	08:38	07:51	06:49	06:38	05:39	05:12	05:31	06:18	07:10	08:01	07:57	08:39
	16:52	17:49	18:40	20:34	21:25	22:00	21:51	21:00	19:50	18:40	16:42	16:22
17	08:37	07:49	06:47	06:35	05:38	05:12	05:32	06:20	07:11	08:03	07:59	08:40
	16:54	17:51	18:42	20:36	21:26	22:00	21:49	20:58	19:48	18:38	16:41	16:22
18	08:36	07:47	06:45	06:33	05:36	05:12	05:34	06:22	07:13	08:04	08:00	08:41
	16:55	17:52	18:44	20:38	21:28	22:00	21:48	20:56	19:45	18:36	16:40	16:22
19	08:35	07:45	06:42	06:31	05:35	05:12	05:35	06:23	07:15	08:06	08:02	08:42
	16:57	17:54	18:45	20:39	21:29	22:01	21:47	20:54	19:43	18:34	16:38	16:22
20	08:34	07:43	06:40	06:29	05:34	05:12	05:36	06:25	07:16	08:08	08:04	08:42
	16:59	17:56	18:47	20:41	21:31	22:01	21:46	20:52	19:41	18:32	16:37	16:23
21	08:33	07:41	06:38	06:27	05:32	05:12	05:38	06:26	07:18	08:10	08:06	08:43
	17:00	17:58	18:49	20:43	21:32	22:01	21:45	20:50	19:38	18:30	16:36	16:23
22	08:32	07:39	06:35	06:24	05:31	05:13	05:39	06:28	07:20	08:11	08:07	08:43
	17:02	18:00	18:51	20:45	21:34	22:02	21:43	20:47	19:36	18:27	16:35	16:24
23	08:31	07:37	06:33	06:22	05:30	05:13	05:40	06:30	07:21	08:13	08:09	08:44
	17:04	18:02	18:52	20:46	21:35	22:02	21:42	20:45	19:33	18:25	16:33	16:24
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	17:06	18:04	18:54	20:48	21:37	22:02	21:41	20:43	19:31	18:23	16:32	16:25
25	08:28	07:32	06:28	06:18	05:27	05:13	05:43	06:33	07:25	07:17	08:12	08:45
	17:07	18:06	18:56	20:50	21:38	22:02	21:39	20:41	19:29	17:21	16:31	16:25
26	08:27	07:30	06:26	06:16	05:26	05:14	05:45	06:35	07:26	07:19	08:14	08:45
	17:09	18:07	18:58	20:51	21:39	22:02	21:38	20:39	19:26	17:19	16:30	16:26
27	08:25	07:28	06:24	06:14	05:25	05:14	05:46	06:36	07:28	07:21	08:16	08:45
	17:11	18:09	18:59	20:53	21:41	22:02	21:36	20:36	19:24	17:17	16:29	16:27
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	17:13	18:11	19:01	20:55	21:42	22:02	21:35	20:34	19:22	17:15	16:28	16:28
29	08:23		07:19	06:10	05:23	05:15	05:49	06:40	07:31	07:24	08:19	08:46
	17:15		20:03	20:57	21:43	22:01	21:33	20:32	19:19	17:13	16:28	16:28
30	08:21		07:17	06:08	05:22	05:16	05:51	06:41	07:33	07:26	08:20	08:46
	17:17		20:05	20:58	21:44	22:01	21:32	20:30	19:17	17:11	16:27	16:29
31	08:20		07:14		05:21		05:52	06:43		07:28		08:46
	17:18		20:06		21:46		21:30	20:27		17:09		16:30
Potential sun hours	257	277	367	417	487	502	504	455	381	331	264	241
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
Jennings O'Donovan
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padraig / podowd@jodireland.com

Calculated:
11/06/2025 09:22/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Real Case - V150 **Shadow receptor:** AN - 40

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January			February	March	April	May	June	July	August	September	October	November	December		
1	08:46		09:43 (9)	08:18	07:24	07:12	06:06	05:20	05:17	05:54	06:45	07:35	07:30	08:22		
	16:32	7	09:50 (9)	17:20	18:13	20:08	21:00	21:47	22:01	21:28	20:25	19:15	17:07	16:26		
2	08:46		09:45 (9)	08:16	07:21	07:10	06:04	05:19	05:17	05:55	06:46	07:37	07:32	08:23		
	16:33	3	09:48 (9)	17:22	18:15	20:10	21:02	21:48	22:01	21:27	20:23	19:12	17:05	16:25		
3	08:45			08:15	07:19	07:07	06:02	05:18	05:18	05:57	06:48	07:38	07:33	08:25		
	16:34			17:24	18:17	20:12	21:03	21:49	22:00	21:25	20:21	19:10	17:04	16:25		
4	08:45			08:13	07:17	07:05	06:00	05:17	05:19	05:59	06:50	07:40	07:35	08:26		
	16:35			17:26	18:18	20:13	21:05	21:50	22:00	21:23	20:18	19:08	17:02	16:24		
5	08:45			08:11	07:15	07:03	05:58	05:17	05:20	06:00	06:51	07:42	07:37	08:27		
	16:36			17:28	18:20	20:15	21:07	21:51	21:59	21:21	20:16	19:05	17:00	16:24		
6	08:45			08:10	07:12	07:00	05:56	05:16	05:20	06:02	06:53	07:43	07:39	08:29		
	16:37			17:30	18:22	20:17	21:09	21:52	21:59	21:20	20:14	19:03	16:58	16:23		
7	08:44			08:08	07:10	06:58	05:55	05:15	05:21	06:03	06:55	07:45	07:41	08:30		
	16:39			17:32	18:24	20:19	21:10	21:53	21:58	21:18	20:11	19:01	16:57	16:23		
8	08:44			08:06	07:08	06:56	05:53	05:15	05:22	06:05	06:56	07:47	07:43	08:31		
	16:40			17:34	18:26	20:20	21:12	21:54	21:58	21:16	20:09	18:58	16:55	16:22		
9	08:43			08:04	07:06	06:53	05:51	05:14	05:23	06:07	06:58	07:49	07:44	08:32		
	16:41			17:35	18:28	20:22	21:14	21:55	21:57	21:14	20:07	18:56	16:53	16:22		
10	08:43			08:03	07:03	06:51	05:49	05:14	05:24	06:08	07:00	07:50	07:46	08:33		09:35 (9)
	16:43			17:37	18:29	20:24	21:15	21:56	21:56	21:12	20:04	18:54	16:51	16:22	2	09:37 (9)
11	08:42			08:01	07:01	06:49	05:48	05:13	05:25	06:10	07:01	07:52	07:48	08:35		09:33 (9)
	16:44			17:39	18:31	20:25	21:17	21:56	21:55	21:10	20:02	18:52	16:50	16:22	7	09:40 (9)
12	08:41			07:59	06:59	06:47	05:46	05:13	05:26	06:12	07:03	07:54	07:50	08:36		09:33 (9)
	16:46			17:41	18:33	20:27	21:18	21:57	21:54	21:08	20:00	18:49	16:48	16:22	9	09:42 (9)
13	08:41			07:57	06:56	06:44	05:44	05:13	05:28	06:13	07:05	07:56	07:52	08:37		09:32 (9)
	16:47			17:43	18:35	20:29	21:20	21:58	21:54	21:06	19:57	18:47	16:47	16:22	11	09:43 (9)
14	08:40			07:55	06:54	06:42	05:43	05:13	05:29	06:15	07:06	07:57	07:53	08:38		09:25 (7)
	16:49			17:45	18:36	20:31	21:22	21:58	21:53	21:04	19:55	18:45	16:45	16:21	16	09:44 (9)
15	08:39			07:53	06:52	06:40	05:41	05:12	05:30	06:17	07:08	07:59	07:55	08:38		09:25 (7)
	16:50			17:47	18:38	20:32	21:23	21:59	21:52	21:02	19:52	18:43	16:44	16:22	19	09:45 (9)
16	08:38			07:51	06:49	06:38	05:39	05:12	05:31	06:18	07:10	08:01	07:57	08:39		09:25 (7)
	16:52			17:49	18:40	20:34	21:25	22:00	21:51	21:00	19:50	18:40	16:42	16:22	21	09:46 (9)
17	08:37			07:49	06:47	06:35	05:38	05:12	05:32	06:20	07:11	08:03	07:59	08:40		09:25 (7)
	16:54			17:51	18:42	20:36	21:26	22:00	21:49	20:58	19:48	18:38	16:41	16:22	22	09:47 (9)
18	08:36			07:47	06:45	06:33	05:36	05:12	05:34	06:22	07:13	08:04	08:00	08:41		09:24 (7)
	16:55			17:52	18:44	20:38	21:28	22:00	21:48	20:56	19:45	18:36	16:40	16:22	23	09:47 (9)
19	08:35			07:45	06:42	06:31	05:35	05:12	05:35	06:23	07:15	08:06	08:02	08:42		09:25 (7)
	16:57			17:54	18:45	20:39	21:29	22:01	21:47	20:54	19:43	18:34	16:38	16:22	23	09:48 (9)
20	08:34			07:43	06:40	06:29	05:34	05:12	05:36	06:25	07:16	08:08	08:04	08:42		09:26 (7)
	16:59			17:56	18:47	20:41	21:31	22:01	21:46	20:52	19:41	18:32	16:37	16:23	23	09:49 (9)
21	08:33			07:41	06:38	06:27	05:32	05:12	05:38	06:26	07:18	08:10	08:06	08:43		09:25 (7)
	17:00			17:58	18:49	20:43	21:32	22:01	21:45	20:50	19:38	18:30	16:36	16:23	24	09:49 (9)
22	08:32			07:39	06:35	06:24	05:31	05:13	05:39	06:28	07:20	08:12	08:07	08:43		09:26 (7)
	17:02			18:00	18:51	20:45	21:34	22:02	21:43	20:47	19:36	18:27	16:35	16:24	24	09:50 (9)
23	08:31			07:37	06:33	06:22	05:30	05:13	05:40	06:30	07:21	08:13	08:09	08:44		09:27 (7)
	17:04			18:02	18:52	20:46	21:35	22:02	21:42	20:45	19:33	18:25	16:33	16:24	23	09:50 (9)
24	08:29			07:34	06:31	06:20	05:28	05:13	05:42	06:31	07:23	08:15	08:11	08:44		09:27 (7)
	17:06			18:04	18:54	20:48	21:37	22:02	21:41	20:43	19:31	18:23	16:32	16:25	23	09:50 (9)
25	08:28			07:32	06:28	06:18	05:27	05:13	05:43	06:33	07:25	07:17	08:12	08:45		09:28 (7)
	17:07			18:06	18:56	20:50	21:38	22:02	21:39	20:41	19:29	17:21	16:31	16:25	23	09:51 (9)
26	08:27			07:30	06:26	06:16	05:26	05:14	05:45	06:35	07:26	07:19	08:14	08:45		09:29 (7)
	17:09			18:07	18:58	20:51	21:39	22:02	21:38	20:39	19:26	17:19	16:30	16:26	22	09:51 (9)
27	08:25			07:28	06:24	06:14	05:25	05:14	05:46	06:36	07:28	07:21	08:16	08:45		09:29 (7)
	17:11			18:09	18:59	20:53	21:41	22:02	21:36	20:36	19:24	17:17	16:29	16:27	22	09:51 (9)
28	08:24			07:26	06:21	06:12	05:24	05:15	05:48	06:38	07:30	07:22	08:17	08:45		09:30 (7)
	17:13			18:11	19:01	20:55	21:42	22:02	21:35	20:34	19:22	17:15	16:28	16:28	20	09:51 (9)
29	08:23				07:19	06:10	05:23	05:15	05:49	06:40	07:31	07:24	08:19	08:46		09:32 (7)
	17:15				20:03	20:57	21:43	22:01	21:33	20:32	19:19	17:13	16:28	16:28	16	09:51 (9)
30	08:21				07:17	06:08	05:22	05:16	05:51	06:41	07:33	07:26	08:20	08:46		09:40 (9)
	17:17				20:05	20:58	21:44	22:01	21:32	20:30	19:17	17:11	16:27	16:29	11	09:51 (9)
31	08:20				07:14		05:21		05:52	06:43		07:28		08:46		09:41 (9)
	17:18				20:06		21:46		21:30	20:27		17:09		16:30	10	09:51 (9)
Potential sun hours	257			277	367	417	487	502	504	455	381	331	264	241		
Total, worst case		10													394	
Sun reduction		0.22													0.22	
Oper. time red.		1.00													1.00	
Wind dir. red.		0.67													0.67	
Total reduction		0.14													0.15	
Total, real		1													57	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

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Calculated:
11/06/2025 09:22/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Real Case - V150 **Shadow receptor:** AO - 41

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January			February	March	April	May	June	July	August	September	October	November	December		
1	08:46		09:25 (7)	08:18	07:24	07:12	06:06	05:20	05:17	05:54	06:45	07:35	07:30	08:22		
	16:32	24	09:49 (9)	17:20	18:13	20:08	21:00	21:47	22:01	21:28	20:25	19:15	17:07	16:26		
2	08:46		09:25 (7)	08:16	07:21	07:10	06:04	05:19	05:17	05:55	06:46	07:37	07:32	08:23		
	16:33	23	09:48 (9)	17:22	18:15	20:10	21:02	21:48	22:01	21:27	20:23	19:12	17:05	16:25		
3	08:45		09:27 (7)	08:15	07:19	07:07	06:02	05:18	05:18	05:57	06:48	07:38	07:33	08:25		
	16:34	21	09:48 (9)	17:24	18:17	20:12	21:03	21:49	22:00	21:25	20:21	19:10	17:04	16:25		
4	08:45		09:29 (7)	08:13	07:17	07:05	06:00	05:17	05:19	05:59	06:50	07:40	07:35	08:26		
	16:35	19	09:48 (9)	17:26	18:18	20:13	21:05	21:50	22:00	21:23	20:18	19:08	17:02	16:24		
5	08:45		09:35 (9)	08:11	07:15	07:03	05:58	05:17	05:20	06:00	06:51	07:42	07:37	08:27		09:23 (9)
	16:36	12	09:47 (9)	17:28	18:20	20:15	21:07	21:51	21:59	21:21	20:16	19:05	17:00	16:24	7	09:30 (9)
6	08:45		09:36 (9)	08:10	07:12	07:00	05:56	05:16	05:20	06:02	06:53	07:43	07:39	08:29		09:23 (9)
	16:37	11	09:47 (9)	17:30	18:22	20:17	21:09	21:52	21:59	21:20	20:14	19:03	16:58	16:23	10	09:33 (9)
7	08:44		09:38 (9)	08:08	07:10	06:58	05:55	05:15	05:21	06:03	06:55	07:45	07:41	08:30		09:22 (9)
	16:39	7	09:45 (9)	17:32	18:24	20:19	21:10	21:53	21:58	21:18	20:11	19:01	16:57	16:23	12	09:34 (9)
8	08:44			08:06	07:08	06:56	05:53	05:15	05:22	06:05	06:56	07:47	07:43	08:31		09:16 (7)
	16:40			17:34	18:26	20:20	21:12	21:54	21:58	21:16	20:09	18:58	16:55	16:22	19	09:35 (9)
9	08:43			08:04	07:06	06:53	05:51	05:14	05:23	06:07	06:58	07:49	07:44	08:32		09:16 (7)
	16:41			17:35	18:28	20:22	21:14	21:55	21:57	21:14	20:07	18:56	16:53	16:22	21	09:37 (9)
10	08:43			08:03	07:03	06:51	05:49	05:14	05:24	06:08	07:00	07:50	07:46	08:33		09:15 (7)
	16:43			17:37	18:29	20:24	21:15	21:56	21:56	21:12	20:04	18:54	16:51	16:22	23	09:38 (9)
11	08:42			08:01	07:01	06:49	05:48	05:13	05:25	06:10	07:01	07:52	07:48	08:35		09:15 (7)
	16:44			17:39	18:31	20:25	21:17	21:56	21:55	21:10	20:02	18:52	16:50	16:22	24	09:39 (9)
12	08:41			07:59	06:59	06:47	05:46	05:13	05:26	06:12	07:03	07:54	07:50	08:36		09:15 (7)
	16:46			17:41	18:33	20:27	21:18	21:57	21:54	21:08	20:00	18:49	16:48	16:22	24	09:39 (9)
13	08:41			07:57	06:56	06:44	05:44	05:13	05:28	06:13	07:05	07:56	07:52	08:37		09:15 (7)
	16:47			17:43	18:35	20:29	21:20	21:58	21:54	21:06	19:57	18:47	16:47	16:22	25	09:40 (9)
14	08:40			07:55	06:54	06:42	05:43	05:13	05:29	06:15	07:06	07:57	07:53	08:38		09:15 (7)
	16:49			17:45	18:36	20:31	21:22	21:58	21:53	21:04	19:55	18:45	16:45	16:22	26	09:41 (9)
15	08:39			07:53	06:52	06:40	05:41	05:12	05:30	06:17	07:08	07:59	07:55	08:38		09:15 (7)
	16:50			17:47	18:38	20:32	21:23	21:59	21:52	21:02	19:52	18:43	16:44	16:22	27	09:42 (9)
16	08:38			07:51	06:49	06:38	05:39	05:12	05:31	06:18	07:10	08:01	07:57	08:39		09:16 (7)
	16:52			17:49	18:40	20:34	21:25	22:00	21:51	21:00	19:50	18:40	16:42	16:22	26	09:42 (9)
17	08:37			07:49	06:47	06:35	05:38	05:12	05:32	06:20	07:11	08:03	07:59	08:40		09:16 (7)
	16:54			17:51	18:42	20:36	21:26	22:00	21:49	20:58	19:48	18:38	16:41	16:22	27	09:43 (9)
18	08:36			07:47	06:45	06:33	05:36	05:12	05:34	06:22	07:13	08:04	08:00	08:41		09:16 (7)
	16:55			17:53	18:44	20:38	21:28	22:00	21:48	20:56	19:45	18:36	16:40	16:22	27	09:43 (9)
19	08:35			07:45	06:42	06:31	05:35	05:12	05:35	06:23	07:15	08:06	08:02	08:42		09:16 (7)
	16:57			17:54	18:45	20:39	21:29	22:01	21:47	20:54	19:43	18:34	16:38	16:22	28	09:44 (9)
20	08:34			07:43	06:40	06:29	05:34	05:12	05:36	06:25	07:16	08:08	08:04	08:42		09:17 (7)
	16:59			17:56	18:47	20:41	21:31	22:01	21:46	20:52	19:41	18:32	16:37	16:23	28	09:45 (9)
21	08:33			07:41	06:38	06:27	05:32	05:12	05:38	06:26	07:18	08:10	08:06	08:43		09:17 (7)
	17:00			17:58	18:49	20:43	21:32	22:01	21:45	20:50	19:38	18:30	16:36	16:23	28	09:45 (9)
22	08:32			07:39	06:35	06:24	05:31	05:13	05:39	06:28	07:20	08:12	08:07	08:43		09:18 (7)
	17:02			18:00	18:51	20:45	21:34	22:02	21:43	20:47	19:36	18:27	16:35	16:24	28	09:46 (9)
23	08:31			07:37	06:33	06:22	05:30	05:13	05:40	06:30	07:21	08:13	08:09	08:44		09:18 (7)
	17:04			18:02	18:52	20:46	21:35	22:02	21:42	20:45	19:33	18:25	16:33	16:24	28	09:46 (9)
24	08:29			07:34	06:31	06:20	05:28	05:13	05:42	06:31	07:23	08:15	08:11	08:44		09:18 (7)
	17:06			18:04	18:54	20:48	21:37	22:02	21:41	20:43	19:31	18:23	16:32	16:25	28	09:46 (9)
25	08:28			07:32	06:28	06:18	05:27	05:13	05:43	06:33	07:25	07:17	08:12	08:45		09:20 (7)
	17:07			18:06	18:56	20:50	21:38	22:02	21:39	20:41	19:29	17:21	16:31	16:25	27	09:47 (9)
26	08:27			07:30	06:26	06:16	05:26	05:14	05:45	06:35	07:26	07:19	08:14	08:45		09:20 (7)
	17:09			18:07	18:58	20:51	21:39	22:02	21:38	20:39	19:26	17:19	16:30	16:26	27	09:47 (9)
27	08:25			07:28	06:24	06:14	05:25	05:14	05:46	06:36	07:28	07:21	08:16	08:45		09:20 (7)
	17:11			18:09	18:59	20:53	21:41	22:02	21:36	20:36	19:24	17:17	16:29	16:27	27	09:47 (9)
28	08:24			07:26	06:21	06:12	05:24	05:15	05:48	06:38	07:30	07:22	08:17	08:45		09:21 (7)
	17:13			18:11	19:01	20:55	21:42	22:02	21:35	20:34	19:22	17:15	16:28	16:28	26	09:47 (9)
29	08:23				07:19	06:10	05:23	05:15	05:49	06:40	07:31	07:24	08:19	08:46		09:22 (7)
	17:15				20:03	20:57	21:43	22:01	21:33	20:32	19:19	17:13	16:28	16:28	26	09:48 (9)
30	08:21				07:17	06:08	05:22	05:16	05:51	06:41	07:33	07:26	08:20	08:46		09:23 (7)
	17:17				20:05	20:58	21:44	22:01	21:32	20:30	19:17	17:11	16:27	16:29	25	09:48 (9)
31	08:20				07:14		05:21		05:52	06:43		07:28		08:46		09:23 (7)
	17:18				20:06		21:46		21:30	20:27		17:09		16:30	25	09:48 (9)
Potential sun hours	257			277	367	417	487	502	504	455	381	331	264	241		
Total, worst case		117													649	
Sun reduction		0.22													0.22	
Oper. time red.		1.00													1.00	
Wind dir. red.		0.67													0.67	
Total reduction		0.14													0.15	
Total, real		17													94	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
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padraig / podowd@jodireland.com
Calculated:
11/06/2025 09:22/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Real Case - V150 **Shadow receptor:** AP - 42

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January			February	March	April	May	June	July	August	September	October	November			December		
1	08:46		09:18 (7)	08:18	07:24	07:12	06:06	05:20	05:17	05:54	06:45	07:35	07:30			08:22		08:57 (7)
	16:32	18	09:36 (9)	17:20	18:13	20:08	21:00	21:47	22:01	21:28	20:25	19:15	17:07			16:26	22	09:19 (9)
2	08:46		09:17 (7)	08:16	07:21	07:10	06:04	05:19	05:17	05:56	06:46	07:37	07:32			08:23		08:57 (7)
	16:33	18	09:35 (9)	17:22	18:15	20:10	21:02	21:48	22:01	21:27	20:23	19:12	17:06			16:25	24	09:21 (9)
3	08:45		09:17 (7)	08:15	07:19	07:07	06:02	05:18	05:18	05:57	06:48	07:38	07:33			08:25		08:57 (7)
	16:34	19	09:36 (9)	17:24	18:17	20:12	21:03	21:49	22:00	21:25	20:21	19:10	17:04			16:25	24	09:21 (9)
4	08:45		09:17 (7)	08:13	07:17	07:05	06:00	05:17	05:19	05:59	06:50	07:40	07:35			08:26		08:59 (7)
	16:35	20	09:37 (9)	17:26	18:18	20:13	21:05	21:50	22:00	21:23	20:18	19:08	17:02			16:24	23	09:22 (9)
5	08:45		09:16 (7)	08:11	07:15	07:03	05:58	05:17	05:20	06:00	06:51	07:42	07:37			08:27		09:00 (7)
	16:36	21	09:37 (9)	17:28	18:20	20:15	21:07	21:51	21:59	21:21	20:16	19:05	17:00			16:24	22	09:22 (9)
6	08:45		09:16 (7)	08:10	07:12	07:00	05:56	05:16	05:20	06:02	06:53	07:43	07:39			08:29		09:02 (7)
	16:37	21	09:37 (9)	17:30	18:22	20:17	21:09	21:52	21:59	21:20	20:14	19:03	16:58			16:23	21	09:23 (9)
7	08:44		09:15 (7)	08:08	07:10	06:58	05:55	05:15	05:21	06:03	06:55	07:45	07:41			08:30		09:03 (7)
	16:39	22	09:37 (9)	17:32	18:24	20:19	21:10	21:53	21:58	21:18	20:11	19:01	16:57			16:23	21	09:24 (9)
8	08:44		09:15 (7)	08:06	07:08	06:56	05:53	05:15	05:22	06:05	06:56	07:47	07:43			08:31		09:04 (7)
	16:40	23	09:38 (9)	17:34	18:26	20:20	21:12	21:54	21:58	21:16	20:09	18:58	16:55			16:22	20	09:24 (9)
9	08:43		09:14 (7)	08:04	07:06	06:53	05:51	05:14	05:23	06:07	06:58	07:49	07:44			08:32		09:06 (7)
	16:41	24	09:38 (9)	17:35	18:28	20:22	21:14	21:55	21:57	21:14	20:07	18:56	16:53			16:22	19	09:25 (9)
10	08:43		09:14 (7)	08:03	07:03	06:51	05:49	05:14	05:24	06:08	07:00	07:50	07:46			08:33		09:07 (7)
	16:43	24	09:38 (9)	17:37	18:29	20:24	21:15	21:56	21:56	21:12	20:04	18:54	16:51			16:22	19	09:26 (9)
11	08:42		09:14 (7)	08:01	07:01	06:49	05:48	05:13	05:25	06:10	07:01	07:52	07:48			08:35		09:08 (7)
	16:44	23	09:37 (9)	17:39	18:31	20:25	21:17	21:56	21:55	21:10	20:02	18:52	16:50			16:22	18	09:26 (9)
12	08:41		09:16 (7)	07:59	06:59	06:47	05:46	05:13	05:26	06:12	07:03	07:54	07:50			08:36		09:09 (7)
	16:46	22	09:38 (9)	17:41	18:33	20:27	21:18	21:57	21:54	21:08	20:00	18:49	16:48			16:22	17	09:26 (9)
13	08:41		09:18 (7)	07:57	06:56	06:44	05:44	05:13	05:28	06:13	07:05	07:56	07:52			08:37		09:10 (7)
	16:47	20	09:38 (9)	17:43	18:35	20:29	21:20	21:58	21:54	21:06	19:57	18:47	16:47			16:22	17	09:27 (9)
14	08:40		09:20 (7)	07:55	06:54	06:42	05:43	05:13	05:29	06:15	07:06	07:57	07:53			08:38		09:11 (7)
	16:49	17	09:37 (9)	17:45	18:36	20:31	21:22	21:58	21:53	21:04	19:55	18:45	16:45			16:22	16	09:27 (9)
15	08:39		09:21 (9)	07:53	06:52	06:40	05:41	05:12	05:30	06:17	07:08	07:59	07:55			08:38		09:12 (7)
	16:50	16	09:37 (9)	17:47	18:38	20:32	21:23	21:59	21:52	21:02	19:52	18:43	16:44			16:22	16	09:28 (9)
16	08:38		09:23 (9)	07:51	06:49	06:38	05:39	05:12	05:31	06:18	07:10	08:01	07:57			08:39		09:13 (7)
	16:52	13	09:36 (9)	17:49	18:40	20:34	21:25	22:00	21:51	21:00	19:50	18:40	16:42			16:22	15	09:28 (9)
17	08:37		09:24 (9)	07:49	06:47	06:35	05:38	05:12	05:32	06:20	07:11	08:03	07:59			08:40		09:14 (7)
	16:54	10	09:34 (9)	17:51	18:42	20:36	21:26	22:00	21:49	20:58	19:48	18:38	16:41			16:22	15	09:29 (9)
18	08:36		09:27 (9)	07:47	06:45	06:33	05:36	05:12	05:34	06:22	07:13	08:04	08:00			08:41		09:14 (7)
	16:55	5	09:32 (9)	17:53	18:44	20:38	21:28	22:00	21:48	20:56	19:45	18:36	16:40			16:22	15	09:29 (9)
19	08:35			07:45	06:42	06:31	05:35	05:12	05:35	06:23	07:15	08:06	08:02			08:42		09:15 (7)
	16:57			17:54	18:45	20:39	21:29	22:01	21:47	20:54	19:43	18:34	16:38			16:22	15	09:30 (9)
20	08:34			07:43	06:40	06:29	05:34	05:12	05:36	06:25	07:16	08:08	08:04			08:42		09:16 (7)
	16:59			17:56	18:47	20:41	21:31	22:01	21:46	20:52	19:41	18:32	16:37			16:23	14	09:30 (9)
21	08:33			07:41	06:38	06:27	05:32	05:12	05:38	06:26	07:18	08:10	08:06			08:43		09:16 (7)
	17:00			17:58	18:49	20:43	21:32	22:01	21:45	20:50	19:38	18:30	16:36			16:23	14	09:30 (9)
22	08:32			07:39	06:35	06:25	05:31	05:13	05:39	06:28	07:20	08:12	08:07			08:43		09:17 (7)
	17:02			18:00	18:51	20:45	21:34	22:02	21:43	20:47	19:36	18:27	16:35			16:24	14	09:31 (9)
23	08:31			07:37	06:33	06:22	05:30	05:13	05:40	06:30	07:21	08:13	08:09			08:44		09:17 (7)
	17:04			18:02	18:52	20:46	21:35	22:02	21:42	20:45	19:33	18:25	16:33			16:24	14	09:31 (9)
24	08:29			07:34	06:31	06:20	05:28	05:13	05:42	06:31	07:23	08:15	08:11		09:05 (9)	08:44		09:17 (7)
	17:06			18:04	18:54	20:48	21:37	22:02	21:41	20:43	19:31	18:23	16:32	5	09:10 (9)	16:25	14	09:31 (9)
25	08:28			07:32	06:28	06:18	05:27	05:13	05:43	06:33	07:25	07:17	08:12		09:02 (9)	08:45		09:18 (7)
	17:07			18:06	18:56	20:50	21:38	22:02	21:39	20:41	19:29	17:21	16:31	10	09:12 (9)	16:25	15	09:33 (9)
26	08:27			07:30	06:26	06:16	05:26	05:14	05:45	06:35	07:26	07:19	08:14		09:01 (9)	08:45		09:18 (7)
	17:09			18:07	18:58	20:51	21:39	22:02	21:38	20:39	19:26	17:19	16:30	13	09:14 (9)	16:26	15	09:33 (9)
27	08:25			07:28	06:24	06:14	05:25	05:14	05:46	06:36	07:28	07:21	08:16		09:00 (9)	08:45		09:18 (7)
	17:11			18:09	18:59	20:53	21:41	22:02	21:36	20:36	19:24	17:17	16:29	16	09:16 (9)	16:27	15	09:33 (9)
28	08:24			07:26	06:21	06:12	05:24	05:15	05:48	06:38	07:30	07:22	08:17		08:59 (7)	08:45		09:18 (7)
	17:13			18:11	19:01	20:55	21:42	22:02	21:35	20:34	19:22	17:15	16:28	17	09:16 (9)	16:28	16	09:34 (9)
29	08:23				07:19	06:10	05:23	05:15	05:49	06:40	07:31	07:24	08:19		08:58 (7)	08:46		09:18 (7)
	17:15				20:03	20:57	21:43	22:01	21:33	20:32	19:19	17:13	16:28	20	09:18 (9)	16:28	16	09:34 (9)
30	08:21				07:17	06:08	05:22	05:16	05:51	06:41	07:33	07:26	08:20		08:58 (7)	08:46		09:18 (7)
	17:17				20:05	20:58	21:45	22:01	21:32	20:30	19:17	17:11	16:27	21	09:19 (9)	16:29	17	09:35 (9)
31	08:20				07:14		05:21		05:52	06:43		07:28				08:46		09:18 (7)
	17:18				20:06		21:46		21:30	20:27		17:09				16:30	17	09:35 (9)
Potential sun hours	257			277	367	417	487	502	504	455	381	331	264			241		
Total, worst case		336												102			540	
Sun reduction		0.22												0.26			0.22	
Oper. time red.		1.00												1.00			1.00	
Wind dir. red.		0.66												0.66			0.66	
Total reduction		0.14												0.17			0.15	
Total, real		48												18			78	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

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Calculated:
11/06/2025 09:22/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Real Case - V150 **Shadow receptor:** AQ - 46

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January			February	March	April	May	June	July	August	September	October	November	December		
1	08:46		09:40 (9)	08:18	07:24	07:12	06:06	05:20	05:17	05:54	06:45	07:35	07:30	08:22		
	16:32	8	09:48 (9)	17:20	18:13	20:08	21:00	21:47	22:01	21:28	20:25	19:15	17:07	16:26		
2	08:46		09:41 (9)	08:16	07:21	07:10	06:04	05:19	05:17	05:55	06:46	07:37	07:32	08:23		
	16:33	5	09:46 (9)	17:22	18:15	20:10	21:02	21:48	22:01	21:27	20:23	19:12	17:05	16:25		
3	08:45			08:15	07:19	07:07	06:02	05:18	05:18	05:57	06:48	07:38	07:33	08:25		
	16:34			17:24	18:17	20:12	21:03	21:49	22:00	21:25	20:21	19:10	17:04	16:25		
4	08:45			08:13	07:17	07:05	06:00	05:17	05:19	05:59	06:50	07:40	07:35	08:26		
	16:35			17:26	18:18	20:13	21:05	21:50	22:00	21:23	20:18	19:08	17:02	16:24		
5	08:45			08:11	07:15	07:03	05:58	05:17	05:20	06:00	06:51	07:42	07:37	08:27		
	16:36			17:28	18:20	20:15	21:07	21:51	21:59	21:21	20:16	19:05	17:00	16:24		
6	08:45			08:10	07:12	07:00	05:56	05:16	05:20	06:02	06:53	07:43	07:39	08:29		
	16:37			17:30	18:22	20:17	21:09	21:52	21:59	21:20	20:14	19:03	16:58	16:23		
7	08:44			08:08	07:10	06:58	05:55	05:15	05:21	06:03	06:55	07:45	07:41	08:30		
	16:39			17:32	18:24	20:19	21:10	21:53	21:58	21:18	20:11	19:01	16:57	16:23		
8	08:44			08:06	07:08	06:56	05:53	05:15	05:22	06:05	06:56	07:47	07:43	08:31		
	16:40			17:34	18:26	20:20	21:12	21:54	21:58	21:16	20:09	18:58	16:55	16:22		
9	08:43			08:04	07:06	06:53	05:51	05:14	05:23	06:07	06:58	07:49	07:44	08:32		
	16:41			17:35	18:28	20:22	21:14	21:55	21:57	21:14	20:07	18:56	16:53	16:22		
10	08:43			08:03	07:03	06:51	05:49	05:14	05:24	06:08	07:00	07:50	07:46	08:33		09:31 (9)
	16:43			17:37	18:29	20:24	21:15	21:56	21:56	21:12	20:04	18:54	16:51	16:22	5	09:36 (9)
11	08:42			08:01	07:01	06:49	05:48	05:13	05:25	06:10	07:01	07:52	07:48	08:35		09:30 (9)
	16:44			17:39	18:31	20:25	21:17	21:56	21:55	21:10	20:02	18:52	16:50	16:22	8	09:38 (9)
12	08:41			07:59	06:59	06:47	05:46	05:13	05:26	06:12	07:03	07:54	07:50	08:36		09:30 (9)
	16:46			17:41	18:33	20:27	21:18	21:57	21:54	21:08	20:00	18:49	16:48	16:22	9	09:39 (9)
13	08:41			07:57	06:56	06:44	05:44	05:13	05:28	06:13	07:05	07:56	07:52	08:37		09:24 (7)
	16:47			17:43	18:35	20:29	21:20	21:58	21:54	21:06	19:57	18:47	16:47	16:22	13	09:40 (9)
14	08:40			07:55	06:54	06:42	05:43	05:13	05:29	06:15	07:06	07:57	07:53	08:38		09:23 (7)
	16:49			17:45	18:36	20:31	21:22	21:58	21:53	21:04	19:55	18:45	16:45	16:22	17	09:41 (9)
15	08:39			07:53	06:52	06:40	05:41	05:12	05:30	06:17	07:08	07:59	07:55	08:38		09:23 (7)
	16:50			17:47	18:38	20:32	21:23	21:59	21:52	21:02	19:52	18:43	16:44	16:22	19	09:42 (9)
16	08:38			07:51	06:49	06:38	05:39	05:12	05:31	06:18	07:10	08:01	07:57	08:39		09:23 (7)
	16:52			17:49	18:40	20:34	21:25	22:00	21:51	21:00	19:50	18:40	16:42	16:22	20	09:43 (9)
17	08:37			07:49	06:47	06:35	05:38	05:12	05:32	06:20	07:11	08:03	07:59	08:40		09:23 (7)
	16:54			17:51	18:42	20:36	21:26	22:00	21:49	20:58	19:48	18:38	16:41	16:22	21	09:44 (9)
18	08:36			07:47	06:45	06:33	05:36	05:12	05:34	06:22	07:13	08:04	08:00	08:41		09:22 (7)
	16:55			17:52	18:44	20:38	21:28	22:00	21:48	20:56	19:45	18:36	16:40	16:22	22	09:44 (9)
19	08:35			07:45	06:42	06:31	05:35	05:12	05:35	06:23	07:15	08:06	08:02	08:42		09:23 (7)
	16:57			17:54	18:45	20:39	21:29	22:01	21:47	20:54	19:43	18:34	16:38	16:22	22	09:45 (9)
20	08:34			07:43	06:40	06:29	05:34	05:12	05:36	06:25	07:16	08:08	08:04	08:42		09:24 (7)
	16:59			17:56	18:47	20:41	21:31	22:01	21:46	20:52	19:41	18:32	16:37	16:23	22	09:46 (9)
21	08:33			07:41	06:38	06:27	05:32	05:12	05:38	06:26	07:18	08:10	08:06	08:43		09:23 (7)
	17:00			17:58	18:49	20:43	21:32	22:01	21:45	20:50	19:38	18:30	16:36	16:23	23	09:46 (9)
22	08:32			07:39	06:35	06:24	05:31	05:13	05:39	06:28	07:20	08:12	08:07	08:43		09:24 (7)
	17:02			18:00	18:51	20:45	21:34	22:02	21:43	20:47	19:36	18:27	16:35	16:24	23	09:47 (9)
23	08:31			07:37	06:33	06:22	05:30	05:13	05:40	06:30	07:21	08:13	08:09	08:44		09:25 (7)
	17:04			18:02	18:52	20:46	21:35	22:02	21:42	20:45	19:33	18:25	16:33	16:24	22	09:47 (9)
24	08:29			07:34	06:31	06:20	05:28	05:13	05:42	06:31	07:23	08:15	08:11	08:44		09:25 (7)
	17:06			18:04	18:54	20:48	21:37	22:02	21:41	20:43	19:31	18:23	16:32	16:25	22	09:47 (9)
25	08:28			07:32	06:28	06:18	05:27	05:13	05:43	06:33	07:25	07:17	08:12	08:45		09:26 (7)
	17:07			18:06	18:56	20:50	21:38	22:02	21:39	20:41	19:29	17:21	16:31	16:25	22	09:48 (9)
26	08:27			07:30	06:26	06:16	05:26	05:14	05:45	06:35	07:26	07:19	08:14	08:45		09:27 (7)
	17:09			18:07	18:58	20:51	21:39	22:02	21:38	20:39	19:26	17:19	16:30	16:26	21	09:48 (9)
27	08:25			07:28	06:24	06:14	05:25	05:14	05:46	06:36	07:28	07:21	08:16	08:45		09:27 (7)
	17:11			18:09	18:59	20:53	21:41	22:02	21:36	20:36	19:24	17:17	16:29	16:27	21	09:48 (9)
28	08:24			07:26	06:21	06:12	05:24	05:15	05:48	06:38	07:30	07:22	08:17	08:45		09:28 (7)
	17:13			18:11	19:01	20:55	21:42	22:02	21:35	20:34	19:22	17:15	16:28	16:28	20	09:48 (9)
29	08:23				07:19	06:10	05:23	05:15	05:49	06:40	07:31	07:24	08:19	08:46		09:29 (7)
	17:15				20:03	20:57	21:43	22:01	21:33	20:32	19:19	17:13	16:28	16:28	18	09:48 (9)
30	08:21				07:17	06:08	05:22	05:16	05:51	06:41	07:33	07:26	08:20	08:46		09:31 (7)
	17:17				20:05	20:58	21:44	22:01	21:32	20:30	19:17	17:11	16:27	16:29	15	09:48 (9)
31	08:20				07:14		05:21		05:52	06:43		07:28		08:46		09:38 (9)
	17:18				20:06		21:46		21:30	20:27		17:09		16:30	10	09:48 (9)
Potential sun hours	257			277	367	417	487	502	504	455	381	331	264	241		
Total, worst case		13													395	
Sun reduction		0.22													0.22	
Oper. time red.		1.00													1.00	
Wind dir. red.		0.67													0.67	
Total reduction		0.14													0.15	
Total, real		2													57	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

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SHADOW - Calendar

Calculation: 6839 Garrane WF Real Case - V150 **Shadow receptor:** AR - 47

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January	February	March	April	May	June	July	August	September	October	November	December		
1	08:46	08:18	07:24	07:12	06:06	05:20	05:17	05:54	06:45	07:35	07:30	08:22		
	16:32	17:20	18:13	20:08	21:00	21:47	22:01	21:28	20:25	19:15	17:07	16:26		
2	08:46	08:16	07:21	07:10	06:04	05:19	05:17	05:55	06:46	07:37	07:32	08:23		
	16:33	17:22	18:15	20:10	21:02	21:48	22:01	21:27	20:23	19:12	17:05	16:25		
3	08:45	08:15	07:19	07:07	06:02	05:18	05:18	05:57	06:48	07:38	07:33	08:25		
	16:34	17:24	18:17	20:12	21:03	21:49	22:00	21:25	20:21	19:10	17:04	16:25		
4	08:45	08:13	07:17	07:05	06:00	05:17	05:19	05:59	06:50	07:40	07:35	08:26		
	16:35	17:26	18:18	20:13	21:05	21:50	22:00	21:23	20:18	19:08	17:02	16:24		
5	08:45	08:11	07:15	07:03	05:58	05:17	05:20	06:00	06:51	07:42	07:37	08:27		
	16:36	17:28	18:20	20:15	21:07	21:51	21:59	21:21	20:16	19:05	17:00	16:24		
6	08:45	08:10	07:12	07:00	05:56	05:16	05:20	06:02	06:53	07:43	07:39	08:29		
	16:37	17:30	18:22	20:17	21:09	21:52	21:59	21:20	20:14	19:03	16:58	16:23		
7	08:44	08:08	07:10	06:58	05:55	05:15	05:21	06:03	06:55	07:45	07:41	08:30		
	16:39	17:32	18:24	20:19	21:10	21:53	21:58	21:18	20:11	19:01	16:57	16:23		
8	08:44	08:06	07:08	06:56	05:53	05:15	05:22	06:05	06:56	07:47	07:43	08:31		
	16:40	17:34	18:26	20:20	21:12	21:54	21:58	21:16	20:09	18:58	16:55	16:22		
9	08:43	08:04	07:06	06:53	05:51	05:14	05:23	06:07	06:58	07:49	07:44	08:32		
	16:41	17:35	18:28	20:22	21:14	21:55	21:57	21:14	20:07	18:56	16:53	16:22		
10	08:43	08:03	07:03	06:51	05:49	05:14	05:24	06:08	07:00	07:50	07:46	08:33		
	16:43	17:37	18:29	20:24	21:15	21:56	21:56	21:12	20:04	18:54	16:51	16:22		
11	08:42	08:01	07:01	06:49	05:48	05:13	05:25	06:10	07:01	07:52	07:48	08:35		
	16:44	17:39	18:31	20:25	21:17	21:56	21:55	21:10	20:02	18:52	16:50	16:22		
12	08:41	07:59	06:59	06:47	05:46	05:13	05:26	06:12	07:03	07:54	07:50	08:36		
	16:46	17:41	18:33	20:27	21:18	21:57	21:54	21:08	20:00	18:49	16:48	16:22		
13	08:41	07:57	06:56	06:44	05:44	05:13	05:28	06:13	07:05	07:56	07:52	08:37		
	16:47	17:43	18:35	20:29	21:20	21:58	21:54	21:06	19:57	18:47	16:47	16:22		
14	08:40	07:55	06:54	06:42	05:43	05:13	05:29	06:15	07:06	07:57	07:53	08:38		
	16:49	17:45	18:36	20:31	21:22	21:58	21:53	21:04	19:55	18:45	16:45	16:21		
15	08:39	07:53	06:52	06:40	05:41	05:12	05:30	06:17	07:08	07:59	07:55	08:38		
	16:50	17:47	18:38	20:32	21:23	21:59	21:52	21:02	19:52	18:43	16:44	16:22		
16	08:38	07:51	06:49	06:38	05:39	05:12	05:31	06:18	07:10	08:01	07:57	08:39		09:39 (9)
	16:52	17:49	18:40	20:34	21:25	22:00	21:51	21:00	19:50	18:40	16:42	16:22	4	09:43 (9)
17	08:37	07:49	06:47	06:35	05:38	05:12	05:32	06:20	07:11	08:03	07:59	08:40		09:38 (9)
	16:54	17:51	18:42	20:36	21:26	22:00	21:49	20:58	19:48	18:38	16:41	16:22	7	09:45 (9)
18	08:36	07:47	06:45	06:33	05:36	05:12	05:34	06:22	07:13	08:04	08:00	08:41		09:38 (9)
	16:55	17:52	18:44	20:38	21:28	22:00	21:48	20:56	19:45	18:36	16:40	16:22	7	09:45 (9)
19	08:35	07:45	06:42	06:31	05:35	05:12	05:35	06:23	07:15	08:06	08:02	08:42		09:38 (9)
	16:57	17:54	18:45	20:39	21:29	22:01	21:47	20:54	19:43	18:34	16:38	16:22	8	09:46 (9)
20	08:34	07:43	06:40	06:29	05:34	05:12	05:36	06:25	07:16	08:08	08:04	08:42		09:39 (9)
	16:59	17:56	18:47	20:41	21:31	22:01	21:46	20:52	19:41	18:32	16:37	16:23	8	09:47 (9)
21	08:33	07:41	06:38	06:27	05:32	05:12	05:38	06:26	07:18	08:10	08:06	08:43		09:38 (9)
	17:00	17:58	18:49	20:43	21:32	22:01	21:45	20:50	19:38	18:30	16:36	16:23	9	09:47 (9)
22	08:32	07:39	06:35	06:24	05:31	05:13	05:39	06:28	07:20	08:12	08:07	08:43		09:39 (9)
	17:02	18:00	18:51	20:45	21:34	22:02	21:43	20:47	19:36	18:27	16:35	16:24	9	09:48 (9)
23	08:31	07:37	06:33	06:22	05:30	05:13	05:40	06:30	07:21	08:13	08:09	08:44		09:40 (9)
	17:04	18:02	18:52	20:46	21:35	22:02	21:42	20:45	19:33	18:25	16:33	16:24	8	09:48 (9)
24	08:29	07:34	06:31	06:20	05:28	05:13	05:42	06:31	07:23	08:15	08:11	08:44		09:40 (9)
	17:06	18:04	18:54	20:48	21:37	22:02	21:41	20:43	19:31	18:23	16:32	16:25	8	09:48 (9)
25	08:28	07:32	06:28	06:18	05:27	05:13	05:43	06:33	07:25	07:17	08:12	08:45		09:41 (9)
	17:07	18:06	18:56	20:50	21:38	22:02	21:39	20:41	19:29	17:21	16:31	16:25	8	09:49 (9)
26	08:27	07:30	06:26	06:16	05:26	05:14	05:45	06:35	07:26	07:19	08:14	08:45		09:42 (9)
	17:09	18:07	18:58	20:51	21:39	22:02	21:38	20:39	19:26	17:19	16:30	16:26	7	09:49 (9)
27	08:25	07:28	06:24	06:14	05:25	05:14	05:46	06:36	07:28	07:21	08:16	08:45		09:43 (9)
	17:11	18:09	18:59	20:53	21:41	22:02	21:36	20:36	19:24	17:17	16:29	16:27	5	09:48 (9)
28	08:24	07:26	06:21	06:12	05:24	05:15	05:48	06:38	07:30	07:22	08:17	08:45		09:45 (9)
	17:13	18:11	19:01	20:55	21:42	22:02	21:35	20:34	19:22	17:15	16:28	16:28	2	09:47 (9)
29	08:23		07:19	06:10	05:23	05:15	05:49	06:40	07:31	07:24	08:19	08:46		
	17:15		20:03	20:57	21:43	22:01	21:33	20:32	19:19	17:13	16:28	16:28		
30	08:21		07:17	06:08	05:22	05:16	05:51	06:41	07:33	07:26	08:20	08:46		
	17:17		20:05	20:58	21:44	22:01	21:32	20:30	19:17	17:11	16:27	16:29		
31	08:20		07:14		05:21		05:52	06:43		07:28		08:46		
	17:18		20:06		21:46		21:30	20:27		17:09		16:30		
Potential sun hours	257	277	367	417	487	502	504	455	381	331	264	241		
Total, worst case													90	
Sun reduction													0.22	
Oper. time red.													1.00	
Wind dir. red.													0.67	
Total reduction													0.15	
Total, real													13	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
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Finisklin Business Park
F91 RHH9 Sligo
+353719161416
padraig / podowd@jodireland.com

Calculated:
11/06/2025 09:22/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Real Case - V150 **Shadow receptor:** AS - 48

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:46	08:18	07:24	07:12	06:06	05:20	05:17	05:54	06:45	07:35	07:30	08:22
	16:32	17:20	18:13	20:08	21:00	21:47	22:01	21:28	20:25	19:15	17:07	16:26
2	08:46	08:16	07:21	07:10	06:04	05:19	05:17	05:55	06:46	07:37	07:32	08:23
	16:33	17:22	18:15	20:10	21:02	21:48	22:01	21:27	20:23	19:12	17:05	16:25
3	08:45	08:15	07:19	07:07	06:02	05:18	05:18	05:57	06:48	07:38	07:33	08:25
	16:34	17:24	18:17	20:12	21:03	21:49	22:00	21:25	20:21	19:10	17:04	16:25
4	08:45	08:13	07:17	07:05	06:00	05:17	05:19	05:59	06:50	07:40	07:35	08:26
	16:35	17:26	18:18	20:13	21:05	21:50	22:00	21:23	20:18	19:08	17:02	16:24
5	08:45	08:11	07:15	07:03	05:58	05:17	05:20	06:00	06:51	07:42	07:37	08:27
	16:36	17:28	18:20	20:15	21:07	21:51	21:59	21:21	20:16	19:05	17:00	16:24
6	08:45	08:10	07:12	07:00	05:56	05:16	05:20	06:02	06:53	07:43	07:39	08:29
	16:37	17:30	18:22	20:17	21:09	21:52	21:59	21:20	20:14	19:03	16:58	16:23
7	08:44	08:08	07:10	06:58	05:55	05:15	05:21	06:03	06:55	07:45	07:41	08:30
	16:39	17:32	18:24	20:19	21:10	21:53	21:58	21:18	20:11	19:01	16:57	16:23
8	08:44	08:06	07:08	06:56	05:53	05:15	05:22	06:05	06:56	07:47	07:43	08:31
	16:40	17:34	18:26	20:20	21:12	21:54	21:58	21:16	20:09	18:58	16:55	16:22
9	08:43	08:04	07:06	06:53	05:51	05:14	05:23	06:07	06:58	07:49	07:44	08:32
	16:41	17:35	18:28	20:22	21:14	21:55	21:57	21:14	20:07	18:56	16:53	16:22
10	08:43	08:03	07:03	06:51	05:49	05:14	05:24	06:08	07:00	07:50	07:46	08:33
	16:43	17:37	18:29	20:24	21:15	21:56	21:56	21:12	20:04	18:54	16:51	16:22
11	08:42	08:01	07:01	06:49	05:48	05:13	05:25	06:10	07:01	07:52	07:48	08:35
	16:44	17:39	18:31	20:25	21:17	21:56	21:55	21:10	20:02	18:52	16:50	16:22
12	08:41	07:59	06:59	06:47	05:46	05:13	05:26	06:12	07:03	07:54	07:50	08:36
	16:46	17:41	18:33	20:27	21:18	21:57	21:54	21:08	20:00	18:49	16:48	16:22
13	08:41	07:57	06:56	06:44	05:44	05:13	05:28	06:13	07:05	07:56	07:52	08:37
	16:47	17:43	18:35	20:29	21:20	21:58	21:54	21:06	19:57	18:47	16:47	16:22
14	08:40	07:55	06:54	06:42	05:43	05:13	05:29	06:15	07:06	07:57	07:53	08:38
	16:49	17:45	18:36	20:31	21:22	21:58	21:53	21:04	19:55	18:45	16:45	16:21
15	08:39	07:53	06:52	06:40	05:41	05:12	05:30	06:17	07:08	07:59	07:55	08:38
	16:50	17:47	18:38	20:32	21:23	21:59	21:52	21:02	19:52	18:43	16:44	16:22
16	08:38	07:51	06:49	06:38	05:39	05:12	05:31	06:18	07:10	08:01	07:57	08:39
	16:52	17:49	18:40	20:34	21:25	22:00	21:51	21:00	19:50	18:40	16:42	16:22
17	08:37	07:49	06:47	06:35	05:38	05:12	05:32	06:20	07:11	08:03	07:59	08:40
	16:54	17:51	18:42	20:36	21:26	22:00	21:49	20:58	19:48	18:38	16:41	16:22
18	08:36	07:47	06:45	06:33	05:36	05:12	05:34	06:22	07:13	08:04	08:00	08:41
	16:55	17:52	18:44	20:38	21:28	22:00	21:48	20:56	19:45	18:36	16:40	16:22
19	08:35	07:45	06:42	06:31	05:35	05:12	05:35	06:23	07:15	08:06	08:02	08:42
	16:57	17:54	18:45	20:39	21:29	22:01	21:47	20:54	19:43	18:34	16:38	16:22
20	08:34	07:43	06:40	06:29	05:34	05:12	05:36	06:25	07:16	08:08	08:04	08:42
	16:59	17:56	18:47	20:41	21:31	22:01	21:46	20:52	19:41	18:32	16:37	16:23
21	08:33	07:41	06:38	06:27	05:32	05:12	05:38	06:26	07:18	08:10	08:06	08:43
	17:00	17:58	18:49	20:43	21:32	22:01	21:45	20:50	19:38	18:30	16:36	16:23
22	08:32	07:39	06:35	06:24	05:31	05:13	05:39	06:28	07:20	08:12	08:07	08:43
	17:02	18:00	18:51	20:45	21:34	22:02	21:43	20:47	19:36	18:27	16:35	16:24
23	08:31	07:37	06:33	06:22	05:30	05:13	05:40	06:30	07:21	08:13	08:09	08:44
	17:04	18:02	18:52	20:46	21:35	22:02	21:42	20:45	19:33	18:25	16:33	16:24
24	08:29	07:34	06:31	06:20	05:28	05:13	05:42	06:31	07:23	08:15	08:11	08:44
	17:06	18:04	18:54	20:48	21:37	22:02	21:41	20:43	19:31	18:23	16:32	16:25
25	08:28	07:32	06:28	06:18	05:27	05:13	05:43	06:33	07:25	07:17	08:12	08:45
	17:07	18:06	18:56	20:50	21:38	22:02	21:39	20:41	19:29	17:21	16:31	16:25
26	08:27	07:30	06:26	06:16	05:26	05:14	05:45	06:35	07:26	07:19	08:14	08:45
	17:09	18:07	18:58	20:51	21:39	22:02	21:38	20:39	19:26	17:19	16:30	16:26
27	08:25	07:28	06:24	06:14	05:25	05:14	05:46	06:36	07:28	07:21	08:16	08:45
	17:11	18:09	18:59	20:53	21:41	22:02	21:36	20:36	19:24	17:17	16:29	16:27
28	08:24	07:26	06:21	06:12	05:24	05:15	05:48	06:38	07:30	07:22	08:17	08:45
	17:13	18:11	19:01	20:55	21:42	22:02	21:35	20:34	19:22	17:15	16:28	16:28
29	08:23		07:19	06:10	05:23	05:15	05:49	06:40	07:31	07:24	08:19	08:46
	17:15		20:03	20:57	21:43	22:01	21:33	20:32	19:19	17:13	16:28	16:28
30	08:21		07:17	06:08	05:22	05:16	05:51	06:41	07:33	07:26	08:20	08:46
	17:17		20:05	20:58	21:44	22:01	21:32	20:30	19:17	17:11	16:27	16:29
31	08:20		07:14		05:21		05:52	06:43		07:28		08:46
	17:18		20:06		21:46		21:30	20:27		17:09		16:30
Potential sun hours	257	277	367	417	487	502	504	455	381	331	264	241
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
Jennings O'Donovan
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F91 RHH9 Sligo
+353719161416
padraig / podowd@jodireland.com

Calculated:
11/06/2025 09:22/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Real Case - V150 **Shadow receptor:** AT - 49

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:46	08:18	07:24	07:12	06:06	05:20	05:17	05:54	06:45	07:35	07:30	08:22
	16:32	17:20	18:13	20:08	21:00	21:47	22:01	21:28	20:25	19:15	17:07	16:26
2	08:46	08:16	07:21	07:10	06:04	05:19	05:17	05:55	06:46	07:37	07:32	08:23
	16:33	17:22	18:15	20:10	21:02	21:48	22:01	21:27	20:23	19:12	17:05	16:25
3	08:45	08:15	07:19	07:07	06:02	05:18	05:18	05:57	06:48	07:38	07:33	08:25
	16:34	17:24	18:17	20:12	21:03	21:49	22:00	21:25	20:21	19:10	17:04	16:25
4	08:45	08:13	07:17	07:05	06:00	05:17	05:19	05:59	06:50	07:40	07:35	08:26
	16:35	17:26	18:18	20:13	21:05	21:50	22:00	21:23	20:18	19:08	17:02	16:24
5	08:45	08:11	07:15	07:03	05:58	05:17	05:20	06:00	06:51	07:42	07:37	08:27
	16:36	17:28	18:20	20:15	21:07	21:51	21:59	21:21	20:16	19:05	17:00	16:24
6	08:45	08:10	07:12	07:00	05:56	05:16	05:20	06:02	06:53	07:43	07:39	08:29
	16:37	17:30	18:22	20:17	21:09	21:52	21:59	21:20	20:14	19:03	16:58	16:23
7	08:44	08:08	07:10	06:58	05:55	05:15	05:21	06:03	06:55	07:45	07:41	08:30
	16:39	17:32	18:24	20:19	21:10	21:53	21:58	21:18	20:11	19:01	16:56	16:23
8	08:44	08:06	07:08	06:56	05:53	05:15	05:22	06:05	06:56	07:47	07:43	08:31
	16:40	17:34	18:26	20:20	21:12	21:54	21:58	21:16	20:09	18:58	16:55	16:22
9	08:43	08:04	07:06	06:53	05:51	05:14	05:23	06:07	06:58	07:49	07:44	08:32
	16:41	17:35	18:28	20:22	21:14	21:55	21:57	21:14	20:07	18:56	16:53	16:22
10	08:43	08:03	07:03	06:51	05:49	05:14	05:24	06:08	07:00	07:50	07:46	08:33
	16:43	17:37	18:29	20:24	21:15	21:56	21:56	21:12	20:04	18:54	16:51	16:22
11	08:42	08:01	07:01	06:49	05:48	05:13	05:25	06:10	07:01	07:52	07:48	08:35
	16:44	17:39	18:31	20:25	21:17	21:56	21:55	21:10	20:02	18:52	16:50	16:22
12	08:41	07:59	06:59	06:47	05:46	05:13	05:26	06:12	07:03	07:54	07:50	08:36
	16:46	17:41	18:33	20:27	21:18	21:57	21:54	21:08	20:00	18:49	16:48	16:22
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	16:49	17:45	18:36	20:31	21:22	21:58	21:53	21:04	19:55	18:45	16:45	16:21
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	16:50	17:47	18:38	20:32	21:23	21:59	21:52	21:02	19:52	18:43	16:44	16:22
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	16:52	17:49	18:40	20:34	21:25	22:00	21:51	21:00	19:50	18:40	16:42	16:22
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	16:54	17:51	18:42	20:36	21:26	22:00	21:49	20:58	19:48	18:38	16:41	16:22
18	08:36	07:47	06:45	06:33	05:36	05:12	05:34	06:21	07:13	08:04	08:00	08:41
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19	08:35	07:45	06:42	06:31	05:35	05:12	05:35	06:23	07:15	08:06	08:02	08:42
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21	08:33	07:41	06:38	06:27	05:32	05:12	05:38	06:26	07:18	08:10	08:06	08:43
	17:00	17:58	18:49	20:43	21:32	22:01	21:45	20:50	19:38	18:30	16:36	16:23
22	08:32	07:39	06:35	06:24	05:31	05:13	05:39	06:28	07:20	08:12	08:07	08:43
	17:02	18:00	18:51	20:45	21:34	22:02	21:43	20:47	19:36	18:27	16:35	16:24
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25	08:28	07:32	06:28	06:18	05:27	05:13	05:43	06:33	07:25	07:17	08:12	08:45
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	17:09	18:07	18:58	20:51	21:39	22:02	21:38	20:39	19:26	17:19	16:30	16:26
27	08:25	07:28	06:24	06:14	05:25	05:14	05:46	06:36	07:28	07:21	08:16	08:45
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	17:13	18:11	19:01	20:55	21:42	22:02	21:35	20:34	19:22	17:15	16:28	16:28
29	08:23		07:19	06:10	05:23	05:15	05:49	06:40	07:31	07:24	08:19	08:46
	17:15		20:03	20:57	21:43	22:01	21:33	20:32	19:19	17:13	16:28	16:28
30	08:21		07:17	06:08	05:22	05:16	05:51	06:41	07:33	07:26	08:20	08:46
	17:17		20:05	20:58	21:44	22:01	21:32	20:30	19:17	17:11	16:27	16:29
31	08:20		07:14		05:21		05:52	06:43		07:28		08:46
	17:18		20:06		21:46		21:30	20:27		17:09		16:30
Potential sun hours	257	277	367	417	487	502	504	455	381	331	264	241
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
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Finisklin Business Park
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padraig / podowd@jodireland.com

Calculated:
11/06/2025 09:22/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Real Case - V150 **Shadow receptor:** AU - 50

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:46	08:18	07:24	07:12	06:06	05:20	05:17	05:54	06:45	07:35	07:30	08:22
	16:32	17:20	18:13	20:08	21:00	21:47	22:01	21:28	20:25	19:15	17:07	16:26
2	08:46	08:16	07:21	07:10	06:04	05:19	05:17	05:55	06:46	07:37	07:32	08:23
	16:33	17:22	18:15	20:10	21:02	21:48	22:01	21:27	20:23	19:12	17:05	16:25
3	08:45	08:15	07:19	07:07	06:02	05:18	05:18	05:57	06:48	07:38	07:33	08:25
	16:34	17:24	18:17	20:12	21:03	21:49	22:00	21:25	20:21	19:10	17:04	16:25
4	08:45	08:13	07:17	07:05	06:00	05:17	05:19	05:59	06:50	07:40	07:35	08:26
	16:35	17:26	18:18	20:13	21:05	21:50	22:00	21:23	20:18	19:08	17:02	16:24
5	08:45	08:11	07:15	07:03	05:58	05:17	05:20	06:00	06:51	07:42	07:37	08:27
	16:36	17:28	18:20	20:15	21:07	21:51	21:59	21:21	20:16	19:05	17:00	16:24
6	08:45	08:10	07:12	07:00	05:56	05:16	05:20	06:02	06:53	07:43	07:39	08:29
	16:37	17:30	18:22	20:17	21:09	21:52	21:59	21:20	20:14	19:03	16:58	16:23
7	08:44	08:08	07:10	06:58	05:55	05:15	05:21	06:03	06:55	07:45	07:41	08:30
	16:39	17:32	18:24	20:18	21:10	21:53	21:58	21:18	20:11	19:01	16:56	16:23
8	08:44	08:06	07:08	06:56	05:53	05:15	05:22	06:05	06:56	07:47	07:43	08:31
	16:40	17:34	18:26	20:20	21:12	21:54	21:58	21:16	20:09	18:58	16:55	16:22
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	16:41	17:35	18:28	20:22	21:14	21:55	21:57	21:14	20:07	18:56	16:53	16:22
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	16:43	17:37	18:29	20:24	21:15	21:56	21:56	21:12	20:04	18:54	16:51	16:22
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12	08:41	07:59	06:59	06:47	05:46	05:13	05:26	06:12	07:03	07:54	07:50	08:36
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	16:49	17:45	18:36	20:31	21:22	21:58	21:53	21:04	19:55	18:45	16:45	16:21
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	16:50	17:47	18:38	20:32	21:23	21:59	21:52	21:02	19:52	18:43	16:44	16:22
16	08:38	07:51	06:49	06:38	05:39	05:12	05:31	06:18	07:10	08:01	07:57	08:39
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17	08:37	07:49	06:47	06:35	05:38	05:12	05:32	06:20	07:11	08:03	07:59	08:40
	16:54	17:51	18:42	20:36	21:26	22:00	21:49	20:58	19:48	18:38	16:41	16:22
18	08:36	07:47	06:45	06:33	05:36	05:12	05:34	06:21	07:13	08:04	08:00	08:41
	16:55	17:52	18:44	20:38	21:28	22:00	21:48	20:56	19:45	18:36	16:40	16:22
19	08:35	07:45	06:42	06:31	05:35	05:12	05:35	06:23	07:15	08:06	08:02	08:42
	16:57	17:54	18:45	20:39	21:29	22:01	21:47	20:54	19:43	18:34	16:38	16:22
20	08:34	07:43	06:40	06:29	05:34	05:12	05:36	06:25	07:16	08:08	08:04	08:42
	16:59	17:56	18:47	20:41	21:31	22:01	21:46	20:52	19:41	18:32	16:37	16:23
21	08:33	07:41	06:38	06:27	05:32	05:12	05:38	06:26	07:18	08:10	08:06	08:43
	17:00	17:58	18:49	20:43	21:32	22:01	21:45	20:50	19:38	18:30	16:36	16:23
22	08:32	07:39	06:35	06:24	05:31	05:13	05:39	06:28	07:20	08:11	08:07	08:43
	17:02	18:00	18:51	20:45	21:34	22:02	21:43	20:47	19:36	18:27	16:35	16:24
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27	08:25	07:28	06:24	06:14	05:25	05:14	05:46	06:36	07:28	07:21	08:16	08:45
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28	08:24	07:26	06:21	06:12	05:24	05:15	05:48	06:38	07:30	07:22	08:17	08:45
	17:13	18:11	19:01	20:55	21:42	22:02	21:35	20:34	19:22	17:15	16:28	16:28
29	08:23		07:19	06:10	05:23	05:15	05:49	06:40	07:31	07:24	08:19	08:46
	17:15		20:03	20:57	21:43	22:01	21:33	20:32	19:19	17:13	16:28	16:28
30	08:21		07:17	06:08	05:22	05:16	05:51	06:41	07:33	07:26	08:20	08:46
	17:17		20:05	20:58	21:44	22:01	21:32	20:30	19:17	17:11	16:27	16:29
31	08:20		07:14		05:21		05:52	06:43		07:28		08:46
	17:18		20:06		21:46		21:30	20:27		17:09		16:30
Potential sun hours	257	277	367	417	487	502	504	455	381	331	264	241
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
Jennings O'Donovan
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+353719161416
padraig / podowd@jodireland.com

Calculated:
11/06/2025 09:22/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Real Case - V150 **Shadow receptor:** AV - 51

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:46	08:18	07:24	07:12	06:06	05:20	05:17	05:54	06:45	07:35	07:30	08:22
	16:32	17:20	18:13	20:08	21:00	21:47	22:01	21:28	20:25	19:15	17:07	16:26
2	08:46	08:16	07:21	07:10	06:04	05:19	05:17	05:55	06:46	07:37	07:32	08:23
	16:33	17:22	18:15	20:10	21:02	21:48	22:01	21:27	20:23	19:12	17:05	16:25
3	08:45	08:15	07:19	07:07	06:02	05:18	05:18	05:57	06:48	07:38	07:33	08:25
	16:34	17:24	18:17	20:12	21:03	21:49	22:00	21:25	20:21	19:10	17:04	16:25
4	08:45	08:13	07:17	07:05	06:00	05:17	05:19	05:59	06:50	07:40	07:35	08:26
	16:35	17:26	18:18	20:13	21:05	21:50	22:00	21:23	20:18	19:08	17:02	16:24
5	08:45	08:11	07:15	07:03	05:58	05:17	05:20	06:00	06:51	07:42	07:37	08:27
	16:36	17:28	18:20	20:15	21:07	21:51	21:59	21:21	20:16	19:05	17:00	16:24
6	08:45	08:10	07:12	07:00	05:56	05:16	05:20	06:02	06:53	07:43	07:39	08:29
	16:37	17:30	18:22	20:17	21:09	21:52	21:59	21:20	20:14	19:03	16:58	16:23
7	08:44	08:08	07:10	06:58	05:55	05:15	05:21	06:03	06:55	07:45	07:41	08:30
	16:39	17:32	18:24	20:18	21:10	21:53	21:58	21:18	20:11	19:01	16:56	16:23
8	08:44	08:06	07:08	06:56	05:53	05:15	05:22	06:05	06:56	07:47	07:43	08:31
	16:40	17:34	18:26	20:20	21:12	21:54	21:58	21:16	20:09	18:58	16:55	16:22
9	08:43	08:04	07:06	06:53	05:51	05:14	05:23	06:07	06:58	07:49	07:44	08:32
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10	08:43	08:03	07:03	06:51	05:49	05:14	05:24	06:08	07:00	07:50	07:46	08:33
	16:43	17:37	18:29	20:24	21:15	21:56	21:56	21:12	20:04	18:54	16:51	16:22
11	08:42	08:01	07:01	06:49	05:48	05:13	05:25	06:10	07:01	07:52	07:48	08:35
	16:44	17:39	18:31	20:25	21:17	21:56	21:55	21:10	20:02	18:51	16:50	16:22
12	08:41	07:59	06:59	06:47	05:46	05:13	05:26	06:12	07:03	07:54	07:50	08:36
	16:46	17:41	18:33	20:27	21:18	21:57	21:54	21:08	19:59	18:49	16:48	16:22
13	08:41	07:57	06:56	06:44	05:44	05:13	05:28	06:13	07:05	07:56	07:52	08:37
	16:47	17:43	18:35	20:29	21:20	21:58	21:54	21:06	19:57	18:47	16:47	16:21
14	08:40	07:55	06:54	06:42	05:43	05:13	05:29	06:15	07:06	07:57	07:53	08:38
	16:49	17:45	18:36	20:31	21:22	21:58	21:53	21:04	19:55	18:45	16:45	16:21
15	08:39	07:53	06:52	06:40	05:41	05:12	05:30	06:17	07:08	07:59	07:55	08:38
	16:50	17:47	18:38	20:32	21:23	21:59	21:52	21:02	19:52	18:43	16:44	16:22
16	08:38	07:51	06:49	06:38	05:39	05:12	05:31	06:18	07:10	08:01	07:57	08:39
	16:52	17:49	18:40	20:34	21:25	22:00	21:51	21:00	19:50	18:40	16:42	16:22
17	08:37	07:49	06:47	06:35	05:38	05:12	05:32	06:20	07:11	08:03	07:59	08:40
	16:54	17:51	18:42	20:36	21:26	22:00	21:49	20:58	19:48	18:38	16:41	16:22
18	08:36	07:47	06:45	06:33	05:36	05:12	05:34	06:21	07:13	08:04	08:00	08:41
	16:55	17:52	18:44	20:38	21:28	22:00	21:48	20:56	19:45	18:36	16:40	16:22
19	08:35	07:45	06:42	06:31	05:35	05:12	05:35	06:23	07:15	08:06	08:02	08:42
	16:57	17:54	18:45	20:39	21:29	22:01	21:47	20:54	19:43	18:34	16:38	16:22
20	08:34	07:43	06:40	06:29	05:34	05:12	05:36	06:25	07:16	08:08	08:04	08:42
	16:59	17:56	18:47	20:41	21:31	22:01	21:46	20:52	19:41	18:32	16:37	16:23
21	08:33	07:41	06:38	06:27	05:32	05:12	05:38	06:26	07:18	08:10	08:06	08:43
	17:00	17:58	18:49	20:43	21:32	22:01	21:45	20:50	19:38	18:30	16:36	16:23
22	08:32	07:39	06:35	06:24	05:31	05:13	05:39	06:28	07:20	08:11	08:07	08:43
	17:02	18:00	18:51	20:45	21:34	22:02	21:43	20:47	19:36	18:27	16:35	16:24
23	08:31	07:37	06:33	06:22	05:30	05:13	05:40	06:30	07:21	08:13	08:09	08:44
	17:04	18:02	18:52	20:46	21:35	22:02	21:42	20:45	19:33	18:25	16:33	16:24
24	08:29	07:34	06:31	06:20	05:28	05:13	05:42	06:31	07:23	08:15	08:11	08:44
	17:06	18:04	18:54	20:48	21:37	22:02	21:41	20:43	19:31	18:23	16:32	16:25
25	08:28	07:32	06:28	06:18	05:27	05:13	05:43	06:33	07:25	07:17	08:12	08:45
	17:07	18:06	18:56	20:50	21:38	22:02	21:39	20:41	19:29	17:21	16:31	16:25
26	08:27	07:30	06:26	06:16	05:26	05:14	05:45	06:35	07:26	07:19	08:14	08:45
	17:09	18:07	18:58	20:51	21:39	22:02	21:38	20:39	19:26	17:19	16:30	16:26
27	08:25	07:28	06:24	06:14	05:25	05:14	05:46	06:36	07:28	07:21	08:16	08:45
	17:11	18:09	18:59	20:53	21:41	22:02	21:36	20:36	19:24	17:17	16:29	16:27
28	08:24	07:26	06:21	06:12	05:24	05:15	05:48	06:38	07:30	07:22	08:17	08:45
	17:13	18:11	19:01	20:55	21:42	22:02	21:35	20:34	19:22	17:15	16:28	16:28
29	08:23		07:19	06:10	05:23	05:15	05:49	06:40	07:31	07:24	08:19	08:46
	17:15		20:03	20:57	21:43	22:01	21:33	20:32	19:19	17:13	16:28	16:28
30	08:21		07:17	06:08	05:22	05:16	05:51	06:41	07:33	07:26	08:20	08:46
	17:17		20:05	20:58	21:44	22:01	21:32	20:30	19:17	17:11	16:27	16:29
31	08:20		07:14		05:21		05:52	06:43		07:28		08:46
	17:18		20:06		21:46		21:30	20:27		17:09		16:30
Potential sun hours	257	277	367	417	487	502	504	455	381	331	264	241
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
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Finisklin Business Park
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padraig / podowd@jodireland.com

Calculated:
11/06/2025 09:22/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Real Case - V150 **Shadow receptor:** AW - 62

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:46	08:18	07:23	07:12	06:06	05:20	05:16	05:54	06:45	07:35	07:30	08:22
	16:32	17:20	18:13	20:08	21:00	21:47	22:01	21:28	20:25	19:14	17:07	16:26
2	08:46	08:16	07:21	07:09	06:04	05:19	05:17	05:55	06:46	07:36	07:31	08:23
	16:33	17:22	18:15	20:10	21:02	21:48	22:01	21:26	20:23	19:12	17:05	16:25
3	08:45	08:15	07:19	07:07	06:02	05:18	05:18	05:57	06:48	07:38	07:33	08:24
	16:34	17:24	18:17	20:11	21:03	21:49	22:00	21:25	20:20	19:10	17:04	16:25
4	08:45	08:13	07:17	07:05	06:00	05:17	05:19	05:59	06:50	07:40	07:35	08:26
	16:35	17:26	18:18	20:13	21:05	21:50	22:00	21:23	20:18	19:07	17:02	16:24
5	08:45	08:11	07:15	07:02	05:58	05:17	05:20	06:00	06:51	07:42	07:37	08:27
	16:36	17:28	18:20	20:15	21:07	21:51	21:59	21:21	20:16	19:05	17:00	16:24
6	08:45	08:10	07:12	07:00	05:56	05:16	05:20	06:02	06:53	07:43	07:39	08:28
	16:37	17:30	18:22	20:17	21:08	21:52	21:59	21:19	20:13	19:03	16:58	16:23
7	08:44	08:08	07:10	06:58	05:55	05:15	05:21	06:03	06:55	07:45	07:41	08:30
	16:39	17:32	18:24	20:18	21:10	21:53	21:58	21:18	20:11	19:01	16:56	16:23
8	08:44	08:06	07:08	06:56	05:53	05:15	05:22	06:05	06:56	07:47	07:42	08:31
	16:40	17:33	18:26	20:20	21:12	21:54	21:57	21:16	20:09	18:58	16:55	16:22
9	08:43	08:04	07:05	06:53	05:51	05:14	05:23	06:07	06:58	07:48	07:44	08:32
	16:41	17:35	18:27	20:22	21:13	21:55	21:57	21:14	20:06	18:56	16:53	16:22
10	08:43	08:02	07:03	06:51	05:49	05:14	05:24	06:08	07:00	07:50	07:46	08:33
	16:43	17:37	18:29	20:24	21:15	21:56	21:56	21:12	20:04	18:54	16:51	16:22
11	08:42	08:01	07:01	06:49	05:47	05:13	05:25	06:10	07:01	07:52	07:48	08:34
	16:44	17:39	18:31	20:25	21:17	21:56	21:55	21:10	20:02	18:51	16:50	16:22
12	08:41	07:59	06:59	06:46	05:46	05:13	05:26	06:12	07:03	07:54	07:50	08:35
	16:46	17:41	18:33	20:27	21:18	21:57	21:54	21:08	19:59	18:49	16:48	16:21
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	16:47	17:43	18:35	20:29	21:20	21:58	21:53	21:06	19:57	18:47	16:47	16:21
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	16:49	17:45	18:36	20:31	21:22	21:58	21:52	21:04	19:55	18:45	16:45	16:21
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	16:50	17:47	18:38	20:32	21:23	21:59	21:51	21:02	19:52	18:42	16:44	16:21
16	08:38	07:51	06:49	06:37	05:39	05:12	05:31	06:18	07:10	08:01	07:57	08:39
	16:52	17:49	18:40	20:34	21:25	21:59	21:50	21:00	19:50	18:40	16:42	16:22
17	08:37	07:49	06:47	06:35	05:38	05:12	05:32	06:20	07:11	08:02	07:59	08:40
	16:54	17:51	18:42	20:36	21:26	22:00	21:49	20:58	19:48	18:38	16:41	16:22
18	08:36	07:47	06:45	06:33	05:36	05:12	05:34	06:21	07:13	08:04	08:00	08:41
	16:55	17:52	18:43	20:38	21:28	22:00	21:48	20:56	19:45	18:36	16:39	16:22
19	08:35	07:45	06:42	06:31	05:35	05:12	05:35	06:23	07:15	08:06	08:02	08:42
	16:57	17:54	18:45	20:39	21:29	22:01	21:47	20:54	19:43	18:34	16:38	16:22
20	08:34	07:43	06:40	06:29	05:33	05:12	05:36	06:25	07:16	08:08	08:04	08:42
	16:59	17:56	18:47	20:41	21:31	22:01	21:46	20:52	19:40	18:32	16:37	16:23
21	08:33	07:41	06:38	06:27	05:32	05:12	05:38	06:26	07:18	08:10	08:06	08:43
	17:00	17:58	18:49	20:43	21:32	22:01	21:45	20:49	19:38	18:29	16:36	16:23
22	08:32	07:39	06:35	06:24	05:31	05:12	05:39	06:28	07:20	08:11	08:07	08:43
	17:02	18:00	18:50	20:44	21:34	22:01	21:43	20:47	19:36	18:27	16:34	16:23
23	08:31	07:36	06:33	06:22	05:29	05:13	05:40	06:30	07:21	08:13	08:09	08:44
	17:04	18:02	18:52	20:46	21:35	22:02	21:42	20:45	19:33	18:25	16:33	16:24
24	08:29	07:34	06:31	06:20	05:28	05:13	05:42	06:31	07:23	08:15	08:11	08:44
	17:06	18:04	18:54	20:48	21:37	22:02	21:41	20:43	19:31	18:23	16:32	16:25
25	08:28	07:32	06:28	06:18	05:27	05:13	05:43	06:33	07:25	07:17	08:12	08:45
	17:07	18:05	18:56	20:50	21:38	22:02	21:39	20:41	19:29	17:21	16:31	16:25
26	08:27	07:30	06:26	06:16	05:26	05:14	05:45	06:35	07:26	07:19	08:14	08:45
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27	08:25	07:28	06:23	06:14	05:25	05:14	05:46	06:36	07:28	07:20	08:15	08:45
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28	08:24	07:26	06:21	06:12	05:24	05:15	05:48	06:38	07:30	07:22	08:17	08:45
	17:13	18:11	19:01	20:55	21:42	22:02	21:35	20:34	19:22	17:15	16:28	16:27
29	08:22		07:19	06:10	05:23	05:15	05:49	06:40	07:31	07:24	08:19	08:46
	17:15		20:03	20:57	21:43	22:01	21:33	20:32	19:19	17:13	16:28	16:28
30	08:21		07:16	06:08	05:22	05:16	05:51	06:41	07:33	07:26	08:20	08:46
	17:16		20:04	20:58	21:44	22:01	21:31	20:30	19:17	17:11	16:27	16:29
31	08:19		07:14		05:21		05:52	06:43		07:28		08:46
	17:18		20:06		21:46		21:30	20:27		17:09		16:30
Potential sun hours	257	277	367	417	487	502	504	455	381	331	264	241
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
Jennings O'Donovan
Finisklin Business Park
F91 RHH9 Sligo
+353719161416
padraig / podowd@jodireland.com

Calculated:
11/06/2025 09:22/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Real Case - V150 **Shadow receptor:** AX - 63

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:46	08:18	07:23	07:12	06:06	05:20	05:16	05:54	06:45	07:35	07:30	08:22
	16:32	17:20	18:13	20:08	21:00	21:47	22:01	21:28	20:25	19:14	17:07	16:26
2	08:46	08:16	07:21	07:09	06:04	05:19	05:17	05:55	06:46	07:36	07:31	08:23
	16:33	17:22	18:15	20:10	21:02	21:48	22:01	21:26	20:23	19:12	17:05	16:25
3	08:45	08:15	07:19	07:07	06:02	05:18	05:18	05:57	06:48	07:38	07:33	08:24
	16:34	17:24	18:17	20:11	21:03	21:49	22:00	21:25	20:20	19:10	17:04	16:25
4	08:45	08:13	07:17	07:05	06:00	05:17	05:19	05:59	06:50	07:40	07:35	08:26
	16:35	17:26	18:18	20:13	21:05	21:50	22:00	21:23	20:18	19:07	17:02	16:24
5	08:45	08:11	07:15	07:02	05:58	05:17	05:20	06:00	06:51	07:42	07:37	08:27
	16:36	17:28	18:20	20:15	21:07	21:51	21:59	21:21	20:16	19:05	17:00	16:24
6	08:45	08:10	07:12	07:00	05:56	05:16	05:20	06:02	06:53	07:43	07:39	08:28
	16:37	17:30	18:22	20:17	21:08	21:52	21:59	21:19	20:13	19:03	16:58	16:23
7	08:44	08:08	07:10	06:58	05:55	05:15	05:21	06:03	06:55	07:45	07:41	08:30
	16:39	17:32	18:24	20:18	21:10	21:53	21:58	21:18	20:11	19:01	16:56	16:23
8	08:44	08:06	07:08	06:56	05:53	05:15	05:22	06:05	06:56	07:47	07:42	08:31
	16:40	17:33	18:26	20:20	21:12	21:54	21:57	21:16	20:09	18:58	16:55	16:22
9	08:43	08:04	07:05	06:53	05:51	05:14	05:23	06:07	06:58	07:48	07:44	08:32
	16:41	17:35	18:27	20:22	21:13	21:55	21:57	21:14	20:06	18:56	16:53	16:22
10	08:43	08:02	07:03	06:51	05:49	05:14	05:24	06:08	07:00	07:50	07:46	08:33
	16:43	17:37	18:29	20:24	21:15	21:56	21:56	21:12	20:04	18:54	16:51	16:22
11	08:42	08:01	07:01	06:49	05:47	05:13	05:25	06:10	07:01	07:52	07:48	08:34
	16:44	17:39	18:31	20:25	21:17	21:56	21:55	21:10	20:02	18:51	16:50	16:22
12	08:41	07:59	06:59	06:46	05:46	05:13	05:26	06:12	07:03	07:54	07:50	08:35
	16:46	17:41	18:33	20:27	21:18	21:57	21:54	21:08	19:59	18:49	16:48	16:21
13	08:41	07:57	06:56	06:44	05:44	05:13	05:28	06:13	07:05	07:55	07:52	08:36
	16:47	17:43	18:35	20:29	21:20	21:58	21:53	21:06	19:57	18:47	16:47	16:21
14	08:40	07:55	06:54	06:42	05:43	05:12	05:29	06:15	07:06	07:57	07:53	08:37
	16:49	17:45	18:36	20:31	21:22	21:58	21:52	21:04	19:55	18:45	16:45	16:21
15	08:39	07:53	06:52	06:40	05:41	05:12	05:30	06:16	07:08	07:59	07:55	08:38
	16:50	17:47	18:38	20:32	21:23	21:59	21:51	21:02	19:52	18:42	16:44	16:21
16	08:38	07:51	06:49	06:37	05:39	05:12	05:31	06:18	07:10	08:01	07:57	08:39
	16:52	17:49	18:40	20:34	21:25	21:59	21:50	21:00	19:50	18:40	16:42	16:22
17	08:37	07:49	06:47	06:35	05:38	05:12	05:32	06:20	07:11	08:02	07:59	08:40
	16:54	17:51	18:42	20:36	21:26	22:00	21:49	20:58	19:48	18:38	16:41	16:22
18	08:36	07:47	06:45	06:33	05:36	05:12	05:34	06:21	07:13	08:04	08:00	08:41
	16:55	17:52	18:43	20:38	21:28	22:00	21:48	20:56	19:45	18:36	16:39	16:22
19	08:35	07:45	06:42	06:31	05:35	05:12	05:35	06:23	07:15	08:06	08:02	08:42
	16:57	17:54	18:45	20:39	21:29	22:01	21:47	20:54	19:43	18:34	16:38	16:22
20	08:34	07:43	06:40	06:29	05:33	05:12	05:36	06:25	07:16	08:08	08:04	08:42
	16:59	17:56	18:47	20:41	21:31	22:01	21:46	20:52	19:40	18:32	16:37	16:23
21	08:33	07:41	06:38	06:27	05:32	05:12	05:38	06:26	07:18	08:10	08:06	08:43
	17:00	17:58	18:49	20:43	21:32	22:01	21:45	20:49	19:38	18:29	16:36	16:23
22	08:32	07:39	06:35	06:24	05:31	05:12	05:39	06:28	07:20	08:11	08:07	08:43
	17:02	18:00	18:50	20:44	21:34	22:01	21:43	20:47	19:36	18:27	16:34	16:23
23	08:31	07:36	06:33	06:22	05:29	05:13	05:40	06:30	07:21	08:13	08:09	08:44
	17:04	18:02	18:52	20:46	21:35	22:02	21:42	20:45	19:33	18:25	16:33	16:24
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25	08:28	07:32	06:28	06:18	05:27	05:13	05:43	06:33	07:25	07:17	08:12	08:45
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	17:11	18:09	18:59	20:53	21:41	22:02	21:36	20:36	19:24	17:17	16:29	16:27
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29	08:22		07:19	06:10	05:23	05:15	05:49	06:40	07:31	07:24	08:19	08:46
	17:15		20:03	20:57	21:43	22:01	21:33	20:32	19:19	17:13	16:28	16:28
30	08:21		07:16	06:08	05:22	05:16	05:51	06:41	07:33	07:26	08:20	08:46
	17:16		20:04	20:58	21:44	22:01	21:31	20:30	19:17	17:11	16:27	16:29
31	08:19		07:14		05:21		05:52	06:43		07:28		08:46
	17:18		20:06		21:46		21:30	20:27		17:09		16:30
Potential sun hours	257	277	367	417	487	502	504	455	381	331	264	241
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

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padraig / podowd@jodireland.com
Calculated:
11/06/2025 09:22/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Real Case - V150 **Shadow receptor:** AY - 64

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:46	08:18	07:23	07:12	06:06	05:20	05:16	05:54	06:45	07:35	07:30	08:22
	16:32	17:20	18:13	20:08	21:00	21:47	22:01	21:28	20:25	19:14	17:07	16:26
2	08:46	08:16	07:21	07:09	06:04	05:19	05:17	05:55	06:46	07:36	07:31	08:23
	16:33	17:22	18:15	20:10	21:02	21:48	22:01	21:26	20:23	19:12	17:05	16:25
3	08:45	08:15	07:19	07:07	06:02	05:18	05:18	05:57	06:48	07:38	07:33	08:24
	16:34	17:24	18:17	20:11	21:03	21:49	22:00	21:25	20:20	19:10	17:04	16:25
4	08:45	08:13	07:17	07:05	06:00	05:17	05:19	05:59	06:50	07:40	07:35	08:26
	16:35	17:26	18:18	20:13	21:05	21:50	22:00	21:23	20:18	19:07	17:02	16:24
5	08:45	08:11	07:15	07:02	05:58	05:17	05:20	06:00	06:51	07:42	07:37	08:27
	16:36	17:28	18:20	20:15	21:07	21:51	21:59	21:21	20:16	19:05	17:00	16:24
6	08:45	08:10	07:12	07:00	05:56	05:16	05:20	06:02	06:53	07:43	07:39	08:28
	16:37	17:30	18:22	20:17	21:08	21:52	21:59	21:19	20:13	19:03	16:58	16:23
7	08:44	08:08	07:10	06:58	05:55	05:15	05:21	06:03	06:55	07:45	07:41	08:30
	16:39	17:32	18:24	20:18	21:10	21:53	21:58	21:18	20:11	19:01	16:56	16:23
8	08:44	08:06	07:08	06:56	05:53	05:15	05:22	06:05	06:56	07:47	07:42	08:31
	16:40	17:33	18:26	20:20	21:12	21:54	21:57	21:16	20:09	18:58	16:55	16:22
9	08:43	08:04	07:05	06:53	05:51	05:14	05:23	06:07	06:58	07:48	07:44	08:32
	16:41	17:35	18:27	20:22	21:13	21:55	21:57	21:14	20:06	18:56	16:53	16:22
10	08:43	08:02	07:03	06:51	05:49	05:14	05:24	06:08	07:00	07:50	07:46	08:33
	16:43	17:37	18:29	20:24	21:15	21:56	21:56	21:12	20:04	18:54	16:51	16:22
11	08:42	08:01	07:01	06:49	05:47	05:13	05:25	06:10	07:01	07:52	07:48	08:34
	16:44	17:39	18:31	20:25	21:17	21:56	21:55	21:10	20:02	18:51	16:50	16:22
12	08:41	07:59	06:59	06:46	05:46	05:13	05:26	06:12	07:03	07:54	07:50	08:35
	16:46	17:41	18:33	20:27	21:18	21:57	21:54	21:08	19:59	18:49	16:48	16:21
13	08:41	07:57	06:56	06:44	05:44	05:13	05:28	06:13	07:05	07:55	07:52	08:36
	16:47	17:43	18:35	20:29	21:20	21:58	21:53	21:06	19:57	18:47	16:47	16:21
14	08:40	07:55	06:54	06:42	05:43	05:12	05:29	06:15	07:06	07:57	07:53	08:37
	16:49	17:45	18:36	20:31	21:22	21:58	21:52	21:04	19:55	18:45	16:45	16:21
15	08:39	07:53	06:52	06:40	05:41	05:12	05:30	06:16	07:08	07:59	07:55	08:38
	16:50	17:47	18:38	20:32	21:23	21:59	21:51	21:02	19:52	18:42	16:44	16:21
16	08:38	07:51	06:49	06:37	05:39	05:12	05:31	06:18	07:10	08:01	07:57	08:39
	16:52	17:49	18:40	20:34	21:25	21:59	21:50	21:00	19:50	18:40	16:42	16:22
17	08:37	07:49	06:47	06:35	05:38	05:12	05:32	06:20	07:11	08:02	07:59	08:40
	16:54	17:51	18:42	20:36	21:26	22:00	21:49	20:58	19:48	18:38	16:41	16:22
18	08:36	07:47	06:45	06:33	05:36	05:12	05:34	06:21	07:13	08:04	08:00	08:41
	16:55	17:52	18:43	20:38	21:28	22:00	21:48	20:56	19:45	18:36	16:39	16:22
19	08:35	07:45	06:42	06:31	05:35	05:12	05:35	06:23	07:15	08:06	08:02	08:42
	16:57	17:54	18:45	20:39	21:29	22:01	21:47	20:54	19:43	18:34	16:38	16:22
20	08:34	07:43	06:40	06:29	05:33	05:12	05:36	06:25	07:16	08:08	08:04	08:42
	16:59	17:56	18:47	20:41	21:31	22:01	21:46	20:52	19:40	18:32	16:37	16:23
21	08:33	07:41	06:38	06:27	05:32	05:12	05:38	06:26	07:18	08:10	08:06	08:43
	17:00	17:58	18:49	20:43	21:32	22:01	21:45	20:49	19:38	18:29	16:36	16:23
22	08:32	07:39	06:35	06:24	05:31	05:12	05:39	06:28	07:20	08:11	08:07	08:43
	17:02	18:00	18:50	20:44	21:34	22:01	21:43	20:47	19:36	18:27	16:34	16:23
23	08:31	07:36	06:33	06:22	05:29	05:13	05:40	06:30	07:21	08:13	08:09	08:44
	17:04	18:02	18:52	20:46	21:35	22:02	21:42	20:45	19:33	18:25	16:33	16:24
24	08:29	07:34	06:31	06:20	05:28	05:13	05:42	06:31	07:23	08:15	08:11	08:44
	17:06	18:04	18:54	20:48	21:37	22:02	21:41	20:43	19:31	18:23	16:32	16:25
25	08:28	07:32	06:28	06:18	05:27	05:13	05:43	06:33	07:25	07:17	08:12	08:45
	17:07	18:05	18:56	20:50	21:38	22:02	21:39	20:41	19:29	17:21	16:31	16:25
26	08:27	07:30	06:26	06:16	05:26	05:14	05:45	06:35	07:26	07:19	08:14	08:45
	17:09	18:07	18:57	20:51	21:39	22:02	21:38	20:39	19:26	17:19	16:30	16:26
27	08:25	07:28	06:23	06:14	05:25	05:14	05:46	06:36	07:28	07:20	08:15	08:45
	17:11	18:09	18:59	20:53	21:41	22:02	21:36	20:36	19:24	17:17	16:29	16:27
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	17:13	18:11	19:01	20:55	21:42	22:02	21:35	20:34	19:22	17:15	16:28	16:27
29	08:22		07:19	06:10	05:23	05:15	05:49	06:40	07:31	07:24	08:19	08:46
	17:15		20:03	20:57	21:43	22:01	21:33	20:32	19:19	17:13	16:28	16:28
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Potential sun hours	257	277	367	417	487	502	504	455	381	331	264	241
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

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SHADOW - Calendar

Calculation: 6839 Garrane WF Real Case - V150 **Shadow receptor:** AZ - 65

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:46	08:18	07:23	07:12	06:06	05:20	05:16	05:54	06:45	07:35	07:30	08:22
	16:32	17:20	18:13	20:08	21:00	21:47	22:01	21:28	20:25	19:14	17:07	16:26
2	08:46	08:16	07:21	07:09	06:04	05:19	05:17	05:55	06:46	07:36	07:31	08:23
	16:33	17:22	18:15	20:10	21:02	21:48	22:01	21:26	20:23	19:12	17:05	16:25
3	08:45	08:15	07:19	07:07	06:02	05:18	05:18	05:57	06:48	07:38	07:33	08:24
	16:34	17:24	18:17	20:11	21:03	21:49	22:00	21:25	20:20	19:10	17:04	16:25
4	08:45	08:13	07:17	07:05	06:00	05:17	05:19	05:59	06:50	07:40	07:35	08:26
	16:35	17:26	18:18	20:13	21:05	21:50	22:00	21:23	20:18	19:07	17:02	16:24
5	08:45	08:11	07:15	07:02	05:58	05:17	05:20	06:00	06:51	07:42	07:37	08:27
	16:36	17:28	18:20	20:15	21:07	21:51	21:59	21:21	20:16	19:05	17:00	16:24
6	08:45	08:10	07:12	07:00	05:56	05:16	05:20	06:02	06:53	07:43	07:39	08:28
	16:37	17:30	18:22	20:17	21:08	21:52	21:59	21:19	20:13	19:03	16:58	16:23
7	08:44	08:08	07:10	06:58	05:55	05:15	05:21	06:03	06:55	07:45	07:41	08:30
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	16:41	17:35	18:27	20:22	21:13	21:55	21:57	21:14	20:06	18:56	16:53	16:22
10	08:43	08:02	07:03	06:51	05:49	05:14	05:24	06:08	07:00	07:50	07:46	08:33
	16:43	17:37	18:29	20:24	21:15	21:56	21:56	21:12	20:04	18:54	16:51	16:22
11	08:42	08:01	07:01	06:49	05:47	05:13	05:25	06:10	07:01	07:52	07:48	08:34
	16:44	17:39	18:31	20:25	21:17	21:56	21:55	21:10	20:02	18:51	16:50	16:22
12	08:41	07:59	06:59	06:46	05:46	05:13	05:26	06:12	07:03	07:54	07:50	08:35
	16:46	17:41	18:33	20:27	21:18	21:57	21:54	21:08	19:59	18:49	16:48	16:21
13	08:41	07:57	06:56	06:44	05:44	05:13	05:28	06:13	07:05	07:55	07:52	08:36
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14	08:40	07:55	06:54	06:42	05:43	05:12	05:29	06:15	07:06	07:57	07:53	08:37
	16:49	17:45	18:36	20:31	21:22	21:58	21:52	21:04	19:55	18:45	16:45	16:21
15	08:39	07:53	06:52	06:40	05:41	05:12	05:30	06:16	07:08	07:59	07:55	08:38
	16:50	17:47	18:38	20:32	21:23	21:59	21:51	21:02	19:52	18:42	16:44	16:21
16	08:38	07:51	06:49	06:37	05:39	05:12	05:31	06:18	07:10	08:01	07:57	08:39
	16:52	17:49	18:40	20:34	21:25	21:59	21:50	21:00	19:50	18:40	16:42	16:22
17	08:37	07:49	06:47	06:35	05:38	05:12	05:32	06:20	07:11	08:02	07:59	08:40
	16:54	17:51	18:42	20:36	21:26	22:00	21:49	20:58	19:48	18:38	16:41	16:22
18	08:36	07:47	06:45	06:33	05:36	05:12	05:34	06:21	07:13	08:04	08:00	08:41
	16:55	17:52	18:43	20:38	21:28	22:00	21:48	20:56	19:45	18:36	16:39	16:22
19	08:35	07:45	06:42	06:31	05:35	05:12	05:35	06:23	07:15	08:06	08:02	08:42
	16:57	17:54	18:45	20:39	21:29	22:01	21:47	20:54	19:43	18:34	16:38	16:22
20	08:34	07:43	06:40	06:29	05:33	05:12	05:36	06:25	07:16	08:08	08:04	08:42
	16:59	17:56	18:47	20:41	21:31	22:01	21:46	20:52	19:40	18:32	16:37	16:23
21	08:33	07:41	06:38	06:27	05:32	05:12	05:38	06:26	07:18	08:10	08:06	08:43
	17:00	17:58	18:49	20:43	21:32	22:01	21:45	20:49	19:38	18:29	16:36	16:23
22	08:32	07:39	06:35	06:24	05:31	05:12	05:39	06:28	07:20	08:11	08:07	08:43
	17:02	18:00	18:50	20:44	21:34	22:01	21:43	20:47	19:36	18:27	16:34	16:23
23	08:31	07:36	06:33	06:22	05:29	05:13	05:40	06:30	07:21	08:13	08:09	08:44
	17:04	18:02	18:52	20:46	21:35	22:02	21:42	20:45	19:33	18:25	16:33	16:24
24	08:29	07:34	06:31	06:20	05:28	05:13	05:42	06:31	07:23	08:15	08:11	08:44
	17:06	18:04	18:54	20:48	21:37	22:02	21:41	20:43	19:31	18:23	16:32	16:25
25	08:28	07:32	06:28	06:18	05:27	05:13	05:43	06:33	07:25	07:17	08:12	08:45
	17:07	18:05	18:56	20:50	21:38	22:02	21:39	20:41	19:29	17:21	16:31	16:25
26	08:27	07:30	06:26	06:16	05:26	05:14	05:45	06:35	07:26	07:19	08:14	08:45
	17:09	18:07	18:57	20:51	21:39	22:02	21:38	20:39	19:26	17:19	16:30	16:26
27	08:25	07:28	06:23	06:14	05:25	05:14	05:46	06:36	07:28	07:20	08:15	08:45
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28	08:24	07:26	06:21	06:12	05:24	05:15	05:48	06:38	07:30	07:22	08:17	08:45
	17:13	18:11	19:01	20:55	21:42	22:02	21:35	20:34	19:22	17:15	16:28	16:28
29	08:22		07:19	06:10	05:23	05:15	05:49	06:40	07:31	07:24	08:19	08:46
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Potential sun hours	257	277	367	417	487	502	504	455	381	331	264	241
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
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Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

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padraig / podowd@jodireland.com

Calculated:
11/06/2025 09:22/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Real Case - V150 **Shadow receptor:** BA - 66

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
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	January	February	March	April	May	June	July	August	September	October	November	December
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	16:32	17:20	18:13	20:08	21:00	21:47	22:01	21:28	20:25	19:14	17:07	16:26
2	08:46	08:16	07:21	07:09	06:04	05:19	05:17	05:55	06:46	07:36	07:31	08:23
	16:33	17:22	18:15	20:10	21:02	21:48	22:01	21:26	20:23	19:12	17:05	16:25
3	08:45	08:15	07:19	07:07	06:02	05:18	05:18	05:57	06:48	07:38	07:33	08:24
	16:34	17:24	18:17	20:11	21:03	21:49	22:00	21:25	20:20	19:10	17:04	16:25
4	08:45	08:13	07:17	07:05	06:00	05:17	05:19	05:59	06:50	07:40	07:35	08:26
	16:35	17:26	18:18	20:13	21:05	21:50	22:00	21:23	20:18	19:07	17:02	16:24
5	08:45	08:11	07:15	07:02	05:58	05:17	05:20	06:00	06:51	07:42	07:37	08:27
	16:36	17:28	18:20	20:15	21:07	21:51	21:59	21:21	20:16	19:05	17:00	16:24
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7	08:44	08:08	07:10	06:58	05:55	05:15	05:21	06:03	06:55	07:45	07:41	08:30
	16:39	17:32	18:24	20:18	21:10	21:53	21:58	21:18	20:11	19:01	16:56	16:23
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	16:40	17:33	18:26	20:20	21:12	21:54	21:57	21:16	20:09	18:58	16:55	16:22
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	16:43	17:37	18:29	20:24	21:15	21:56	21:56	21:12	20:04	18:54	16:51	16:22
11	08:42	08:01	07:01	06:49	05:47	05:13	05:25	06:10	07:01	07:52	07:48	08:34
	16:44	17:39	18:31	20:25	21:17	21:56	21:55	21:10	20:02	18:51	16:50	16:22
12	08:41	07:59	06:59	06:46	05:46	05:13	05:26	06:12	07:03	07:54	07:50	08:35
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	16:49	17:45	18:36	20:31	21:22	21:58	21:52	21:04	19:55	18:45	16:45	16:21
15	08:39	07:53	06:52	06:40	05:41	05:12	05:30	06:16	07:08	07:59	07:55	08:38
	16:50	17:47	18:38	20:32	21:23	21:59	21:51	21:02	19:52	18:42	16:44	16:21
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	16:52	17:49	18:40	20:34	21:25	21:59	21:50	21:00	19:50	18:40	16:42	16:22
17	08:37	07:49	06:47	06:35	05:38	05:12	05:32	06:20	07:11	08:02	07:59	08:40
	16:54	17:51	18:42	20:36	21:26	22:00	21:49	20:58	19:48	18:38	16:41	16:22
18	08:36	07:47	06:45	06:33	05:36	05:12	05:34	06:21	07:13	08:04	08:00	08:41
	16:55	17:52	18:43	20:38	21:28	22:00	21:48	20:56	19:45	18:36	16:39	16:22
19	08:35	07:45	06:42	06:31	05:35	05:12	05:35	06:23	07:15	08:06	08:02	08:42
	16:57	17:54	18:45	20:39	21:29	22:01	21:47	20:54	19:43	18:34	16:38	16:22
20	08:34	07:43	06:40	06:29	05:33	05:12	05:36	06:25	07:16	08:08	08:04	08:42
	16:59	17:56	18:47	20:41	21:31	22:01	21:46	20:52	19:40	18:32	16:37	16:23
21	08:33	07:41	06:38	06:27	05:32	05:12	05:38	06:26	07:18	08:10	08:06	08:43
	17:00	17:58	18:49	20:43	21:32	22:01	21:45	20:49	19:38	18:29	16:36	16:23
22	08:32	07:39	06:35	06:24	05:31	05:12	05:39	06:28	07:20	08:11	08:07	08:43
	17:02	18:00	18:50	20:44	21:34	22:01	21:43	20:47	19:36	18:27	16:34	16:23
23	08:31	07:36	06:33	06:22	05:29	05:13	05:40	06:30	07:21	08:13	08:09	08:44
	17:04	18:02	18:52	20:46	21:35	22:02	21:42	20:45	19:33	18:25	16:33	16:24
24	08:29	07:34	06:31	06:20	05:28	05:13	05:42	06:31	07:23	08:15	08:11	08:44
	17:06	18:04	18:54	20:48	21:37	22:02	21:41	20:43	19:31	18:23	16:32	16:25
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	17:07	18:05	18:56	20:50	21:38	22:02	21:39	20:41	19:29	17:21	16:31	16:25
26	08:27	07:30	06:26	06:16	05:26	05:14	05:45	06:35	07:26	07:19	08:14	08:45
	17:09	18:07	18:57	20:51	21:39	22:02	21:38	20:39	19:26	17:19	16:30	16:26
27	08:25	07:28	06:23	06:14	05:25	05:14	05:46	06:36	07:28	07:20	08:15	08:45
	17:11	18:09	18:59	20:53	21:41	22:02	21:36	20:36	19:24	17:17	16:29	16:27
28	08:24	07:26	06:21	06:12	05:24	05:15	05:48	06:38	07:30	07:22	08:17	08:45
	17:13	18:11	19:01	20:55	21:42	22:02	21:35	20:34	19:22	17:15	16:28	16:28
29	08:22		07:19	06:10	05:23	05:15	05:49	06:40	07:31	07:24	08:19	08:46
	17:15		20:03	20:57	21:43	22:01	21:33	20:32	19:19	17:13	16:28	16:28
30	08:21		07:16	06:08	05:22	05:16	05:51	06:41	07:33	07:26	08:20	08:46
	17:16		20:04	20:58	21:44	22:01	21:31	20:30	19:17	17:11	16:27	16:29
31	08:19		07:14		05:21		05:52	06:43		07:28		08:46
	17:18		20:06		21:46		21:30	20:27		17:09		16:30
Potential sun hours	257	277	367	417	487	502	504	455	381	331	264	241
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

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+353719161416
padraig / podowd@jodireland.com

SHADOW - Calendar

Calculation: 6839 Garrane WF Real Case - V150 **Shadow receptor:** BB - 67

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:46	08:18	07:23	07:12	06:06	05:20	05:16	05:54	06:45	07:35	07:30	08:22
	16:32	17:20	18:13	20:08	21:00	21:47	22:01	21:28	20:25	19:14	17:07	16:26
2	08:46	08:16	07:21	07:09	06:04	05:19	05:17	05:55	06:46	07:36	07:31	08:23
	16:33	17:22	18:15	20:10	21:02	21:48	22:01	21:26	20:23	19:12	17:05	16:25
3	08:45	08:15	07:19	07:07	06:02	05:18	05:18	05:57	06:48	07:38	07:33	08:24
	16:34	17:24	18:17	20:11	21:03	21:49	22:00	21:25	20:20	19:10	17:04	16:25
4	08:45	08:13	07:17	07:05	06:00	05:17	05:19	05:59	06:50	07:40	07:35	08:26
	16:35	17:26	18:18	20:13	21:05	21:50	22:00	21:23	20:18	19:07	17:02	16:24
5	08:45	08:11	07:15	07:02	05:58	05:17	05:20	06:00	06:51	07:42	07:37	08:27
	16:36	17:28	18:20	20:15	21:07	21:51	21:59	21:21	20:16	19:05	17:00	16:24
6	08:45	08:10	07:12	07:00	05:56	05:16	05:20	06:02	06:53	07:43	07:39	08:28
	16:37	17:30	18:22	20:17	21:08	21:52	21:59	21:19	20:13	19:03	16:58	16:23
7	08:44	08:08	07:10	06:58	05:55	05:15	05:21	06:03	06:55	07:45	07:41	08:30
	16:39	17:32	18:24	20:18	21:10	21:53	21:58	21:18	20:11	19:01	16:56	16:23
8	08:44	08:06	07:08	06:56	05:53	05:15	05:22	06:05	06:56	07:47	07:42	08:31
	16:40	17:33	18:26	20:20	21:12	21:54	21:57	21:16	20:09	18:58	16:55	16:22
9	08:43	08:04	07:05	06:53	05:51	05:14	05:23	06:07	06:58	07:48	07:44	08:32
	16:41	17:35	18:27	20:22	21:13	21:55	21:57	21:14	20:06	18:56	16:53	16:22
10	08:43	08:02	07:03	06:51	05:49	05:14	05:24	06:08	07:00	07:50	07:46	08:33
	16:43	17:37	18:29	20:24	21:15	21:56	21:56	21:12	20:04	18:54	16:51	16:22
11	08:42	08:01	07:01	06:49	05:47	05:13	05:25	06:10	07:01	07:52	07:48	08:34
	16:44	17:39	18:31	20:25	21:17	21:56	21:55	21:10	20:02	18:51	16:50	16:22
12	08:41	07:59	06:59	06:46	05:46	05:13	05:26	06:12	07:03	07:54	07:50	08:35
	16:46	17:41	18:33	20:27	21:18	21:57	21:54	21:08	19:59	18:49	16:48	16:21
13	08:41	07:57	06:56	06:44	05:44	05:13	05:28	06:13	07:05	07:55	07:52	08:36
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	16:49	17:45	18:36	20:31	21:22	21:58	21:52	21:04	19:55	18:45	16:45	16:21
15	08:39	07:53	06:52	06:40	05:41	05:12	05:30	06:16	07:08	07:59	07:55	08:38
	16:50	17:47	18:38	20:32	21:23	21:59	21:51	21:02	19:52	18:42	16:44	16:21
16	08:38	07:51	06:49	06:37	05:39	05:12	05:31	06:18	07:10	08:01	07:57	08:39
	16:52	17:49	18:40	20:34	21:25	21:59	21:50	21:00	19:50	18:40	16:42	16:22
17	08:37	07:49	06:47	06:35	05:38	05:12	05:32	06:20	07:11	08:02	07:59	08:40
	16:54	17:51	18:42	20:36	21:26	22:00	21:49	20:58	19:48	18:38	16:41	16:22
18	08:36	07:47	06:45	06:33	05:36	05:12	05:34	06:21	07:13	08:04	08:00	08:41
	16:55	17:52	18:43	20:38	21:28	22:00	21:48	20:56	19:45	18:36	16:39	16:22
19	08:35	07:45	06:42	06:31	05:35	05:12	05:35	06:23	07:15	08:06	08:02	08:42
	16:57	17:54	18:45	20:39	21:29	22:01	21:47	20:54	19:43	18:34	16:38	16:22
20	08:34	07:43	06:40	06:29	05:33	05:12	05:36	06:25	07:16	08:08	08:04	08:42
	16:59	17:56	18:47	20:41	21:31	22:01	21:46	20:52	19:40	18:32	16:37	16:23
21	08:33	07:41	06:38	06:27	05:32	05:12	05:38	06:26	07:18	08:10	08:06	08:43
	17:00	17:58	18:49	20:43	21:32	22:01	21:45	20:49	19:38	18:29	16:36	16:23
22	08:32	07:39	06:35	06:24	05:31	05:12	05:39	06:28	07:20	08:11	08:07	08:43
	17:02	18:00	18:50	20:44	21:34	22:01	21:43	20:47	19:36	18:27	16:34	16:23
23	08:31	07:36	06:33	06:22	05:29	05:13	05:40	06:30	07:21	08:13	08:09	08:44
	17:04	18:02	18:52	20:46	21:35	22:02	21:42	20:45	19:33	18:25	16:33	16:24
24	08:29	07:34	06:31	06:20	05:28	05:13	05:42	06:31	07:23	08:15	08:11	08:44
	17:06	18:04	18:54	20:48	21:37	22:02	21:41	20:43	19:31	18:23	16:32	16:25
25	08:28	07:32	06:28	06:18	05:27	05:13	05:43	06:33	07:25	07:17	08:12	08:45
	17:07	18:05	18:56	20:50	21:38	22:02	21:39	20:41	19:29	17:21	16:31	16:25
26	08:27	07:30	06:26	06:16	05:26	05:14	05:45	06:35	07:26	07:19	08:14	08:45
	17:09	18:07	18:57	20:51	21:39	22:02	21:38	20:39	19:26	17:19	16:30	16:26
27	08:25	07:28	06:23	06:14	05:25	05:14	05:46	06:36	07:28	07:20	08:15	08:45
	17:11	18:09	18:59	20:53	21:41	22:02	21:36	20:36	19:24	17:17	16:29	16:27
28	08:24	07:26	06:21	06:12	05:24	05:15	05:48	06:38	07:30	07:22	08:17	08:45
	17:13	18:11	19:01	20:55	21:42	22:02	21:35	20:34	19:22	17:15	16:28	16:28
29	08:22		07:19	06:10	05:23	05:15	05:49	06:40	07:31	07:24	08:19	08:46
	17:15		20:03	20:57	21:43	22:01	21:33	20:32	19:19	17:13	16:28	16:28
30	08:21		07:16	06:08	05:22	05:16	05:51	06:41	07:33	07:26	08:20	08:46
	17:17		20:04	20:58	21:44	22:01	21:31	20:30	19:17	17:11	16:27	16:29
31	08:19		07:14		05:21		05:52	06:43		07:28		08:46
	17:18		20:06		21:46		21:30	20:27		17:09		16:30
Potential sun hours	257	277	367	417	487	502	504	455	381	331	264	241
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
Jennings O'Donovan
Finisklin Business Park
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+353719161416
padraig / podowd@jodireland.com
Calculated:
11/06/2025 09:22/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Real Case - V150 **Shadow receptor:** BC - 68

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January	February	March	April	May	June	July	August	September	October	November	December		
1	08:46	08:18	07:23	07:12	06:06	05:20	05:16	05:54	06:45	07:35	07:30	08:22		
	16:32	17:20	18:13	20:08	21:00	21:47	22:01	21:28	20:25	19:14	17:07	16:26		
2	08:46	08:16	07:21	07:09	06:04	05:19	05:17	05:55	06:46	07:36	07:31	08:23		
	16:33	17:22	18:15	20:10	21:02	21:48	22:01	21:26	20:23	19:12	17:05	16:25		
3	08:45	08:15	07:19	07:07	06:02	05:18	05:18	05:57	06:48	07:38	07:33	08:24		
	16:34	17:24	18:17	20:11	21:03	21:49	22:00	21:25	20:20	19:10	17:04	16:25		
4	08:45	08:13	07:17	07:05	06:00	05:17	05:19	05:59	06:50	07:40	07:35	08:26		
	16:35	17:26	18:18	20:13	21:05	21:50	22:00	21:23	20:18	19:07	17:02	16:24		
5	08:45	08:11	07:15	07:02	05:58	05:17	05:20	06:00	06:51	07:42	07:37	08:27		
	16:36	17:28	18:20	20:15	21:07	21:51	21:59	21:21	20:16	19:05	17:00	16:24		
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	16:37	17:30	18:22	20:17	21:08	21:52	21:59	21:19	20:13	19:03	16:58	16:23		
7	08:44	08:08	07:10	06:58	05:55	05:15	05:21	06:03	06:55	07:45	07:41	08:30		
	16:39	17:32	18:24	20:18	21:10	21:53	21:58	21:18	20:11	19:01	16:56	16:23		
8	08:44	08:06	07:08	06:56	05:53	05:15	05:22	06:05	06:56	07:47	07:42	08:31		
	16:40	17:33	18:26	20:20	21:12	21:54	21:57	21:16	20:09	18:58	16:55	16:22		
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	16:41	17:35	18:27	20:22	21:13	21:55	21:57	21:14	20:06	18:56	16:53	16:22		
10	08:43	08:02	07:03	06:51	05:49	05:14	05:24	06:08	07:00	07:50	07:46	08:33		
	16:43	17:37	18:29	20:24	21:15	21:56	21:56	21:12	20:04	18:54	16:51	16:22		
11	08:42	08:01	07:01	06:49	05:47	05:13	05:25	06:10	07:01	07:52	07:48	08:34		
	16:44	17:39	18:31	20:25	21:17	21:56	21:55	21:10	20:02	18:51	16:50	16:22		
12	08:41	07:59	06:59	06:46	05:46	05:13	05:26	06:12	07:03	07:54	07:50	08:35		
	16:46	17:41	18:33	20:27	21:18	21:57	21:54	21:08	19:59	18:49	16:48	16:21		
13	08:41	07:57	06:56	06:44	05:44	05:13	05:28	06:13	07:05	07:55	07:52	08:36		
	16:47	17:43	18:35	20:29	21:20	21:58	21:53	21:06	19:57	18:47	16:47	16:21		
14	08:40	07:55	06:54	06:42	05:43	05:12	05:29	06:15	07:06	07:57	07:53	08:37		15:12 (9)
	16:49	17:45	18:36	20:31	21:22	21:58	21:52	21:04	19:55	18:45	16:45	16:21	2	15:14 (9)
15	08:39	07:53	06:52	06:40	05:41	05:12	05:30	06:16	07:08	07:59	07:55	08:38		15:11 (9)
	16:50	17:47	18:38	20:32	21:23	21:59	21:51	21:02	19:52	18:42	16:44	16:21	6	15:17 (9)
16	08:38	07:51	06:49	06:37	05:39	05:12	05:31	06:18	07:10	08:01	07:57	08:39		15:11 (9)
	16:52	17:49	18:40	20:34	21:25	21:59	21:50	21:00	19:50	18:40	16:42	16:22	7	15:18 (9)
17	08:37	07:49	06:47	06:35	05:38	05:12	05:32	06:20	07:11	08:02	07:59	08:40		15:11 (9)
	16:54	17:51	18:42	20:36	21:26	22:00	21:49	20:58	19:48	18:38	16:41	16:22	8	15:19 (9)
18	08:36	07:47	06:45	06:33	05:36	05:12	05:34	06:21	07:13	08:04	08:00	08:41		15:10 (9)
	16:55	17:52	18:43	20:38	21:28	22:00	21:48	20:56	19:45	18:36	16:39	16:22	10	15:20 (9)
19	08:35	07:45	06:42	06:31	05:35	05:12	05:35	06:23	07:15	08:06	08:02	08:42		15:11 (9)
	16:57	17:54	18:45	20:39	21:29	22:01	21:47	20:54	19:43	18:34	16:38	16:22	10	15:21 (9)
20	08:34	07:43	06:40	06:29	05:33	05:12	05:36	06:25	07:16	08:08	08:04	08:42		15:11 (9)
	16:59	17:56	18:47	20:41	21:31	22:01	21:46	20:52	19:40	18:32	16:37	16:23	11	15:22 (9)
21	08:33	07:41	06:38	06:27	05:32	05:12	05:38	06:26	07:18	08:10	08:06	08:43		15:11 (9)
	17:00	17:58	18:49	20:43	21:32	22:01	21:45	20:49	19:38	18:29	16:36	16:23	11	15:22 (9)
22	08:32	07:39	06:35	06:24	05:31	05:12	05:39	06:28	07:20	08:11	08:07	08:43		15:12 (9)
	17:02	18:00	18:50	20:44	21:34	22:01	21:43	20:47	19:36	18:27	16:34	16:23	11	15:23 (9)
23	08:31	07:36	06:33	06:22	05:29	05:13	05:40	06:30	07:21	08:13	08:09	08:44		15:12 (9)
	17:04	18:02	18:52	20:46	21:35	22:02	21:42	20:45	19:33	18:25	16:33	16:24	11	15:23 (9)
24	08:29	07:34	06:31	06:20	05:28	05:13	05:42	06:31	07:23	08:15	08:11	08:44		15:12 (9)
	17:06	18:04	18:54	20:48	21:37	22:02	21:41	20:43	19:31	18:23	16:32	16:25	11	15:23 (9)
25	08:28	07:32	06:28	06:18	05:27	05:13	05:43	06:33	07:25	07:17	08:12	08:45		15:14 (9)
	17:07	18:05	18:56	20:50	21:38	22:02	21:39	20:41	19:29	17:21	16:31	16:25	10	15:24 (9)
26	08:27	07:30	06:26	06:16	05:26	05:14	05:45	06:35	07:26	07:19	08:14	08:45		15:15 (9)
	17:09	18:07	18:57	20:51	21:39	22:02	21:38	20:39	19:26	17:19	16:30	16:26	8	15:23 (9)
27	08:25	07:28	06:23	06:14	05:25	05:14	05:46	06:36	07:28	07:20	08:15	08:45		15:15 (9)
	17:11	18:09	18:59	20:53	21:41	22:02	21:36	20:36	19:24	17:17	16:29	16:27	8	15:23 (9)
28	08:24	07:26	06:21	06:12	05:24	05:15	05:48	06:38	07:30	07:22	08:17	08:45		15:16 (9)
	17:13	18:11	19:01	20:55	21:42	22:02	21:35	20:34	19:22	17:15	16:28	16:28	7	15:23 (9)
29	08:22		07:19	06:10	05:23	05:15	05:49	06:40	07:31	07:24	08:19	08:46		15:18 (9)
	17:15		20:03	20:57	21:43	22:01	21:33	20:32	19:19	17:13	16:28	16:28	4	15:22 (9)
30	08:21		07:16	06:08	05:22	05:16	05:51	06:41	07:33	07:26	08:20	08:46		
	17:16		20:04	20:58	21:44	22:01	21:31	20:30	19:17	17:11	16:27	16:29		
31	08:19		07:14		05:21		05:52	06:43		07:28		08:46		
	17:18		20:06		21:46		21:30	20:27		17:09		16:30		
Potential sun hours	257	277	367	417	487	502	504	455	381	331	264	241		
Total, worst case													135	
Sun reduction													0.22	
Oper. time red.													1.00	
Wind dir. red.													0.62	
Total reduction													0.13	
Total, real													18	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
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Finisklin Business Park
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padraig / podowd@jodireland.com
Calculated:
11/06/2025 09:22/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Real Case - V150 **Shadow receptor:** BD - 69

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January	February	March	April	May	June	July	August	September	October	November	December		
1	08:46	08:18	07:23	07:12	06:06	05:20	05:16	05:54	06:45	07:35	07:30	08:22		
	16:32	17:20	18:13	20:08	21:00	21:47	22:01	21:28	20:25	19:14	17:07	16:26		
2	08:46	08:16	07:21	07:09	06:04	05:19	05:17	05:55	06:46	07:36	07:31	08:23		
	16:33	17:22	18:15	20:10	21:02	21:48	22:01	21:26	20:23	19:12	17:05	16:25		
3	08:45	08:15	07:19	07:07	06:02	05:18	05:18	05:57	06:48	07:38	07:33	08:24		
	16:34	17:24	18:17	20:11	21:03	21:49	22:00	21:25	20:20	19:10	17:04	16:25		
4	08:45	08:13	07:17	07:05	06:00	05:17	05:19	05:59	06:50	07:40	07:35	08:26		
	16:35	17:26	18:18	20:13	21:05	21:50	22:00	21:23	20:18	19:07	17:02	16:24		
5	08:45	08:11	07:15	07:02	05:58	05:17	05:20	06:00	06:51	07:42	07:37	08:27		
	16:36	17:28	18:20	20:15	21:07	21:51	21:59	21:21	20:16	19:05	17:00	16:24		
6	08:45	08:10	07:12	07:00	05:56	05:16	05:20	06:02	06:53	07:43	07:39	08:28		
	16:37	17:30	18:22	20:17	21:08	21:52	21:59	21:19	20:13	19:03	16:58	16:23		
7	08:44	08:08	07:10	06:58	05:55	05:15	05:21	06:03	06:55	07:45	07:41	08:30		
	16:39	17:32	18:24	20:18	21:10	21:53	21:58	21:18	20:11	19:01	16:56	16:23		
8	08:44	08:06	07:08	06:56	05:53	05:15	05:22	06:05	06:56	07:47	07:42	08:31		
	16:40	17:33	18:26	20:20	21:12	21:54	21:57	21:16	20:09	18:58	16:55	16:22		
9	08:43	08:04	07:05	06:53	05:51	05:14	05:23	06:07	06:58	07:48	07:44	08:32		
	16:41	17:35	18:27	20:22	21:13	21:55	21:57	21:14	20:06	18:56	16:53	16:22		
10	08:43	08:02	07:03	06:51	05:49	05:14	05:24	06:08	07:00	07:50	07:46	08:33		
	16:43	17:37	18:29	20:24	21:15	21:56	21:56	21:12	20:04	18:54	16:51	16:22		
11	08:42	08:01	07:01	06:49	05:47	05:13	05:25	06:10	07:01	07:52	07:48	08:34		
	16:44	17:39	18:31	20:25	21:17	21:56	21:55	21:10	20:02	18:51	16:50	16:22		
12	08:41	07:59	06:59	06:46	05:46	05:13	05:26	06:12	07:03	07:54	07:50	08:35		15:12 (9)
	16:46	17:41	18:33	20:27	21:18	21:57	21:54	21:08	19:59	18:49	16:48	16:21	3	15:15 (9)
13	08:41	07:57	06:56	06:44	05:44	05:13	05:28	06:13	07:05	07:55	07:52	08:36		15:11 (9)
	16:47	17:43	18:35	20:29	21:20	21:58	21:53	21:06	19:57	18:47	16:47	16:21	6	15:17 (9)
14	08:40	07:55	06:54	06:42	05:43	05:12	05:29	06:15	07:06	07:57	07:53	08:37		15:10 (9)
	16:49	17:45	18:36	20:31	21:22	21:58	21:52	21:04	19:55	18:45	16:45	16:21	9	15:19 (9)
15	08:39	07:53	06:52	06:40	05:41	05:12	05:30	06:16	07:08	07:59	07:55	08:38		15:10 (9)
	16:50	17:47	18:38	20:32	21:23	21:59	21:51	21:02	19:52	18:42	16:44	16:21	10	15:20 (9)
16	08:38	07:51	06:49	06:37	05:39	05:12	05:31	06:18	07:10	08:01	07:57	08:39		15:10 (9)
	16:52	17:49	18:40	20:34	21:25	21:59	21:50	21:00	19:50	18:40	16:42	16:22	11	15:21 (9)
17	08:37	07:49	06:47	06:35	05:38	05:12	05:32	06:20	07:11	08:02	07:59	08:40		15:10 (9)
	16:54	17:51	18:42	20:36	21:26	22:00	21:49	20:58	19:48	18:38	16:41	16:22	12	15:22 (9)
18	08:36	07:47	06:45	06:33	05:36	05:12	05:34	06:21	07:13	08:04	08:00	08:41		15:10 (9)
	16:55	17:52	18:43	20:38	21:28	22:00	21:48	20:56	19:45	18:36	16:39	16:22	12	15:22 (9)
19	08:35	07:45	06:42	06:31	05:35	05:12	05:35	06:23	07:15	08:06	08:02	08:42		15:10 (9)
	16:57	17:54	18:45	20:39	21:29	22:01	21:47	20:54	19:43	18:34	16:38	16:22	13	15:23 (9)
20	08:34	07:43	06:40	06:29	05:33	05:12	05:36	06:25	07:16	08:08	08:04	08:42		15:11 (9)
	16:59	17:56	18:47	20:41	21:31	22:01	21:46	20:52	19:40	18:32	16:37	16:23	13	15:24 (9)
21	08:33	07:41	06:38	06:27	05:32	05:12	05:38	06:26	07:18	08:10	08:06	08:43		15:11 (9)
	17:00	17:58	18:49	20:43	21:32	22:01	21:45	20:49	19:38	18:29	16:36	16:23	13	15:24 (9)
22	08:32	07:39	06:35	06:24	05:31	05:12	05:39	06:28	07:20	08:11	08:07	08:43		15:12 (9)
	17:02	18:00	18:50	20:44	21:34	22:01	21:43	20:47	19:36	18:27	16:34	16:23	13	15:25 (9)
23	08:31	07:36	06:33	06:22	05:29	05:13	05:40	06:30	07:21	08:13	08:09	08:44		15:12 (9)
	17:04	18:02	18:52	20:46	21:35	22:02	21:42	20:45	19:33	18:25	16:33	16:24	13	15:25 (9)
24	08:29	07:34	06:31	06:20	05:28	05:13	05:42	06:31	07:23	08:15	08:11	08:44		15:12 (9)
	17:06	18:04	18:54	20:48	21:37	22:02	21:41	20:43	19:31	18:23	16:32	16:25	13	15:25 (9)
25	08:28	07:32	06:28	06:18	05:27	05:13	05:43	06:33	07:25	07:17	08:12	08:45		15:14 (9)
	17:07	18:05	18:56	20:50	21:38	22:02	21:39	20:41	19:29	17:21	16:31	16:25	12	15:26 (9)
26	08:27	07:30	06:26	06:16	05:26	05:14	05:45	06:35	07:26	07:19	08:14	08:45		15:14 (9)
	17:09	18:07	18:57	20:51	21:39	22:02	21:38	20:39	19:26	17:19	16:30	16:26	12	15:26 (9)
27	08:25	07:28	06:23	06:14	05:25	05:14	05:46	06:36	07:28	07:20	08:15	08:45		15:15 (9)
	17:11	18:09	18:59	20:53	21:41	22:02	21:36	20:36	19:24	17:17	16:29	16:27	11	15:26 (9)
28	08:24	07:26	06:21	06:12	05:24	05:15	05:48	06:38	07:30	07:22	08:17	08:45		15:16 (9)
	17:13	18:11	19:01	20:55	21:42	22:02	21:35	20:34	19:22	17:15	16:28	16:28	10	15:26 (9)
29	08:22		07:19	06:10	05:23	05:15	05:49	06:40	07:31	07:24	08:19	08:46		15:17 (9)
	17:15		20:03	20:57	21:43	22:01	21:33	20:32	19:19	17:13	16:28	16:28	9	15:26 (9)
30	08:21		07:16	06:08	05:22	05:16	05:51	06:41	07:33	07:26	08:20	08:46		15:18 (9)
	17:16		20:04	20:58	21:44	22:01	21:31	20:30	19:17	17:11	16:27	16:29	7	15:25 (9)
31	08:19		07:14		05:21		05:52	06:43		07:28		08:46		15:20 (9)
	17:18		20:06		21:46		21:30	20:27		17:09		16:30	4	15:24 (9)
Potential sun hours	257	277	367	417	487	502	504	455	381	331	264	241		
Total, worst case													206	
Sun reduction													0.22	
Oper. time red.													1.00	
Wind dir. red.													0.62	
Total reduction													0.13	
Total, real													28	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
Jennings O'Donovan
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padraig / podowd@jodireland.com
Calculated:
11/06/2025 09:22/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Real Case - V150 **Shadow receptor:** BE - 70

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January			February	March	April	May	June	July	August	September	October	November	December		
1	08:46		15:20 (9)	08:18	07:23	07:12	06:06	05:20	05:16	05:54	06:45	07:35	07:30	08:22		
	16:32	15	15:35 (9)	17:20	18:13	20:08	21:00	21:47	22:01	21:28	20:25	19:14	17:07	16:26		
2	08:46		15:20 (9)	08:16	07:21	07:09	06:04	05:19	05:17	05:55	06:46	07:36	07:31	08:23		
	16:33	14	15:34 (9)	17:22	18:15	20:10	21:02	21:48	22:01	21:26	20:23	19:12	17:05	16:25		
3	08:45		15:21 (9)	08:15	07:19	07:07	06:02	05:18	05:18	05:57	06:48	07:38	07:33	08:24		
	16:34	13	15:34 (9)	17:24	18:17	20:11	21:03	21:49	22:00	21:25	20:20	19:10	17:04	16:25		
4	08:45		15:23 (9)	08:13	07:17	07:05	06:00	05:17	05:19	05:59	06:50	07:40	07:35	08:26		
	16:35	11	15:34 (9)	17:26	18:18	20:13	21:05	21:50	22:00	21:23	20:18	19:07	17:02	16:24		
5	08:45		15:24 (9)	08:11	07:15	07:02	05:58	05:17	05:20	06:00	06:51	07:42	07:37	08:27		
	16:36	9	15:33 (9)	17:28	18:20	20:15	21:07	21:51	21:59	21:21	20:16	19:05	17:00	16:24		
6	08:45		15:28 (9)	08:10	07:12	07:00	05:56	05:16	05:20	06:02	06:53	07:43	07:39	08:28		15:14 (9)
	16:37	3	15:31 (9)	17:30	18:22	20:17	21:08	21:52	21:59	21:19	20:13	19:03	16:58	16:23	3	15:17 (9)
7	08:44			08:08	07:10	06:58	05:55	05:15	05:21	06:03	06:55	07:45	07:41	08:30		15:12 (9)
	16:39			17:32	18:24	20:18	21:10	21:53	21:58	21:18	20:11	19:01	16:56	16:23	8	15:20 (9)
8	08:44			08:06	07:08	06:56	05:53	05:15	05:22	06:05	06:56	07:47	07:42	08:31		15:10 (9)
	16:40			17:33	18:26	20:20	21:12	21:54	21:57	21:16	20:09	18:58	16:55	16:22	11	15:21 (9)
9	08:43			08:04	07:05	06:53	05:51	05:14	05:23	06:07	06:58	07:48	07:44	08:32		15:11 (9)
	16:41			17:35	18:27	20:22	21:13	21:55	21:57	21:14	20:06	18:56	16:53	16:22	12	15:23 (9)
10	08:43			08:02	07:03	06:51	05:49	05:14	05:24	06:08	07:00	07:50	07:46	08:33		15:10 (9)
	16:43			17:37	18:29	20:24	21:15	21:56	21:56	21:12	20:04	18:54	16:51	16:22	14	15:24 (9)
11	08:42			08:01	07:01	06:49	05:47	05:13	05:25	06:10	07:01	07:52	07:48	08:34		15:10 (9)
	16:44			17:39	18:31	20:25	21:17	21:56	21:55	21:10	20:02	18:51	16:50	16:22	15	15:25 (9)
12	08:41			07:59	06:59	06:46	05:46	05:13	05:26	06:12	07:03	07:54	07:50	08:35		15:10 (9)
	16:46			17:41	18:33	20:27	21:18	21:57	21:54	21:08	19:59	18:49	16:48	16:21	16	15:26 (9)
13	08:41			07:57	06:56	06:44	05:44	05:13	05:28	06:13	07:05	07:55	07:51	08:36		15:09 (9)
	16:47			17:43	18:35	20:29	21:20	21:58	21:53	21:06	19:57	18:47	16:47	16:21	18	15:27 (9)
14	08:40			07:55	06:54	06:42	05:43	05:12	05:29	06:15	07:06	07:57	07:53	08:37		15:10 (9)
	16:49			17:45	18:36	20:31	21:22	21:58	21:52	21:04	19:55	18:45	16:45	16:21	18	15:28 (9)
15	08:39			07:53	06:52	06:40	05:41	05:12	05:30	06:16	07:08	07:59	07:55	08:38		15:10 (9)
	16:50			17:47	18:38	20:32	21:23	21:59	21:51	21:02	19:52	18:42	16:44	16:21	18	15:28 (9)
16	08:38			07:51	06:49	06:37	05:39	05:12	05:31	06:18	07:10	08:01	07:57	08:39		15:10 (9)
	16:52			17:49	18:40	20:34	21:25	21:59	21:50	21:00	19:50	18:40	16:42	16:22	19	15:29 (9)
17	08:37			07:49	06:47	06:35	05:38	05:12	05:32	06:20	07:11	08:02	07:59	08:40		15:11 (9)
	16:54			17:51	18:42	20:36	21:26	22:00	21:49	20:58	19:48	18:38	16:41	16:22	19	15:30 (9)
18	08:36			07:47	06:45	06:33	05:36	05:12	05:34	06:21	07:13	08:04	08:00	08:41		15:10 (9)
	16:55			17:52	18:43	20:38	21:28	22:00	21:48	20:56	19:45	18:36	16:39	16:22	20	15:30 (9)
19	08:35			07:45	06:42	06:31	05:35	05:12	05:35	06:23	07:15	08:06	08:02	08:42		15:11 (9)
	16:57			17:54	18:45	20:39	21:29	22:01	21:47	20:54	19:43	18:34	16:38	16:22	20	15:31 (9)
20	08:34			07:43	06:40	06:29	05:33	05:12	05:36	06:25	07:16	08:08	08:04	08:42		15:12 (9)
	16:59			17:56	18:47	20:41	21:31	22:01	21:46	20:52	19:40	18:32	16:37	16:23	20	15:32 (9)
21	08:33			07:41	06:38	06:27	05:32	05:12	05:38	06:26	07:18	08:10	08:06	08:43		15:12 (9)
	17:00			17:58	18:49	20:43	21:32	22:01	21:45	20:49	19:38	18:29	16:36	16:23	20	15:32 (9)
22	08:32			07:39	06:35	06:24	05:31	05:12	05:39	06:28	07:20	08:11	08:07	08:43		15:12 (9)
	17:02			18:00	18:50	20:44	21:34	22:01	21:43	20:47	19:36	18:27	16:34	16:23	21	15:33 (9)
23	08:31			07:36	06:33	06:22	05:29	05:13	05:40	06:30	07:21	08:13	08:09	08:44		15:13 (9)
	17:04			18:02	18:52	20:46	21:35	22:02	21:42	20:45	19:33	18:25	16:33	16:24	20	15:33 (9)
24	08:29			07:34	06:31	06:20	05:28	05:13	05:42	06:31	07:23	08:15	08:11	08:44		15:13 (9)
	17:06			18:04	18:54	20:48	21:37	22:02	21:41	20:43	19:31	18:23	16:32	16:25	20	15:33 (9)
25	08:28			07:32	06:28	06:18	05:27	05:13	05:43	06:33	07:25	07:17	08:12	08:45		15:14 (9)
	17:07			18:05	18:56	20:50	21:38	22:02	21:39	20:41	19:29	17:21	16:31	16:25	20	15:34 (9)
26	08:27			07:30	06:26	06:16	05:26	05:14	05:45	06:35	07:26	07:19	08:14	08:45		15:14 (9)
	17:09			18:07	18:57	20:51	21:39	22:02	21:38	20:39	19:26	17:19	16:30	16:26	20	15:34 (9)
27	08:25			07:28	06:23	06:14	05:25	05:14	05:46	06:36	07:28	07:20	08:15	08:45		15:15 (9)
	17:11			18:09	18:59	20:53	21:41	22:02	21:36	20:36	19:24	17:17	16:29	16:27	19	15:34 (9)
28	08:24			07:26	06:21	06:12	05:24	05:15	05:48	06:38	07:30	07:22	08:17	08:45		15:16 (9)
	17:13			18:11	19:01	20:55	21:42	22:02	21:35	20:34	19:22	17:15	16:28	16:28	18	15:34 (9)
29	08:22				07:19	06:10	05:23	05:15	05:49	06:40	07:31	07:24	08:19	08:46		15:16 (9)
	17:15				20:03	20:57	21:43	22:01	21:33	20:32	19:19	17:13	16:28	16:28	19	15:35 (9)
30	08:21				07:16	06:08	05:22	05:16	05:51	06:41	07:33	07:26	08:20	08:46		15:17 (9)
	17:17				20:04	20:58	21:44	22:01	21:31	20:30	19:17	17:11	16:27	16:29	18	15:35 (9)
31	08:19				07:14		05:21		05:52	06:43		07:28		08:46		15:18 (9)
	17:18				20:06		21:46		21:30	20:27		17:09		16:30	17	15:35 (9)
Potential sun hours	257			277	367	417	487	502	504	455	381	331	264	241		
Total, worst case		65													443	
Sun reduction		0.22													0.22	
Oper. time red.		1.00													1.00	
Wind dir. red.		0.62													0.62	
Total reduction		0.13													0.13	
Total, real		9													60	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

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padraig / podowd@jodireland.com
Calculated:
11/06/2025 09:22/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Real Case - V150 **Shadow receptor:** BF - 71

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January			February	March	April	May	June	July	August	September	October	November	December		
1	08:46		15:20 (9)	08:18	07:23	07:12	06:06	05:20	05:16	05:54	06:45	07:35	07:30	08:22		
	16:32	17	15:37 (9)	17:20	18:13	20:08	21:00	21:47	22:01	21:28	20:25	19:14	17:07	16:26		
2	08:46		15:20 (9)	08:16	07:21	07:09	06:04	05:19	05:17	05:55	06:46	07:36	07:31	08:23		
	16:33	16	15:36 (9)	17:22	18:15	20:10	21:02	21:48	22:01	21:26	20:23	19:12	17:05	16:25		
3	08:45		15:21 (9)	08:15	07:19	07:07	06:02	05:18	05:18	05:57	06:48	07:38	07:33	08:24		
	16:34	15	15:36 (9)	17:24	18:17	20:11	21:03	21:49	22:00	21:25	20:20	19:10	17:04	16:25		
4	08:45		15:23 (9)	08:13	07:17	07:05	06:00	05:17	05:19	05:59	06:50	07:40	07:35	08:26		
	16:35	13	15:36 (9)	17:26	18:18	20:13	21:05	21:50	22:00	21:23	20:18	19:07	17:02	16:24		
5	08:45		15:24 (9)	08:11	07:15	07:02	05:58	05:17	05:20	06:00	06:51	07:42	07:37	08:27		15:14 (9)
	16:36	11	15:35 (9)	17:28	18:20	20:15	21:07	21:51	21:59	21:21	20:16	19:05	17:00	16:24	3	15:17 (9)
6	08:45		15:26 (9)	08:10	07:12	07:00	05:56	05:16	05:20	06:02	06:53	07:43	07:39	08:28		15:12 (9)
	16:37	9	15:35 (9)	17:30	18:22	20:17	21:08	21:52	21:59	21:19	20:13	19:03	16:58	16:23	9	15:21 (9)
7	08:44		15:29 (9)	08:08	07:10	06:58	05:55	05:15	05:21	06:03	06:55	07:45	07:41	08:30		15:11 (9)
	16:39	3	15:32 (9)	17:32	18:24	20:18	21:10	21:53	21:58	21:18	20:11	19:01	16:56	16:23	11	15:22 (9)
8	08:44			08:06	07:08	06:56	05:53	05:15	05:22	06:05	06:56	07:47	07:42	08:31		15:10 (9)
	16:40			17:33	18:26	20:20	21:12	21:54	21:57	21:16	20:09	18:58	16:55	16:22	13	15:23 (9)
9	08:43			08:04	07:05	06:53	05:51	05:14	05:23	06:07	06:58	07:48	07:44	08:32		15:10 (9)
	16:41			17:35	18:27	20:22	21:13	21:55	21:57	21:14	20:06	18:56	16:53	16:22	15	15:25 (9)
10	08:43			08:02	07:03	06:51	05:49	05:14	05:24	06:08	07:00	07:50	07:46	08:33		15:10 (9)
	16:43			17:37	18:29	20:24	21:15	21:56	21:56	21:12	20:04	18:54	16:51	16:22	16	15:26 (9)
11	08:42			08:01	07:01	06:49	05:47	05:13	05:25	06:10	07:01	07:52	07:48	08:34		15:10 (9)
	16:44			17:39	18:31	20:25	21:17	21:56	21:55	21:10	20:02	18:51	16:50	16:22	17	15:27 (9)
12	08:41			07:59	06:59	06:46	05:46	05:13	05:26	06:12	07:03	07:54	07:50	08:35		15:10 (9)
	16:46			17:41	18:33	20:27	21:18	21:57	21:54	21:08	19:59	18:49	16:48	16:21	18	15:28 (9)
13	08:41			07:57	06:56	06:44	05:44	05:13	05:28	06:13	07:05	07:55	07:51	08:36		15:10 (9)
	16:47			17:43	18:35	20:29	21:20	21:58	21:53	21:06	19:57	18:47	16:47	16:21	18	15:28 (9)
14	08:40			07:55	06:54	06:42	05:43	05:12	05:29	06:15	07:06	07:57	07:53	08:37		15:10 (9)
	16:49			17:45	18:36	20:31	21:22	21:58	21:52	21:04	19:55	18:45	16:45	16:21	19	15:29 (9)
15	08:39			07:53	06:52	06:40	05:41	05:12	05:30	06:16	07:08	07:59	07:55	08:38		15:10 (9)
	16:50			17:47	18:38	20:32	21:23	21:59	21:51	21:02	19:52	18:42	16:44	16:21	20	15:30 (9)
16	08:38			07:51	06:49	06:37	05:39	05:12	05:31	06:18	07:10	08:01	07:57	08:39		15:10 (9)
	16:52			17:49	18:40	20:34	21:25	21:59	21:50	21:00	19:50	18:40	16:42	16:22	21	15:31 (9)
17	08:37			07:49	06:47	06:35	05:38	05:12	05:32	06:20	07:11	08:02	07:59	08:40		15:11 (9)
	16:54			17:51	18:42	20:36	21:26	22:00	21:49	20:58	19:48	18:38	16:41	16:22	21	15:32 (9)
18	08:36			07:47	06:45	06:33	05:36	05:12	05:34	06:21	07:13	08:04	08:00	08:41		15:11 (9)
	16:55			17:52	18:43	20:38	21:28	22:00	21:48	20:56	19:45	18:36	16:39	16:22	21	15:32 (9)
19	08:35			07:45	06:42	06:31	05:35	05:12	05:35	06:23	07:15	08:06	08:02	08:42		15:11 (9)
	16:57			17:54	18:45	20:39	21:29	22:01	21:47	20:54	19:43	18:34	16:38	16:22	21	15:32 (9)
20	08:34			07:43	06:40	06:29	05:33	05:12	05:36	06:25	07:16	08:08	08:04	08:42		15:12 (9)
	16:59			17:56	18:47	20:41	21:31	22:01	21:46	20:52	19:40	18:32	16:37	16:23	21	15:33 (9)
21	08:33			07:41	06:38	06:27	05:32	05:12	05:38	06:26	07:18	08:10	08:06	08:43		15:12 (9)
	17:00			17:58	18:49	20:43	21:32	22:01	21:45	20:49	19:38	18:29	16:36	16:23	21	15:33 (9)
22	08:32			07:39	06:35	06:24	05:31	05:12	05:39	06:28	07:20	08:11	08:07	08:43		15:13 (9)
	17:02			18:00	18:50	20:44	21:34	22:01	21:43	20:47	19:36	18:27	16:34	16:23	21	15:34 (9)
23	08:31			07:36	06:33	06:22	05:29	05:13	05:40	06:30	07:21	08:13	08:09	08:44		15:13 (9)
	17:04			18:02	18:52	20:46	21:35	22:02	21:42	20:45	19:33	18:25	16:33	16:24	21	15:34 (9)
24	08:29			07:34	06:31	06:20	05:28	05:13	05:42	06:31	07:23	08:15	08:11	08:44		15:13 (9)
	17:06			18:04	18:54	20:48	21:37	22:02	21:41	20:43	19:31	18:23	16:32	16:25	21	15:34 (9)
25	08:28			07:32	06:28	06:18	05:27	05:13	05:43	06:33	07:25	07:17	08:12	08:45		15:14 (9)
	17:07			18:05	18:56	20:50	21:38	22:02	21:39	20:41	19:29	17:21	16:31	16:25	21	15:35 (9)
26	08:27			07:30	06:26	06:16	05:26	05:14	05:45	06:35	07:26	07:19	08:14	08:45		15:15 (9)
	17:09			18:07	18:57	20:51	21:39	22:02	21:38	20:39	19:26	17:19	16:30	16:26	21	15:36 (9)
27	08:25			07:28	06:23	06:14	05:25	05:14	05:46	06:36	07:28	07:20	08:15	08:45		15:15 (9)
	17:11			18:09	18:59	20:53	21:41	22:02	21:36	20:36	19:24	17:17	16:29	16:27	21	15:36 (9)
28	08:24			07:26	06:21	06:12	05:24	05:15	05:48	06:38	07:30	07:22	08:17	08:45		15:16 (9)
	17:13			18:11	19:01	20:55	21:42	22:02	21:35	20:34	19:22	17:15	16:28	16:28	20	15:36 (9)
29	08:22				07:19	06:10	05:23	05:15	05:49	06:40	07:31	07:24	08:19	08:46		15:17 (9)
	17:15				20:03	20:57	21:43	22:01	21:33	20:32	19:19	17:13	16:28	16:28	19	15:36 (9)
30	08:21				07:16	06:08	05:22	05:16	05:51	06:41	07:33	07:26	08:20	08:46		15:17 (9)
	17:17				20:04	20:58	21:44	22:01	21:31	20:30	19:17	17:11	16:27	16:29	19	15:36 (9)
31	08:19				07:14		05:21		05:52	06:43		07:28		08:46		15:18 (9)
	17:18				20:06		21:46		21:30	20:27		17:09		16:30	19	15:37 (9)
Potential sun hours	257			277	367	417	487	502	504	455	381	331	264	241		
Total, worst case		84													488	
Sun reduction		0.22													0.22	
Oper. time red.		1.00													1.00	
Wind dir. red.		0.62													0.62	
Total reduction		0.13													0.14	
Total, real		11													66	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
Jennings O'Donovan
Finisklin Business Park
F91 RHH9 Sligo
+353719161416
padraig / podowd@jodireland.com
Calculated:
11/06/2025 09:22/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Real Case - V150 **Shadow receptor:** BG - 72

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January			February	March	April	May	June	July	August	September	October	November	December		
1	08:46		15:17 (9)	08:18	07:23	07:12	06:06	05:20	05:16	05:54	06:45	07:35	07:30	08:22		
	16:32	15	15:32 (9)	17:20	18:13	20:08	21:00	21:47	22:01	21:28	20:25	19:14	17:07	16:26		
2	08:46		15:17 (9)	08:16	07:21	07:09	06:04	05:19	05:17	05:55	06:46	07:36	07:31	08:23		
	16:33	15	15:32 (9)	17:22	18:15	20:10	21:02	21:48	22:01	21:26	20:23	19:12	17:05	16:25		
3	08:45		15:18 (9)	08:15	07:19	07:07	06:02	05:18	05:18	05:57	06:48	07:38	07:33	08:24		
	16:34	14	15:32 (9)	17:24	18:17	20:11	21:03	21:49	22:00	21:25	20:20	19:10	17:04	16:25		
4	08:45		15:20 (9)	08:13	07:17	07:05	06:00	05:17	05:19	05:59	06:50	07:40	07:35	08:26		
	16:35	11	15:31 (9)	17:26	18:18	20:13	21:05	21:50	22:00	21:23	20:18	19:07	17:02	16:24		
5	08:45		15:22 (9)	08:11	07:15	07:02	05:58	05:17	05:20	06:00	06:51	07:42	07:37	08:27		
	16:36	8	15:30 (9)	17:28	18:20	20:15	21:07	21:51	21:59	21:21	20:16	19:05	17:00	16:24		
6	08:45		15:25 (9)	08:10	07:12	07:00	05:56	05:16	05:20	06:02	06:53	07:43	07:39	08:28		15:11 (9)
	16:37	4	15:29 (9)	17:30	18:22	20:17	21:08	21:52	21:59	21:19	20:13	19:03	16:58	16:23	3	15:14 (9)
7	08:44			08:08	07:10	06:58	05:55	05:15	05:21	06:03	06:55	07:45	07:41	08:30		15:09 (9)
	16:39			17:32	18:24	20:18	21:10	21:53	21:58	21:18	20:11	19:01	16:56	16:23	8	15:17 (9)
8	08:44			08:06	07:08	06:56	05:53	05:15	05:22	06:05	06:56	07:47	07:42	08:31		15:08 (9)
	16:40			17:33	18:26	20:20	21:12	21:54	21:57	21:16	20:09	18:58	16:55	16:22	10	15:18 (9)
9	08:43			08:04	07:05	06:53	05:51	05:14	05:23	06:07	06:58	07:48	07:44	08:32		15:08 (9)
	16:41			17:35	18:27	20:22	21:13	21:55	21:57	21:14	20:06	18:56	16:53	16:22	13	15:21 (9)
10	08:43			08:02	07:03	06:51	05:49	05:14	05:24	06:08	07:00	07:50	07:46	08:33		15:07 (9)
	16:43			17:37	18:29	20:24	21:15	21:56	21:56	21:12	20:04	18:54	16:51	16:22	15	15:22 (9)
11	08:42			08:01	07:01	06:49	05:47	05:13	05:25	06:10	07:01	07:52	07:48	08:34		15:07 (9)
	16:44			17:39	18:31	20:25	21:17	21:56	21:55	21:10	20:02	18:51	16:50	16:22	16	15:23 (9)
12	08:41			07:59	06:59	06:46	05:46	05:13	05:26	06:12	07:03	07:54	07:50	08:35		15:06 (9)
	16:46			17:41	18:33	20:27	21:18	21:57	21:54	21:08	19:59	18:49	16:48	16:21	17	15:23 (9)
13	08:41			07:57	06:56	06:44	05:44	05:13	05:28	06:13	07:05	07:55	07:52	08:36		15:06 (9)
	16:47			17:43	18:35	20:29	21:20	21:58	21:53	21:06	19:57	18:47	16:47	16:21	18	15:24 (9)
14	08:40			07:55	06:54	06:42	05:43	05:12	05:29	06:15	07:06	07:57	07:53	08:37		15:07 (9)
	16:49			17:45	18:36	20:31	21:22	21:58	21:52	21:04	19:55	18:45	16:45	16:21	18	15:25 (9)
15	08:39			07:53	06:52	06:40	05:41	05:12	05:30	06:16	07:08	07:59	07:55	08:38		15:07 (9)
	16:50			17:47	18:38	20:32	21:23	21:59	21:51	21:02	19:52	18:42	16:44	16:21	19	15:26 (9)
16	08:38			07:51	06:49	06:37	05:39	05:12	05:31	06:18	07:10	08:01	07:57	08:39		15:07 (9)
	16:52			17:49	18:40	20:34	21:25	21:59	21:50	21:00	19:50	18:40	16:42	16:22	20	15:27 (9)
17	08:37			07:49	06:47	06:35	05:38	05:12	05:32	06:20	07:11	08:02	07:59	08:40		15:08 (9)
	16:54			17:51	18:42	20:36	21:26	22:00	21:49	20:58	19:48	18:38	16:41	16:22	20	15:28 (9)
18	08:36			07:47	06:45	06:33	05:36	05:12	05:34	06:21	07:13	08:04	08:00	08:41		15:07 (9)
	16:55			17:52	18:43	20:38	21:28	22:00	21:48	20:56	19:45	18:36	16:39	16:22	20	15:27 (9)
19	08:35			07:45	06:42	06:31	05:35	05:12	05:35	06:23	07:15	08:06	08:02	08:42		15:08 (9)
	16:57			17:54	18:45	20:39	21:29	22:01	21:47	20:54	19:43	18:34	16:38	16:22	20	15:28 (9)
20	08:34			07:43	06:40	06:29	05:33	05:12	05:36	06:25	07:16	08:08	08:04	08:42		15:09 (9)
	16:59			17:56	18:47	20:41	21:31	22:01	21:46	20:52	19:40	18:32	16:37	16:23	20	15:29 (9)
21	08:33			07:41	06:38	06:27	05:32	05:12	05:38	06:26	07:18	08:10	08:06	08:43		15:08 (9)
	17:00			17:58	18:49	20:43	21:32	22:01	21:45	20:49	19:38	18:29	16:36	16:23	21	15:29 (9)
22	08:32			07:39	06:35	06:24	05:31	05:12	05:39	06:28	07:20	08:11	08:07	08:43		15:09 (9)
	17:02			18:00	18:50	20:44	21:34	22:01	21:43	20:47	19:36	18:27	16:34	16:24	21	15:30 (9)
23	08:31			07:36	06:33	06:22	05:29	05:13	05:40	06:30	07:21	08:13	08:09	08:44		15:10 (9)
	17:04			18:02	18:52	20:46	21:35	22:02	21:42	20:45	19:33	18:25	16:33	16:24	20	15:30 (9)
24	08:29			07:34	06:31	06:20	05:28	05:13	05:42	06:31	07:23	08:15	08:11	08:44		15:10 (9)
	17:06			18:04	18:54	20:48	21:37	22:02	21:41	20:43	19:31	18:23	16:32	16:25	20	15:30 (9)
25	08:28			07:32	06:28	06:18	05:27	05:13	05:43	06:33	07:25	07:17	08:12	08:45		15:11 (9)
	17:07			18:05	18:56	20:50	21:38	22:02	21:39	20:41	19:29	17:21	16:31	16:25	20	15:31 (9)
26	08:27			07:30	06:26	06:16	05:26	05:14	05:45	06:35	07:26	07:19	08:14	08:45		15:11 (9)
	17:09			18:07	18:57	20:51	21:39	22:02	21:38	20:39	19:26	17:19	16:30	16:26	21	15:32 (9)
27	08:25			07:28	06:23	06:14	05:25	05:14	05:46	06:36	07:28	07:20	08:15	08:45		15:12 (9)
	17:11			18:09	18:59	20:53	21:41	22:02	21:36	20:36	19:24	17:17	16:29	16:27	20	15:32 (9)
28	08:24			07:26	06:21	06:12	05:24	05:15	05:48	06:38	07:30	07:22	08:17	08:45		15:12 (9)
	17:13			18:11	19:01	20:55	21:42	22:02	21:35	20:34	19:22	17:15	16:28	16:28	20	15:32 (9)
29	08:22				07:19	06:10	05:23	05:15	05:49	06:40	07:31	07:24	08:19	08:46		15:13 (9)
	17:15				20:03	20:57	21:43	22:01	21:33	20:32	19:19	17:13	16:28	16:28	19	15:32 (9)
30	08:21				07:16	06:08	05:22	05:16	05:51	06:41	07:33	07:26	08:20	08:46		15:14 (9)
	17:17				20:04	20:58	21:44	22:01	21:31	20:30	19:17	17:11	16:27	16:29	18	15:32 (9)
31	08:19				07:14		05:21		05:52	06:43		07:28		08:46		15:15 (9)
	17:18				20:06		21:46		21:30	20:27		17:09		16:30	17	15:32 (9)
Potential sun hours	257			277	367	417	487	502	504	455	381	331	264	241		
Total, worst case		67													454	
Sun reduction		0.22													0.22	
Oper. time red.		1.00													1.00	
Wind dir. red.		0.62													0.62	
Total reduction		0.13													0.13	
Total, real		9													61	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

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Calculated:
11/06/2025 09:22/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Real Case - V150 **Shadow receptor:** BH - 73

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January			February	March	April	May	June	July	August	September	October	November	December		
1	08:46		15:17 (9)	08:18	07:23	07:12	06:06	05:20	05:16	05:54	06:45	07:35	07:30	08:22		
	16:32	23	15:40 (9)	17:20	18:13	20:08	21:00	21:47	22:01	21:28	20:25	19:14	17:07	16:26		
2	08:46		15:17 (9)	08:16	07:21	07:09	06:04	05:19	05:17	05:55	06:46	07:36	07:31	08:23		15:11 (9)
	16:33	22	15:39 (9)	17:22	18:15	20:10	21:02	21:48	22:01	21:26	20:23	19:12	17:05	16:25	8	15:19 (9)
3	08:45		15:18 (9)	08:15	07:19	07:07	06:02	05:18	05:18	05:57	06:48	07:38	07:33	08:24		15:09 (9)
	16:34	22	15:40 (9)	17:24	18:17	20:11	21:03	21:49	22:00	21:25	20:20	19:10	17:04	16:25	12	15:21 (9)
4	08:45		15:20 (9)	08:13	07:17	07:05	06:00	05:17	05:19	05:59	06:50	07:40	07:35	08:26		15:09 (9)
	16:35	20	15:40 (9)	17:26	18:18	20:13	21:05	21:50	22:00	21:23	20:18	19:07	17:02	16:24	14	15:23 (9)
5	08:45		15:20 (9)	08:11	07:15	07:02	05:58	05:17	05:20	06:00	06:51	07:42	07:37	08:27		15:08 (9)
	16:36	20	15:40 (9)	17:28	18:20	20:15	21:07	21:51	21:59	21:21	20:16	19:05	17:00	16:24	16	15:24 (9)
6	08:45		15:22 (9)	08:10	07:12	07:00	05:56	05:16	05:20	06:02	06:53	07:43	07:39	08:28		15:08 (9)
	16:37	18	15:40 (9)	17:30	18:22	20:17	21:08	21:52	21:59	21:19	20:13	19:03	16:58	16:23	18	15:26 (9)
7	08:44		15:23 (9)	08:08	07:10	06:58	05:55	05:15	05:21	06:03	06:55	07:45	07:41	08:30		15:07 (9)
	16:39	16	15:39 (9)	17:32	18:24	20:18	21:10	21:53	21:58	21:18	20:11	19:01	16:56	16:23	20	15:27 (9)
8	08:44		15:25 (9)	08:06	07:08	06:56	05:53	05:15	05:22	06:05	06:56	07:47	07:42	08:31		15:07 (9)
	16:40	14	15:39 (9)	17:33	18:26	20:20	21:12	21:54	21:57	21:16	20:09	18:58	16:55	16:22	20	15:27 (9)
9	08:43		15:26 (9)	08:04	07:05	06:53	05:51	05:14	05:23	06:07	06:58	07:48	07:44	08:32		15:08 (9)
	16:41	12	15:38 (9)	17:35	18:27	20:22	21:13	21:55	21:57	21:14	20:06	18:56	16:53	16:22	21	15:29 (9)
10	08:43		15:28 (9)	08:02	07:03	06:51	05:49	05:14	05:24	06:08	07:00	07:50	07:46	08:33		15:07 (9)
	16:43	8	15:36 (9)	17:37	18:29	20:24	21:15	21:56	21:56	21:12	20:04	18:54	16:51	16:22	22	15:29 (9)
11	08:42			08:01	07:01	06:49	05:48	05:13	05:25	06:10	07:01	07:52	07:48	08:34		15:07 (9)
	16:44			17:39	18:31	20:25	21:17	21:56	21:55	21:10	20:02	18:51	16:50	16:22	23	15:30 (9)
12	08:41			07:59	06:59	06:46	05:46	05:13	05:26	06:12	07:03	07:54	07:50	08:35		15:07 (9)
	16:46			17:41	18:33	20:27	21:18	21:57	21:54	21:08	19:59	18:49	16:48	16:21	24	15:31 (9)
13	08:41			07:57	06:56	06:44	05:44	05:13	05:28	06:13	07:05	07:55	07:51	08:36		15:08 (9)
	16:47			17:43	18:35	20:29	21:20	21:58	21:53	21:06	19:57	18:47	16:47	16:21	23	15:31 (9)
14	08:40			07:55	06:54	06:42	05:43	05:12	05:29	06:15	07:06	07:57	07:53	08:37		15:08 (9)
	16:49			17:45	18:36	20:31	21:22	21:58	21:52	21:04	19:55	18:45	16:45	16:21	24	15:32 (9)
15	08:39			07:53	06:52	06:40	05:41	05:12	05:30	06:16	07:08	07:59	07:55	08:38		15:08 (9)
	16:50			17:47	18:38	20:32	21:23	21:59	21:51	21:02	19:52	18:42	16:44	16:21	25	15:33 (9)
16	08:38			07:51	06:49	06:37	05:39	05:12	05:31	06:18	07:10	08:01	07:57	08:39		15:09 (9)
	16:52			17:49	18:40	20:34	21:25	21:59	21:50	21:00	19:50	18:40	16:42	16:22	25	15:34 (9)
17	08:37			07:49	06:47	06:35	05:38	05:12	05:32	06:20	07:11	08:02	07:59	08:40		15:09 (9)
	16:54			17:51	18:42	20:36	21:26	22:00	21:49	20:58	19:48	18:38	16:41	16:22	25	15:34 (9)
18	08:36			07:47	06:45	06:33	05:36	05:12	05:34	06:21	07:13	08:04	08:00	08:41		15:09 (9)
	16:55			17:52	18:43	20:38	21:28	22:00	21:48	20:56	19:45	18:36	16:39	16:22	25	15:34 (9)
19	08:35			07:45	06:42	06:31	05:35	05:12	05:35	06:23	07:15	08:06	08:02	08:42		15:09 (9)
	16:57			17:54	18:45	20:39	21:29	22:01	21:47	20:54	19:43	18:34	16:38	16:22	26	15:35 (9)
20	08:34			07:43	06:40	06:29	05:33	05:12	05:36	06:25	07:16	08:08	08:04	08:42		15:10 (9)
	16:59			17:56	18:47	20:41	21:31	22:01	21:46	20:52	19:40	18:32	16:37	16:23	26	15:36 (9)
21	08:33			07:41	06:38	06:27	05:32	05:12	05:38	06:26	07:18	08:10	08:06	08:43		15:10 (9)
	17:00			17:58	18:49	20:43	21:32	22:01	21:45	20:49	19:38	18:29	16:36	16:23	26	15:36 (9)
22	08:32			07:39	06:35	06:24	05:31	05:12	05:39	06:28	07:20	08:11	08:07	08:43		15:11 (9)
	17:02			18:00	18:50	20:44	21:34	22:01	21:43	20:47	19:36	18:27	16:35	16:24	26	15:37 (9)
23	08:31			07:36	06:33	06:22	05:29	05:13	05:40	06:30	07:21	08:13	08:09	08:44		15:11 (9)
	17:04			18:02	18:52	20:46	21:35	22:02	21:42	20:45	19:33	18:25	16:33	16:24	26	15:37 (9)
24	08:29			07:34	06:31	06:20	05:28	05:13	05:42	06:31	07:23	08:15	08:11	08:44		15:11 (9)
	17:06			18:04	18:54	20:48	21:37	22:02	21:41	20:43	19:31	18:23	16:32	16:25	26	15:37 (9)
25	08:28			07:32	06:28	06:18	05:27	05:13	05:43	06:33	07:25	07:17	08:12	08:45		15:13 (9)
	17:07			18:05	18:56	20:50	21:38	22:02	21:39	20:41	19:29	17:21	16:31	16:25	25	15:38 (9)
26	08:27			07:30	06:26	06:16	05:26	05:14	05:45	06:35	07:26	07:19	08:14	08:45		15:13 (9)
	17:09			18:07	18:57	20:51	21:39	22:02	21:38	20:39	19:26	17:19	16:30	16:26	25	15:38 (9)
27	08:25			07:28	06:23	06:14	05:25	05:14	05:46	06:36	07:28	07:20	08:15	08:45		15:13 (9)
	17:11			18:09	18:59	20:53	21:41	22:02	21:36	20:36	19:24	17:17	16:29	16:27	25	15:38 (9)
28	08:24			07:26	06:21	06:12	05:24	05:15	05:48	06:38	07:30	07:22	08:17	08:45		15:14 (9)
	17:13			18:11	19:01	20:55	21:42	22:02	21:35	20:34	19:22	17:15	16:28	16:28	25	15:39 (9)
29	08:22				07:19	06:10	05:23	05:15	05:49	06:40	07:31	07:24	08:19	08:46		15:14 (9)
	17:15				20:03	20:57	21:43	22:01	21:33	20:32	19:19	17:13	16:28	16:28	25	15:39 (9)
30	08:21				07:16	06:08	05:22	05:16	05:51	06:41	07:33	07:26	08:20	08:46		15:15 (9)
	17:17				20:04	20:58	21:44	22:01	21:31	20:30	19:17	17:11	16:27	16:29	24	15:39 (9)
31	08:19				07:14		05:21		05:52	06:43		07:28		08:46		15:16 (9)
	17:18				20:06		21:46		21:30	20:27		17:09		16:30	24	15:40 (9)
Potential sun hours	257			277	367	417	487	502	504	455	381	331	264	241		
Total, worst case		175													674	
Sun reduction		0.22													0.22	
Oper. time red.		1.00													1.00	
Wind dir. red.		0.62													0.62	
Total reduction		0.13													0.14	
Total, real		24													91	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

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padraig / podowd@jodireland.com
Calculated:
11/06/2025 09:22/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Real Case - V150 **Shadow receptor:** BI - 74

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January			February	March	April	May	June	July	August	September	October	November			December		
1	08:46		15:23 (9)	08:18	07:23	07:12	06:06	05:20	05:16	05:54	06:45	07:35	07:30			08:22		15:12 (9)
	16:32	28	15:51 (9)	17:20	18:13	20:08	21:00	21:47	22:01	21:28	20:25	19:14	17:07			16:26	21	15:33 (9)
2	08:46		15:23 (9)	08:16	07:21	07:09	06:04	05:19	05:17	05:55	06:46	07:36	07:31			08:23		15:12 (9)
	16:33	28	15:51 (9)	17:22	18:15	20:10	21:02	21:48	22:01	21:26	20:23	19:12	17:05			16:25	23	15:35 (9)
3	08:45		15:24 (9)	08:15	07:19	07:07	06:02	05:18	05:18	05:57	06:48	07:38	07:33			08:24		15:12 (9)
	16:34	27	15:51 (9)	17:24	18:17	20:11	21:03	21:49	22:00	21:25	20:20	19:10	17:04			16:25	23	15:35 (9)
4	08:45		15:25 (9)	08:13	07:17	07:05	06:00	05:17	05:19	05:59	06:50	07:40	07:35			08:26		15:12 (9)
	16:35	27	15:52 (9)	17:26	18:18	20:13	21:05	21:50	22:00	21:23	20:18	19:07	17:02			16:24	24	15:36 (9)
5	08:45		15:25 (9)	08:11	07:15	07:02	05:58	05:17	05:20	06:00	06:51	07:42	07:37			08:27		15:11 (9)
	16:36	26	15:51 (9)	17:28	18:20	20:15	21:07	21:51	21:59	21:21	20:16	19:05	17:00			16:24	26	15:37 (9)
6	08:45		15:26 (9)	08:10	07:12	07:00	05:56	05:16	05:20	06:02	06:53	07:43	07:39			08:28		15:12 (9)
	16:37	26	15:52 (9)	17:30	18:22	20:17	21:08	21:52	21:59	21:19	20:13	19:03	16:58			16:23	26	15:38 (9)
7	08:44		15:26 (9)	08:08	07:10	06:58	05:55	05:15	05:21	06:03	06:55	07:45	07:41			08:30		15:12 (9)
	16:39	26	15:52 (9)	17:32	18:24	20:18	21:10	21:53	21:58	21:18	20:11	19:01	16:56			16:23	26	15:38 (9)
8	08:44		15:28 (9)	08:06	07:08	06:56	05:53	05:15	05:22	06:05	06:56	07:47	07:42			08:31		15:12 (9)
	16:40	24	15:52 (9)	17:33	18:26	20:20	21:12	21:54	21:57	21:16	20:09	18:58	16:55			16:22	27	15:39 (9)
9	08:43		15:28 (9)	08:04	07:05	06:53	05:51	05:14	05:23	06:07	06:58	07:48	07:44			08:32		15:13 (9)
	16:41	24	15:52 (9)	17:35	18:27	20:22	21:13	21:55	21:57	21:14	20:06	18:56	16:53			16:22	27	15:40 (9)
10	08:43		15:29 (9)	08:02	07:03	06:51	05:49	05:14	05:24	06:08	07:00	07:50	07:46			08:33		15:13 (9)
	16:43	23	15:52 (9)	17:37	18:29	20:24	21:15	21:56	21:56	21:12	20:04	18:54	16:51			16:22	28	15:41 (9)
11	08:42		15:30 (9)	08:01	07:01	06:49	05:48	05:13	05:25	06:10	07:01	07:52	07:48			08:34		15:13 (9)
	16:44	21	15:51 (9)	17:39	18:31	20:25	21:17	21:56	21:55	21:10	20:02	18:51	16:50			16:22	28	15:41 (9)
12	08:41		15:31 (9)	07:59	06:59	06:46	05:46	05:13	05:26	06:12	07:03	07:54	07:50			08:35		15:13 (9)
	16:46	20	15:51 (9)	17:41	18:33	20:27	21:18	21:57	21:54	21:08	19:59	18:49	16:48			16:21	29	15:42 (9)
13	08:41		15:33 (9)	07:57	06:56	06:44	05:44	05:13	05:28	06:13	07:05	07:55	07:51			08:36		15:13 (9)
	16:47	18	15:51 (9)	17:43	18:35	20:29	21:20	21:58	21:53	21:06	19:57	18:47	16:47			16:21	29	15:42 (9)
14	08:40		15:35 (9)	07:55	06:54	06:42	05:43	05:12	05:29	06:15	07:06	07:57	07:53			08:37		15:14 (9)
	16:49	15	15:50 (9)	17:45	18:36	20:31	21:22	21:58	21:52	21:04	19:55	18:45	16:45			16:21	29	15:43 (9)
15	08:39		15:37 (9)	07:53	06:52	06:40	05:41	05:12	05:30	06:16	07:08	07:59	07:55			08:38		15:14 (9)
	16:50	12	15:49 (9)	17:47	18:38	20:32	21:23	21:59	21:51	21:02	19:52	18:42	16:44			16:21	29	15:43 (9)
16	08:38		15:38 (9)	07:51	06:49	06:37	05:39	05:12	05:31	06:18	07:10	08:01	07:57			08:39		15:15 (9)
	16:52	8	15:46 (9)	17:49	18:40	20:34	21:25	21:59	21:50	21:00	19:50	18:40	16:42			16:22	29	15:44 (9)
17	08:37			07:49	06:47	06:35	05:38	05:12	05:32	06:20	07:11	08:02	07:59			08:40		15:14 (9)
	16:54			17:51	18:42	20:36	21:26	22:00	21:49	20:58	19:48	18:38	16:41			16:22	30	15:44 (9)
18	08:36			07:47	06:45	06:33	05:36	05:12	05:34	06:21	07:13	08:04	08:00			08:41		15:15 (9)
	16:55			17:52	18:43	20:38	21:28	22:00	21:48	20:56	19:45	18:36	16:39			16:22	29	15:44 (9)
19	08:35			07:45	06:42	06:31	05:35	05:12	05:35	06:23	07:15	08:06	08:02			08:42		15:16 (9)
	16:57			17:54	18:45	20:39	21:29	22:01	21:47	20:54	19:43	18:34	16:38			16:22	29	15:45 (9)
20	08:34			07:43	06:40	06:29	05:33	05:12	05:36	06:25	07:16	08:08	08:04			08:42		15:17 (9)
	16:59			17:56	18:47	20:41	21:31	22:01	21:46	20:52	19:40	18:32	16:37			16:23	29	15:46 (9)
21	08:33			07:41	06:38	06:27	05:32	05:12	05:38	06:26	07:18	08:10	08:06			08:43		15:16 (9)
	17:00			17:58	18:49	20:43	21:32	22:01	21:45	20:49	19:38	18:29	16:36			16:23	30	15:46 (9)
22	08:32			07:39	06:35	06:24	05:31	05:12	05:39	06:28	07:20	08:11	08:07			08:43		15:17 (9)
	17:02			18:00	18:50	20:44	21:34	22:01	21:43	20:47	19:36	18:27	16:35			16:24	30	15:47 (9)
23	08:31			07:36	06:33	06:22	05:29	05:13	05:40	06:30	07:21	08:13	08:09			08:44		15:18 (9)
	17:04			18:02	18:52	20:46	21:35	22:02	21:42	20:45	19:33	18:25	16:33			16:24	29	15:47 (9)
24	08:29			07:34	06:31	06:20	05:28	05:13	05:42	06:31	07:23	08:15	08:11			08:44		15:18 (9)
	17:06			18:04	18:54	20:48	21:37	22:02	21:41	20:43	19:31	18:23	16:32			16:25	29	15:47 (9)
25	08:28			07:32	06:28	06:18	05:27	05:13	05:43	06:33	07:25	07:17	08:12			08:45		15:19 (9)
	17:07			18:05	18:56	20:50	21:38	22:02	21:39	20:41	19:29	17:21	16:31			16:25	29	15:48 (9)
26	08:27			07:30	06:26	06:16	05:26	05:14	05:45	06:35	07:26	07:19	08:14		15:18 (9)	08:45		15:19 (9)
	17:09			18:07	18:57	20:51	21:39	22:02	21:38	20:39	19:26	17:19	16:30	7	15:25 (9)	16:26	30	15:49 (9)
27	08:25			07:28	06:23	06:14	05:25	05:14	05:46	06:36	07:28	07:20	08:15		15:16 (9)	08:45		15:20 (9)
	17:11			18:09	18:59	20:53	21:41	22:02	21:36	20:36	19:24	17:17	16:29	12	15:28 (9)	16:27	29	15:49 (9)
28	08:24			07:26	06:21	06:12	05:24	05:15	05:48	06:38	07:30	07:22	08:17		15:14 (9)	08:45		15:20 (9)
	17:13			18:11	19:01	20:55	21:42	22:02	21:35	20:34	19:22	17:15	16:28	15	15:29 (9)	16:28	29	15:49 (9)
29	08:22				07:19	06:10	05:23	05:15	05:49	06:40	07:31	07:24	08:19		15:13 (9)	08:46		15:20 (9)
	17:15				20:03	20:57	21:43	22:01	21:33	20:32	19:19	17:13	16:28	18	15:31 (9)	16:28	30	15:50 (9)
30	08:21				07:16	06:08	05:22	05:16	05:51	06:41	07:33	07:26	08:20		15:13 (9)	08:46		15:21 (9)
	17:17				20:04	20:58	21:44	22:01	21:31	20:30	19:17	17:11	16:27	20	15:33 (9)	16:29	29	15:50 (9)
31	08:19				07:14		05:21		05:52	06:43		07:28				08:46		15:22 (9)
	17:18				20:06		21:46		21:30	20:27		17:09				16:30	28	15:50 (9)
Potential sun hours	257			277	367	417	487	502	504	455	381	331	264			241		
Total, worst case		353												72			863	
Sun reduction		0.22												0.26			0.22	
Oper. time red.		1.00												1.00			1.00	
Wind dir. red.		0.62												0.62			0.62	
Total reduction		0.13												0.16			0.14	
Total, real		47												12			117	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
Jennings O'Donovan
Finisklin Business Park
F91 RHH9 Sligo
+353719161416
padraig / podowd@jodireland.com
Calculated:
11/06/2025 09:22/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Real Case - V150 **Shadow receptor:** BJ - 75

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January			February	March	April	May	June	July	August	September	October	November			December		
1	08:46		15:26 (9)	08:18	07:23	07:12	06:06	05:20	05:17	05:54	06:45	07:35	07:30			08:22		15:14 (9)
	16:32	30	15:56 (9)	17:20	18:13	20:08	21:00	21:47	22:01	21:28	20:25	19:14	17:07			16:26	28	15:42 (9)
2	08:46		15:26 (9)	08:16	07:21	07:09	06:04	05:19	05:17	05:55	06:46	07:36	07:31			08:23		15:14 (9)
	16:33	31	15:57 (9)	17:22	18:15	20:10	21:02	21:48	22:01	21:26	20:23	19:12	17:05			16:25	29	15:43 (9)
3	08:45		15:27 (9)	08:15	07:19	07:07	06:02	05:18	05:18	05:57	06:48	07:38	07:33			08:24		15:14 (9)
	16:34	31	15:58 (9)	17:24	18:17	20:11	21:03	21:49	22:00	21:25	20:20	19:10	17:04			16:25	29	15:43 (9)
4	08:45		15:28 (9)	08:13	07:17	07:05	06:00	05:17	05:19	05:59	06:50	07:40	07:35			08:26		15:14 (9)
	16:35	31	15:59 (9)	17:26	18:18	20:13	21:05	21:50	22:00	21:23	20:18	19:07	17:02			16:24	30	15:44 (9)
5	08:45		15:28 (9)	08:11	07:15	07:02	05:58	05:17	05:20	06:00	06:51	07:42	07:37			08:27		15:14 (9)
	16:36	31	15:59 (9)	17:28	18:20	20:15	21:07	21:51	21:59	21:21	20:16	19:05	17:00			16:24	30	15:44 (9)
6	08:45		15:29 (9)	08:10	07:12	07:00	05:56	05:16	05:20	06:02	06:53	07:43	07:39			08:28		15:15 (9)
	16:37	30	15:59 (9)	17:30	18:22	20:17	21:08	21:52	21:59	21:19	20:13	19:03	16:58			16:23	30	15:45 (9)
7	08:44		15:29 (9)	08:08	07:10	06:58	05:55	05:15	05:21	06:03	06:55	07:45	07:41			08:30		15:15 (9)
	16:39	30	15:59 (9)	17:32	18:24	20:18	21:10	21:53	21:58	21:18	20:11	19:01	16:56			16:23	31	15:46 (9)
8	08:44		15:29 (9)	08:06	07:08	06:56	05:53	05:15	05:22	06:05	06:56	07:47	07:42			08:31		15:15 (9)
	16:40	30	15:59 (9)	17:33	18:26	20:20	21:12	21:54	21:57	21:16	20:09	18:58	16:55			16:22	31	15:46 (9)
9	08:43		15:31 (9)	08:04	07:05	06:53	05:51	05:14	05:23	06:07	06:58	07:48	07:44			08:32		15:16 (9)
	16:41	29	16:00 (9)	17:35	18:27	20:22	21:13	21:55	21:57	21:14	20:06	18:56	16:53			16:22	31	15:47 (9)
10	08:43		15:31 (9)	08:02	07:03	06:51	05:49	05:14	05:24	06:08	07:00	07:50	07:46			08:33		15:16 (9)
	16:43	29	16:00 (9)	17:37	18:29	20:24	21:15	21:56	21:56	21:12	20:04	18:54	16:51			16:22	31	15:47 (9)
11	08:42		15:32 (9)	08:01	07:01	06:49	05:48	05:13	05:25	06:10	07:01	07:52	07:48			08:34		15:16 (9)
	16:44	28	16:00 (9)	17:39	18:31	20:25	21:17	21:56	21:55	21:10	20:02	18:51	16:50			16:22	31	15:47 (9)
12	08:41		15:32 (9)	07:59	06:59	06:46	05:46	05:13	05:26	06:12	07:03	07:54	07:50			08:35		15:17 (9)
	16:46	27	15:59 (9)	17:41	18:33	20:27	21:18	21:57	21:54	21:08	19:59	18:49	16:48			16:21	29	15:46 (9)
13	08:41		15:33 (9)	07:57	06:56	06:44	05:44	05:13	05:28	06:13	07:05	07:55	07:51			08:36		15:17 (9)
	16:47	26	15:59 (9)	17:43	18:35	20:29	21:20	21:58	21:53	21:06	19:57	18:47	16:47			16:21	29	15:46 (9)
14	08:40		15:35 (9)	07:55	06:54	06:42	05:43	05:12	05:29	06:15	07:06	07:57	07:53			08:37		15:18 (9)
	16:49	25	16:00 (9)	17:45	18:36	20:31	21:22	21:58	21:52	21:04	19:55	18:45	16:45			16:21	28	15:46 (9)
15	08:39		15:36 (9)	07:53	06:52	06:40	05:41	05:12	05:30	06:16	07:08	07:59	07:55			08:38		15:18 (9)
	16:50	24	16:00 (9)	17:47	18:38	20:32	21:23	21:59	21:51	21:02	19:52	18:42	16:44			16:21	28	15:46 (9)
16	08:38		15:36 (9)	07:51	06:49	06:37	05:39	05:12	05:31	06:18	07:10	08:01	07:57			08:39		15:19 (9)
	16:52	23	15:59 (9)	17:49	18:40	20:34	21:25	21:59	21:50	21:00	19:50	18:40	16:42			16:22	27	15:46 (9)
17	08:37		15:38 (9)	07:49	06:47	06:35	05:38	05:12	05:32	06:20	07:11	08:02	07:59			08:40		15:18 (9)
	16:54	20	15:58 (9)	17:51	18:42	20:36	21:26	22:00	21:49	20:58	19:48	18:38	16:41			16:22	28	15:46 (9)
18	08:36		15:39 (9)	07:47	06:45	06:33	05:36	05:12	05:34	06:21	07:13	08:04	08:00			08:41		15:19 (9)
	16:55	19	15:58 (9)	17:52	18:43	20:38	21:28	22:00	21:48	20:56	19:45	18:36	16:39			16:22	27	15:46 (9)
19	08:35		15:41 (9)	07:45	06:42	06:31	05:35	05:12	05:35	06:23	07:15	08:06	08:02			08:42		15:20 (9)
	16:57	16	15:57 (9)	17:54	18:45	20:39	21:29	22:01	21:47	20:54	19:43	18:34	16:38			16:22	27	15:47 (9)
20	08:34		15:44 (9)	07:43	06:40	06:29	05:33	05:12	05:36	06:25	07:16	08:08	08:04			08:42		15:21 (9)
	16:59	11	15:55 (9)	17:56	18:47	20:41	21:31	22:01	21:46	20:52	19:40	18:32	16:37			16:23	26	15:47 (9)
21	08:33		15:47 (9)	07:41	06:38	06:27	05:32	05:12	05:38	06:26	07:18	08:10	08:06		15:23 (9)	08:43		15:21 (9)
	17:00	5	15:52 (9)	17:58	18:49	20:43	21:32	22:01	21:45	20:49	19:38	18:29	16:36	5	15:28 (9)	16:23	26	15:47 (9)
22	08:32			07:39	06:35	06:24	05:31	05:12	05:39	06:28	07:20	08:11	08:07		15:20 (9)	08:43		15:22 (9)
	17:02			18:00	18:50	20:44	21:34	22:01	21:43	20:47	19:36	18:27	16:35	11	15:31 (9)	16:24	26	15:48 (9)
23	08:31			07:36	06:33	06:22	05:29	05:13	05:40	06:30	07:21	08:13	08:09		15:18 (9)	08:44		15:22 (9)
	17:04			18:02	18:52	20:46	21:35	22:02	21:42	20:45	19:33	18:25	16:33	16	15:34 (9)	16:24	26	15:48 (9)
24	08:29			07:34	06:31	06:20	05:28	05:13	05:42	06:31	07:23	08:15	08:11		15:16 (9)	08:44		15:22 (9)
	17:06			18:04	18:54	20:48	21:37	22:02	21:41	20:43	19:31	18:23	16:32	19	15:35 (9)	16:25	26	15:48 (9)
25	08:28			07:32	06:28	06:18	05:27	05:13	05:43	06:33	07:25	07:17	08:12		15:16 (9)	08:45		15:23 (9)
	17:07			18:05	18:56	20:50	21:38	22:02	21:39	20:41	19:29	17:21	16:31	20	15:36 (9)	16:25	27	15:50 (9)
26	08:27			07:30	06:26	06:16	05:26	05:14	05:45	06:35	07:26	07:19	08:14		15:15 (9)	08:45		15:23 (9)
	17:09			18:07	18:57	20:51	21:39	22:02	21:38	20:39	19:26	17:19	16:30	23	15:38 (9)	16:26	27	15:50 (9)
27	08:25			07:28	06:23	06:14	05:25	05:14	05:46	06:36	07:28	07:20	08:15		15:15 (9)	08:45		15:23 (9)
	17:11			18:09	18:59	20:53	21:41	22:02	21:36	20:36	19:24	17:17	16:29	24	15:39 (9)	16:27	28	15:51 (9)
28	08:24			07:26	06:21	06:12	05:24	05:15	05:48	06:38	07:30	07:22	08:17		15:14 (9)	08:45		15:24 (9)
	17:13			18:11	19:01	20:55	21:42	22:02	21:35	20:34	19:22	17:15	16:28	25	15:39 (9)	16:28	28	15:52 (9)
29	08:22				07:19	06:10	05:23	05:15	05:49	06:40	07:31	07:24	08:19		15:14 (9)	08:46		15:24 (9)
	17:15				20:03	20:57	21:43	22:01	21:33	20:32	19:19	17:13	16:28	26	15:40 (9)	16:28	29	15:53 (9)
30	08:21				07:16	06:08	05:22	05:16	05:51	06:41	07:33	07:26	08:20		15:14 (9)	08:46		15:25 (9)
	17:17				20:04	20:58	21:44	22:01	21:31	20:30	19:17	17:11	16:27	28	15:42 (9)	16:29	29	15:54 (9)
31	08:19				07:14		05:21		05:52	06:43		07:28				08:46		15:25 (9)
	17:18				20:06		21:46		21:30	20:27		17:09				16:30	30	15:55 (9)
Potential sun hours	257			277	367	417	487	502	504	455	381	331	264			241		
Total, worst case		526												197			882	
Sun reduction		0.22												0.26			0.22	
Oper. time red.		1.00												1.00			1.00	
Wind dir. red.		0.62												0.62			0.62	
Total reduction		0.13												0.16			0.14	
Total, real		71												32			119	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
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padraig / podowd@jodireland.com
Calculated:
11/06/2025 09:22/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Real Case - V150 **Shadow receptor:** BK - 76

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January			February	March	April	May	June	July	August	September	October	November			December		
1	08:46		15:31 (9)	08:18	07:23	07:12	06:06	05:20	05:17	05:54	06:45	07:35	07:30			08:22		15:17 (9)
	16:32	25	15:56 (9)	17:20	18:13	20:08	21:00	21:47	22:01	21:28	20:25	19:14	17:07			16:26	31	15:48 (9)
2	08:46		15:31 (9)	08:16	07:21	07:09	06:04	05:19	05:17	05:55	06:46	07:36	07:31			08:23		15:18 (9)
	16:33	26	15:57 (9)	17:22	18:15	20:10	21:02	21:48	22:01	21:26	20:23	19:12	17:05			16:25	31	15:49 (9)
3	08:45		15:31 (9)	08:15	07:19	07:07	06:02	05:18	05:18	05:57	06:48	07:38	07:33			08:24		15:18 (9)
	16:34	27	15:58 (9)	17:24	18:17	20:11	21:03	21:49	22:00	21:25	20:20	19:10	17:04			16:25	31	15:49 (9)
4	08:45		15:32 (9)	08:13	07:17	07:05	06:00	05:17	05:19	05:59	06:50	07:40	07:35			08:26		15:18 (9)
	16:35	28	16:00 (9)	17:26	18:18	20:13	21:05	21:50	22:00	21:23	20:18	19:07	17:02			16:24	32	15:50 (9)
5	08:45		15:32 (9)	08:11	07:15	07:02	05:58	05:17	05:20	06:00	06:51	07:42	07:37			08:27		15:18 (9)
	16:36	29	16:01 (9)	17:28	18:20	20:15	21:07	21:51	21:59	21:21	20:16	19:05	17:00			16:24	31	15:49 (9)
6	08:45		15:33 (9)	08:10	07:12	07:00	05:56	05:16	05:20	06:02	06:53	07:43	07:39			08:28		15:19 (9)
	16:37	30	16:03 (9)	17:30	18:22	20:17	21:08	21:52	21:59	21:19	20:13	19:03	16:58			16:23	30	15:49 (9)
7	08:44		15:33 (9)	08:08	07:10	06:58	05:55	05:15	05:21	06:03	06:55	07:45	07:41			08:30		15:19 (9)
	16:39	31	16:04 (9)	17:32	18:24	20:18	21:10	21:53	21:58	21:18	20:11	19:01	16:56			16:23	29	15:48 (9)
8	08:44		15:33 (9)	08:06	07:08	06:56	05:53	05:15	05:22	06:05	06:56	07:47	07:42			08:31		15:19 (9)
	16:40	32	16:05 (9)	17:33	18:26	20:20	21:12	21:54	21:57	21:16	20:09	18:58	16:55			16:22	28	15:47 (9)
9	08:43		15:34 (9)	08:04	07:05	06:53	05:51	05:14	05:23	06:07	06:58	07:48	07:44			08:32		15:20 (9)
	16:41	32	16:06 (9)	17:35	18:27	20:22	21:13	21:55	21:57	21:14	20:06	18:56	16:53			16:22	27	15:47 (9)
10	08:43		15:35 (9)	08:02	07:03	06:51	05:49	05:14	05:24	06:08	07:00	07:50	07:46			08:33		15:21 (9)
	16:43	31	16:06 (9)	17:37	18:29	20:24	21:15	21:56	21:56	21:12	20:04	18:54	16:51			16:22	26	15:47 (9)
11	08:42		15:35 (9)	08:01	07:01	06:49	05:48	05:13	05:25	06:10	07:01	07:52	07:48			08:34		15:21 (9)
	16:44	31	16:06 (9)	17:39	18:31	20:25	21:17	21:56	21:55	21:10	20:02	18:51	16:50			16:22	26	15:47 (9)
12	08:41		15:36 (9)	07:59	06:59	06:46	05:46	05:13	05:26	06:12	07:03	07:54	07:50			08:35		15:21 (9)
	16:46	30	16:06 (9)	17:41	18:33	20:27	21:18	21:57	21:54	21:08	19:59	18:49	16:48			16:21	25	15:46 (9)
13	08:41		15:36 (9)	07:57	06:56	06:44	05:44	05:13	05:28	06:13	07:05	07:55	07:51			08:36		15:22 (9)
	16:47	30	16:06 (9)	17:43	18:35	20:29	21:20	21:58	21:53	21:06	19:57	18:47	16:47			16:21	24	15:46 (9)
14	08:40		15:38 (9)	07:55	06:54	06:42	05:43	05:12	05:29	06:15	07:06	07:57	07:53			08:37		15:22 (9)
	16:49	29	16:07 (9)	17:45	18:36	20:31	21:22	21:58	21:52	21:04	19:55	18:45	16:45			16:21	24	15:46 (9)
15	08:39		15:39 (9)	07:53	06:52	06:40	05:41	05:12	05:30	06:16	07:08	07:59	07:55			08:38		15:23 (9)
	16:50	28	16:07 (9)	17:47	18:38	20:32	21:23	21:59	21:51	21:02	19:52	18:42	16:44			16:21	23	15:46 (9)
16	08:38		15:38 (9)	07:51	06:49	06:37	05:39	05:12	05:31	06:18	07:10	08:01	07:57			08:39		15:23 (9)
	16:52	28	16:06 (9)	17:49	18:40	20:34	21:25	21:59	21:50	21:00	19:50	18:40	16:42			16:22	23	15:46 (9)
17	08:37		15:39 (9)	07:49	06:47	06:35	05:38	05:12	05:32	06:20	07:11	08:02	07:59			08:40		15:23 (9)
	16:54	27	16:06 (9)	17:51	18:42	20:36	21:26	22:00	21:49	20:58	19:48	18:38	16:41			16:22	23	15:46 (9)
18	08:36		15:40 (9)	07:47	06:45	06:33	05:36	05:12	05:34	06:21	07:13	08:04	08:00		15:25 (9)	08:41		15:24 (9)
	16:55	26	16:06 (9)	17:52	18:43	20:38	21:28	22:00	21:48	20:56	19:45	18:36	16:39	9	15:34 (9)	16:22	22	15:46 (9)
19	08:35		15:42 (9)	07:45	06:42	06:31	05:35	05:12	05:35	06:23	07:15	08:06	08:02		15:22 (9)	08:41		15:25 (9)
	16:57	24	16:06 (9)	17:54	18:45	20:39	21:29	22:01	21:47	20:54	19:43	18:34	16:38	14	15:36 (9)	16:22	22	15:47 (9)
20	08:34		15:43 (9)	07:43	06:40	06:29	05:33	05:12	05:36	06:25	07:16	08:08	08:04		15:21 (9)	08:42		15:26 (9)
	16:59	23	16:06 (9)	17:56	18:47	20:41	21:31	22:01	21:46	20:52	19:40	18:32	16:37	17	15:38 (9)	16:23	21	15:47 (9)
21	08:33		15:44 (9)	07:41	06:38	06:27	05:32	05:12	05:38	06:26	07:18	08:10	08:06		15:20 (9)	08:43		15:26 (9)
	17:00	20	16:04 (9)	17:58	18:49	20:43	21:32	22:01	21:45	20:49	19:38	18:29	16:36	20	15:40 (9)	16:23	21	15:47 (9)
22	08:32		15:46 (9)	07:39	06:35	06:24	05:31	05:13	05:39	06:28	07:20	08:11	08:07		15:19 (9)	08:43		15:26 (9)
	17:02	17	16:03 (9)	18:00	18:50	20:44	21:34	22:01	21:43	20:47	19:36	18:27	16:35	23	15:42 (9)	16:24	22	15:48 (9)
23	08:31		15:48 (9)	07:36	06:33	06:22	05:29	05:13	05:40	06:30	07:21	08:13	08:09		15:19 (9)	08:44		15:27 (9)
	17:04	14	16:02 (9)	18:02	18:52	20:46	21:35	22:02	21:42	20:45	19:33	18:25	16:33	24	15:43 (9)	16:24	21	15:48 (9)
24	08:29		15:51 (9)	07:34	06:31	06:20	05:28	05:13	05:42	06:31	07:23	08:15	08:11		15:18 (9)	08:44		15:27 (9)
	17:06	9	16:00 (9)	18:04	18:54	20:48	21:37	22:02	21:41	20:43	19:31	18:23	16:32	25	15:43 (9)	16:25	21	15:48 (9)
25	08:28			07:32	06:28	06:18	05:27	05:13	05:43	06:33	07:25	07:17	08:12		15:17 (9)	08:45		15:28 (9)
	17:07			18:05	18:56	20:50	21:38	22:02	21:39	20:41	19:29	17:21	16:31	27	15:44 (9)	16:25	22	15:50 (9)
26	08:27			07:30	06:26	06:16	05:26	05:14	05:45	06:35	07:26	07:19	08:14		15:17 (9)	08:45		15:28 (9)
	17:09			18:07	18:57	20:51	21:39	22:02	21:38	20:39	19:26	17:19	16:30	28	15:45 (9)	16:26	22	15:50 (9)
27	08:25			07:28	06:23	06:14	05:25	05:14	05:46	06:36	07:28	07:20	08:15		15:18 (9)	08:45		15:28 (9)
	17:11			18:09	18:59	20:53	21:41	22:02	21:36	20:36	19:24	17:17	16:29	28	15:46 (9)	16:27	23	15:51 (9)
28	08:24			07:26	06:21	06:12	05:24	05:15	05:48	06:38	07:30	07:22	08:17		15:17 (9)	08:45		15:29 (9)
	17:13			18:11	19:01	20:55	21:42	22:02	21:35	20:34	19:22	17:15	16:28	29	15:46 (9)	16:28	23	15:52 (9)
29	08:22				07:19	06:10	05:23	05:15	05:49	06:40	07:31	07:24	08:19		15:17 (9)	08:46		15:29 (9)
	17:15				20:03	20:57	21:43	22:01	21:33	20:32	19:19	17:13	16:28	30	15:47 (9)	16:28	24	15:53 (9)
30	08:21				07:16	06:08	05:22	05:16	05:51	06:41	07:33	07:26	08:20		15:18 (9)	08:46		15:30 (9)
	17:17				20:04	20:58	21:44	22:01	21:31	20:30	19:17	17:11	16:27	30	15:48 (9)	16:29	24	15:54 (9)
31	08:19				07:14		05:21		05:52	06:43		07:28				08:46		15:30 (9)
	17:18				20:06		21:46		21:30	20:27		17:09				16:30	25	15:55 (9)
Potential sun hours	257			277	367	417	487	502	504	455	381	331	264			241		
Total, worst case		627												304			777	
Sun reduction		0.22												0.26			0.22	
Oper. time red.		1.00												1.00			1.00	
Wind dir. red.		0.62												0.62			0.62	
Total reduction		0.13												0.16			0.14	
Total, real		84												49			105	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
Jennings O'Donovan
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F91 RHH9 Sligo
+353719161416
padraig / podowd@jodireland.com
Calculated:
11/06/2025 09:22/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Real Case - V150 **Shadow receptor:** BL - 77

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January			February	March	April	May	June	July	August	September	October	November			December		
1	08:46		15:43 (9)	08:18	07:23	07:12	06:06	05:20	05:17	05:54	06:45	07:35	07:30			08:22		15:27 (9)
	16:32	13	15:56 (9)	17:20	18:13	20:08	21:00	21:47	22:01	21:28	20:25	19:14	17:07			16:26	25	15:52 (9)
2	08:46		15:42 (9)	08:16	07:21	07:09	06:04	05:19	05:17	05:55	06:46	07:36	07:31			08:23		15:28 (9)
	16:33	15	15:57 (9)	17:22	18:15	20:10	21:02	21:48	22:01	21:26	20:23	19:12	17:05			16:25	23	15:51 (9)
3	08:45		15:43 (9)	08:15	07:19	07:07	06:02	05:18	05:18	05:57	06:48	07:38	07:33			08:24		15:28 (9)
	16:34	15	15:58 (9)	17:24	18:17	20:11	21:03	21:49	22:00	21:25	20:20	19:10	17:04			16:25	22	15:50 (9)
4	08:45		15:44 (9)	08:13	07:17	07:05	06:00	05:17	05:19	05:59	06:50	07:40	07:35			08:26		15:29 (9)
	16:35	16	16:00 (9)	17:26	18:18	20:13	21:05	21:50	22:00	21:23	20:18	19:07	17:02			16:24	21	15:50 (9)
5	08:45		15:43 (9)	08:11	07:15	07:02	05:58	05:17	05:20	06:00	06:51	07:42	07:37			08:27		15:29 (9)
	16:36	18	16:01 (9)	17:28	18:20	20:15	21:07	21:51	21:59	21:21	20:16	19:05	17:00			16:24	20	15:49 (9)
6	08:44		15:44 (9)	08:10	07:12	07:00	05:56	05:16	05:20	06:02	06:53	07:43	07:39			08:28		15:30 (9)
	16:37	19	16:03 (9)	17:30	18:22	20:17	21:08	21:52	21:59	21:19	20:13	19:03	16:58			16:23	19	15:49 (9)
7	08:44		15:44 (9)	08:08	07:10	06:58	05:55	05:15	05:21	06:03	06:55	07:45	07:41			08:30		15:30 (9)
	16:39	20	16:04 (9)	17:32	18:24	20:18	21:10	21:53	21:58	21:18	20:11	19:01	16:56			16:23	18	15:48 (9)
8	08:44		15:44 (9)	08:06	07:08	06:56	05:53	05:15	05:22	06:05	06:56	07:47	07:42			08:31		15:31 (9)
	16:40	21	16:05 (9)	17:33	18:26	20:20	21:12	21:54	21:57	21:16	20:09	18:58	16:55			16:22	16	15:47 (9)
9	08:43		15:45 (9)	08:04	07:05	06:53	05:51	05:14	05:23	06:07	06:58	07:48	07:44			08:32		15:31 (9)
	16:41	22	16:07 (9)	17:35	18:27	20:22	21:13	21:55	21:57	21:14	20:06	18:56	16:53			16:22	15	15:46 (9)
10	08:43		15:45 (9)	08:02	07:03	06:51	05:49	05:14	05:24	06:08	07:00	07:50	07:46			08:33		15:32 (9)
	16:43	23	16:08 (9)	17:37	18:29	20:24	21:15	21:56	21:56	21:12	20:04	18:54	16:51			16:22	15	15:47 (9)
11	08:42		15:45 (9)	08:01	07:01	06:49	05:47	05:13	05:25	06:10	07:01	07:52	07:48			08:34		15:33 (9)
	16:44	25	16:10 (9)	17:39	18:31	20:25	21:17	21:56	21:55	21:10	20:02	18:51	16:50			16:22	14	15:47 (9)
12	08:41		15:46 (9)	07:59	06:59	06:46	05:46	05:13	05:26	06:12	07:03	07:54	07:50			08:35		15:33 (9)
	16:46	25	16:11 (9)	17:41	18:33	20:27	21:18	21:57	21:54	21:08	19:59	18:49	16:48			16:21	13	15:46 (9)
13	08:41		15:46 (9)	07:57	06:56	06:44	05:44	05:13	05:28	06:13	07:05	07:55	07:51			08:36		15:34 (9)
	16:47	27	16:13 (9)	17:43	18:35	20:29	21:20	21:58	21:53	21:06	19:57	18:47	16:47			16:21	12	15:46 (9)
14	08:40		15:47 (9)	07:55	06:54	06:42	05:43	05:12	05:29	06:15	07:06	07:57	07:53		15:37 (9)	08:37		15:34 (9)
	16:49	28	16:15 (9)	17:45	18:36	20:31	21:22	21:58	21:52	21:04	19:55	18:45	16:45	4	15:41 (9)	16:21	12	15:46 (9)
15	08:39		15:48 (9)	07:53	06:52	06:40	05:41	05:12	05:30	06:16	07:08	07:59	07:55		15:32 (9)	08:38		15:35 (9)
	16:50	29	16:17 (9)	17:47	18:38	20:32	21:23	21:59	21:51	21:02	19:52	18:42	16:44	12	15:44 (9)	16:21	11	15:46 (9)
16	08:38		15:47 (9)	07:51	06:49	06:37	05:39	05:12	05:31	06:18	07:10	08:01	07:57		15:31 (9)	08:39		15:36 (9)
	16:52	30	16:17 (9)	17:49	18:40	20:34	21:25	21:59	21:50	21:00	19:50	18:40	16:42	16	15:47 (9)	16:22	10	15:46 (9)
17	08:37		15:48 (9)	07:49	06:47	06:35	05:38	05:12	05:32	06:20	07:11	08:02	07:59		15:29 (9)	08:40		15:35 (9)
	16:54	29	16:17 (9)	17:51	18:42	20:36	21:26	22:00	21:49	20:58	19:48	18:38	16:41	19	15:48 (9)	16:22	11	15:46 (9)
18	08:36		15:49 (9)	07:47	06:45	06:33	05:36	05:12	05:34	06:21	07:13	08:04	08:00		15:28 (9)	08:41		15:36 (9)
	16:55	29	16:18 (9)	17:52	18:43	20:38	21:28	22:00	21:48	20:56	19:45	18:36	16:39	22	15:50 (9)	16:22	10	15:46 (9)
19	08:35		15:50 (9)	07:45	06:42	06:31	05:35	05:12	05:35	06:23	07:15	08:06	08:02		15:28 (9)	08:41		15:37 (9)
	16:57	28	16:18 (9)	17:54	18:45	20:39	21:29	22:01	21:47	20:54	19:43	18:34	16:38	23	15:51 (9)	16:22	10	15:47 (9)
20	08:34		15:51 (9)	07:43	06:40	06:29	05:33	05:12	05:36	06:25	07:16	08:08	08:04		15:27 (9)	08:42		15:37 (9)
	16:59	27	16:18 (9)	17:56	18:47	20:41	21:31	22:01	21:46	20:52	19:40	18:32	16:37	25	15:52 (9)	16:23	9	15:46 (9)
21	08:33		15:51 (9)	07:41	06:38	06:27	05:32	05:12	05:38	06:26	07:18	08:10	08:06		15:27 (9)	08:43		15:38 (9)
	17:00	26	16:17 (9)	17:58	18:49	20:43	21:32	22:01	21:45	20:49	19:38	18:29	16:36	26	15:53 (9)	16:23	9	15:47 (9)
22	08:32		15:52 (9)	07:39	06:35	06:24	05:31	05:12	05:39	06:28	07:20	08:11	08:07		15:27 (9)	08:43		15:39 (9)
	17:02	25	16:17 (9)	18:00	18:50	20:44	21:34	22:01	21:43	20:47	19:36	18:27	16:34	27	15:54 (9)	16:24	9	15:48 (9)
23	08:31		15:54 (9)	07:36	06:33	06:22	05:29	05:13	05:40	06:30	07:21	08:13	08:09		15:27 (9)	08:44		15:39 (9)
	17:04	23	16:17 (9)	18:02	18:52	20:46	21:35	22:02	21:42	20:45	19:33	18:25	16:33	28	15:55 (9)	16:24	9	15:48 (9)
24	08:29		15:54 (9)	07:34	06:31	06:20	05:28	05:13	05:42	06:31	07:23	08:15	08:11		15:26 (9)	08:44		15:39 (9)
	17:06	22	16:16 (9)	18:04	18:54	20:48	21:37	22:02	21:41	20:43	19:31	18:23	16:32	29	15:55 (9)	16:25	9	15:48 (9)
25	08:28		15:56 (9)	07:32	06:28	06:18	05:27	05:13	05:43	06:33	07:25	07:17	08:12		15:26 (9)	08:45		15:40 (9)
	17:07	19	16:15 (9)	18:05	18:56	20:50	21:38	22:02	21:39	20:41	19:29	17:21	16:31	29	15:55 (9)	16:25	10	15:50 (9)
26	08:27		15:58 (9)	07:30	06:26	06:16	05:26	05:14	05:45	06:35	07:26	07:19	08:14		15:26 (9)	08:45		15:40 (9)
	17:09	16	16:14 (9)	18:07	18:57	20:51	21:39	22:02	21:38	20:39	19:26	17:19	16:30	30	15:56 (9)	16:26	10	15:50 (9)
27	08:25		16:01 (9)	07:28	06:23	06:14	05:25	05:14	05:46	06:36	07:28	07:20	08:15		15:27 (9)	08:45		15:41 (9)
	17:11	11	16:12 (9)	18:09	18:59	20:53	21:41	22:02	21:36	20:36	19:24	17:17	16:29	29	15:56 (9)	16:27	10	15:51 (9)
28	08:24		16:05 (9)	07:26	06:21	06:12	05:24	05:15	05:48	06:38	07:30	07:22	08:17		15:26 (9)	08:45		15:41 (9)
	17:13	3	16:08 (9)	18:11	19:01	20:55	21:42	22:02	21:35	20:34	19:22	17:15	16:28	28	15:54 (9)	16:28	11	15:52 (9)
29	08:22				07:19	06:10	05:23	05:15	05:49	06:40	07:31	07:24	08:19		15:27 (9)	08:46		15:41 (9)
	17:15				20:03	20:57	21:43	22:01	21:33	20:32	19:19	17:13	16:28	27	15:54 (9)	16:28	12	15:53 (9)
30	08:21				07:16	06:08	05:22	05:16	05:51	06:41	07:33	07:26	08:20		15:28 (9)	08:46		15:42 (9)
	17:17				20:04	20:58	21:44	22:01	21:31	20:30	19:17	17:11	16:27	25	15:53 (9)	16:29	12	15:54 (9)
31	08:19				07:14		05:21		05:52	06:43		07:28				08:46		15:42 (9)
	17:18				20:06		21:46		21:30	20:27		17:09				16:30	13	15:55 (9)
Potential sun hours	257			277	367	417	487	502	504	455	381	331	264			241		
Total, worst case		604												399			420	
Sun reduction		0.22												0.26			0.22	
Oper. time red.		1.00												1.00			1.00	
Wind dir. red.		0.62												0.62			0.62	
Total reduction		0.13												0.16			0.13	
Total, real		81												64			57	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
Jennings O'Donovan
Finisklin Business Park
F91 RHH9 Sligo
+353719161416
padraig / podowd@jodireland.com
Calculated:
11/06/2025 09:22/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Real Case - V150 **Shadow receptor:** BM - 78

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January			February	March	April	May	June	July	August	September	October	November			December		
1	08:46		15:46 (9)	08:18	07:23	07:12	06:06	05:20	05:17	05:54	06:45	07:35	07:30			08:22		15:30 (9)
	16:32	10	15:56 (9)	17:20	18:13	20:08	21:00	21:47	22:01	21:28	20:25	19:14	17:07			16:26	22	15:52 (9)
2	08:46		15:46 (9)	08:16	07:21	07:09	06:04	05:19	05:17	05:55	06:46	07:36	07:31			08:23		15:31 (9)
	16:33	11	15:57 (9)	17:22	18:15	20:10	21:02	21:48	22:01	21:26	20:23	19:12	17:05			16:25	20	15:51 (9)
3	08:45		15:46 (9)	08:15	07:19	07:07	06:02	05:18	05:18	05:57	06:48	07:38	07:33			08:24		15:31 (9)
	16:34	12	15:58 (9)	17:24	18:17	20:11	21:03	21:49	22:00	21:25	20:20	19:10	17:04			16:25	19	15:50 (9)
4	08:45		15:47 (9)	08:13	07:17	07:05	06:00	05:17	05:19	05:59	06:50	07:40	07:35			08:26		15:32 (9)
	16:35	13	16:00 (9)	17:26	18:18	20:13	21:05	21:50	22:00	21:23	20:18	19:07	17:02			16:24	18	15:50 (9)
5	08:45		15:46 (9)	08:11	07:15	07:02	05:58	05:17	05:20	06:00	06:51	07:42	07:37			08:27		15:32 (9)
	16:36	15	16:01 (9)	17:28	18:20	20:15	21:07	21:51	21:59	21:21	20:16	19:05	17:00			16:24	17	15:49 (9)
6	08:44		15:47 (9)	08:10	07:12	07:00	05:56	05:16	05:20	06:02	06:53	07:43	07:39			08:28		15:33 (9)
	16:37	16	16:03 (9)	17:30	18:22	20:17	21:08	21:52	21:59	21:19	20:13	19:03	16:58			16:23	16	15:49 (9)
7	08:44		15:47 (9)	08:08	07:10	06:58	05:55	05:15	05:21	06:03	06:55	07:45	07:41			08:30		15:34 (9)
	16:39	17	16:04 (9)	17:32	18:24	20:18	21:10	21:53	21:58	21:18	20:11	19:01	16:56			16:23	14	15:48 (9)
8	08:44		15:47 (9)	08:06	07:08	06:56	05:53	05:15	05:22	06:05	06:56	07:47	07:42			08:31		15:34 (9)
	16:40	18	16:05 (9)	17:33	18:26	20:20	21:12	21:54	21:57	21:16	20:09	18:58	16:55			16:22	13	15:47 (9)
9	08:43		15:48 (9)	08:04	07:05	06:53	05:51	05:14	05:23	06:07	06:58	07:48	07:44			08:32		15:34 (9)
	16:41	19	16:07 (9)	17:35	18:27	20:22	21:13	21:55	21:57	21:14	20:06	18:56	16:53			16:22	12	15:46 (9)
10	08:43		15:48 (9)	08:02	07:03	06:51	05:49	05:14	05:24	06:08	07:00	07:50	07:46			08:33		15:36 (9)
	16:43	20	16:08 (9)	17:37	18:29	20:24	21:15	21:56	21:56	21:12	20:04	18:54	16:51			16:22	11	15:47 (9)
11	08:42		15:48 (9)	08:01	07:01	06:49	05:48	05:13	05:25	06:10	07:01	07:52	07:48			08:34		15:36 (9)
	16:44	22	16:10 (9)	17:39	18:31	20:25	21:17	21:56	21:55	21:10	20:02	18:51	16:50			16:22	11	15:47 (9)
12	08:41		15:48 (9)	07:59	06:59	06:46	05:46	05:13	05:26	06:12	07:03	07:54	07:50		15:39 (9)	08:35		15:37 (9)
	16:46	23	16:11 (9)	17:41	18:33	20:27	21:18	21:57	21:54	21:08	19:59	18:49	16:48	5	15:44 (9)	16:21	9	15:46 (9)
13	08:41		15:48 (9)	07:57	06:56	06:44	05:44	05:13	05:28	06:13	07:05	07:55	07:51		15:35 (9)	08:36		15:37 (9)
	16:47	25	16:13 (9)	17:43	18:35	20:29	21:20	21:58	21:53	21:06	19:57	18:47	16:47	13	15:48 (9)	16:21	9	15:46 (9)
14	08:40		15:50 (9)	07:55	06:54	06:42	05:43	05:12	05:29	06:15	07:06	07:57	07:53		15:33 (9)	08:37		15:38 (9)
	16:49	25	16:15 (9)	17:45	18:36	20:31	21:22	21:58	21:52	21:04	19:55	18:45	16:45	17	15:50 (9)	16:21	8	15:46 (9)
15	08:39		15:50 (9)	07:53	06:52	06:40	05:41	05:12	05:30	06:16	07:08	07:59	07:55		15:31 (9)	08:38		15:39 (9)
	16:50	27	16:17 (9)	17:47	18:38	20:32	21:23	21:59	21:51	21:02	19:52	18:42	16:44	20	15:51 (9)	16:21	7	15:46 (9)
16	08:38		15:49 (9)	07:51	06:49	06:37	05:39	05:12	05:31	06:18	07:10	08:01	07:57		15:30 (9)	08:39		15:39 (9)
	16:52	29	16:18 (9)	17:49	18:40	20:34	21:25	21:59	21:50	21:00	19:50	18:40	16:42	22	15:52 (9)	16:22	7	15:46 (9)
17	08:37		15:50 (9)	07:49	06:47	06:35	05:38	05:12	05:32	06:20	07:11	08:02	07:59		15:29 (9)	08:40		15:39 (9)
	16:54	30	16:20 (9)	17:51	18:42	20:36	21:26	22:00	21:49	20:58	19:48	18:38	16:41	25	15:54 (9)	16:22	7	15:46 (9)
18	08:36		15:51 (9)	07:47	06:45	06:33	05:36	05:12	05:34	06:21	07:13	08:04	08:00		15:29 (9)	08:41		15:40 (9)
	16:55	30	16:21 (9)	17:52	18:43	20:38	21:28	22:00	21:48	20:56	19:45	18:36	16:39	26	15:55 (9)	16:22	6	15:46 (9)
19	08:35		15:51 (9)	07:45	06:42	06:31	05:35	05:12	05:35	06:23	07:15	08:06	08:02		15:29 (9)	08:41		15:41 (9)
	16:57	31	16:22 (9)	17:54	18:45	20:39	21:29	22:01	21:47	20:54	19:43	18:34	16:38	27	15:56 (9)	16:22	6	15:47 (9)
20	08:34		15:52 (9)	07:43	06:40	06:29	05:33	05:12	05:36	06:25	07:16	08:08	08:04		15:28 (9)	08:42		15:41 (9)
	16:59	30	16:22 (9)	17:56	18:47	20:41	21:31	22:01	21:46	20:52	19:40	18:32	16:37	28	15:56 (9)	16:23	5	15:46 (9)
21	08:33		15:52 (9)	07:41	06:38	06:27	05:32	05:12	05:38	06:26	07:18	08:10	08:06		15:28 (9)	08:43		15:42 (9)
	17:00	29	16:21 (9)	17:58	18:49	20:43	21:32	22:01	21:45	20:49	19:38	18:29	16:36	29	15:57 (9)	16:23	5	15:47 (9)
22	08:32		15:53 (9)	07:39	06:35	06:24	05:31	05:12	05:39	06:28	07:20	08:11	08:07		15:28 (9)	08:43		15:43 (9)
	17:02	28	16:21 (9)	18:00	18:50	20:44	21:34	22:01	21:43	20:47	19:36	18:27	16:35	30	15:58 (9)	16:24	5	15:48 (9)
23	08:31		15:55 (9)	07:36	06:33	06:22	05:29	05:13	05:40	06:30	07:21	08:13	08:09		15:29 (9)	08:44		15:43 (9)
	17:04	27	16:22 (9)	18:02	18:52	20:46	21:35	22:02	21:42	20:45	19:33	18:25	16:33	30	15:59 (9)	16:24	5	15:48 (9)
24	08:29		15:55 (9)	07:34	06:31	06:20	05:28	05:13	05:42	06:31	07:23	08:15	08:11		15:28 (9)	08:44		15:43 (9)
	17:06	26	16:21 (9)	18:04	18:54	20:48	21:37	22:02	21:41	20:43	19:31	18:23	16:32	30	15:58 (9)	16:25	5	15:48 (9)
25	08:28		15:56 (9)	07:32	06:28	06:18	05:27	05:13	05:43	06:33	07:25	07:17	08:12		15:28 (9)	08:45		15:44 (9)
	17:07	25	16:21 (9)	18:05	18:56	20:50	21:38	22:02	21:39	20:41	19:29	17:21	16:31	30	15:58 (9)	16:25	6	15:50 (9)
26	08:27		15:57 (9)	07:30	06:26	06:16	05:26	05:14	05:45	06:35	07:26	07:19	08:14		15:29 (9)	08:45		15:44 (9)
	17:09	22	16:19 (9)	18:07	18:57	20:51	21:39	22:02	21:38	20:39	19:26	17:19	16:30	28	15:57 (9)	16:26	6	15:50 (9)
27	08:25		15:59 (9)	07:28	06:23	06:14	05:25	05:14	05:46	06:36	07:28	07:20	08:15		15:29 (9)	08:45		15:44 (9)
	17:11	20	16:19 (9)	18:09	18:59	20:53	21:41	22:02	21:36	20:36	19:24	17:17	16:29	27	15:56 (9)	16:27	7	15:51 (9)
28	08:24		16:01 (9)	07:26	06:21	06:12	05:24	05:15	05:48	06:38	07:30	07:22	08:17		15:29 (9)	08:45		15:44 (9)
	17:13	16	16:17 (9)	18:11	19:01	20:55	21:42	22:02	21:35	20:34	19:22	17:15	16:28	25	15:54 (9)	16:28	8	15:52 (9)
29	08:22		16:04 (9)		07:19	06:10	05:23	05:15	05:49	06:40	07:31	07:24	08:19		15:29 (9)	08:46		15:45 (9)
	17:15	12	16:16 (9)		20:03	20:57	21:43	22:01	21:33	20:32	19:19	17:13	16:28	25	15:54 (9)	16:28	8	15:53 (9)
30	08:21		16:07 (9)		07:16	06:08	05:22	05:16	05:51	06:41	07:33	07:26	08:20		15:30 (9)	08:46		15:45 (9)
	17:17	5	16:12 (9)		20:04	20:58	21:44	22:01	21:31	20:30	19:17	17:11	16:27	23	15:53 (9)	16:29	9	15:54 (9)
31	08:19				07:14		05:21		05:52	06:43		07:28				08:46		15:45 (9)
	17:18				20:06		21:46		21:30	20:27		17:09				16:30	10	15:55 (9)
Potential sun hours	257			277	367	417	487	502	504	455	381	331	264			241		
Total, worst case		633												460			311	
Sun reduction		0.22												0.26			0.22	
Oper. time red.		1.00												1.00			1.00	
Wind dir. red.		0.62												0.62			0.62	
Total reduction		0.13												0.16			0.13	
Total, real		85												74			42	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
Jennings O'Donovan
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F91 RHH9 Sligo
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padraig / podowd@jodireland.com
Calculated:
11/06/2025 09:22/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Real Case - V150 **Shadow receptor:** BN - 79

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January		February		March	April	May	June	July	August	September	October	November		December	
1	08:46	15:50 (8)	08:18	16:10 (9)	07:23	07:12	06:06	05:20	05:17	05:54	06:45	07:35	07:30		08:22	15:35 (9)
	16:32 6	15:56 (9)	17:20 9	16:19 (9)	18:13	20:08	21:00	21:47	22:01	21:28	20:25	19:14	17:07		16:26 17	15:52 (9)
2	08:46	15:50 (8)	08:16		07:21	07:09	06:04	05:19	05:17	05:55	06:46	07:36	07:31		08:23	15:36 (9)
	16:33 7	15:57 (9)	17:22		18:15	20:10	21:02	21:48	22:01	21:26	20:23	19:12	17:05		16:25 15	15:51 (9)
3	08:45	15:51 (8)	08:15		07:19	07:07	06:02	05:18	05:18	05:57	06:48	07:38	07:33		08:24	15:36 (9)
	16:34 7	15:58 (9)	17:24		18:17	20:11	21:03	21:49	22:00	21:25	20:20	19:10	17:04		16:25 14	15:50 (9)
4	08:45	15:51 (8)	08:13		07:17	07:05	06:00	05:17	05:19	05:59	06:50	07:40	07:35		08:26	15:37 (9)
	16:35 9	16:00 (9)	17:26		18:18	20:13	21:05	21:50	22:00	21:23	20:18	19:07	17:02		16:24 13	15:50 (9)
5	08:45	15:51 (8)	08:11		07:15	07:02	05:58	05:17	05:20	06:00	06:51	07:42	07:37		08:27	15:37 (9)
	16:36 10	16:01 (9)	17:28		18:20	20:15	21:07	21:51	21:59	21:21	20:16	19:05	17:00		16:24 12	15:49 (9)
6	08:44	15:52 (9)	08:10		07:12	07:00	05:56	05:16	05:20	06:02	06:53	07:43	07:39		08:28	15:38 (9)
	16:37 11	16:03 (9)	17:30		18:22	20:17	21:08	21:52	21:59	21:19	20:13	19:03	16:58		16:23 11	15:49 (9)
7	08:44	15:52 (9)	08:08		07:10	06:58	05:55	05:15	05:21	06:03	06:55	07:45	07:41		08:30	15:38 (8)
	16:39 12	16:04 (9)	17:32		18:24	20:18	21:10	21:53	21:58	21:18	20:11	19:01	16:56		16:23 10	15:48 (9)
8	08:44	15:52 (9)	08:06		07:08	06:56	05:53	05:15	05:22	06:05	06:56	07:47	07:42		08:31	15:38 (8)
	16:40 13	16:05 (9)	17:33		18:26	20:20	21:12	21:54	21:57	21:16	20:09	18:58	16:55		16:22 9	15:47 (9)
9	08:43	15:53 (9)	08:04		07:05	06:53	05:51	05:14	05:23	06:07	06:58	07:48	07:44		08:32	15:39 (8)
	16:41 14	16:07 (9)	17:35		18:27	20:22	21:13	21:55	21:57	21:14	20:06	18:56	16:53		16:22 7	15:46 (9)
10	08:43	15:52 (9)	08:02		07:03	06:51	05:49	05:14	05:24	06:08	07:00	07:50	07:46	15:40 (9)	08:33	15:40 (8)
	16:43 16	16:08 (9)	17:37		18:29	20:24	21:15	21:56	21:56	21:12	20:04	18:54	16:51 10	15:50 (9)	16:22 7	15:47 (9)
11	08:42	15:52 (9)	08:01		07:01	06:49	05:48	05:13	05:25	06:10	07:01	07:52	07:48	15:38 (9)	08:34	15:40 (8)
	16:44 18	16:10 (9)	17:39		18:31	20:25	21:17	21:56	21:55	21:10	20:02	18:51	16:50 15	15:53 (9)	16:22 7	15:47 (9)
12	08:41	15:52 (9)	07:59		06:59	06:46	05:46	05:13	05:26	06:12	07:03	07:54	07:50	15:36 (9)	08:35	15:41 (8)
	16:46 19	16:11 (9)	17:41		18:33	20:27	21:18	21:57	21:54	21:08	19:59	18:49	16:48 19	15:55 (9)	16:21 5	15:46 (9)
13	08:41	15:53 (9)	07:57		06:56	06:44	05:44	05:13	05:28	06:13	07:05	07:55	07:51	15:35 (9)	08:36	15:41 (8)
	16:47 20	16:13 (9)	17:43		18:35	20:29	21:20	21:58	21:53	21:06	19:57	18:47	16:47 22	15:57 (9)	16:21 5	15:46 (9)
14	08:40	15:54 (9)	07:55		06:54	06:42	05:43	05:12	05:29	06:15	07:06	07:57	07:53	15:34 (9)	08:37	15:42 (8)
	16:49 21	16:15 (9)	17:45		18:36	20:31	21:22	21:58	21:52	21:04	19:55	18:45	16:45 24	15:58 (9)	16:21 4	15:46 (9)
15	08:39	15:54 (9)	07:53		06:52	06:40	05:41	05:12	05:30	06:16	07:08	07:59	07:55	15:32 (9)	08:38	15:43 (8)
	16:50 23	16:17 (9)	17:47		18:38	20:32	21:23	21:59	21:51	21:02	19:52	18:42	16:44 26	15:58 (9)	16:21 3	15:46 (9)
16	08:38	15:53 (9)	07:51		06:49	06:37	05:39	05:12	05:31	06:18	07:10	08:01	07:57	15:32 (9)	08:39	15:43 (8)
	16:52 25	16:18 (9)	17:49		18:40	20:34	21:25	21:59	21:50	21:00	19:50	18:40	16:42 27	15:59 (9)	16:22 3	15:46 (9)
17	08:37	15:54 (9)	07:49		06:47	06:35	05:38	05:12	05:32	06:20	07:11	08:02	07:59	15:31 (9)	08:40	15:43 (8)
	16:54 26	16:20 (9)	17:51		18:42	20:36	21:26	22:00	21:49	20:58	19:48	18:38	16:41 29	16:00 (9)	16:22 3	15:46 (9)
18	08:36	15:54 (9)	07:47		06:45	06:33	05:36	05:12	05:34	06:21	07:13	08:04	08:00	15:31 (9)	08:41	15:44 (8)
	16:55 28	16:22 (9)	17:52		18:43	20:38	21:28	22:00	21:48	20:56	19:45	18:36	16:39 29	16:00 (9)	16:22 2	15:46 (8)
19	08:35	15:55 (9)	07:45		06:42	06:31	05:35	05:12	05:35	06:23	07:15	08:06	08:02	15:31 (9)	08:41	15:45 (8)
	16:57 29	16:24 (9)	17:54		18:45	20:39	21:29	22:01	21:47	20:54	19:43	18:34	16:38 30	16:01 (9)	16:22 2	15:47 (8)
20	08:34	15:56 (9)	07:43		06:40	06:29	05:33	05:12	05:36	06:25	07:16	08:08	08:04	15:31 (9)	08:42	15:45 (8)
	16:59 30	16:26 (9)	17:56		18:47	20:41	21:31	22:01	21:46	20:52	19:40	18:32	16:37 31	16:02 (9)	16:23 1	15:46 (8)
21	08:33	15:55 (9)	07:41		06:38	06:27	05:32	05:12	05:38	06:26	07:18	08:10	08:06	15:31 (9)	08:43	15:46 (8)
	17:00 31	16:26 (9)	17:58		18:49	20:43	21:32	22:01	21:45	20:49	19:38	18:29	16:36 31	16:02 (9)	16:23 1	15:47 (8)
22	08:32	15:56 (9)	07:39		06:35	06:24	05:31	05:13	05:39	06:28	07:20	08:11	08:07	15:32 (9)	08:43	15:46 (8)
	17:02 31	16:27 (9)	18:00		18:50	20:44	21:34	22:01	21:43	20:47	19:36	18:27	16:35 30	16:02 (9)	16:24 2	15:48 (8)
23	08:31	15:57 (9)	07:36		06:33	06:22	05:29	05:13	05:40	06:30	07:21	08:13	08:09	15:32 (9)	08:44	15:47 (8)
	17:04 30	16:27 (9)	18:02		18:52	20:46	21:35	22:02	21:42	20:45	19:33	18:25	16:33 29	16:01 (9)	16:24 1	15:48 (8)
24	08:29	15:57 (9)	07:34		06:31	06:20	05:28	05:13	05:42	06:31	07:23	08:15	08:11	15:31 (9)	08:44	15:47 (8)
	17:06 29	16:26 (9)	18:04		18:54	20:48	21:37	22:02	21:41	20:43	19:31	18:23	16:32 28	15:59 (9)	16:25 1	15:48 (8)
25	08:28	15:59 (9)	07:32		06:28	06:18	05:27	05:13	05:43	06:33	07:25	07:17	08:12	15:32 (9)	08:45	15:48 (8)
	17:07 28	16:27 (9)	18:05		18:56	20:50	21:38	22:02	21:39	20:41	19:29	17:21	16:31 26	15:58 (9)	16:25 2	15:50 (8)
26	08:27	15:59 (9)	07:30		06:26	06:16	05:26	05:14	05:45	06:35	07:26	07:19	08:14	15:32 (9)	08:45	15:48 (8)
	17:09 27	16:26 (9)	18:07		18:57	20:51	21:39	22:02	21:38	20:39	19:26	17:19	16:30 25	15:57 (9)	16:26 2	15:50 (8)
27	08:25	16:00 (9)	07:28		06:23	06:14	05:25	05:14	05:46	06:36	07:28	07:20	08:15	15:33 (9)	08:45	15:48 (8)
	17:11 26	16:26 (9)	18:09		18:59	20:53	21:41	22:02	21:36	20:36	19:24	17:17	16:29 23	15:56 (9)	16:27 3	15:51 (9)
28	08:24	16:01 (9)	07:26		06:21	06:12	05:24	05:15	05:48	06:38	07:30	07:22	08:17	15:33 (9)	08:45	15:48 (8)
	17:13 24	16:25 (9)	18:11		19:01	20:55	21:42	22:02	21:35	20:34	19:22	17:15	16:28 21	15:54 (9)	16:28 4	15:52 (9)
29	08:22	16:03 (9)			07:19	06:10	05:23	05:15	05:49	06:40	07:31	07:24	08:19	15:34 (9)	08:46	15:49 (8)
	17:15 22	16:25 (9)			20:03	20:57	21:43	22:01	21:33	20:32	19:19	17:13	16:28 20	15:54 (9)	16:28 4	15:53 (9)
30	08:21	16:04 (9)			07:16	06:08	05:22	05:16	05:51	06:41	07:33	07:26	08:20	15:35 (9)	08:46	15:49 (8)
	17:17 19	16:23 (9)			20:04	20:58	21:44	22:01	21:31	20:30	19:17	17:11	16:27 18	15:53 (9)	16:29 5	15:54 (9)
31	08:19	16:06 (9)			07:14		05:21		05:52	06:43		07:28			08:46	15:50 (8)
	17:18 15	16:21 (9)			20:06		21:46		21:30	20:27		17:09			16:30 5	15:55 (9)
Potential sun hours	257		277		367	417	487	502	504	455	381	331	264		241	
Total, worst case	626		9										513		180	
Sun reduction	0.22		0.24										0.26		0.22	
Oper. time red.	1.00		1.00										1.00		1.00	
Wind dir. red.	0.61		0.61										0.61		0.61	
Total reduction	0.13		0.15										0.16		0.13	
Total, real	84		1										82		24	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
Jennings O'Donovan
Finisklin Business Park
F91 RHH9 Sligo
+353719161416
padraig / podowd@jodireland.com
Calculated:
11/06/2025 09:22/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Real Case - V150 **Shadow receptor:** BO - 80

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January			February	March	April	May	June	July	August	September	October	November			December		
1	08:46		15:41 (9)	08:18	07:23	07:12	06:06	05:20	05:17	05:54	06:45	07:35	07:30			08:22		15:25 (9)
	16:32	15	15:56 (9)	17:20	18:13	20:08	21:00	21:47	22:01	21:28	20:25	19:14	17:07			16:26	27	15:52 (9)
2	08:46		15:41 (9)	08:16	07:21	07:09	06:04	05:19	05:17	05:55	06:46	07:36	07:31			08:23		15:26 (9)
	16:33	16	15:57 (9)	17:22	18:15	20:10	21:02	21:48	22:01	21:26	20:23	19:12	17:05			16:25	25	15:51 (9)
3	08:45		15:41 (9)	08:15	07:19	07:07	06:02	05:18	05:18	05:57	06:48	07:38	07:33			08:24		15:26 (9)
	16:34	17	15:58 (9)	17:24	18:17	20:11	21:03	21:49	22:00	21:25	20:20	19:10	17:04			16:25	24	15:50 (9)
4	08:45		15:42 (9)	08:13	07:17	07:05	06:00	05:17	05:19	05:59	06:50	07:40	07:35			08:26		15:27 (9)
	16:35	18	16:00 (9)	17:26	18:18	20:13	21:05	21:50	22:00	21:23	20:18	19:07	17:02			16:24	23	15:50 (9)
5	08:45		15:42 (9)	08:11	07:15	07:02	05:58	05:17	05:20	06:00	06:51	07:42	07:37			08:27		15:27 (9)
	16:36	19	16:01 (9)	17:28	18:20	20:15	21:07	21:51	21:59	21:21	20:16	19:05	17:00			16:24	22	15:49 (9)
6	08:44		15:42 (9)	08:10	07:12	07:00	05:56	05:16	05:20	06:02	06:53	07:43	07:39			08:28		15:28 (9)
	16:37	21	16:03 (9)	17:30	18:22	20:17	21:08	21:52	21:59	21:19	20:13	19:03	16:58			16:23	21	15:49 (9)
7	08:44		15:42 (9)	08:08	07:10	06:58	05:55	05:15	05:21	06:03	06:55	07:45	07:41			08:30		15:29 (9)
	16:39	22	16:04 (9)	17:32	18:24	20:18	21:10	21:53	21:58	21:18	20:11	19:01	16:56			16:23	19	15:48 (9)
8	08:44		15:42 (9)	08:06	07:08	06:56	05:53	05:15	05:22	06:05	06:56	07:47	07:42			08:31		15:29 (9)
	16:40	23	16:05 (9)	17:33	18:26	20:20	21:12	21:54	21:57	21:16	20:09	18:58	16:55			16:22	18	15:47 (9)
9	08:43		15:43 (9)	08:04	07:05	06:53	05:51	05:14	05:23	06:07	06:58	07:48	07:44			08:32		15:29 (9)
	16:41	24	16:07 (9)	17:35	18:27	20:22	21:13	21:55	21:57	21:14	20:06	18:56	16:53			16:22	17	15:46 (9)
10	08:43		15:43 (9)	08:02	07:03	06:51	05:49	05:14	05:24	06:08	07:00	07:50	07:46			08:33		15:31 (9)
	16:43	25	16:08 (9)	17:37	18:29	20:24	21:15	21:56	21:56	21:12	20:04	18:54	16:51			16:22	16	15:47 (9)
11	08:42		15:43 (9)	08:01	07:01	06:49	05:48	05:13	05:25	06:10	07:01	07:52	07:48			08:34		15:31 (9)
	16:44	27	16:10 (9)	17:39	18:31	20:25	21:17	21:56	21:55	21:10	20:02	18:51	16:50			16:22	16	15:47 (9)
12	08:41		15:43 (9)	07:59	06:59	06:46	05:46	05:13	05:26	06:12	07:03	07:54	07:50		15:32 (9)	08:35		15:32 (9)
	16:46	28	16:11 (9)	17:41	18:33	20:27	21:18	21:57	21:54	21:08	19:59	18:49	16:48	12	15:44 (9)	16:21	14	15:46 (9)
13	08:41		15:44 (9)	07:57	06:56	06:44	05:44	05:13	05:28	06:13	07:05	07:55	07:51		15:30 (9)	08:36		15:32 (9)
	16:47	29	16:13 (9)	17:43	18:35	20:29	21:20	21:58	21:53	21:06	19:57	18:47	16:47	17	15:47 (9)	16:21	14	15:46 (9)
14	08:40		15:45 (9)	07:55	06:54	06:42	05:43	05:12	05:29	06:15	07:06	07:57	07:53		15:28 (9)	08:37		15:33 (9)
	16:49	30	16:15 (9)	17:45	18:36	20:31	21:22	21:58	21:52	21:04	19:55	18:45	16:45	20	15:48 (9)	16:21	13	15:46 (9)
15	08:39		15:45 (9)	07:53	06:52	06:40	05:41	05:12	05:30	06:16	07:08	07:59	07:55		15:26 (9)	08:38		15:33 (9)
	16:50	32	16:17 (9)	17:47	18:38	20:32	21:23	21:59	21:51	21:02	19:52	18:42	16:44	23	15:49 (9)	16:21	13	15:46 (9)
16	08:38		15:45 (9)	07:51	06:49	06:37	05:39	05:12	05:31	06:18	07:10	08:01	07:57		15:25 (9)	08:39		15:34 (9)
	16:52	33	16:18 (9)	17:49	18:40	20:34	21:25	21:59	21:50	21:00	19:50	18:40	16:42	25	15:50 (9)	16:22	12	15:46 (9)
17	08:37		15:45 (9)	07:49	06:47	06:35	05:38	05:12	05:32	06:20	07:11	08:02	07:59		15:25 (9)	08:40		15:34 (9)
	16:54	34	16:19 (9)	17:51	18:42	20:36	21:26	22:00	21:49	20:58	19:48	18:38	16:41	26	15:51 (9)	16:22	12	15:46 (9)
18	08:36		15:46 (9)	07:47	06:45	06:33	05:36	05:12	05:34	06:21	07:13	08:04	08:00		15:24 (9)	08:41		15:35 (9)
	16:55	33	16:19 (9)	17:52	18:43	20:38	21:28	22:00	21:48	20:56	19:45	18:36	16:39	28	15:52 (9)	16:22	11	15:46 (9)
19	08:35		15:47 (9)	07:45	06:42	06:31	05:35	05:12	05:35	06:23	07:15	08:06	08:02		15:24 (9)	08:41		15:36 (9)
	16:57	32	16:19 (9)	17:54	18:45	20:39	21:29	22:01	21:47	20:54	19:43	18:34	16:38	29	15:53 (9)	16:22	11	15:47 (9)
20	08:34		15:48 (9)	07:43	06:40	06:29	05:33	05:12	05:36	06:25	07:16	08:08	08:04		15:24 (9)	08:42		15:36 (9)
	16:59	32	16:20 (9)	17:56	18:47	20:41	21:31	22:01	21:46	20:52	19:40	18:32	16:37	30	15:54 (9)	16:23	10	15:46 (9)
21	08:33		15:48 (9)	07:41	06:38	06:27	05:32	05:12	05:38	06:26	07:18	08:10	08:06		15:24 (9)	08:43		15:36 (9)
	17:00	31	16:19 (9)	17:58	18:49	20:43	21:32	22:01	21:45	20:49	19:38	18:29	16:36	31	15:55 (9)	16:23	11	15:47 (9)
22	08:32		15:49 (9)	07:39	06:35	06:24	05:31	05:13	05:39	06:28	07:20	08:11	08:07		15:24 (9)	08:43		15:37 (9)
	17:02	30	16:19 (9)	18:00	18:50	20:44	21:34	22:01	21:43	20:47	19:36	18:27	16:35	32	15:56 (9)	16:24	11	15:48 (9)
23	08:31		15:50 (9)	07:36	06:33	06:22	05:29	05:13	05:40	06:30	07:21	08:13	08:09		15:24 (9)	08:44		15:37 (9)
	17:04	29	16:19 (9)	18:02	18:52	20:46	21:35	22:02	21:42	20:45	19:33	18:25	16:33	32	15:56 (9)	16:24	11	15:48 (9)
24	08:29		15:50 (9)	07:34	06:31	06:20	05:28	05:13	05:42	06:31	07:23	08:15	08:11		15:23 (9)	08:44		15:38 (9)
	17:06	28	16:18 (9)	18:04	18:54	20:48	21:37	22:02	21:41	20:43	19:31	18:23	16:32	33	15:56 (9)	16:25	10	15:48 (9)
25	08:28		15:52 (9)	07:32	06:28	06:18	05:27	05:13	05:43	06:33	07:25	07:17	08:12		15:24 (9)	08:45		15:39 (9)
	17:07	26	16:18 (9)	18:05	18:56	20:50	21:38	22:02	21:39	20:41	19:29	17:21	16:31	33	15:57 (9)	16:25	11	15:50 (9)
26	08:27		15:52 (9)	07:30	06:26	06:16	05:26	05:14	05:45	06:35	07:26	07:19	08:14		15:24 (9)	08:45		15:39 (9)
	17:09	25	16:17 (9)	18:07	18:57	20:51	21:39	22:02	21:38	20:39	19:26	17:19	16:30	33	15:57 (9)	16:26	11	15:50 (9)
27	08:25		15:54 (9)	07:28	06:23	06:14	05:25	05:14	05:46	06:36	07:28	07:20	08:15		15:24 (9)	08:45		15:39 (9)
	17:11	23	16:17 (9)	18:09	18:59	20:53	21:41	22:02	21:36	20:36	19:24	17:17	16:29	32	15:56 (9)	16:27	12	15:51 (9)
28	08:24		15:56 (9)	07:26	06:21	06:12	05:24	05:15	05:48	06:38	07:30	07:22	08:17		15:24 (9)	08:45		15:39 (9)
	17:13	19	16:15 (9)	18:11	19:01	20:55	21:42	22:02	21:35	20:34	19:22	17:15	16:28	30	15:54 (9)	16:28	13	15:52 (9)
29	08:22		15:58 (9)		07:19	06:10	05:23	05:15	05:49	06:40	07:31	07:24	08:19		15:25 (9)	08:46		15:40 (9)
	17:15	17	16:15 (9)		20:03	20:57	21:43	22:01	21:33	20:32	19:19	17:13	16:28	29	15:54 (9)	16:28	13	15:53 (9)
30	08:21		16:01 (9)		07:16	06:08	05:22	05:16	05:51	06:41	07:33	07:26	08:20		15:25 (9)	08:46		15:40 (9)
	17:17	11	16:12 (9)		20:04	20:58	21:44	22:01	21:31	20:30	19:17	17:11	16:27	28	15:53 (9)	16:29	14	15:54 (9)
31	08:19				07:14		05:21		05:52	06:43		07:28				08:46		15:40 (9)
	17:18				20:06		21:46		21:30	20:27		17:09				16:30	15	15:55 (9)
Potential sun hours	257			277	367	417	487	502	504	455	381	331	264			241		
Total, worst case		749												523			470	
Sun reduction		0.22												0.26			0.22	
Oper. time red.		1.00												1.00			1.00	
Wind dir. red.		0.62												0.62			0.62	
Total reduction		0.13												0.16			0.13	
Total, real		100												84			63	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
Jennings O'Donovan
Finisklin Business Park
F91 RHH9 Sligo
+353719161416
padraig / podowd@jodireland.com
Calculated:
11/06/2025 09:22/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Real Case - V150 **Shadow receptor:** BP - 81

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January		February		March	April	May	June	July	August	September	October	November		December		
1	08:46		15:54 (8)	08:18	16:09 (9)	07:23	07:12	06:06	05:20	05:17	05:54	06:45	07:35	07:30		08:22		15:39 (8)
	16:32	2	15:56 (8)	17:20	20 16:29 (9)	18:13	20:08	21:00	21:47	22:01	21:28	20:25	19:14	17:07		16:26	13	15:52 (9)
2	08:46		15:54 (8)	08:16	16:11 (9)	07:21	07:09	06:04	05:19	05:17	05:55	06:46	07:36	07:31		08:23		15:39 (8)
	16:33	3	15:57 (8)	17:22	16 16:27 (9)	18:15	20:10	21:02	21:48	22:01	21:26	20:23	19:12	17:05		16:25	12	15:51 (9)
3	08:45		15:54 (8)	08:15	16:13 (9)	07:19	07:07	06:02	05:18	05:18	05:57	06:48	07:38	07:33		08:24		15:39 (8)
	16:34	4	15:58 (8)	17:24	11 16:24 (9)	18:17	20:11	21:03	21:49	22:00	21:25	20:20	19:10	17:04		16:25	11	15:50 (9)
4	08:45		15:55 (8)	08:13		07:17	07:05	06:00	05:17	05:19	05:59	06:50	07:40	07:35		08:26		15:40 (8)
	16:35	5	16:00 (9)	17:26		18:18	20:13	21:05	21:50	22:00	21:23	20:18	19:07	17:02		16:24	10	15:50 (9)
5	08:45		15:55 (8)	08:11		07:15	07:02	05:58	05:17	05:20	06:00	06:51	07:42	07:37		08:27		15:40 (8)
	16:36	6	16:01 (9)	17:28		18:20	20:15	21:07	21:51	21:59	21:21	20:16	19:05	17:00		16:24	9	15:49 (9)
6	08:44		15:55 (8)	08:10		07:12	07:00	05:56	05:16	05:20	06:02	06:53	07:43	07:39		08:28		15:42 (8)
	16:37	8	16:03 (9)	17:30		18:22	20:17	21:08	21:52	21:59	21:19	20:13	19:03	16:58		16:23	7	15:49 (9)
7	08:44		15:55 (8)	08:08		07:10	06:58	05:55	05:15	05:21	06:03	06:55	07:45	07:41		08:30		15:42 (8)
	16:39	9	16:04 (9)	17:32		18:24	20:18	21:10	21:53	21:58	21:18	20:11	19:01	16:56		16:23	6	15:48 (9)
8	08:44		15:55 (8)	08:06		07:08	06:56	05:53	05:15	05:22	06:05	06:56	07:47	07:42	15:43 (9)	08:31		15:42 (8)
	16:40	10	16:05 (9)	17:33		18:26	20:20	21:12	21:54	21:57	21:16	20:09	18:58	16:55	12 15:55 (9)	16:22	5	15:47 (9)
9	08:43		15:56 (8)	08:04		07:05	06:53	05:51	05:14	05:23	06:07	06:58	07:48	07:44	15:41 (9)	08:32		15:42 (8)
	16:41	11	16:07 (9)	17:35		18:27	20:22	21:13	21:55	21:57	21:14	20:06	18:56	16:53	17 15:58 (9)	16:22	4	15:46 (8)
10	08:43		15:56 (8)	08:02		07:03	06:51	05:49	05:14	05:24	06:08	07:00	07:50	07:46	15:40 (9)	08:33		15:44 (8)
	16:43	12	16:08 (9)	17:37		18:29	20:24	21:15	21:56	21:56	21:12	20:04	18:54	16:51	20 16:00 (9)	16:22	3	15:47 (8)
11	08:42		15:56 (8)	08:01		07:01	06:49	05:48	05:13	05:25	06:10	07:01	07:52	07:48	15:38 (9)	08:34		15:44 (8)
	16:44	14	16:10 (9)	17:39		18:31	20:25	21:17	21:56	21:55	21:10	20:02	18:51	16:50	23 16:01 (9)	16:22	3	15:47 (8)
12	08:41		15:57 (8)	07:59		06:59	06:46	05:46	05:13	05:26	06:12	07:03	07:54	07:50	15:37 (9)	08:35		15:45 (8)
	16:46	14	16:11 (9)	17:41		18:33	20:27	21:18	21:57	21:54	21:08	19:59	18:49	16:48	25 16:02 (9)	16:21	1	15:46 (8)
13	08:41		15:57 (8)	07:57		06:56	06:44	05:44	05:13	05:28	06:13	07:05	07:55	07:51	15:37 (9)	08:36		15:45 (8)
	16:47	16	16:13 (9)	17:43		18:35	20:29	21:20	21:58	21:53	21:06	19:57	18:47	16:47	26 16:03 (9)	16:21	1	15:46 (8)
14	08:40		15:58 (8)	07:55		06:54	06:42	05:43	05:12	05:29	06:15	07:06	07:57	07:53	15:36 (9)	08:37		
	16:49	17	16:15 (9)	17:45		18:36	20:31	21:22	21:58	21:52	21:04	19:55	18:45	16:45	28 16:04 (9)	16:21		
15	08:39		15:59 (9)	07:53		06:52	06:40	05:41	05:12	05:30	06:16	07:08	07:59	07:55	15:35 (9)	08:38		
	16:50	18	16:17 (9)	17:47		18:38	20:32	21:23	21:59	21:51	21:02	19:52	18:42	16:44	29 16:04 (9)	16:21		
16	08:38		15:58 (9)	07:51		06:49	06:37	05:39	05:12	05:31	06:18	07:10	08:01	07:57	15:35 (9)	08:39		
	16:52	20	16:18 (9)	17:49		18:40	20:34	21:25	21:59	21:50	21:00	19:50	18:40	16:42	30 16:05 (9)	16:22		
17	08:37		15:58 (9)	07:49		06:47	06:35	05:38	05:12	05:32	06:20	07:11	08:02	07:59	15:34 (9)	08:40		
	16:54	22	16:20 (9)	17:51		18:42	20:36	21:26	22:00	21:49	20:58	19:48	18:38	16:41	31 16:05 (9)	16:22		
18	08:36		15:59 (9)	07:47		06:45	06:33	05:36	05:12	05:34	06:21	07:13	08:04	08:00	15:35 (9)	08:41		
	16:55	23	16:22 (9)	17:52		18:43	20:38	21:28	22:00	21:48	20:56	19:45	18:36	16:39	31 16:06 (9)	16:22		
19	08:35		15:59 (9)	07:45		06:42	06:31	05:35	05:12	05:35	06:23	07:15	08:06	08:02	15:35 (9)	08:41		
	16:57	25	16:24 (9)	17:54		18:45	20:39	21:29	22:01	21:47	20:54	19:43	18:34	16:38	31 16:06 (9)	16:22		
20	08:34		16:00 (9)	07:43		06:40	06:29	05:33	05:12	05:36	06:25	07:16	08:08	08:04	15:35 (9)	08:42		
	16:59	26	16:26 (9)	17:56		18:47	20:41	21:31	22:01	21:46	20:52	19:40	18:32	16:37	29 16:04 (9)	16:23		
21	08:33		15:59 (9)	07:41		06:38	06:27	05:32	05:12	05:38	06:26	07:18	08:10	08:06	15:35 (9)	08:43		
	17:00	28	16:27 (9)	17:58		18:49	20:43	21:32	22:01	21:45	20:49	19:38	18:29	16:36	28 16:03 (9)	16:23		
22	08:32		16:00 (9)	07:39		06:35	06:24	05:31	05:13	05:39	06:28	07:20	08:11	08:07	15:36 (9)	08:43		
	17:02	29	16:29 (9)	18:00		18:50	20:44	21:34	22:01	21:43	20:47	19:36	18:27	16:35	26 16:02 (9)	16:24		
23	08:31		16:01 (9)	07:36		06:33	06:22	05:29	05:13	05:40	06:30	07:21	08:13	08:09	15:36 (9)	08:44		
	17:04	31	16:32 (9)	18:02		18:52	20:46	21:35	22:02	21:42	20:45	19:33	18:25	16:33	25 16:01 (9)	16:24		
24	08:29		16:01 (9)	07:34		06:31	06:20	05:28	05:13	05:42	06:31	07:23	08:15	08:11	15:36 (9)	08:44		
	17:06	31	16:32 (9)	18:04		18:54	20:48	21:37	22:02	21:40	20:43	19:31	18:23	16:32	23 15:59 (9)	16:25		
25	08:28		16:02 (9)	07:32		06:28	06:18	05:27	05:13	05:43	06:33	07:25	07:17	08:12	15:36 (9)	08:45		
	17:07	30	16:32 (9)	18:05		18:56	20:50	21:38	22:02	21:39	20:41	19:29	17:21	16:31	22 15:58 (9)	16:25		
26	08:27		16:02 (9)	07:30		06:26	06:16	05:26	05:14	05:45	06:35	07:26	07:19	08:14	15:37 (9)	08:45		
	17:09	30	16:32 (9)	18:07		18:57	20:51	21:39	22:02	21:38	20:39	19:26	17:19	16:30	20 15:57 (9)	16:26		
27	08:25		16:03 (9)	07:28		06:23	06:14	05:25	05:14	05:46	06:36	07:28	07:20	08:15	15:38 (9)	08:45		
	17:11	29	16:32 (9)	18:09		18:59	20:53	21:41	22:02	21:36	20:36	19:24	17:17	16:29	18 15:56 (9)	16:27		
28	08:24		16:03 (9)	07:26		06:21	06:12	05:24	05:15	05:48	06:38	07:30	07:22	08:17	15:38 (9)	08:45		
	17:13	28	16:31 (9)	18:11		19:01	20:55	21:42	22:02	21:35	20:34	19:22	17:15	16:28	16 15:54 (9)	16:28		
29	08:22		16:05 (9)			07:19	06:10	05:23	05:15	05:49	06:40	07:31	07:24	08:19	15:38 (8)	08:46		
	17:15	26	16:31 (9)			20:03	20:57	21:43	22:01	21:33	20:32	19:19	17:13	16:28	16 15:54 (9)	16:28		
30	08:21		16:06 (9)			07:16	06:08	05:22	05:16	05:51	06:41	07:33	07:26	08:20	15:39 (8)	08:46		15:53 (8)
	17:17	24	16:30 (9)			20:04	20:58	21:44	22:01	21:31	20:30	19:17	17:11	16:27	14 15:53 (9)	16:29	1	15:54 (8)
31	08:19		16:07 (9)			07:14		05:21		05:52	06:43		07:28			08:46		15:54 (8)
	17:18	22	16:29 (9)			20:06		21:46		21:30	20:27		17:09			16:30	1	15:55 (8)
Potential sun hours	257			277		367	417	487	502	504	455	381	331	264		241		
Total, worst case		573			47										540		87	
Sun reduction		0.22			0.24										0.26		0.22	
Oper. time red.		1.00			1.00										1.00		1.00	
Wind dir. red.		0.61			0.61										0.61		0.61	
Total reduction		0.13			0.15										0.16		0.13	
Total, real		76			7										86		12	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
Jennings O'Donovan
Finisklin Business Park
F91 RHH9 Sligo
+353719161416
padraig / podowd@jodireland.com

Calculated:
11/06/2025 09:22/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Real Case - V150 **Shadow receptor:** BQ - 82

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January		February		March	April	May	June	July	August	September	October	November		December	
1	08:46		08:18	16:10 (9)	07:23	07:12	06:06	05:20	05:17	05:54	06:45	07:35	07:30		08:22	15:43 (8)
	16:32		17:20	27 16:37 (9)	18:13	20:08	21:00	21:47	22:01	21:28	20:25	19:14	17:07		16:26	9 15:52 (9)
2	08:46		08:16	16:11 (9)	07:21	07:09	06:04	05:19	05:17	05:55	06:46	07:36	07:31		08:23	15:44 (8)
	16:33		17:22	25 16:36 (9)	18:15	20:10	21:02	21:48	22:01	21:26	20:23	19:12	17:05		16:25	7 15:51 (9)
3	08:45		08:15	16:12 (9)	07:19	07:07	06:02	05:18	05:18	05:57	06:48	07:38	07:33		08:24	15:44 (8)
	16:34		17:24	23 16:35 (9)	18:17	20:11	21:03	21:49	22:00	21:25	20:20	19:10	17:04		16:25	6 15:50 (9)
4	08:45		08:13	16:14 (9)	07:17	07:05	06:00	05:17	05:19	05:59	06:50	07:40	07:35		08:26	15:45 (8)
	16:35		17:26	20 16:34 (9)	18:18	20:13	21:05	21:50	22:00	21:23	20:18	19:07	17:02		16:24	5 15:50 (8)
5	08:45	16:00 (8)	08:11	16:16 (9)	07:15	07:02	05:58	05:17	05:20	06:00	06:51	07:42	07:37	15:48 (9)	08:27	15:45 (8)
	16:36	1 16:01 (8)	17:28	16 16:32 (9)	18:20	20:15	21:07	21:51	21:59	21:21	20:16	19:05	17:00	12 16:00 (9)	16:24	4 15:49 (8)
6	08:44	16:00 (8)	08:10	16:19 (9)	07:12	07:00	05:56	05:16	05:20	06:02	06:53	07:43	07:39	15:46 (9)	08:28	15:46 (8)
	16:37	3 16:03 (8)	17:30	11 16:30 (9)	18:22	20:17	21:08	21:52	21:59	21:19	20:13	19:03	16:58	17 16:03 (9)	16:23	3 15:49 (8)
7	08:44	16:00 (8)	08:08		07:10	06:58	05:55	05:15	05:21	06:03	06:55	07:45	07:41	15:44 (9)	08:30	15:47 (8)
	16:39	4 16:04 (8)	17:32		18:24	20:18	21:10	21:53	21:58	21:18	20:11	19:01	16:56	21 16:05 (9)	16:23	1 15:48 (8)
8	08:44	16:00 (8)	08:06		07:08	06:56	05:53	05:15	05:22	06:05	06:56	07:47	07:42	15:43 (9)	08:31	
	16:40	5 16:05 (8)	17:33		18:26	20:20	21:12	21:54	21:57	21:16	20:09	18:58	16:55	23 16:06 (9)	16:22	
9	08:43	16:01 (8)	08:04		07:05	06:53	05:51	05:14	05:23	06:07	06:58	07:48	07:44	15:42 (9)	08:32	
	16:41	6 16:07 (9)	17:35		18:27	20:22	21:13	21:55	21:57	21:14	20:06	18:56	16:53	25 16:07 (9)	16:22	
10	08:43	16:01 (8)	08:02		07:03	06:51	05:49	05:14	05:24	06:08	07:00	07:50	07:46	15:41 (9)	08:33	
	16:43	7 16:08 (9)	17:37		18:29	20:24	21:15	21:56	21:56	21:12	20:04	18:54	16:51	27 16:08 (9)	16:22	
11	08:42	16:01 (8)	08:01		07:01	06:49	05:48	05:13	05:25	06:10	07:01	07:52	07:48	15:41 (9)	08:34	
	16:44	9 16:10 (9)	17:39		18:31	20:25	21:17	21:56	21:55	21:10	20:02	18:51	16:50	28 16:09 (9)	16:22	
12	08:41	16:01 (8)	07:59		06:59	06:46	05:46	05:13	05:26	06:12	07:03	07:54	07:50	15:40 (9)	08:35	
	16:46	10 16:11 (9)	17:41		18:33	20:27	21:18	21:57	21:54	21:08	19:59	18:49	16:48	30 16:10 (9)	16:21	
13	08:41	16:01 (8)	07:57		06:56	06:44	05:44	05:13	05:28	06:13	07:05	07:55	07:51	15:40 (9)	08:36	
	16:47	12 16:13 (9)	17:43		18:35	20:29	21:20	21:58	21:53	21:06	19:57	18:47	16:47	30 16:10 (9)	16:21	
14	08:40	16:02 (8)	07:55		06:54	06:42	05:43	05:12	05:29	06:15	07:06	07:57	07:53	15:40 (9)	08:37	
	16:49	13 16:15 (9)	17:45		18:36	20:31	21:22	21:58	21:52	21:04	19:55	18:45	16:45	31 16:11 (9)	16:21	
15	08:39	16:03 (8)	07:53		06:52	06:40	05:41	05:12	05:30	06:16	07:08	07:59	07:55	15:39 (9)	08:38	
	16:50	14 16:17 (9)	17:47		18:38	20:32	21:23	21:59	21:51	21:02	19:52	18:42	16:44	31 16:10 (9)	16:21	
16	08:38	16:02 (8)	07:51		06:49	06:37	05:39	05:12	05:31	06:18	07:10	08:01	07:57	15:39 (9)	08:39	
	16:52	16 16:18 (9)	17:49		18:40	20:34	21:25	21:59	21:50	21:00	19:50	18:40	16:42	31 16:10 (9)	16:22	
17	08:37	16:03 (8)	07:49		06:47	06:35	05:38	05:12	05:32	06:20	07:11	08:02	07:59	15:39 (9)	08:40	
	16:54	17 16:20 (9)	17:51		18:42	20:36	21:26	22:00	21:49	20:58	19:48	18:38	16:41	30 16:09 (9)	16:22	
18	08:36	16:03 (8)	07:47		06:45	06:33	05:36	05:12	05:34	06:21	07:13	08:04	08:00	15:39 (9)	08:41	
	16:55	19 16:22 (9)	17:52		18:43	20:38	21:28	22:00	21:48	20:56	19:45	18:36	16:39	28 16:07 (9)	16:22	
19	08:35	16:04 (8)	07:45		06:42	06:31	05:35	05:12	05:35	06:23	07:15	08:06	08:02	15:39 (9)	08:41	
	16:57	20 16:24 (9)	17:54		18:45	20:39	21:29	22:01	21:47	20:54	19:43	18:34	16:38	27 16:06 (9)	16:22	
20	08:34	16:05 (9)	07:43		06:40	06:29	05:33	05:12	05:36	06:25	07:16	08:08	08:04	15:40 (9)	08:42	
	16:59	21 16:26 (9)	17:56		18:47	20:41	21:31	22:01	21:46	20:52	19:40	18:32	16:37	24 16:04 (9)	16:23	
21	08:33	16:04 (9)	07:41		06:38	06:27	05:32	05:12	05:38	06:26	07:18	08:10	08:06	15:40 (9)	08:43	
	17:00	23 16:27 (9)	17:58		18:49	20:43	21:32	22:01	21:45	20:49	19:38	18:29	16:36	23 16:03 (9)	16:23	
22	08:32	16:05 (9)	07:39		06:35	06:24	05:31	05:13	05:39	06:28	07:20	08:11	08:07	15:41 (9)	08:43	
	17:02	24 16:29 (9)	18:00		18:50	20:44	21:34	22:01	21:43	20:47	19:36	18:27	16:35	21 16:02 (9)	16:24	
23	08:31	16:05 (9)	07:36		06:33	06:22	05:29	05:13	05:40	06:30	07:21	08:13	08:09	15:41 (8)	08:44	
	17:04	27 16:32 (9)	18:02		18:52	20:46	21:35	22:02	21:42	20:45	19:33	18:25	16:33	20 16:01 (9)	16:24	
24	08:29	16:05 (9)	07:34		06:31	06:20	05:28	05:13	05:42	06:31	07:23	08:15	08:11	15:40 (8)	08:44	
	17:06	28 16:33 (9)	18:04		18:54	20:48	21:37	22:02	21:40	20:43	19:31	18:23	16:32	19 15:59 (9)	16:25	
25	08:28	16:06 (9)	07:32		06:28	06:18	05:27	05:13	05:43	06:33	07:25	07:17	08:12	15:41 (8)	08:45	
	17:07	30 16:36 (9)	18:05		18:56	20:50	21:38	22:02	21:39	20:41	19:29	17:21	16:31	17 15:58 (9)	16:25	
26	08:27	16:06 (9)	07:30		06:26	06:16	05:26	05:14	05:45	06:35	07:26	07:19	08:14	15:41 (8)	08:45	
	17:09	31 16:37 (9)	18:07		18:57	20:51	21:39	22:02	21:38	20:39	19:26	17:19	16:30	16 15:57 (9)	16:26	
27	08:25	16:07 (9)	07:28		06:23	06:14	05:25	05:14	05:46	06:36	07:28	07:20	08:15	15:42 (8)	08:45	
	17:11	32 16:39 (9)	18:09		18:59	20:53	21:41	22:02	21:36	20:36	19:24	17:17	16:29	14 15:56 (9)	16:27	
28	08:24	16:07 (9)	07:26		06:21	06:12	05:24	05:15	05:48	06:38	07:30	07:22	08:17	15:41 (8)	08:45	
	17:13	31 16:38 (9)	18:11		19:01	20:55	21:42	22:02	21:35	20:34	19:22	17:15	16:28	13 15:54 (9)	16:28	
29	08:22	16:08 (9)			07:19	06:10	05:23	05:15	05:49	06:40	07:31	07:24	08:19	15:42 (8)	08:46	
	17:15	30 16:38 (9)			20:03	20:57	21:43	22:01	21:33	20:32	19:19	17:13	16:28	12 15:54 (9)	16:28	
30	08:21	16:08 (9)			07:16	06:08	05:22	05:16	05:51	06:41	07:33	07:26	08:20	15:43 (8)	08:46	
	17:17	30 16:38 (9)			20:04	20:58	21:44	22:01	21:31	20:30	19:17	17:11	16:27	10 15:53 (9)	16:29	
31	08:19	16:09 (9)			07:14		05:21		05:52	06:43		07:28			08:46	
	17:18	28 16:37 (9)			20:06		21:46		21:30	20:27		17:09			16:30	
Potential sun hours	257		277		367	417	487	502	504	455	381	331	264		241	
Total, worst case	491		122										580		35	
Sun reduction	0.22		0.24										0.26		0.22	
Oper. time red.	1.00		1.00										1.00		1.00	
Wind dir. red.	0.61		0.61										0.61		0.61	
Total reduction	0.13		0.15										0.16		0.13	
Total, real	65		18										92		5	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

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SHADOW - Calendar

Calculation: 6839 Garrane WF Real Case - V150 **Shadow receptor:** BR - 83

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

January			February			March			April			May			June		
1	08:46		15:47 (1)	08:18			07:23		17:37 (3)	07:12		19:24 (5)	06:06		20:27 (7)	05:20	
	16:32	9	15:56 (1)	17:20			18:13	9	17:46 (3)	20:08	18	19:42 (5)	21:00	4	20:31 (7)	21:47	
2	08:45		15:47 (1)	08:16		16:51 (2)	07:21		17:37 (3)	07:09		19:24 (5)	06:04		20:26 (7)	05:19	
	16:33	10	15:57 (1)	17:22	1	16:52 (2)	18:15	11	17:48 (3)	20:10	19	19:43 (5)	21:02	7	20:33 (7)	21:48	
3	08:45		15:48 (1)	08:15		16:50 (2)	07:19		17:37 (3)	07:07		19:24 (5)	06:02		20:25 (7)	05:18	
	16:34	10	15:58 (1)	17:24	4	16:54 (2)	18:17	13	17:50 (3)	20:11	21	19:45 (5)	21:03	9	20:34 (7)	21:49	
4	08:45		15:49 (1)	08:13		16:50 (2)	07:17		17:36 (3)	07:05		19:25 (5)	06:00		20:24 (7)	05:17	
	16:35	11	16:00 (1)	17:26	6	16:56 (2)	18:18	16	17:52 (3)	20:13	22	19:47 (6)	21:05	12	20:36 (7)	21:50	
5	08:45		15:48 (1)	08:11		16:49 (2)	07:15		17:37 (3)	07:02		19:26 (5)	05:58		20:23 (7)	05:17	
	16:36	13	16:01 (1)	17:28	9	16:58 (2)	18:20	17	17:54 (3)	20:15	22	19:48 (6)	21:07	14	20:37 (7)	21:51	
6	08:44		15:49 (1)	08:10		16:48 (2)	07:12		17:37 (3)	07:00		19:27 (5)	05:56		20:24 (7)	05:16	
	16:37	14	16:03 (1)	17:30	11	16:59 (2)	18:22	19	17:56 (3)	20:17	23	19:50 (6)	21:08	15	20:39 (7)	21:52	
7	08:44		15:49 (1)	08:08		16:49 (2)	07:10		17:37 (3)	06:58		19:30 (5)	05:55		20:23 (7)	05:15	
	16:39	15	16:04 (1)	17:32	13	17:02 (2)	18:24	20	17:57 (3)	20:18	22	19:52 (6)	21:10	17	20:40 (7)	21:53	
8	08:44		15:49 (1)	08:06		16:49 (2)	07:08		17:39 (3)	06:56		19:37 (6)	05:53		20:23 (7)	05:15	
	16:40	16	16:05 (1)	17:33	15	17:04 (2)	18:26	20	17:59 (4)	20:20	17	19:54 (6)	21:12	19	20:42 (7)	21:54	
9	08:43		15:50 (1)	08:04		16:49 (2)	07:05		17:41 (3)	06:53		19:35 (6)	05:51		20:23 (7)	05:14	
	16:41	17	16:07 (1)	17:35	17	17:06 (2)	18:27	21	18:02 (4)	20:22	20	19:55 (6)	21:13	21	20:44 (7)	21:55	
10	08:42		15:50 (1)	08:02		16:49 (2)	07:03		17:43 (3)	06:51		19:35 (6)	05:49		20:23 (7)	05:14	
	16:43	18	16:08 (1)	17:37	19	17:08 (2)	18:29	20	18:03 (4)	20:24	22	19:57 (6)	21:15	22	20:45 (7)	21:55	
11	08:42		15:51 (1)	08:01		16:49 (2)	07:01		17:50 (4)	06:49		19:34 (6)	05:48		20:24 (7)	05:13	
	16:44	19	16:10 (1)	17:39	21	17:10 (2)	18:31	15	18:05 (4)	20:25	25	19:59 (6)	21:17	23	20:47 (7)	21:56	
12	08:41		15:51 (1)	07:59		16:49 (2)	06:59		17:49 (4)	06:46		19:34 (6)	05:46		20:23 (7)	05:13	
	16:46	20	16:11 (1)	17:41	24	17:13 (2)	18:33	18	18:07 (4)	20:27	27	20:01 (6)	21:18	25	20:48 (7)	21:57	
13	08:40		15:51 (1)	07:57		16:50 (2)	06:56		17:48 (4)	06:44		19:33 (6)	05:44		20:23 (7)	05:13	
	16:47	22	16:13 (1)	17:43	24	17:14 (2)	18:35	20	18:08 (4)	20:29	28	20:01 (6)	21:20	26	20:49 (7)	21:58	
14	08:40		15:52 (1)	07:55		16:51 (2)	06:54		17:48 (4)	06:42		19:34 (6)	05:43		20:24 (7)	05:13	
	16:49	22	16:14 (1)	17:45	23	17:14 (2)	18:36	22	18:10 (4)	20:31	29	20:03 (6)	21:21	27	20:51 (9)	21:58	
15	08:39		15:52 (1)	07:53		16:52 (2)	06:52		17:48 (4)	06:40		19:34 (6)	05:41		20:25 (7)	05:12	
	16:50	24	16:16 (1)	17:47	21	17:13 (2)	18:38	25	18:13 (4)	20:32	31	20:05 (6)	21:23	28	20:53 (9)	21:59	
16	08:38		15:53 (1)	07:51		16:53 (2)	06:49		17:48 (4)	06:37		19:34 (6)	05:39		20:25 (7)	05:12	
	16:52	25	16:18 (1)	17:49	19	17:12 (2)	18:40	26	18:14 (4)	20:34	30	20:04 (6)	21:25	29	20:54 (9)	21:59	
17	08:37		15:54 (1)	07:49		16:55 (2)	06:47		17:48 (4)	06:35		19:35 (6)	05:38		20:26 (7)	05:12	
	16:54	24	16:18 (1)	17:51	15	17:10 (2)	18:42	28	18:16 (4)	20:36	30	20:09 (8)	21:26	29	20:55 (9)	22:00	
18	08:36		15:55 (1)	07:47		16:57 (2)	06:45		17:49 (4)	06:33		19:36 (6)	05:36		20:27 (7)	05:12	
	16:55	23	16:18 (1)	17:52	9	17:06 (2)	18:43	27	18:16 (4)	20:37	30	20:10 (8)	21:28	29	20:56 (9)	22:00	
19	08:35		15:56 (1)	07:45			06:42		17:49 (4)	06:31		19:37 (6)	05:35		20:28 (7)	05:12	
	16:57	22	16:18 (1)	17:54			18:45	25	18:14 (4)	20:39	30	20:12 (8)	21:29	30	20:58 (9)	22:01	
20	08:34		15:57 (1)	07:43			06:40		17:50 (4)	06:29		19:37 (6)	05:34		20:29 (7)	05:12	
	16:59	21	16:18 (1)	17:56			18:47	23	18:13 (4)	20:41	29	20:13 (8)	21:31	30	20:59 (9)	22:01	
21	08:33		15:57 (1)	07:41			06:38		17:52 (4)	06:27		19:39 (6)	05:32		20:31 (7)	05:12	
	17:00	20	16:17 (1)	17:58			18:49	20	18:12 (4)	20:43	28	20:15 (8)	21:32	30	21:01 (9)	22:01	
22	08:32		15:59 (1)	07:39			06:35		17:53 (4)	06:24		19:41 (6)	05:31		20:32 (7)	05:13	
	17:02	17	16:16 (1)	18:00			18:50	16	18:09 (4)	20:44	24	20:16 (8)	21:34	28	21:01 (9)	22:01	
23	08:30		16:01 (1)	07:36			06:33		17:56 (4)	06:22		19:47 (6)	05:29		20:44 (9)	05:13	
	17:04	15	16:16 (1)	18:02			18:52	10	18:06 (4)	20:46	14	20:18 (8)	21:35	17	21:01 (9)	22:01	
24	08:29		16:03 (1)	07:34			06:30			06:20		20:06 (8)	05:28		20:45 (9)	05:13	
	17:06	11	16:14 (1)	18:04			18:54			20:48	14	20:20 (8)	21:36	15	21:00 (9)	22:02	
25	08:28		16:06 (1)	07:32			06:28			06:18		20:07 (8)	05:27		20:46 (9)	05:13	
	17:07	5	16:11 (1)	18:05			18:56			20:50	14	20:21 (8)	21:38	13	20:59 (9)	22:02	
26	08:27			07:30			06:26		18:28 (5)	06:16		20:08 (8)	05:26		20:47 (9)	05:14	
	17:09			18:07			18:57	4	18:32 (5)	20:51	11	20:19 (8)	21:39	11	20:58 (9)	22:02	
27	08:25			07:28		17:39 (3)	06:23		18:26 (5)	06:14		20:11 (8)	05:25		20:49 (9)	05:14	
	17:11			18:09	4	17:43 (3)	18:59	7	18:33 (5)	20:53	5	20:16 (8)	21:40	8	20:57 (9)	22:02	
28	08:24			07:26		17:39 (3)	06:21		18:26 (5)	06:12			05:24		20:52 (9)	05:15	
	17:13			18:11	6	17:45 (3)	19:01	9	18:35 (5)	20:55			21:42	2	20:54 (9)	22:01	
29	08:22						07:19		19:25 (5)	06:10			05:23			05:15	
	17:15						20:03	12	19:37 (5)	20:56			21:43			22:01	
30	08:21						07:16		19:24 (5)	06:08		20:29 (7)	05:22			05:16	
	17:17						20:04	14	19:38 (5)	20:58	1	20:30 (7)	21:44			22:01	
31	08:19						07:14		19:24 (5)				05:21				
	17:18						20:06	16	19:40 (5)				21:45				
Potential sun hours	257			277			367			417			487			501	
Total, worst case		423			261			503			606			540			
Sun reduction		0.22			0.24			0.28			0.38			0.39			
Oper. time red.		1.00			1.00			1.00			1.00			1.00			
Wind dir. red.		0.62			0.60			0.60			0.61			0.63			
Total reduction		0.13			0.15			0.17			0.23			0.25			
Total, real		57			38			84			140			135			

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

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SHADOW - Calendar

Calculation: 6839 Garrane WF Real Case - V150 **Shadow receptor:** BR - 83

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	July		August		September		October		November		December		
1	05:17		05:54		20:34 (7)	06:45	19:33 (6)	07:35	18:28 (4)	07:30	16:18 (2)	08:21	15:33 (1)
	22:01		21:28	24	20:58 (7)	20:25 25	19:58 (6)	19:14 19	18:47 (4)	17:07 20	16:38 (2)	16:26 19	15:52 (1)
2	05:17		05:55		20:33 (7)	06:46	19:34 (6)	07:36	18:28 (4)	07:31	16:18 (2)	08:23	15:33 (1)
	22:00		21:26	23	20:56 (7)	20:23 22	19:56 (6)	19:12 17	18:45 (4)	17:05 18	16:36 (2)	16:25 19	15:52 (1)
3	05:18		05:57		20:33 (7)	06:48	19:33 (6)	07:38	18:28 (4)	07:33	16:18 (2)	08:24	15:33 (1)
	22:00		21:25	22	20:55 (7)	20:20 20	19:53 (6)	19:10 14	18:42 (4)	17:04 16	16:34 (2)	16:25 17	15:50 (1)
4	05:19		05:59		20:33 (7)	06:50	19:34 (6)	07:40	18:19 (3)	07:35	16:19 (2)	08:26	15:34 (1)
	22:00		21:23	20	20:53 (7)	20:18 17	19:51 (6)	19:07 21	18:40 (4)	17:02 13	16:32 (2)	16:24 16	15:50 (1)
5	05:20		06:00		20:33 (7)	06:51	19:26 (5)	07:42	18:17 (3)	07:37	16:19 (2)	08:27	15:34 (1)
	21:59		21:21	18	20:51 (7)	20:16 22	19:48 (6)	19:05 20	18:37 (4)	17:00 11	16:30 (2)	16:24 15	15:49 (1)
6	05:20		06:02		20:33 (7)	06:53	19:24 (5)	07:43	18:15 (3)	07:39	16:20 (2)	08:28	15:34 (1)
	21:59		21:19	16	20:49 (7)	20:13 22	19:46 (6)	19:03 20	18:35 (4)	16:58 8	16:28 (2)	16:23 14	15:48 (1)
7	05:21		06:03		20:33 (7)	06:55	19:22 (5)	07:45	18:13 (3)	07:41	16:20 (2)	08:30	15:36 (1)
	21:58		21:17	15	20:48 (7)	20:11 22	19:44 (6)	19:01 19	18:32 (3)	16:56 6	16:26 (2)	16:23 12	15:48 (1)
8	05:22		06:05		20:33 (7)	06:56	19:20 (5)	07:47	18:12 (3)	07:42	16:21 (2)	08:31	15:36 (1)
	21:57		21:16	13	20:46 (7)	20:09 21	19:41 (6)	18:58 18	18:30 (3)	16:55 3	16:24 (2)	16:22 11	15:47 (1)
9	05:23		06:07		20:34 (7)	06:58	19:19 (5)	07:48	18:12 (3)	07:44	16:22 (2)	08:32	15:36 (1)
	21:57		21:14	11	20:45 (7)	20:06 21	19:40 (5)	18:56 16	18:28 (3)	16:53 1	16:23 (2)	16:22 11	15:47 (1)
10	05:24		06:08		20:34 (7)	07:00	19:17 (5)	07:50	18:11 (3)	07:46		08:33	15:37 (1)
	21:56		21:12	8	20:42 (7)	20:04 20	19:37 (5)	18:54 15	18:26 (3)	16:51		16:22 10	15:47 (1)
11	05:25		06:10		20:35 (7)	07:01	19:17 (5)	07:52	18:11 (3)	07:48		08:34	15:38 (1)
	21:55		21:10	6	20:41 (7)	20:02 18	19:35 (5)	18:51 13	18:24 (3)	16:50		16:22 9	15:47 (1)
12	05:26		06:12		20:36 (7)	07:03	19:16 (5)	07:54	18:10 (3)	07:50		08:35	15:38 (1)
	21:54		21:08	3	20:39 (7)	19:59 17	19:33 (5)	18:49 10	18:20 (3)	16:48		16:22 8	15:46 (1)
13	05:28		06:13			07:05	19:15 (5)	07:55	18:11 (3)	07:51		08:36	15:39 (1)
	21:53		21:06			19:57 15	19:30 (5)	18:47 7	18:18 (3)	16:47		16:21 7	15:46 (1)
14	05:29		06:15			07:06	19:16 (5)	07:57	18:11 (3)	07:53		08:37	15:39 (1)
	21:52		21:04			19:55 12	19:28 (5)	18:45 5	18:16 (3)	16:45		16:21 7	15:46 (1)
15	05:30		06:16			07:08	19:15 (5)	07:59	18:12 (3)	07:55		08:38	15:40 (1)
	21:51		21:02			19:52 10	19:25 (5)	18:42 2	18:14 (3)	16:44		16:22 6	15:46 (1)
16	05:31		20:59 (9)	06:18		20:18 (8)	07:10	19:16 (5)	08:01		07:57		08:39	15:41 (1)
	21:50	6	21:05 (9)	21:00	7	20:25 (8)	19:50 7	19:23 (5)	18:40		16:42		16:22 5	15:46 (1)
17	05:32		20:58 (9)	06:20		20:14 (8)	07:11	19:17 (5)	08:02		07:59	15:39 (1)	08:40	15:41 (1)
	21:49	9	21:07 (9)	20:58	12	20:26 (8)	19:48 4	19:21 (5)	18:38		16:41 5	15:44 (1)	16:22 5	15:46 (1)
18	05:34		20:56 (9)	06:21		20:13 (8)	07:13	19:17 (5)	08:04		08:00	15:37 (1)	08:41	15:41 (1)
	21:48	12	21:08 (9)	20:56	15	20:28 (8)	19:45 1	19:18 (5)	18:36		16:40 11	15:48 (1)	16:22 5	15:46 (1)
19	05:35		20:55 (9)	06:23		20:11 (8)	07:15		08:06		08:02	15:35 (1)	08:41	15:42 (1)
	21:47	14	21:09 (9)	20:54	14	20:25 (8)	19:43		18:34		16:38 15	15:50 (1)	16:22 5	15:47 (1)
20	05:36		20:55 (9)	06:25		19:50 (6)	07:16	18:44 (4)	08:08		08:04	15:34 (1)	08:42	15:42 (1)
	21:46	16	21:11 (9)	20:51	18	20:23 (8)	19:40 7	18:51 (4)	18:32		16:37 17	15:51 (1)	16:23 4	15:46 (1)
21	05:38		20:44 (7)	06:26		19:46 (6)	07:18	18:39 (4)	08:10		08:05	15:33 (1)	08:43	15:43 (1)
	21:44	24	21:11 (9)	20:49	25	20:22 (8)	19:38 15	18:54 (4)	18:29		16:36 20	15:53 (1)	16:23 4	15:47 (1)
22	05:39		20:42 (7)	06:28		19:43 (6)	07:20	18:37 (4)	08:11		08:07	15:33 (1)	08:43	15:43 (1)
	21:43	29	21:11 (9)	20:47	29	20:19 (8)	19:36 19	18:56 (4)	18:27		16:35 21	15:54 (1)	16:24 4	15:47 (1)
23	05:40		20:40 (7)	06:30		19:42 (6)	07:21	18:35 (4)	08:13		08:09	15:32 (1)	08:44	15:44 (1)
	21:42	30	21:10 (9)	20:45	28	20:17 (8)	19:33 22	18:57 (4)	18:25		16:33 22	15:54 (1)	16:24 4	15:48 (1)
24	05:42		20:39 (7)	06:31		19:39 (6)	07:23	18:33 (4)	08:15	17:26 (2)	08:10	15:32 (1)	08:44	15:44 (1)
	21:40	30	21:09 (9)	20:43	31	20:15 (8)	19:31 24	18:57 (4)	18:23 12	17:38 (2)	16:32 23	15:55 (1)	16:25 5	15:49 (1)
25	05:43		20:38 (7)	06:33		19:38 (6)	07:25	18:32 (4)	07:17	16:24 (2)	08:12	15:32 (1)	08:44	15:44 (1)
	21:39	30	21:08 (9)	20:41	31	20:13 (8)	19:29 26	18:58 (4)	17:21 16	16:40 (2)	16:31 24	15:56 (1)	16:25 5	15:49 (1)
26	05:45		20:37 (7)	06:35		19:37 (6)	07:26	18:31 (4)	07:19	16:22 (2)	08:14	15:32 (1)	08:45	15:45 (1)
	21:38	29	21:06 (9)	20:38	29	20:10 (8)	19:26 28	18:59 (4)	17:19 19	16:41 (2)	16:30 25	15:57 (1)	16:26 6	15:51 (1)
27	05:46		20:36 (7)	06:36		19:36 (6)	07:28	18:29 (4)	07:20	16:21 (2)	08:15	15:32 (1)	08:45	15:46 (1)
	21:36	29	21:05 (9)	20:36	30	20:06 (6)	19:24 27	18:56 (4)	17:17 21	16:42 (2)	16:29 24	15:56 (1)	16:27 5	15:51 (1)
28	05:48		20:35 (7)	06:38		19:36 (6)	07:30	18:29 (4)	07:22	16:20 (2)	08:17	15:32 (1)	08:45	15:46 (1)
	21:35	28	21:03 (9)	20:34	30	20:06 (6)	19:21 25	18:54 (4)	17:15 23	16:43 (2)	16:28 23	15:55 (1)	16:28 6	15:52 (1)
29	05:49		20:35 (7)	06:40		19:34 (6)	07:31	18:29 (4)	07:24	16:19 (2)	08:18	15:32 (1)	08:45	15:46 (1)
	21:33	28	21:03 (9)	20:32	30	20:04 (6)	19:19 23	18:52 (4)	17:13 25	16:44 (2)	16:28 22	15:54 (1)	16:28 7	15:53 (1)
30	05:51		20:34 (7)	06:41		19:34 (6)	07:33	18:28 (4)	07:26	16:19 (2)	08:20	15:33 (1)	08:45	15:47 (1)
	21:31	27	21:01 (9)	20:29	28	20:02 (6)	19:17 21	18:49 (4)	17:11 23	16:42 (2)	16:27 20	15:53 (1)	16:29 7	15:54 (1)
31	05:52		20:35 (7)	06:43		19:33 (6)			07:28	16:18 (2)			08:46	15:47 (1)
	21:30	25	21:00 (7)	20:27	26	19:59 (6)			17:09 22	16:40 (2)			16:30 8	15:55 (1)
Potential sun hours	504			455			381		331		264		241	
Total, worst case		366			562			533		377		368		266
Sun reduction		0.33			0.35			0.34		0.28		0.26		0.22
Oper. time red.		1.00			1.00			1.00		1.00		1.00		1.00
Wind dir. red.		0.63			0.62			0.60		0.60		0.61		0.62
Total reduction		0.21			0.22			0.20		0.17		0.16		0.13
Total, real		77			122			108		63		59		36

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
Jennings O'Donovan
Finisklin Business Park
F91 RHH9 Sligo
+353719161416
padraig / podowd@jodireland.com
Calculated:
11/06/2025 09:22/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Real Case - V150 **Shadow receptor:** BS - 84

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January			February			March			April			May			June		
1	08:45			08:18		16:29 (1)	07:23		17:23 (2)	07:12		19:18 (4)	06:06			05:20		
	16:32			17:20	20	16:49 (1)	18:13	12	17:35 (2)	20:08	10	19:28 (4)	21:00			21:47		
2	08:45			08:16		16:30 (1)	07:21		17:28 (2)	07:09			06:04			05:19		
	16:33			17:22	22	16:52 (1)	18:15	2	17:30 (2)	20:10			21:02			21:48		
3	08:45			08:15		16:31 (1)	07:19			07:07		19:43 (5)	06:02			05:18		
	16:34			17:24	22	16:53 (1)	18:17			20:11	2	19:45 (5)	21:03			21:49		
4	08:45			08:13		16:32 (1)	07:17			07:05		19:42 (5)	06:00			05:17		
	16:35			17:26	20	16:52 (1)	18:18			20:13	5	19:47 (5)	21:05			21:50		
5	08:45			08:11		16:33 (1)	07:14			07:02		19:40 (5)	05:58			05:17		
	16:36			17:28	18	16:51 (1)	18:20			20:15	8	19:48 (5)	21:07			21:51		
6	08:44			08:10		16:34 (1)	07:12			07:00		19:40 (5)	05:56		20:38 (7)	05:16		
	16:37			17:30	16	16:50 (1)	18:22			20:17	10	19:50 (5)	21:08	1	20:39 (7)	21:52		
7	08:44			08:08		16:37 (1)	07:10			06:58		19:40 (5)	05:55		20:37 (7)	05:15		
	16:39			17:32	12	16:49 (1)	18:24			20:18	12	19:52 (5)	21:10	3	20:40 (7)	21:53		
8	08:44			08:06		16:40 (1)	07:08			06:56		19:40 (5)	05:53		20:36 (7)	05:15		
	16:40			17:33	6	16:46 (1)	18:26			20:20	14	19:54 (5)	21:12	6	20:42 (7)	21:54		
9	08:43			08:04			07:05		17:59 (3)	06:53		19:40 (5)	05:51		20:36 (7)	05:14		
	16:41			17:35			18:27	3	18:02 (3)	20:22	15	19:55 (5)	21:13	8	20:44 (7)	21:55		
10	08:42			08:02			07:03		17:58 (3)	06:51		19:40 (5)	05:49		20:35 (7)	05:14		
	16:43			17:37			18:29	5	18:03 (3)	20:24	17	19:57 (5)	21:15	10	20:45 (7)	21:55		
11	08:42			08:00			07:01		17:57 (3)	06:49		19:41 (5)	05:48		20:35 (7)	05:13		
	16:44			17:39			18:31	8	18:05 (3)	20:25	18	19:59 (5)	21:17	12	20:47 (7)	21:56		
12	08:41			07:59			06:59		17:57 (3)	06:46		19:43 (5)	05:46		20:35 (7)	05:13		
	16:46			17:41			18:33	10	18:07 (3)	20:27	15	20:01 (6)	21:18	13	20:48 (7)	21:57		
13	08:40			07:57			06:56		17:56 (3)	06:44		19:44 (5)	05:44		20:34 (7)	05:13		
	16:47			17:43			18:35	12	18:08 (3)	20:29	13	20:01 (6)	21:20	15	20:49 (7)	21:58		
14	08:40			07:55			06:54		17:57 (3)	06:42		19:56 (6)	05:43		20:35 (7)	05:13		
	16:49			17:45			18:36	13	18:10 (3)	20:30	7	20:03 (6)	21:21	16	20:51 (7)	21:58		
15	08:39			07:53			06:52		17:58 (3)	06:40		19:56 (6)	05:41		20:36 (7)	05:12		
	16:50			17:47			18:38	15	18:13 (3)	20:32	9	20:05 (6)	21:23	17	20:53 (7)	21:59		
16	08:38			07:51			06:49		17:58 (3)	06:37		19:55 (6)	05:39		20:35 (7)	05:12		
	16:52			17:49			18:40	16	18:14 (3)	20:34	12	20:07 (6)	21:25	19	20:54 (7)	21:59		
17	08:37			07:49		17:21 (2)	06:47		17:59 (3)	06:35		19:54 (6)	05:38		20:36 (7)	05:12		
	16:54			17:51	2	17:23 (2)	18:42	14	18:13 (3)	20:36	15	20:09 (6)	21:26	19	20:55 (7)	22:00		
18	08:36			07:47		17:19 (2)	06:45		18:02 (3)	06:33		19:54 (6)	05:36		20:36 (7)	05:12		
	16:55			17:52	5	17:24 (2)	18:43	9	18:11 (3)	20:37	16	20:10 (6)	21:28	20	20:56 (7)	22:00		
19	08:35			07:45		17:19 (2)	06:42		18:16 (4)	06:31		19:53 (6)	05:35		20:37 (7)	05:12		
	16:57			17:54	7	17:26 (2)	18:45	3	18:19 (4)	20:39	18	20:11 (6)	21:29	21	20:58 (9)	22:01		
20	08:34			07:43		17:18 (2)	06:40		18:15 (4)	06:29		19:53 (6)	05:34		20:38 (7)	05:12		
	16:59			17:56	10	17:28 (2)	18:47	6	18:21 (4)	20:41	20	20:13 (6)	21:31	21	20:59 (9)	22:01		
21	08:33			07:41		17:18 (2)	06:38		18:14 (4)	06:27		19:53 (6)	05:32		20:39 (7)	05:12		
	17:00			17:58	13	17:31 (2)	18:49	9	18:23 (4)	20:43	22	20:15 (6)	21:32	22	21:01 (9)	22:01		
22	08:32			07:39		17:18 (2)	06:35		18:13 (4)	06:24		19:53 (6)	05:31		20:39 (7)	05:13		
	17:02			18:00	15	17:33 (2)	18:50	12	18:25 (4)	20:44	23	20:16 (6)	21:34	23	21:02 (9)	22:01		
23	08:30		16:30 (1)	07:36		17:18 (2)	06:33		18:12 (4)	06:22		19:53 (6)	05:29		20:40 (7)	05:13		
	17:04	2	16:32 (1)	18:02	17	17:35 (2)	18:52	15	18:27 (4)	20:46	25	20:18 (6)	21:35	23	21:03 (9)	22:01		
24	08:29		16:29 (1)	07:34		17:18 (2)	06:30		18:11 (4)	06:20		19:54 (6)	05:28		20:42 (7)	05:13		
	17:06	4	16:33 (1)	18:04	18	17:36 (2)	18:54	17	18:28 (4)	20:48	24	20:18 (6)	21:36	22	21:04 (9)	22:02		
25	08:28		16:29 (1)	07:32		17:18 (2)	06:28		18:11 (4)	06:18		19:55 (6)	05:27		20:44 (7)	05:13		
	17:07	7	16:36 (1)	18:05	20	17:38 (2)	18:56	19	18:30 (4)	20:50	22	20:17 (6)	21:38	21	21:06 (9)	22:02		
26	08:27		16:28 (1)	07:30		17:19 (2)	06:26		18:12 (4)	06:16		19:56 (6)	05:26		20:53 (9)	05:14		
	17:09	9	16:37 (1)	18:07	21	17:40 (2)	18:57	20	18:32 (4)	20:51	19	20:15 (6)	21:39	13	21:06 (9)	22:02		
27	08:25		16:29 (1)	07:28		17:20 (2)	06:23		18:11 (4)	06:14		19:57 (6)	05:25		20:54 (9)	05:14		
	17:11	11	16:40 (1)	18:09	19	17:39 (2)	18:59	22	18:33 (4)	20:53	17	20:14 (6)	21:40	11	21:05 (9)	22:02		
28	08:24		16:28 (1)	07:26		17:21 (2)	06:21		18:12 (4)	06:12		19:59 (6)	05:24		20:55 (9)	05:15		
	17:13	13	16:41 (1)	18:11	16	17:37 (2)	19:01	23	18:35 (4)	20:55	13	20:12 (6)	21:42	9	21:04 (9)	22:01		
29	08:22		16:28 (1)				07:19		19:13 (4)	06:10		20:02 (6)	05:23		20:57 (9)	05:15		
	17:15	15	16:43 (1)				20:03	21	19:34 (4)	20:56	6	20:08 (6)	21:43	5	21:02 (9)	22:01		
30	08:21		16:29 (1)				07:16		19:13 (4)	06:08			05:22			05:16		
	17:17	17	16:46 (1)				20:04	19	19:32 (4)	20:58			21:44			22:01		
31	08:19		16:29 (1)				07:14		19:15 (4)				05:21					
	17:18	18	16:47 (1)				20:06	16	19:31 (4)				21:45					
Potential sun hours	257			277			367			417			487			501		
Total, worst case		96			299			321			407			350				
Sun reduction		0.22			0.24			0.28			0.38			0.39				
Oper. time red.		1.00			1.00			1.00			1.00			1.00				
Wind dir. red.		0.60			0.60			0.60			0.61			0.64				
Total reduction		0.13			0.15			0.17			0.23			0.25				
Total, real		13			44			54			94			88				

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
Jennings O'Donovan
Finisklin Business Park
F91 RHH9 Sligo
+353719161416
padraig / podowd@jodireland.com
Calculated:
11/06/2025 09:22/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Real Case - V150 **Shadow receptor:** BS - 84

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	July		August		September		October		November		December
1	05:17		05:54		20:45 (7)	06:45	19:40 (5)	07:35	18:36 (3)	07:30	08:21
	22:01		21:28	13	20:58 (7)	20:25 17	19:57 (5)	19:14 11	18:47 (3)	17:07	16:26
2	05:17		05:55		20:45 (7)	06:46	19:39 (5)	07:36	18:36 (3)	07:31	08:23
	22:00		21:26	11	20:56 (7)	20:23 17	19:56 (5)	19:12 9	18:45 (3)	17:05	16:25
3	05:18		05:57		20:46 (7)	06:48	19:38 (5)	07:38	18:35 (3)	07:33 16:09 (1)	08:24
	22:00		21:25	9	20:55 (7)	20:20 15	19:53 (5)	19:10 7	18:42 (3)	17:04 8 16:17 (1)	16:25
4	05:19		05:59		20:45 (7)	06:50	19:37 (5)	07:40	18:36 (3)	07:35 16:06 (1)	08:26
	22:00		21:23	8	20:53 (7)	20:18 14	19:51 (5)	19:07 4	18:40 (3)	17:02 13 16:19 (1)	16:24
5	05:20		06:00		20:46 (7)	06:51	19:36 (5)	07:41		07:37 16:04 (1)	08:27
	21:59		21:21	5	20:51 (7)	20:16 12	19:48 (5)	19:05		17:00 17 16:21 (1)	16:24
6	05:20		06:02		20:46 (7)	06:53	19:36 (5)	07:43		07:39 16:03 (1)	08:28
	21:59		21:19	3	20:49 (7)	20:13 10	19:46 (5)	19:03		16:58 19 16:22 (1)	16:23
7	05:21		06:03		20:47 (7)	06:55	19:37 (5)	07:45		07:41 16:02 (1)	08:30
	21:58		21:17	1	20:48 (7)	20:11 7	19:44 (5)	19:01		16:56 21 16:23 (1)	16:23
8	05:22		06:05			06:56	19:36 (5)	07:47		07:42 16:02 (1)	08:31
	21:57		21:16			20:09 5	19:41 (5)	18:58		16:55 22 16:24 (1)	16:22
9	05:23		06:07			06:58	19:37 (5)	07:48		07:44 16:01 (1)	08:32
	21:57		21:14			20:06 3	19:40 (5)	18:56		16:53 22 16:23 (1)	16:22
10	05:24		06:08			07:00		07:50		07:46 16:01 (1)	08:33
	21:56		21:12			20:04		18:54		16:51 20 16:21 (1)	16:22
11	05:25		06:10			07:01	19:10 (4)	07:52		07:48 16:00 (1)	08:34
	21:55		21:10			20:02 10	19:20 (4)	18:51		16:50 18 16:18 (1)	16:22
12	05:26		06:12			07:03	19:07 (4)	07:54	17:58 (2)	07:50 16:00 (1)	08:35
	21:54		21:08			19:59 16	19:23 (4)	18:49 8	18:06 (2)	16:48 16 16:16 (1)	16:22
13	05:28		06:13			07:05	19:05 (4)	07:55	17:55 (2)	07:51 16:00 (1)	08:36
	21:53		21:06			19:57 18	19:23 (4)	18:47 14	18:09 (2)	16:47 15 16:15 (1)	16:21
14	05:29	21:06 (9)	06:15		20:09 (6)	07:06	19:03 (4)	07:57	17:53 (2)	07:53 16:00 (1)	08:37
	21:52 4	21:10 (9)	21:04	9	20:18 (6)	19:55 22	19:25 (4)	18:45 18	18:11 (2)	16:45 13 16:13 (1)	16:21
15	05:30	21:05 (9)	06:16		20:06 (6)	07:08	19:01 (4)	07:59	17:52 (2)	07:55 16:01 (1)	08:38
	21:51 8	21:13 (9)	21:02	14	20:20 (6)	19:52 24	19:25 (4)	18:42 20	18:12 (2)	16:44 11 16:12 (1)	16:22
16	05:31	21:04 (9)	06:18		20:04 (6)	07:10	19:01 (4)	08:01	17:51 (2)	07:57 16:01 (1)	08:39
	21:50 10	21:14 (9)	21:00	18	20:22 (6)	19:50 22	19:23 (4)	18:40 21	18:12 (2)	16:42 9 16:10 (1)	16:22
17	05:32	21:03 (9)	06:20		20:02 (6)	07:11	19:00 (4)	08:02	17:50 (2)	07:59 16:02 (1)	08:40
	21:49 12	21:15 (9)	20:58	20	20:22 (6)	19:48 21	19:21 (4)	18:38 20	18:10 (2)	16:41 7 16:09 (1)	16:22
18	05:34	20:56 (7)	06:21		20:01 (6)	07:13	18:59 (4)	08:04	17:50 (2)	08:00 16:03 (1)	08:41
	21:48 16	21:16 (9)	20:56	23	20:24 (6)	19:45 19	19:18 (4)	18:36 18	18:08 (2)	16:40 4 16:07 (1)	16:22
19	05:35	20:53 (7)	06:23		19:59 (6)	07:15	18:59 (4)	08:06	17:49 (2)	08:02 16:04 (1)	08:41
	21:47 22	21:15 (9)	20:54	25	20:24 (6)	19:43 17	19:16 (4)	18:34 16	18:05 (2)	16:38 2 16:06 (1)	16:22
20	05:36	20:52 (7)	06:25		19:59 (6)	07:16	18:59 (4)	08:08	17:48 (2)	08:04	08:42
	21:46 22	21:14 (9)	20:51	24	20:23 (6)	19:40 15	19:14 (4)	18:32 14	18:02 (2)	16:37	16:23
21	05:38	20:50 (7)	06:26		19:59 (6)	07:18	18:58 (4)	08:10	17:48 (2)	08:05	08:43
	21:44 23	21:13 (9)	20:49	23	20:22 (6)	19:38 13	19:11 (4)	18:29 12	18:00 (2)	16:36	16:23
22	05:39	20:49 (7)	06:28		19:57 (6)	07:20	18:58 (4)	08:11	17:49 (2)	08:07	08:43
	21:43 22	21:11 (9)	20:47	22	20:19 (6)	19:36 11	19:09 (4)	18:27 9	17:58 (2)	16:35	16:24
23	05:40	20:48 (7)	06:30		19:57 (6)	07:21	18:58 (4)	08:13	17:49 (2)	08:09	08:44
	21:42 22	21:10 (9)	20:45	20	20:17 (6)	19:33 8	19:06 (4)	18:25 7	17:56 (2)	16:33	16:24
24	05:42	20:48 (7)	06:31		19:57 (6)	07:23	18:59 (4)	08:15	17:50 (2)	08:10	08:44
	21:40 21	21:09 (9)	20:43	18	20:15 (6)	19:31 4	19:03 (4)	18:23 4	17:54 (2)	16:32	16:25
25	05:43	20:47 (7)	06:33		19:57 (6)	07:25	18:45 (3)	07:17	16:51 (2)	08:12	08:44
	21:39 21	21:08 (7)	20:41	16	20:13 (6)	19:29 9	19:01 (4)	17:21 1	16:52 (2)	16:31	16:25
26	05:45	20:46 (7)	06:35		19:56 (6)	07:26	18:43 (3)	07:19		08:14	08:45
	21:38 20	21:06 (7)	20:38	14	20:10 (6)	19:26 13	18:56 (3)	17:19		16:30	16:26
27	05:46	20:46 (7)	06:36		19:57 (6)	07:28	18:40 (3)	07:20		08:15	08:45
	21:36 19	21:05 (7)	20:36	12	20:09 (6)	19:24 16	18:56 (3)	17:17		16:29	16:27
28	05:48	20:46 (7)	06:38		19:57 (6)	07:30	18:39 (3)	07:22		08:17	08:45
	21:34 17	21:03 (7)	20:34	10	20:07 (6)	19:21 15	18:54 (3)	17:15		16:28	16:28
29	05:49	20:46 (7)	06:40		19:57 (6)	07:31	18:38 (3)	07:24		08:18	08:45
	21:33 17	21:03 (7)	20:32	7	20:04 (6)	19:19 14	18:52 (3)	17:13		16:28	16:28
30	05:51	20:45 (7)	06:41		19:45 (5)	07:33	18:36 (3)	07:26		08:20	08:45
	21:31 16	21:01 (7)	20:29	13	20:02 (6)	19:17 13	18:49 (3)	17:11		16:27	16:29
31	05:52	20:46 (7)	06:43		19:42 (5)			07:28			08:45
	21:30 14	21:00 (7)	20:27	14	19:56 (5)			17:09			16:30
Potential sun hours	504		455			381		331		264	241
Total, worst case	306		352			400		213		237	
Sun reduction	0.33		0.35			0.34		0.28		0.26	
Oper. time red.	1.00		1.00			1.00		1.00		1.00	
Wind dir. red.	0.64		0.61			0.60		0.60		0.60	
Total reduction	0.21		0.22			0.20		0.17		0.16	
Total, real	65		76			82		36		37	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
Jennings O'Donovan
Finisklin Business Park
F91 RHH9 Sligo
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padraig / podowd@jodireland.com
Calculated:
11/06/2025 09:22/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Real Case - V150 **Shadow receptor:** BT - 85

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:45	08:18	07:23	07:12	06:06	05:20	21:01 (1)	05:17	21:06 (1)	05:54	06:45	07:35	07:29	08:21
	16:32	17:20	18:13	20:08	21:00	21:47	21:14 (1)	22:01	21:27 (1)	21:28	20:25	19:14	17:07	16:26
2	08:45	08:16	07:21	07:09	06:04	05:19	21:01 (1)	05:17	21:07 (1)	05:55	06:46	07:36	07:31	08:23
	16:33	17:22	18:15	20:10	21:02	21:48	21:15 (1)	22:00	21:27 (1)	21:26	20:23	19:12	17:05	16:25
3	08:45	08:15	07:19	07:07	06:02	05:18	21:01 (1)	05:18	21:06 (1)	05:57	06:48	07:38	07:33	08:24
	16:34	17:24	18:17	20:11	21:03	21:49	21:15 (1)	22:00	21:26 (1)	21:25	20:20	19:10	17:04	16:25
4	08:45	08:13	07:17	07:05	06:00	05:17	21:01 (1)	05:19	21:07 (1)	05:59	06:50	07:40	07:35	08:26
	16:35	17:26	18:18	20:13	21:05	21:50	21:17 (1)	21:59	21:26 (1)	21:23	20:18	19:07	17:02	16:24
5	08:45	08:11	07:14	07:02	05:58	05:17	21:01 (1)	05:20	21:07 (1)	06:00	06:51	07:41	07:37	08:27
	16:36	17:28	18:20	20:15	21:07	21:51	21:17 (1)	21:59	21:26 (1)	21:21	20:16	19:05	17:00	16:24
6	08:44	08:09	07:12	07:00	05:56	05:16	21:02 (1)	05:21	21:08 (1)	06:02	06:53	07:43	07:39	08:28
	16:37	17:30	18:22	20:17	21:08	21:52	21:19 (1)	21:58	21:25 (1)	21:19	20:13	19:03	16:58	16:23
7	08:44	08:08	07:10	06:58	05:55	05:15	21:01 (1)	05:21	21:07 (1)	06:03	06:55	07:45	07:40	08:30
	16:39	17:32	18:24	20:18	21:10	21:53	21:19 (1)	21:58	21:24 (1)	21:17	20:11	19:01	16:56	16:23
8	08:43	08:06	07:08	06:56	05:53	05:15	21:02 (1)	05:22	21:08 (1)	06:05	06:56	07:47	07:42	08:31
	16:40	17:34	18:26	20:20	21:12	21:54	21:20 (1)	21:57	21:23 (1)	21:16	20:09	18:58	16:55	16:22
9	08:43	08:04	07:05	06:53	05:51	05:14	21:01 (1)	05:23	21:08 (1)	06:07	06:58	07:48	07:44	08:32
	16:41	17:35	18:27	20:22	21:13	21:55	21:20 (1)	21:57	21:23 (1)	21:14	20:06	18:56	16:53	16:22
10	08:42	08:02	07:03	06:51	05:49	05:14	21:02 (1)	05:24	21:08 (1)	06:08	07:00	07:50	07:46	08:33
	16:43	17:37	18:29	20:24	21:15	21:55	21:22 (1)	21:56	21:22 (1)	21:12	20:04	18:54	16:51	16:22
11	08:42	08:00	07:01	06:49	05:48	05:14	21:02 (1)	05:25	21:09 (1)	06:10	07:01	07:52	07:48	08:34
	16:44	17:39	18:31	20:25	21:17	21:56	21:22 (1)	21:55	21:22 (1)	21:10	20:02	18:51	16:50	16:22
12	08:41	07:59	06:59	06:46	05:46	05:13	21:03 (1)	05:27	21:09 (1)	06:12	07:03	07:54	07:50	08:35
	16:46	17:41	18:33	20:27	21:18	21:57	21:23 (1)	21:54	21:21 (1)	21:08	19:59	18:49	16:48	16:22
13	08:40	07:57	06:56	06:44	05:44	05:13	21:02 (1)	05:28	21:09 (1)	06:13	07:05	07:55	07:51	08:36
	16:47	17:43	18:35	20:29	21:20	21:57	21:23 (1)	21:53	21:20 (1)	21:06	19:57	18:47	16:47	16:22
14	08:40	07:55	06:54	06:42	05:43	05:13	21:02 (1)	05:29	21:10 (1)	06:15	07:06	07:57	07:53	08:37
	16:49	17:45	18:36	20:30	21:21	21:58	21:24 (1)	21:52	21:19 (1)	21:04	19:55	18:45	16:45	16:22
15	08:39	07:53	06:52	06:40	05:41	05:12	21:03 (1)	05:30	21:11 (1)	06:17	07:08	07:59	07:55	08:38
	16:50	17:47	18:38	20:32	21:23	21:59	21:25 (1)	21:51	21:19 (1)	21:02	19:52	18:42	16:44	16:22
16	08:38	07:51	06:49	06:37	05:39	05:12	21:03 (1)	05:31	21:11 (1)	06:18	07:10	08:01	07:57	08:39
	16:52	17:49	18:40	20:34	21:25	21:59	21:25 (1)	21:50	21:18 (1)	21:00	19:50	18:40	16:42	16:22
17	08:37	07:49	06:47	06:35	05:38	05:12	21:03 (1)	05:32	21:12 (1)	06:20	07:11	08:02	07:58	08:40
	16:54	17:51	18:42	20:36	21:26	22:00	21:26 (1)	21:49	21:17 (1)	20:58	19:48	18:38	16:41	16:22
18	08:36	07:47	06:45	06:33	05:36	05:12	21:03 (1)	05:34	21:12 (1)	06:21	07:13	08:04	08:00	08:41
	16:55	17:52	18:43	20:37	21:28	22:00	21:26 (1)	21:48	21:16 (1)	20:56	19:45	18:36	16:40	16:22
19	08:35	07:45	06:42	06:31	05:35	05:12	21:04 (1)	05:35	21:13 (1)	06:23	07:15	08:06	08:02	08:41
	16:57	17:54	18:45	20:39	21:29	22:00	21:26 (1)	21:47	21:14 (1)	20:54	19:43	18:34	16:38	16:22
20	08:34	07:43	06:40	06:29	05:34	05:12	21:04 (1)	05:36		06:25	07:16	08:08	08:04	08:42
	16:59	17:56	18:47	20:41	21:31	22:01	21:26 (1)	21:46		20:51	19:40	18:32	16:37	16:23
21	08:33	07:41	06:38	06:27	05:32	05:12	21:04 (1)	05:38		06:26	07:18	08:10	08:05	08:43
	17:00	17:58	18:49	20:43	21:32	22:01	21:26 (1)	21:44		20:49	19:38	18:29	16:36	16:23
22	08:32	07:39	06:35	06:24	05:31	05:13	21:05 (1)	05:39		06:28	07:20	08:11	08:07	08:43
	17:02	18:00	18:50	20:44	21:34	22:01	21:27 (1)	21:43		20:47	19:36	18:27	16:35	16:24
23	08:30	07:36	06:33	06:22	05:30	05:13	21:05 (1)	05:41		06:30	07:21	08:13	08:09	08:44
	17:04	18:02	18:52	20:46	21:35	22:01	21:27 (1)	21:42		20:45	19:33	18:25	16:33	16:24
24	08:29	07:34	06:30	06:20	05:28	21:03 (1)	05:13	21:05 (1)	05:42	06:31	07:23	08:15	08:10	08:44
	17:06	18:04	18:54	20:48	21:36	1 21:04 (1)	22:01	21:27 (1)	21:40	20:43	19:31	18:23	16:32	16:25
25	08:28	07:32	06:28	06:18	05:27	21:03 (1)	05:14	21:05 (1)	05:43	06:33	07:25	07:17	08:12	08:44
	17:07	18:05	18:56	20:50	21:38	3 21:06 (1)	22:02	21:28 (1)	21:39	20:41	19:29	17:21	16:31	16:25
26	08:27	07:30	06:26	06:16	05:26	21:02 (1)	05:14	21:05 (1)	05:45	06:35	07:26	07:19	08:14	08:45
	17:09	18:07	18:57	20:51	21:39	5 21:07 (1)	22:02	21:27 (1)	21:37	20:38	19:26	17:19	16:30	16:26
27	08:25	07:28	06:23	06:14	05:25	21:02 (1)	05:14	21:06 (1)	05:46	06:36	07:28	07:20	08:15	08:45
	17:11	18:09	18:59	20:53	21:40	6 21:08 (1)	22:01	21:28 (1)	21:36	20:36	19:24	17:17	16:29	16:27
28	08:24	07:26	06:21	06:12	05:24	21:02 (1)	05:15	21:06 (1)	05:48	06:38	07:30	07:22	08:17	08:45
	17:13	18:11	19:01	20:55	21:42	7 21:09 (1)	22:01	21:27 (1)	21:34	20:34	19:21	17:15	16:28	16:28
29	08:22		07:19	06:10	05:23	21:01 (1)	05:15	21:06 (1)	05:49	06:40	07:31	07:24	08:18	08:45
	17:15		20:03	20:56	21:43	9 21:10 (1)	22:01	21:28 (1)	21:33	20:32	19:19	17:13	16:28	16:28
30	08:21		07:16	06:08	05:22	21:01 (1)	05:16	21:06 (1)	05:51	06:41	07:33	07:26	08:20	08:45
	17:17		20:04	20:58	21:44	10 21:11 (1)	22:01	21:27 (1)	21:31	20:29	19:17	17:11	16:27	16:29
31	08:19		07:14		05:21	21:02 (1)			05:52	06:43		07:28		08:45
	17:18		20:06		21:45	11 21:13 (1)			21:30	20:27		17:09		16:30
Potential sun hours	257	277	367	417	487	501	504	455	381	331	265	241
Total, worst case					52	601	247					
Sun reduction					0.39	0.35	0.33					
Oper. time red.					1.00	1.00	1.00					
Wind dir. red.					0.64	0.64	0.64					
Total reduction					0.25	0.22	0.21					
Total, real					13	133	52					

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
Jennings O'Donovan
Finisklin Business Park
F91 RHH9 Sligo
+353719161416
padraig / podowd@jodireland.com
Calculated:
11/06/2025 09:22/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Real Case - V150 **Shadow receptor:** BU - 86

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:45	08:18	07:23	07:12	06:06	05:20	20:51 (1) 05:17	21:17 (2) 05:54	20:51 (1) 06:45	07:35	07:29	08:21
	16:32	17:20	18:13	20:08	21:00	21:47 8	21:14 (2) 22:01 10	21:27 (2) 21:28 7	20:58 (1) 20:25	19:14	17:07	16:26
2	08:45	08:16	07:21	07:09	06:04	05:19	21:11 (2) 05:17	21:18 (2) 05:55	20:51 (1) 06:46	07:36	07:31	08:23
	16:33	17:22	18:15	20:10	21:02	21:48 4	21:15 (2) 22:00 9	21:27 (2) 21:26 5	20:56 (1) 20:23	19:12	17:05	16:25
3	08:45	08:15	07:19	07:07	06:02	05:18	21:11 (2) 05:18	21:17 (2) 05:57	20:52 (1) 06:48	07:38	07:33	08:24
	16:34	17:24	18:17	20:11	21:03	21:49 4	21:15 (2) 22:00 9	21:26 (2) 21:25 3	20:55 (1) 20:20	19:10	17:04	16:25
4	08:45	08:13	07:17	07:05	06:00	05:17	21:12 (2) 05:19	21:18 (2) 05:59	20:52 (1) 06:50	07:40	07:35	08:26
	16:35	17:26	18:18	20:13	21:05	21:50 5	21:17 (2) 21:59 8	21:26 (2) 21:23 1	20:53 (1) 20:18	19:07	17:02	16:24
5	08:45	08:11	07:14	07:02	05:58	05:17	21:11 (2) 05:20	21:18 (2) 06:00	06:51	07:41	07:37	08:27
	16:36	17:28	18:20	20:15	21:07	21:51 6	21:17 (2) 21:59 8	21:26 (2) 21:21	20:16	19:05	17:00	16:24
6	08:44	08:09	07:12	07:00	05:56	05:16	21:12 (2) 05:21	21:18 (2) 06:02	06:53	07:43	07:39	08:28
	16:37	17:30	18:22	20:17	21:08	21:52 7	21:19 (2) 21:58 7	21:25 (2) 21:19	20:13	19:03	16:58	16:23
7	08:44	08:08	07:10	06:58	05:55	05:15	21:12 (2) 05:21	21:18 (2) 06:03	06:55	07:45	07:40	08:30
	16:39	17:32	18:24	20:18	21:10	21:53 7	21:19 (2) 21:58 6	21:24 (2) 21:17	20:11	19:01	16:56	16:23
8	08:43	08:06	07:08	06:56	05:53	05:15	21:12 (2) 05:22	21:18 (2) 06:05	06:56	07:47	07:42	08:31
	16:40	17:33	18:26	20:20	21:12	21:54 8	21:20 (2) 21:57 5	21:23 (2) 21:16	20:09	18:58	16:55	16:22
9	08:43	08:04	07:05	06:53	05:51	20:42 (1) 05:14	21:12 (2) 05:23	21:18 (2) 06:07	06:58	07:48	07:44	08:32
	16:41	17:35	18:27	20:22	21:13 2	20:44 (1) 21:55 8	21:20 (2) 21:56 5	21:23 (2) 21:14	20:06	18:56	16:53	16:22
10	08:42	08:02	07:03	06:51	05:49	20:41 (1) 05:14	21:13 (2) 05:24	21:19 (2) 06:08	07:00	07:50	07:46	08:33
	16:43	17:37	18:29	20:24	21:15 4	20:45 (1) 21:55 9	21:22 (2) 21:56 3	21:22 (2) 21:12	20:04	18:54	16:51	16:22
11	08:42	08:00	07:01	06:49	05:48	20:41 (1) 05:13	21:13 (2) 05:25	21:00 (1) 06:10	07:01	07:52	07:48	08:34
	16:44	17:39	18:31	20:25	21:17 6	20:47 (1) 21:56 9	21:22 (2) 21:55 6	21:22 (2) 21:10	20:02	18:51	16:50	16:22
12	08:41	07:59	06:59	06:46	05:46	20:40 (1) 05:13	21:14 (2) 05:27	20:57 (1) 06:12	07:03	07:54	07:50	08:35
	16:46	17:41	18:33	20:27	21:18 8	20:48 (1) 21:57 9	21:23 (2) 21:54 11	21:21 (2) 21:08	19:59	18:49	16:48	16:22
13	08:40	07:57	06:56	06:44	05:44	20:40 (1) 05:13	21:13 (2) 05:28	20:56 (1) 06:13	07:05	07:55	07:51	08:36
	16:47	17:43	18:35	20:29	21:20 10	20:50 (1) 21:57 10	21:23 (2) 21:53 12	21:20 (2) 21:06	19:57	18:47	16:47	16:22
14	08:40	07:55	06:54	06:42	05:43	20:40 (1) 05:13	21:13 (2) 05:29	20:55 (1) 06:15	07:06	07:57	07:53	08:37
	16:49	17:45	18:36	20:30	21:21 11	20:51 (1) 21:58 11	21:24 (2) 21:52 14	21:09 (1) 21:04	19:55	18:45	16:45	16:22
15	08:39	07:53	06:52	06:40	05:41	20:40 (1) 05:12	21:14 (2) 05:30	20:55 (1) 06:16	07:08	07:59	07:55	08:38
	16:50	17:47	18:38	20:32	21:23 13	20:53 (1) 21:59 11	21:25 (2) 21:51 15	21:10 (1) 21:02	19:52	18:42	16:44	16:22
16	08:38	07:51	06:49	06:37	05:39	20:39 (1) 05:12	21:14 (2) 05:31	20:54 (1) 06:18	07:10	08:01	07:57	08:39
	16:52	17:49	18:40	20:34	21:25 15	20:54 (1) 21:59 11	21:25 (2) 21:50 17	21:11 (1) 21:00	19:50	18:40	16:42	16:22
17	08:37	07:49	06:47	06:35	05:38	20:40 (1) 05:12	21:14 (2) 05:32	20:53 (1) 06:20	07:11	08:02	07:58	08:40
	16:54	17:51	18:42	20:36	21:26 15	20:55 (1) 22:00 12	21:26 (2) 21:49 19	21:12 (1) 20:58	19:48	18:38	16:41	16:22
18	08:36	07:47	06:45	06:33	05:36	20:39 (1) 05:12	21:15 (2) 05:34	20:52 (1) 06:21	07:13	08:04	08:00	08:41
	16:55	17:52	18:43	20:37	21:28 17	20:56 (1) 22:00 11	21:26 (2) 21:48 20	21:12 (1) 20:56	19:45	18:36	16:40	16:22
19	08:35	07:45	06:42	06:31	05:35	20:40 (1) 05:12	21:15 (2) 05:35	20:52 (1) 06:23	07:15	08:06	08:02	08:41
	16:57	17:54	18:45	20:39	21:29 18	20:58 (1) 22:00 11	21:26 (2) 21:47 21	21:13 (1) 20:54	19:43	18:34	16:38	16:22
20	08:34	07:43	06:40	06:29	05:34	20:40 (1) 05:12	21:15 (2) 05:36	20:52 (1) 06:25	07:16	08:08	08:04	08:42
	16:59	17:56	18:47	20:41	21:31 19	20:59 (1) 22:01 11	21:26 (2) 21:46 22	21:14 (1) 20:51	19:40	18:32	16:37	16:23
21	08:33	07:41	06:38	06:27	05:32	20:41 (1) 05:12	21:15 (2) 05:38	20:51 (1) 06:26	07:18	08:09	08:05	08:43
	17:00	17:58	18:49	20:43	21:32 20	21:01 (1) 22:01 11	21:26 (2) 21:44 22	21:13 (1) 20:49	19:38	18:29	16:36	16:23
22	08:32	07:38	06:35	06:24	05:31	20:41 (1) 05:13	21:16 (2) 05:39	20:51 (1) 06:28	07:20	08:11	08:07	08:43
	17:02	18:00	18:50	20:44	21:34 20	21:01 (1) 22:01 11	21:27 (2) 21:43 20	21:11 (1) 20:47	19:36	18:27	16:35	16:24
23	08:30	07:36	06:33	06:22	05:30	20:41 (1) 05:13	21:16 (2) 05:40	20:50 (1) 06:30	07:21	08:13	08:09	08:44
	17:04	18:02	18:52	20:46	21:35 22	21:03 (1) 22:01 11	21:27 (2) 21:42 20	21:10 (1) 20:45	19:33	18:25	16:33	16:24
24	08:29	07:34	06:30	06:20	05:28	20:42 (1) 05:13	21:16 (2) 05:42	20:51 (1) 06:31	07:23	08:15	08:10	08:44
	17:06	18:04	18:54	20:48	21:36 22	21:04 (1) 22:01 11	21:27 (2) 21:40 18	21:09 (1) 20:43	19:31	18:23	16:32	16:25
25	08:28	07:32	06:28	06:18	05:27	20:43 (1) 05:14	21:16 (2) 05:43	20:50 (1) 06:33	07:25	07:17	08:12	08:44
	17:07	18:05	18:56	20:50	21:38 20	21:03 (1) 22:02 12	21:28 (2) 21:39 18	21:08 (1) 20:41	19:29	17:21	16:31	16:25
26	08:27	07:30	06:26	06:16	05:26	20:43 (1) 05:14	21:16 (2) 05:45	20:51 (1) 06:35	07:26	07:19	08:14	08:45
	17:09	18:07	18:57	20:51	21:39 20	21:03 (1) 22:01 11	21:27 (2) 21:37 16	21:07 (1) 20:38	19:26	17:19	16:30	16:26
27	08:25	07:28	06:23	06:14	05:25	20:44 (1) 05:14	21:17 (2) 05:46	20:50 (1) 06:36	07:28	07:20	08:15	08:45
	17:11	18:09	18:59	20:53	21:40 18	21:02 (1) 22:01 11	21:28 (2) 21:36 15	21:05 (1) 20:36	19:24	17:17	16:29	16:27
28	08:24	07:26	06:21	06:12	05:24	20:45 (1) 05:15	21:17 (2) 05:48	20:50 (1) 06:38	07:30	07:22	08:17	08:45
	17:13	18:11	19:01	20:55	21:42 16	21:01 (1) 22:01 10	21:27 (2) 21:34 13	21:03 (1) 20:34	19:21	17:15	16:28	16:28
29	08:22		07:19	06:10	05:23	20:46 (1) 05:15	21:17 (2) 05:49	20:50 (1) 06:40	07:31	07:24	08:18	08:45
	17:15		20:03	20:56	21:43 15	21:01 (1) 22:01 11	21:28 (2) 21:33 12	21:02 (1) 20:32	19:19	17:13	16:28	16:28
30	08:21		07:16	06:08	05:22	20:47 (1) 05:16	21:17 (2) 05:51	20:50 (1) 06:41	07:33	07:26	08:20	08:45
	17:17		20:04	20:58	21:44 12	20:59 (1) 22:01 10	21:27 (2) 21:31 11	21:01 (1) 20:29	19:17	17:11	16:27	16:29
31	08:19		07:14		05:21	20:49 (1)	05:52	20:51 (1) 06:43		07:28		08:45
	17:18		20:06		21:45 11	21:13 (2)	21:30 9	21:00 (1) 20:27		17:09		16:30
Potential sun hours	257	277	367	417	487	501	504	455	381	331	265	241
Total, worst case					334	281	401	16				
Sun reduction					0.39	0.35	0.33	0.35				
Oper. time red.					1.00	1.00	1.00	1.00				
Wind dir. red.					0.64	0.64	0.64	0.64				
Total reduction					0.25	0.22	0.21	0.23				
Total, real					84	62	85	4				

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
Jennings O'Donovan
Finisklin Business Park
F91 RHH9 Sligo
+353719161416
padraig / podowd@jodireland.com

SHADOW - Calendar

Calculation: 6839 Garrane WF Real Case - V150 **Shadow receptor:** BV - 87

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:45	08:18	07:23	07:12	06:06	05:20	05:17	05:54	06:45	07:35	07:29	08:21
	16:32	17:20	18:13	20:08	21:00	21:47	22:01	21:28	20:25	19:14	17:07	16:26
2	08:45	08:16	07:21	07:09	06:04	05:19	05:17	05:55	06:46	07:36	07:31	08:23
	16:33	17:22	18:15	20:10	21:02	21:48	22:00	21:26	20:23	19:12	17:05	16:25
3	08:45	08:15	07:19	07:07	06:02	05:18	05:18	05:57	06:48	07:38	07:33	08:24
	16:34	17:24	18:17	20:11	21:03	21:49	22:00	21:25	20:20	19:10	17:04	16:25
4	08:45	08:13	07:17	07:05	06:00	05:17	05:19	05:59	06:50	07:40	07:35	08:26
	16:35	17:26	18:18	20:13	21:05	21:50	22:00	21:23	20:18	19:07	17:02	16:24
5	08:45	08:11	07:15	07:02	05:58	05:17	05:20	06:00	06:51	07:42	07:37	08:27
	16:36	17:28	18:20	20:15	21:07	21:51	21:59	21:21	20:16	19:05	17:00	16:24
6	08:44	08:09	07:12	07:00	05:56	05:16	05:21	06:02	06:53	07:43	07:39	08:28
	16:38	17:30	18:22	20:17	21:08	21:52	21:58	21:19	20:13	19:03	16:58	16:23
7	08:44	08:08	07:10	06:58	05:55	05:15	05:21	06:03	06:55	07:45	07:40	08:30
	16:39	17:32	18:24	20:18	21:10	21:53	21:58	21:17	20:11	19:01	16:56	16:23
8	08:43	08:06	07:08	06:56	05:53	05:15	05:22	06:05	06:56	07:47	07:42	08:31
	16:40	17:34	18:26	20:20	21:12	21:54	21:57	21:16	20:09	18:58	16:55	16:22
9	08:43	08:04	07:05	06:53	05:51	05:14	05:23	06:07	06:58	07:48	07:44	08:32
	16:42	17:35	18:27	20:22	21:13	21:55	21:57	21:14	20:06	18:56	16:53	16:22
10	08:42	08:02	07:03	06:51	05:49	05:14	05:24	06:08	07:00	07:50	07:46	08:33
	16:43	17:37	18:29	20:24	21:15	21:55	21:56	21:12	20:04	18:54	16:51	16:22
11	08:42	08:00	07:01	06:49	05:48	05:14	05:25	06:10	07:01	07:52	07:48	08:34
	16:44	17:39	18:31	20:25	21:17	21:56	21:55	21:10	20:02	18:51	16:50	16:22
12	08:41	07:59	06:59	06:46	05:46	05:13	05:27	06:12	07:03	07:54	07:50	08:35
	16:46	17:41	18:33	20:27	21:18	21:57	21:54	21:08	19:59	18:49	16:48	16:22
13	08:40	07:57	06:56	06:44	05:44	05:13	05:28	06:13	07:05	07:55	07:51	08:36
	16:47	17:43	18:35	20:29	21:20	21:57	21:53	21:06	19:57	18:47	16:47	16:22
14	08:40	07:55	06:54	06:42	05:43	05:13	05:29	06:15	07:06	07:57	07:53	08:37
	16:49	17:45	18:36	20:30	21:21	21:58	21:52	21:04	19:55	18:45	16:45	16:22
15	08:39	07:53	06:52	06:40	05:41	05:12	05:30	06:17	07:08	07:59	07:55	08:38
	16:50	17:47	18:38	20:32	21:23	21:59	21:51	21:02	19:52	18:42	16:44	16:22
16	08:38	07:51	06:49	06:38	05:39	05:12	05:31	06:18	07:10	08:01	07:57	08:39
	16:52	17:49	18:40	20:34	21:25	21:59	21:50	21:00	19:50	18:40	16:42	16:22
17	08:37	07:49	06:47	06:35	05:38	05:12	05:32	06:20	07:11	08:02	07:58	08:40
	16:54	17:51	18:42	20:36	21:26	22:00	21:49	20:58	19:48	18:38	16:41	16:22
18	08:36	07:47	06:45	06:33	05:36	05:12	05:34	06:21	07:13	08:04	08:00	08:41
	16:55	17:52	18:43	20:37	21:28	22:00	21:48	20:56	19:45	18:36	16:40	16:22
19	08:35	07:45	06:42	06:31	05:35	05:12	05:35	06:23	07:15	08:06	08:02	08:41
	16:57	17:54	18:45	20:39	21:29	22:00	21:47	20:54	19:43	18:34	16:38	16:22
20	08:34	07:43	06:40	06:29	05:34	05:12	05:36	06:25	07:16	08:08	08:04	08:42
	16:59	17:56	18:47	20:41	21:31	22:01	21:46	20:51	19:40	18:32	16:37	16:23
21	08:33	07:41	06:38	06:27	05:32	05:12	05:38	06:26	07:18	08:10	08:05	08:43
	17:00	17:58	18:49	20:43	21:32	22:01	21:44	20:49	19:38	18:29	16:36	16:23
22	08:32	07:39	06:35	06:24	05:31	05:13	05:39	06:28	07:20	08:11	08:07	08:43
	17:02	18:00	18:50	20:44	21:34	22:01	21:43	20:47	19:36	18:27	16:35	16:24
23	08:30	07:36	06:33	06:22	05:30	05:13	05:41	06:30	07:21	08:13	08:09	08:44
	17:04	18:02	18:52	20:46	21:35	22:01	21:42	20:45	19:33	18:25	16:33	16:24
24	08:29	07:34	06:31	06:20	05:28	05:13	05:42	06:31	07:23	08:15	08:10	08:44
	17:06	18:04	18:54	20:48	21:36	22:01	21:40	20:43	19:31	18:23	16:32	16:25
25	08:28	07:32	06:28	06:18	05:27	05:14	05:43	06:33	07:25	07:17	08:12	08:44
	17:07	18:06	18:56	20:50	21:38	22:02	21:39	20:41	19:29	17:21	16:31	16:25
26	08:27	07:30	06:26	06:16	05:26	05:14	05:45	06:35	07:26	07:19	08:14	08:45
	17:09	18:07	18:57	20:51	21:39	22:02	21:37	20:38	19:26	17:19	16:30	16:26
27	08:25	07:28	06:23	06:14	05:25	05:14	05:46	06:36	07:28	07:20	08:15	08:45
	17:11	18:09	18:59	20:53	21:40	22:01	21:36	20:36	19:24	17:17	16:29	16:27
28	08:24	07:26	06:21	06:12	05:24	05:15	05:48	06:38	07:30	07:22	08:17	08:45
	17:13	18:11	19:01	20:55	21:42	22:01	21:34	20:34	19:22	17:15	16:29	16:28
29	08:22		07:19	06:10	05:23	05:15	05:49	06:40	07:31	07:24	08:18	08:45
	17:15		20:03	20:56	21:43	22:01	21:33	20:32	19:19	17:13	16:28	16:29
30	08:21		07:16	06:08	05:22	05:16	05:51	06:41	07:33	07:26	08:20	08:45
	17:17		20:04	20:58	21:44	22:01	21:31	20:29	19:17	17:11	16:27	16:29
31	08:19		07:14		05:21		05:52	06:43		07:28		08:45
	17:18		20:06		21:45		21:30	20:27		17:09		16:30
Potential sun hours	257	277	367	417	487	501	504	455	381	331	265	241
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

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padraig / podowd@jodireland.com

Calculated:
11/06/2025 09:22/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Real Case - V150 **Shadow receptor:** BW - 88

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:45	08:18	07:23	07:12	06:06	05:20	05:17	05:54	06:45	07:35	07:29	08:21
	16:32	17:20	18:13	20:08	21:00	21:47	22:01	21:28	20:25	19:14	17:07	16:26
2	08:45	08:16	07:21	07:09	06:04	05:19	05:17	05:56	06:46	07:36	07:31	08:23
	16:33	17:22	18:15	20:10	21:02	21:48	22:00	21:26	20:23	19:12	17:05	16:25
3	08:45	08:15	07:19	07:07	06:02	05:18	05:18	05:57	06:48	07:38	07:33	08:24
	16:34	17:24	18:17	20:11	21:03	21:49	22:00	21:25	20:20	19:10	17:04	16:25
4	08:45	08:13	07:17	07:05	06:00	05:17	05:19	05:59	06:50	07:40	07:35	08:26
	16:35	17:26	18:18	20:13	21:05	21:50	22:00	21:23	20:18	19:07	17:02	16:24
5	08:45	08:11	07:14	07:02	05:58	05:17	05:20	06:00	06:51	07:42	07:37	08:27
	16:36	17:28	18:20	20:15	21:07	21:51	21:59	21:21	20:16	19:05	17:00	16:24
6	08:44	08:09	07:12	07:00	05:56	05:16	05:21	06:02	06:53	07:43	07:39	08:28
	16:38	17:30	18:22	20:17	21:08	21:52	21:58	21:19	20:13	19:03	16:58	16:23
7	08:44	08:08	07:10	06:58	05:55	05:15	05:21	06:03	06:55	07:45	07:40	08:30
	16:39	17:32	18:24	20:18	21:10	21:53	21:58	21:17	20:11	19:01	16:56	16:23
8	08:43	08:06	07:08	06:56	05:53	05:15	05:22	06:05	06:56	07:47	07:42	08:31
	16:40	17:34	18:26	20:20	21:12	21:54	21:57	21:16	20:09	18:58	16:55	16:22
9	08:43	08:04	07:05	06:53	05:51	05:14	05:23	06:07	06:58	07:48	07:44	08:32
	16:42	17:35	18:27	20:22	21:13	21:55	21:57	21:14	20:06	18:56	16:53	16:22
10	08:42	08:02	07:03	06:51	05:49	05:14	05:24	06:08	07:00	07:50	07:46	08:33
	16:43	17:37	18:29	20:24	21:15	21:55	21:56	21:12	20:04	18:54	16:51	16:22
11	08:42	08:00	07:01	06:49	05:48	05:14	05:25	06:10	07:01	07:52	07:48	08:34
	16:44	17:39	18:31	20:25	21:17	21:56	21:55	21:10	20:02	18:51	16:50	16:22
12	08:41	07:59	06:59	06:46	05:46	05:13	05:27	06:12	07:03	07:54	07:50	08:35
	16:46	17:41	18:33	20:27	21:18	21:57	21:54	21:08	19:59	18:49	16:48	16:22
13	08:40	07:57	06:56	06:44	05:44	05:13	05:28	06:13	07:05	07:55	07:51	08:36
	16:47	17:43	18:35	20:29	21:20	21:57	21:53	21:06	19:57	18:47	16:47	16:22
14	08:40	07:55	06:54	06:42	05:43	05:13	05:29	06:15	07:06	07:57	07:53	08:37
	16:49	17:45	18:36	20:30	21:21	21:58	21:52	21:04	19:55	18:45	16:45	16:22
15	08:39	07:53	06:52	06:40	05:41	05:12	05:30	06:17	07:08	07:59	07:55	08:38
	16:50	17:47	18:38	20:32	21:23	21:59	21:51	21:02	19:52	18:42	16:44	16:22
16	08:38	07:51	06:49	06:38	05:39	05:12	05:31	06:18	07:10	08:01	07:57	08:39
	16:52	17:49	18:40	20:34	21:25	21:59	21:50	21:00	19:50	18:40	16:42	16:22
17	08:37	07:49	06:47	06:35	05:38	05:12	05:32	06:20	07:11	08:02	07:58	08:40
	16:54	17:51	18:42	20:36	21:26	22:00	21:49	20:58	19:48	18:38	16:41	16:22
18	08:36	07:47	06:45	06:33	05:36	05:12	05:34	06:21	07:13	08:04	08:00	08:41
	16:55	17:52	18:43	20:37	21:28	22:00	21:48	20:56	19:45	18:36	16:40	16:22
19	08:35	07:45	06:42	06:31	05:35	05:12	05:35	06:23	07:15	08:06	08:02	08:41
	16:57	17:54	18:45	20:39	21:29	22:00	21:47	20:54	19:43	18:34	16:38	16:22
20	08:34	07:43	06:40	06:29	05:34	05:12	05:36	06:25	07:16	08:08	08:04	08:42
	16:59	17:56	18:47	20:41	21:31	22:01	21:46	20:51	19:40	18:32	16:37	16:23
21	08:33	07:41	06:38	06:27	05:32	05:12	05:38	06:26	07:18	08:10	08:05	08:43
	17:00	17:58	18:49	20:43	21:32	22:01	21:44	20:49	19:38	18:29	16:36	16:23
22	08:32	07:39	06:35	06:24	05:31	05:13	05:39	06:28	07:20	08:11	08:07	08:43
	17:02	18:00	18:50	20:44	21:34	22:01	21:43	20:47	19:36	18:27	16:35	16:24
23	08:30	07:36	06:33	06:22	05:30	05:13	05:41	06:30	07:21	08:13	08:09	08:44
	17:04	18:02	18:52	20:46	21:35	22:01	21:42	20:45	19:33	18:25	16:33	16:24
24	08:29	07:34	06:31	06:20	05:28	05:13	05:42	06:31	07:23	08:15	08:10	08:44
	17:06	18:04	18:54	20:48	21:36	22:01	21:40	20:43	19:31	18:23	16:32	16:25
25	08:28	07:32	06:28	06:18	05:27	05:14	05:43	06:33	07:25	07:17	08:12	08:44
	17:07	18:06	18:56	20:50	21:38	22:02	21:39	20:41	19:29	17:21	16:31	16:25
26	08:27	07:30	06:26	06:16	05:26	05:14	05:45	06:35	07:26	07:19	08:14	08:45
	17:09	18:07	18:57	20:51	21:39	22:02	21:37	20:38	19:26	17:19	16:30	16:26
27	08:25	07:28	06:23	06:14	05:25	05:14	05:46	06:36	07:28	07:20	08:15	08:45
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	17:13	18:11	19:01	20:55	21:42	22:01	21:34	20:34	19:22	17:15	16:29	16:28
29	08:22		07:19	06:10	05:23	05:15	05:49	06:40	07:31	07:24	08:18	08:45
	17:15		20:03	20:56	21:43	22:01	21:33	20:32	19:19	17:13	16:28	16:29
30	08:21		07:16	06:08	05:22	05:16	05:51	06:41	07:33	07:26	08:20	08:45
	17:17		20:04	20:58	21:44	22:01	21:31	20:29	19:17	17:11	16:27	16:29
31	08:19		07:14		05:21		05:52	06:43		07:28		08:45
	17:18		20:06		21:45		21:30	20:27		17:09		16:30
Potential sun hours	257	277	367	417	487	501	504	455	381	331	265	241
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

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padraig / podowd@jodireland.com

Calculated:
11/06/2025 09:22/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Real Case - V150 **Shadow receptor:** BX - 89

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:45	08:18	07:23	07:12	06:06	05:20	05:17	05:54	06:45	07:35	07:29	08:21
	16:32	17:20	18:13	20:08	21:00	21:47	22:01	21:28	20:25	19:14	17:07	16:26
2	08:45	08:16	07:21	07:09	06:04	05:19	05:17	05:56	06:46	07:36	07:31	08:23
	16:33	17:22	18:15	20:10	21:02	21:48	22:00	21:26	20:23	19:12	17:05	16:25
3	08:45	08:15	07:19	07:07	06:02	05:18	05:18	05:57	06:48	07:38	07:33	08:24
	16:34	17:24	18:17	20:11	21:03	21:49	22:00	21:25	20:20	19:10	17:04	16:25
4	08:45	08:13	07:17	07:05	06:00	05:17	05:19	05:59	06:50	07:40	07:35	08:26
	16:35	17:26	18:18	20:13	21:05	21:50	22:00	21:23	20:18	19:07	17:02	16:24
5	08:45	08:11	07:15	07:02	05:58	05:17	05:20	06:00	06:51	07:42	07:37	08:27
	16:36	17:28	18:20	20:15	21:07	21:51	21:59	21:21	20:16	19:05	17:00	16:24
6	08:44	08:09	07:12	07:00	05:56	05:16	05:21	06:02	06:53	07:43	07:39	08:28
	16:38	17:30	18:22	20:17	21:08	21:52	21:58	21:19	20:13	19:03	16:58	16:23
7	08:44	08:08	07:10	06:58	05:55	05:15	05:21	06:03	06:55	07:45	07:40	08:30
	16:39	17:32	18:24	20:18	21:10	21:53	21:58	21:17	20:11	19:01	16:56	16:23
8	08:43	08:06	07:08	06:56	05:53	05:15	05:22	06:05	06:56	07:47	07:42	08:31
	16:40	17:34	18:26	20:20	21:12	21:54	21:57	21:16	20:09	18:58	16:55	16:22
9	08:43	08:04	07:05	06:53	05:51	05:14	05:23	06:07	06:58	07:48	07:44	08:32
	16:42	17:35	18:27	20:22	21:13	21:55	21:57	21:14	20:06	18:56	16:53	16:22
10	08:42	08:02	07:03	06:51	05:49	05:14	05:24	06:08	07:00	07:50	07:46	08:33
	16:43	17:37	18:29	20:24	21:15	21:55	21:56	21:12	20:04	18:54	16:51	16:22
11	08:42	08:00	07:01	06:49	05:48	05:14	05:25	06:10	07:01	07:52	07:48	08:34
	16:44	17:39	18:31	20:25	21:17	21:56	21:55	21:10	20:02	18:51	16:50	16:22
12	08:41	07:59	06:59	06:46	05:46	05:13	05:27	06:12	07:03	07:54	07:50	08:35
	16:46	17:41	18:33	20:27	21:18	21:57	21:54	21:08	19:59	18:49	16:48	16:22
13	08:40	07:57	06:56	06:44	05:44	05:13	05:28	06:13	07:05	07:55	07:51	08:36
	16:47	17:43	18:35	20:29	21:20	21:57	21:53	21:06	19:57	18:47	16:47	16:22
14	08:40	07:55	06:54	06:42	05:43	05:13	05:29	06:15	07:06	07:57	07:53	08:37
	16:49	17:45	18:36	20:30	21:21	21:58	21:52	21:04	19:55	18:45	16:45	16:22
15	08:39	07:53	06:52	06:40	05:41	05:12	05:30	06:17	07:08	07:59	07:55	08:38
	16:50	17:47	18:38	20:32	21:23	21:59	21:51	21:02	19:52	18:42	16:44	16:22
16	08:38	07:51	06:49	06:38	05:39	05:12	05:31	06:18	07:10	08:01	07:57	08:39
	16:52	17:49	18:40	20:34	21:25	21:59	21:50	21:00	19:50	18:40	16:42	16:22
17	08:37	07:49	06:47	06:35	05:38	05:12	05:32	06:20	07:11	08:02	07:58	08:40
	16:54	17:51	18:42	20:36	21:26	22:00	21:49	20:58	19:48	18:38	16:41	16:22
18	08:36	07:47	06:45	06:33	05:36	05:12	05:34	06:21	07:13	08:04	08:00	08:41
	16:55	17:52	18:43	20:37	21:28	22:00	21:48	20:56	19:45	18:36	16:40	16:22
19	08:35	07:45	06:42	06:31	05:35	05:12	05:35	06:23	07:15	08:06	08:02	08:41
	16:57	17:54	18:45	20:39	21:29	22:00	21:47	20:54	19:43	18:34	16:38	16:22
20	08:34	07:43	06:40	06:29	05:34	05:12	05:36	06:25	07:16	08:08	08:04	08:42
	16:59	17:56	18:47	20:41	21:31	22:01	21:46	20:51	19:40	18:32	16:37	16:23
21	08:33	07:41	06:38	06:27	05:32	05:12	05:38	06:26	07:18	08:10	08:05	08:43
	17:00	17:58	18:49	20:43	21:32	22:01	21:44	20:49	19:38	18:29	16:36	16:23
22	08:32	07:39	06:35	06:24	05:31	05:13	05:39	06:28	07:20	08:11	08:07	08:43
	17:02	18:00	18:50	20:44	21:34	22:01	21:43	20:47	19:36	18:27	16:35	16:24
23	08:30	07:36	06:33	06:22	05:30	05:13	05:41	06:30	07:21	08:13	08:09	08:44
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24	08:29	07:34	06:31	06:20	05:28	05:13	05:42	06:31	07:23	08:15	08:10	08:44
	17:06	18:04	18:54	20:48	21:36	22:01	21:40	20:43	19:31	18:23	16:32	16:25
25	08:28	07:32	06:28	06:18	05:27	05:14	05:43	06:33	07:25	07:17	08:12	08:44
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26	08:27	07:30	06:26	06:16	05:26	05:14	05:45	06:35	07:26	07:19	08:14	08:45
	17:09	18:07	18:57	20:51	21:39	22:02	21:37	20:38	19:26	17:19	16:30	16:26
27	08:25	07:28	06:23	06:14	05:25	05:14	05:46	06:36	07:28	07:20	08:15	08:45
	17:11	18:09	18:59	20:53	21:40	22:01	21:36	20:36	19:24	17:17	16:29	16:27
28	08:24	07:26	06:21	06:12	05:24	05:15	05:48	06:38	07:30	07:22	08:17	08:45
	17:13	18:11	19:01	20:55	21:42	22:01	21:34	20:34	19:22	17:15	16:29	16:28
29	08:22		07:19	06:10	05:23	05:15	05:49	06:40	07:31	07:24	08:18	08:45
	17:15		20:03	20:56	21:43	22:01	21:33	20:32	19:19	17:13	16:28	16:29
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	17:17		20:04	20:58	21:44	22:01	21:31	20:29	19:17	17:11	16:27	16:29
31	08:19		07:14		05:21		05:52	06:43		07:28		08:45
	17:18		20:06		21:45		21:30	20:27		17:09		16:30
Potential sun hours	257	277	367	417	487	501	504	455	381	331	265	241
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

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Calculated:
11/06/2025 09:22/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Real Case - V150 **Shadow receptor:** BY - 90

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:45	08:18	07:23	07:12	06:06	05:20	05:17	05:54	06:45	07:35	07:29	08:21
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	16:54	17:51	18:42	20:36	21:26	22:00	21:49	20:58	19:48	18:38	16:41	16:22
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	16:59	17:56	18:47	20:41	21:31	22:01	21:46	20:51	19:40	18:32	16:37	16:23
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	17:00	17:58	18:49	20:43	21:32	22:01	21:44	20:49	19:38	18:29	16:36	16:23
22	08:32	07:39	06:35	06:24	05:31	05:13	05:39	06:28	07:20	08:11	08:07	08:43
	17:02	18:00	18:50	20:44	21:34	22:01	21:43	20:47	19:36	18:27	16:35	16:24
23	08:30	07:36	06:33	06:22	05:30	05:13	05:41	06:30	07:21	08:13	08:09	08:44
	17:04	18:02	18:52	20:46	21:35	22:01	21:42	20:45	19:33	18:25	16:33	16:24
24	08:29	07:34	06:31	06:20	05:28	05:13	05:42	06:31	07:23	08:15	08:10	08:44
	17:06	18:04	18:54	20:48	21:36	22:01	21:40	20:43	19:31	18:23	16:32	16:25
25	08:28	07:32	06:28	06:18	05:27	05:14	05:43	06:33	07:25	07:17	08:12	08:44
	17:07	18:06	18:56	20:50	21:38	22:02	21:39	20:41	19:29	17:21	16:31	16:25
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	17:09	18:07	18:57	20:51	21:39	22:02	21:37	20:38	19:26	17:19	16:30	16:26
27	08:25	07:28	06:23	06:14	05:25	05:14	05:46	06:36	07:28	07:20	08:15	08:45
	17:11	18:09	18:59	20:53	21:40	22:01	21:36	20:36	19:24	17:17	16:29	16:27
28	08:24	07:26	06:21	06:12	05:24	05:15	05:48	06:38	07:30	07:22	08:17	08:45
	17:13	18:11	19:01	20:55	21:42	22:01	21:34	20:34	19:22	17:15	16:29	16:28
29	08:22		07:19	06:10	05:23	05:15	05:49	06:40	07:31	07:24	08:18	08:45
	17:15		20:03	20:56	21:43	22:01	21:33	20:32	19:19	17:13	16:28	16:29
30	08:21		07:16	06:08	05:22	05:16	05:51	06:41	07:33	07:26	08:20	08:45
	17:17		20:04	20:58	21:44	22:01	21:31	20:29	19:17	17:11	16:27	16:29
31	08:19		07:14		05:21		05:52	06:43		07:28		08:45
	17:18		20:06		21:45		21:30	20:27		17:09		16:30
Potential sun hours	257	277	367	417	487	501	504	455	381	331	265	241
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

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SHADOW - Calendar

Calculation: 6839 Garrane WF Real Case - V150 **Shadow receptor:** BZ - 91

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:45	08:18	07:23	07:12	06:06	05:20	05:17	05:54	06:45	07:35	07:29	08:21
	16:32	17:20	18:13	20:08	21:00	21:47	22:01	21:28	20:25	19:14	17:07	16:26
2	08:45	08:16	07:21	07:09	06:04	05:19	05:17	05:56	06:46	07:36	07:31	08:23
	16:33	17:22	18:15	20:10	21:02	21:48	22:00	21:26	20:23	19:12	17:05	16:25
3	08:45	08:15	07:19	07:07	06:02	05:18	05:18	05:57	06:48	07:38	07:33	08:24
	16:34	17:24	18:17	20:11	21:03	21:49	22:00	21:25	20:20	19:10	17:04	16:25
4	08:45	08:13	07:17	07:05	06:00	05:17	05:19	05:59	06:50	07:40	07:35	08:26
	16:35	17:26	18:18	20:13	21:05	21:50	21:59	21:23	20:18	19:07	17:02	16:24
5	08:45	08:11	07:15	07:02	05:58	05:17	05:20	06:00	06:51	07:42	07:37	08:27
	16:36	17:28	18:20	20:15	21:07	21:51	21:59	21:21	20:16	19:05	17:00	16:24
6	08:44	08:09	07:12	07:00	05:56	05:16	05:21	06:02	06:53	07:43	07:39	08:28
	16:38	17:30	18:22	20:17	21:08	21:52	21:58	21:19	20:13	19:03	16:58	16:23
7	08:44	08:08	07:10	06:58	05:55	05:15	05:21	06:03	06:55	07:45	07:40	08:30
	16:39	17:32	18:24	20:18	21:10	21:53	21:58	21:17	20:11	19:01	16:57	16:23
8	08:43	08:06	07:08	06:56	05:53	05:15	05:22	06:05	06:56	07:47	07:42	08:31
	16:40	17:34	18:26	20:20	21:12	21:54	21:57	21:16	20:09	18:58	16:55	16:22
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10	08:42	08:02	07:03	06:51	05:49	05:14	05:24	06:08	07:00	07:50	07:46	08:33
	16:43	17:37	18:29	20:24	21:15	21:55	21:56	21:12	20:04	18:54	16:51	16:22
11	08:42	08:00	07:01	06:49	05:48	05:14	05:25	06:10	07:01	07:52	07:48	08:34
	16:44	17:39	18:31	20:25	21:17	21:56	21:55	21:10	20:02	18:51	16:50	16:22
12	08:41	07:59	06:59	06:46	05:46	05:13	05:27	06:12	07:03	07:54	07:50	08:35
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15	08:39	07:53	06:52	06:40	05:41	05:12	05:30	06:17	07:08	07:59	07:55	08:38
	16:50	17:47	18:38	20:32	21:23	21:59	21:51	21:02	19:52	18:42	16:44	16:22
16	08:38	07:51	06:49	06:38	05:39	05:12	05:31	06:18	07:10	08:01	07:57	08:39
	16:52	17:49	18:40	20:34	21:25	21:59	21:50	21:00	19:50	18:40	16:42	16:22
17	08:37	07:49	06:47	06:35	05:38	05:12	05:33	06:20	07:11	08:02	07:58	08:40
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18	08:36	07:47	06:45	06:33	05:36	05:12	05:34	06:21	07:13	08:04	08:00	08:41
	16:55	17:52	18:43	20:37	21:28	22:00	21:48	20:56	19:45	18:36	16:40	16:22
19	08:35	07:45	06:42	06:31	05:35	05:12	05:35	06:23	07:15	08:06	08:02	08:41
	16:57	17:54	18:45	20:39	21:29	22:00	21:47	20:54	19:43	18:34	16:38	16:22
20	08:34	07:43	06:40	06:29	05:34	05:12	05:36	06:25	07:16	08:08	08:04	08:42
	16:59	17:56	18:47	20:41	21:31	22:01	21:46	20:51	19:40	18:32	16:37	16:23
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	17:00	17:58	18:49	20:43	21:32	22:01	21:44	20:49	19:38	18:29	16:36	16:23
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	17:02	18:00	18:50	20:44	21:34	22:01	21:43	20:47	19:36	18:27	16:35	16:24
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	17:04	18:02	18:52	20:46	21:35	22:01	21:42	20:45	19:33	18:25	16:33	16:24
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28	08:24	07:26	06:21	06:12	05:24	05:15	05:48	06:38	07:30	07:22	08:17	08:45
	17:13	18:11	19:01	20:55	21:42	22:01	21:34	20:34	19:22	17:15	16:29	16:28
29	08:22		07:19	06:10	05:23	05:15	05:49	06:40	07:31	07:24	08:18	08:45
	17:15		20:03	20:56	21:43	22:01	21:33	20:32	19:19	17:13	16:28	16:29
30	08:21		07:16	06:08	05:22	05:16	05:51	06:41	07:33	07:26	08:20	08:45
	17:17		20:04	20:58	21:44	22:01	21:31	20:29	19:17	17:11	16:27	16:29
31	08:19		07:14		05:21		05:52	06:43		07:28		08:45
	17:18		20:06		21:45		21:30	20:27		17:09		16:30
Potential sun hours	257	277	367	417	487	501	504	455	381	331	265	241
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

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SHADOW - Calendar

Calculation: 6839 Garrane WF Real Case - V150 **Shadow receptor:** CA - 92

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:45	08:18	07:23	07:12	06:06	05:20	05:17	05:54	06:45	07:35	07:29	08:21
	16:32	17:20	18:13	20:08	21:00	21:47	22:01	21:28	20:25	19:14	17:07	16:26
2	08:45	08:16	07:21	07:09	06:04	05:19	05:17	05:56	06:46	07:36	07:31	08:23
	16:33	17:22	18:15	20:10	21:02	21:48	22:00	21:26	20:23	19:12	17:05	16:25
3	08:45	08:15	07:19	07:07	06:02	05:18	05:18	05:57	06:48	07:38	07:33	08:24
	16:34	17:24	18:17	20:11	21:03	21:49	22:00	21:25	20:20	19:10	17:04	16:25
4	08:45	08:13	07:17	07:05	06:00	05:17	05:19	05:59	06:50	07:40	07:35	08:26
	16:35	17:26	18:18	20:13	21:05	21:50	21:59	21:23	20:18	19:07	17:02	16:24
5	08:45	08:11	07:15	07:02	05:58	05:17	05:20	06:00	06:51	07:42	07:37	08:27
	16:36	17:28	18:20	20:15	21:07	21:51	21:59	21:21	20:16	19:05	17:00	16:24
6	08:44	08:09	07:12	07:00	05:56	05:16	05:21	06:02	06:53	07:43	07:39	08:28
	16:38	17:30	18:22	20:17	21:08	21:52	21:58	21:19	20:13	19:03	16:58	16:23
7	08:44	08:08	07:10	06:58	05:55	05:15	05:21	06:03	06:55	07:45	07:40	08:30
	16:39	17:32	18:24	20:18	21:10	21:53	21:58	21:17	20:11	19:01	16:57	16:23
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	16:42	17:35	18:27	20:22	21:13	21:55	21:57	21:14	20:06	18:56	16:53	16:22
10	08:42	08:02	07:03	06:51	05:49	05:14	05:24	06:08	07:00	07:50	07:46	08:33
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	16:44	17:39	18:31	20:25	21:17	21:56	21:55	21:10	20:02	18:51	16:50	16:22
12	08:41	07:59	06:59	06:46	05:46	05:13	05:27	06:12	07:03	07:54	07:50	08:35
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13	08:40	07:57	06:56	06:44	05:44	05:13	05:28	06:13	07:05	07:55	07:51	08:36
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	16:49	17:45	18:36	20:30	21:21	21:58	21:52	21:04	19:55	18:45	16:45	16:22
15	08:39	07:53	06:52	06:40	05:41	05:12	05:30	06:17	07:08	07:59	07:55	08:38
	16:50	17:47	18:38	20:32	21:23	21:59	21:51	21:02	19:52	18:42	16:44	16:22
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	16:52	17:49	18:40	20:34	21:25	21:59	21:50	21:00	19:50	18:40	16:42	16:22
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	16:54	17:51	18:42	20:36	21:26	22:00	21:49	20:58	19:48	18:38	16:41	16:22
18	08:36	07:47	06:45	06:33	05:36	05:12	05:34	06:21	07:13	08:04	08:00	08:41
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	17:00	17:58	18:49	20:43	21:32	22:01	21:44	20:49	19:38	18:29	16:36	16:23
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	17:02	18:00	18:50	20:44	21:34	22:01	21:43	20:47	19:36	18:27	16:35	16:24
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	17:13	18:11	19:01	20:55	21:42	22:01	21:34	20:34	19:22	17:15	16:29	16:28
29	08:22		07:19	06:10	05:23	05:15	05:49	06:40	07:31	07:24	08:18	08:45
	17:15		20:03	20:56	21:43	22:01	21:33	20:32	19:19	17:13	16:28	16:29
30	08:21		07:16	06:08	05:22	05:16	05:51	06:41	07:33	07:26	08:20	08:45
	17:17		20:04	20:58	21:44	22:01	21:31	20:29	19:17	17:11	16:27	16:29
31	08:19		07:14		05:21		05:52	06:43		07:28		08:45
	17:18		20:06		21:45		21:30	20:27		17:09		16:30
Potential sun hours	257	277	367	417	487	501	504	455	381	331	265	241
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

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SHADOW - Calendar

Calculation: 6839 Garrane WF Real Case - V150 **Shadow receptor:** CB - 93

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:45	08:18	07:23	07:12	06:06	05:20	05:17	05:54	06:45	07:35	07:29	08:21
	16:32	17:20	18:13	20:08	21:00	21:47	22:01	21:28	20:25	19:14	17:07	16:26
2	08:45	08:16	07:21	07:09	06:04	05:19	05:17	05:56	06:46	07:36	07:31	08:23
	16:33	17:22	18:15	20:10	21:02	21:48	22:00	21:26	20:23	19:12	17:05	16:25
3	08:45	08:15	07:19	07:07	06:02	05:18	05:18	05:57	06:48	07:38	07:33	08:24
	16:34	17:24	18:17	20:11	21:03	21:49	22:00	21:25	20:20	19:10	17:04	16:25
4	08:45	08:13	07:17	07:05	06:00	05:17	05:19	05:59	06:50	07:40	07:35	08:26
	16:35	17:26	18:18	20:13	21:05	21:50	21:59	21:23	20:18	19:07	17:02	16:24
5	08:45	08:11	07:15	07:02	05:58	05:17	05:20	06:00	06:51	07:42	07:37	08:27
	16:36	17:28	18:20	20:15	21:07	21:51	21:59	21:21	20:16	19:05	17:00	16:24
6	08:44	08:09	07:12	07:00	05:56	05:16	05:21	06:02	06:53	07:43	07:39	08:28
	16:38	17:30	18:22	20:17	21:08	21:52	21:58	21:19	20:13	19:03	16:58	16:23
7	08:44	08:08	07:10	06:58	05:55	05:15	05:21	06:03	06:55	07:45	07:40	08:30
	16:39	17:32	18:24	20:18	21:10	21:53	21:58	21:17	20:11	19:01	16:57	16:23
8	08:43	08:06	07:08	06:56	05:53	05:15	05:22	06:05	06:56	07:47	07:42	08:31
	16:40	17:34	18:26	20:20	21:12	21:54	21:57	21:16	20:09	18:58	16:55	16:22
9	08:43	08:04	07:05	06:53	05:51	05:14	05:23	06:07	06:58	07:48	07:44	08:32
	16:42	17:35	18:27	20:22	21:13	21:55	21:57	21:14	20:06	18:56	16:53	16:22
10	08:42	08:02	07:03	06:51	05:49	05:14	05:24	06:08	07:00	07:50	07:46	08:33
	16:43	17:37	18:29	20:24	21:15	21:55	21:56	21:12	20:04	18:54	16:51	16:22
11	08:42	08:00	07:01	06:49	05:48	05:14	05:25	06:10	07:01	07:52	07:48	08:34
	16:44	17:39	18:31	20:25	21:17	21:56	21:55	21:10	20:02	18:51	16:50	16:22
12	08:41	07:59	06:59	06:46	05:46	05:13	05:27	06:12	07:03	07:54	07:50	08:35
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13	08:40	07:57	06:56	06:44	05:44	05:13	05:28	06:13	07:05	07:55	07:51	08:36
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15	08:39	07:53	06:52	06:40	05:41	05:12	05:30	06:17	07:08	07:59	07:55	08:38
	16:50	17:47	18:38	20:32	21:23	21:59	21:51	21:02	19:52	18:42	16:44	16:22
16	08:38	07:51	06:49	06:38	05:40	05:12	05:31	06:18	07:10	08:01	07:57	08:39
	16:52	17:49	18:40	20:34	21:25	21:59	21:50	21:00	19:50	18:40	16:42	16:22
17	08:37	07:49	06:47	06:35	05:38	05:12	05:33	06:20	07:11	08:02	07:58	08:40
	16:54	17:51	18:42	20:36	21:26	22:00	21:49	20:58	19:48	18:38	16:41	16:22
18	08:36	07:47	06:45	06:33	05:36	05:12	05:34	06:21	07:13	08:04	08:00	08:41
	16:55	17:52	18:43	20:37	21:28	22:00	21:48	20:56	19:45	18:36	16:40	16:22
19	08:35	07:45	06:42	06:31	05:35	05:12	05:35	06:23	07:15	08:06	08:02	08:41
	16:57	17:54	18:45	20:39	21:29	22:00	21:47	20:54	19:43	18:34	16:38	16:22
20	08:34	07:43	06:40	06:29	05:34	05:12	05:36	06:25	07:16	08:08	08:04	08:42
	16:59	17:56	18:47	20:41	21:31	22:01	21:46	20:51	19:40	18:32	16:37	16:23
21	08:33	07:41	06:38	06:27	05:32	05:13	05:38	06:26	07:18	08:10	08:05	08:43
	17:00	17:58	18:49	20:43	21:32	22:01	21:44	20:49	19:38	18:29	16:36	16:23
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	17:02	18:00	18:50	20:44	21:34	22:01	21:43	20:47	19:36	18:27	16:35	16:24
23	08:30	07:36	06:33	06:22	05:30	05:13	05:41	06:30	07:21	08:13	08:09	08:44
	17:04	18:02	18:52	20:46	21:35	22:01	21:42	20:45	19:33	18:25	16:34	16:24
24	08:29	07:34	06:31	06:20	05:28	05:13	05:42	06:31	07:23	08:15	08:10	08:44
	17:06	18:04	18:54	20:48	21:36	22:01	21:40	20:43	19:31	18:23	16:32	16:25
25	08:28	07:32	06:28	06:18	05:27	05:14	05:43	06:33	07:25	07:17	08:12	08:44
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27	08:25	07:28	06:23	06:14	05:25	05:14	05:46	06:36	07:28	07:20	08:15	08:45
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28	08:24	07:26	06:21	06:12	05:24	05:15	05:48	06:38	07:30	07:22	08:17	08:45
	17:13	18:11	19:01	20:55	21:42	22:01	21:34	20:34	19:22	17:15	16:29	16:28
29	08:22		07:19	06:10	05:23	05:15	05:49	06:40	07:31	07:24	08:18	08:45
	17:15		20:03	20:56	21:43	22:01	21:33	20:32	19:19	17:13	16:28	16:29
30	08:21		07:16	06:08	05:22	05:16	05:51	06:41	07:33	07:26	08:20	08:45
	17:17		20:04	20:58	21:44	22:01	21:31	20:29	19:17	17:11	16:27	16:29
31	08:19		07:14		05:21		05:52	06:43		07:28		08:45
	17:18		20:06		21:45		21:30	20:27		17:09		16:30
Potential sun hours	257	277	367	417	487	501	504	455	381	331	265	241
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
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Calculated:
11/06/2025 09:22/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Real Case - V150 **Shadow receptor:** CC - 94

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:45	08:18	07:23	07:12	06:06	05:20	05:17	05:54	06:45	07:35	07:29	08:21
	16:32	17:20	18:13	20:08	21:00	21:47	22:01	21:28	20:25	19:14	17:07	16:26
2	08:45	08:16	07:21	07:09	06:04	05:19	05:17	05:56	06:46	07:36	07:31	08:23
	16:33	17:22	18:15	20:10	21:02	21:48	22:00	21:26	20:23	19:12	17:05	16:25
3	08:45	08:15	07:19	07:07	06:02	05:18	05:18	05:57	06:48	07:38	07:33	08:24
	16:34	17:24	18:17	20:11	21:03	21:49	22:00	21:25	20:20	19:10	17:04	16:25
4	08:45	08:13	07:17	07:05	06:00	05:17	05:19	05:59	06:50	07:40	07:35	08:26
	16:35	17:26	18:18	20:13	21:05	21:50	21:59	21:23	20:18	19:07	17:02	16:24
5	08:45	08:11	07:15	07:02	05:58	05:17	05:20	06:00	06:51	07:42	07:37	08:27
	16:36	17:28	18:20	20:15	21:07	21:51	21:59	21:21	20:16	19:05	17:00	16:24
6	08:44	08:09	07:12	07:00	05:56	05:16	05:21	06:02	06:53	07:43	07:39	08:28
	16:38	17:30	18:22	20:17	21:08	21:52	21:58	21:19	20:13	19:03	16:58	16:23
7	08:44	08:08	07:10	06:58	05:55	05:15	05:21	06:03	06:55	07:45	07:40	08:30
	16:39	17:32	18:24	20:18	21:10	21:53	21:58	21:17	20:11	19:01	16:57	16:23
8	08:43	08:06	07:08	06:56	05:53	05:15	05:22	06:05	06:56	07:47	07:42	08:31
	16:40	17:34	18:26	20:20	21:12	21:54	21:57	21:16	20:09	18:58	16:55	16:22
9	08:43	08:04	07:05	06:53	05:51	05:14	05:23	06:07	06:58	07:48	07:44	08:32
	16:42	17:35	18:27	20:22	21:13	21:55	21:57	21:14	20:06	18:56	16:53	16:22
10	08:42	08:02	07:03	06:51	05:49	05:14	05:24	06:08	07:00	07:50	07:46	08:33
	16:43	17:37	18:29	20:24	21:15	21:55	21:56	21:12	20:04	18:54	16:51	16:22
11	08:42	08:00	07:01	06:49	05:48	05:14	05:25	06:10	07:01	07:52	07:48	08:34
	16:44	17:39	18:31	20:25	21:17	21:56	21:55	21:10	20:02	18:51	16:50	16:22
12	08:41	07:59	06:59	06:46	05:46	05:13	05:27	06:12	07:03	07:54	07:50	08:35
	16:46	17:41	18:33	20:27	21:18	21:57	21:54	21:08	19:59	18:49	16:48	16:22
13	08:40	07:57	06:56	06:44	05:44	05:13	05:28	06:13	07:05	07:55	07:51	08:36
	16:47	17:43	18:35	20:29	21:20	21:57	21:53	21:06	19:57	18:47	16:47	16:22
14	08:40	07:55	06:54	06:42	05:43	05:13	05:29	06:15	07:06	07:57	07:53	08:37
	16:49	17:45	18:36	20:30	21:21	21:58	21:52	21:04	19:55	18:45	16:45	16:22
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	16:50	17:47	18:38	20:32	21:23	21:59	21:51	21:02	19:52	18:42	16:44	16:22
16	08:38	07:51	06:49	06:38	05:40	05:12	05:31	06:18	07:10	08:01	07:57	08:39
	16:52	17:49	18:40	20:34	21:25	21:59	21:50	21:00	19:50	18:40	16:42	16:22
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18	08:36	07:47	06:45	06:33	05:36	05:12	05:34	06:21	07:13	08:04	08:00	08:41
	16:55	17:52	18:43	20:37	21:28	22:00	21:48	20:56	19:45	18:36	16:40	16:22
19	08:35	07:45	06:42	06:31	05:35	05:12	05:35	06:23	07:15	08:06	08:02	08:41
	16:57	17:54	18:45	20:39	21:29	22:00	21:47	20:54	19:43	18:34	16:38	16:22
20	08:34	07:43	06:40	06:29	05:34	05:12	05:36	06:25	07:16	08:08	08:04	08:42
	16:59	17:56	18:47	20:41	21:31	22:01	21:46	20:51	19:40	18:32	16:37	16:23
21	08:33	07:41	06:38	06:27	05:32	05:12	05:38	06:26	07:18	08:10	08:05	08:43
	17:00	17:58	18:49	20:43	21:32	22:01	21:44	20:49	19:38	18:29	16:36	16:23
22	08:32	07:39	06:35	06:24	05:31	05:13	05:39	06:28	07:20	08:11	08:07	08:43
	17:02	18:00	18:50	20:44	21:34	22:01	21:43	20:47	19:36	18:27	16:35	16:24
23	08:30	07:36	06:33	06:22	05:30	05:13	05:41	06:30	07:21	08:13	08:09	08:44
	17:04	18:02	18:52	20:46	21:35	22:01	21:42	20:45	19:33	18:25	16:33	16:24
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	17:06	18:04	18:54	20:48	21:36	22:01	21:40	20:43	19:31	18:23	16:32	16:25
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	17:07	18:06	18:56	20:50	21:38	22:02	21:39	20:41	19:29	17:21	16:31	16:25
26	08:27	07:30	06:26	06:16	05:26	05:14	05:45	06:35	07:26	07:19	08:14	08:45
	17:09	18:07	18:57	20:51	21:39	22:02	21:37	20:38	19:26	17:19	16:30	16:26
27	08:25	07:28	06:23	06:14	05:25	05:14	05:46	06:36	07:28	07:20	08:15	08:45
	17:11	18:09	18:59	20:53	21:40	22:01	21:36	20:36	19:24	17:17	16:29	16:27
28	08:24	07:26	06:21	06:12	05:24	05:15	05:48	06:38	07:30	07:22	08:17	08:45
	17:13	18:11	19:01	20:55	21:42	22:01	21:34	20:34	19:22	17:15	16:29	16:28
29	08:22		07:19	06:10	05:23	05:15	05:49	06:40	07:31	07:24	08:18	08:45
	17:15		20:03	20:56	21:43	22:01	21:33	20:32	19:19	17:13	16:28	16:29
30	08:21		07:16	06:08	05:22	05:16	05:51	06:41	07:33	07:26	08:20	08:45
	17:17		20:04	20:58	21:44	22:01	21:31	20:29	19:17	17:11	16:27	16:29
31	08:19		07:14		05:21		05:52	06:43		07:28		08:45
	17:18		20:06		21:45		21:30	20:27		17:09		16:30
Potential sun hours	257	277	367	417	487	501	504	455	381	331	265	241
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

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SHADOW - Calendar

Calculation: 6839 Garrane WF Real Case - V150 **Shadow receptor:** CD - 95

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:45	08:18	07:23	07:12	06:06	05:20	05:17	05:54	06:45	07:35	07:29	08:21
	16:32	17:20	18:13	20:08	21:00	21:47	22:01	21:28	20:25	19:14	17:07	16:26
2	08:45	08:16	07:21	07:09	06:04	05:19	05:17	05:56	06:46	07:36	07:31	08:23
	16:33	17:22	18:15	20:10	21:02	21:48	22:00	21:26	20:23	19:12	17:05	16:25
3	08:45	08:15	07:19	07:07	06:02	05:18	05:18	05:57	06:48	07:38	07:33	08:24
	16:34	17:24	18:17	20:11	21:03	21:49	22:00	21:25	20:20	19:10	17:04	16:25
4	08:45	08:13	07:17	07:05	06:00	05:17	05:19	05:59	06:50	07:40	07:35	08:26
	16:35	17:26	18:18	20:13	21:05	21:50	21:59	21:23	20:18	19:07	17:02	16:24
5	08:45	08:11	07:15	07:02	05:58	05:17	05:20	06:00	06:51	07:42	07:37	08:27
	16:36	17:28	18:20	20:15	21:07	21:51	21:59	21:21	20:16	19:05	17:00	16:24
6	08:44	08:09	07:12	07:00	05:56	05:16	05:21	06:02	06:53	07:43	07:39	08:28
	16:38	17:30	18:22	20:17	21:08	21:52	21:58	21:19	20:13	19:03	16:58	16:23
7	08:44	08:08	07:10	06:58	05:55	05:15	05:21	06:03	06:55	07:45	07:40	08:30
	16:39	17:32	18:24	20:18	21:10	21:53	21:58	21:17	20:11	19:01	16:57	16:23
8	08:43	08:06	07:08	06:56	05:53	05:15	05:22	06:05	06:56	07:47	07:42	08:31
	16:40	17:34	18:26	20:20	21:12	21:54	21:57	21:16	20:09	18:58	16:55	16:22
9	08:43	08:04	07:05	06:53	05:51	05:14	05:23	06:07	06:58	07:48	07:44	08:32
	16:42	17:35	18:27	20:22	21:13	21:55	21:56	21:14	20:06	18:56	16:53	16:22
10	08:42	08:02	07:03	06:51	05:49	05:14	05:24	06:08	07:00	07:50	07:46	08:33
	16:43	17:37	18:29	20:24	21:15	21:55	21:56	21:12	20:04	18:54	16:51	16:22
11	08:42	08:00	07:01	06:49	05:48	05:14	05:25	06:10	07:01	07:52	07:48	08:34
	16:44	17:39	18:31	20:25	21:17	21:56	21:55	21:10	20:02	18:51	16:50	16:22
12	08:41	07:59	06:59	06:46	05:46	05:13	05:27	06:12	07:03	07:54	07:50	08:35
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13	08:40	07:57	06:56	06:44	05:44	05:13	05:28	06:13	07:05	07:55	07:51	08:36
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	16:49	17:45	18:36	20:30	21:21	21:58	21:52	21:04	19:55	18:45	16:45	16:22
15	08:39	07:53	06:52	06:40	05:41	05:12	05:30	06:17	07:08	07:59	07:55	08:38
	16:50	17:47	18:38	20:32	21:23	21:59	21:51	21:02	19:52	18:42	16:44	16:22
16	08:38	07:51	06:49	06:38	05:40	05:12	05:31	06:18	07:10	08:01	07:57	08:39
	16:52	17:49	18:40	20:34	21:25	21:59	21:50	21:00	19:50	18:40	16:42	16:22
17	08:37	07:49	06:47	06:35	05:38	05:12	05:33	06:20	07:11	08:02	07:58	08:40
	16:54	17:51	18:42	20:36	21:26	22:00	21:49	20:58	19:48	18:38	16:41	16:22
18	08:36	07:47	06:45	06:33	05:36	05:12	05:34	06:21	07:13	08:04	08:00	08:41
	16:55	17:52	18:43	20:37	21:28	22:00	21:48	20:56	19:45	18:36	16:40	16:22
19	08:35	07:45	06:42	06:31	05:35	05:12	05:35	06:23	07:15	08:06	08:02	08:41
	16:57	17:54	18:45	20:39	21:29	22:00	21:47	20:54	19:43	18:34	16:38	16:22
20	08:34	07:43	06:40	06:29	05:34	05:12	05:36	06:25	07:16	08:08	08:04	08:42
	16:59	17:56	18:47	20:41	21:31	22:01	21:46	20:51	19:40	18:32	16:37	16:23
21	08:33	07:41	06:38	06:27	05:32	05:13	05:38	06:26	07:18	08:10	08:05	08:43
	17:00	17:58	18:49	20:43	21:32	22:01	21:44	20:49	19:38	18:29	16:36	16:23
22	08:32	07:39	06:35	06:24	05:31	05:13	05:39	06:28	07:20	08:11	08:07	08:43
	17:02	18:00	18:50	20:44	21:34	22:01	21:43	20:47	19:36	18:27	16:35	16:24
23	08:30	07:36	06:33	06:22	05:30	05:13	05:41	06:30	07:21	08:13	08:09	08:44
	17:04	18:02	18:52	20:46	21:35	22:01	21:42	20:45	19:33	18:25	16:33	16:24
24	08:29	07:34	06:31	06:20	05:28	05:13	05:42	06:31	07:23	08:15	08:10	08:44
	17:06	18:04	18:54	20:48	21:36	22:01	21:40	20:43	19:31	18:23	16:32	16:25
25	08:28	07:32	06:28	06:18	05:27	05:14	05:43	06:33	07:25	07:17	08:12	08:44
	17:07	18:06	18:56	20:50	21:38	22:02	21:39	20:41	19:29	17:21	16:31	16:25
26	08:27	07:30	06:26	06:16	05:26	05:14	05:45	06:35	07:26	07:19	08:14	08:45
	17:09	18:07	18:57	20:51	21:39	22:01	21:37	20:38	19:26	17:19	16:30	16:26
27	08:25	07:28	06:23	06:14	05:25	05:14	05:46	06:36	07:28	07:20	08:15	08:45
	17:11	18:09	18:59	20:53	21:40	22:01	21:36	20:36	19:24	17:17	16:29	16:27
28	08:24	07:26	06:21	06:12	05:24	05:15	05:48	06:38	07:30	07:22	08:17	08:45
	17:13	18:11	19:01	20:55	21:42	22:01	21:34	20:34	19:22	17:15	16:29	16:28
29	08:22		07:19	06:10	05:23	05:15	05:49	06:40	07:31	07:24	08:18	08:45
	17:15		20:03	20:56	21:43	22:01	21:33	20:32	19:19	17:13	16:28	16:29
30	08:21		07:16	06:08	05:22	05:16	05:51	06:41	07:33	07:26	08:20	08:45
	17:17		20:04	20:58	21:44	22:01	21:31	20:29	19:17	17:11	16:27	16:29
31	08:19		07:14		05:21		05:52	06:43		07:28		08:45
	17:18		20:06		21:45		21:30	20:27		17:09		16:30
Potential sun hours	257	277	367	417	487	501	504	455	381	331	265	241
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
Jennings O'Donovan
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Calculated:
11/06/2025 09:22/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Real Case - V150 **Shadow receptor:** CE - 96

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:45	08:18	07:23	07:12	06:06	05:20	05:17	05:54	06:45	07:35	07:29	08:21
	16:32	17:20	18:13	20:08	21:00	21:47	22:01	21:28	20:25	19:14	17:07	16:26
2	08:45	08:16	07:21	07:09	06:04	05:19	05:17	05:56	06:46	07:36	07:31	08:23
	16:33	17:22	18:15	20:10	21:02	21:48	22:00	21:26	20:23	19:12	17:05	16:25
3	08:45	08:15	07:19	07:07	06:02	05:18	05:18	05:57	06:48	07:38	07:33	08:24
	16:34	17:24	18:17	20:11	21:03	21:49	22:00	21:25	20:20	19:10	17:04	16:25
4	08:45	08:13	07:17	07:05	06:00	05:17	05:19	05:59	06:50	07:40	07:35	08:26
	16:35	17:26	18:18	20:13	21:05	21:50	21:59	21:23	20:18	19:07	17:02	16:24
5	08:45	08:11	07:15	07:02	05:58	05:17	05:20	06:00	06:51	07:42	07:37	08:27
	16:36	17:28	18:20	20:15	21:07	21:51	21:59	21:21	20:16	19:05	17:00	16:24
6	08:44	08:09	07:12	07:00	05:56	05:16	05:21	06:02	06:53	07:43	07:39	08:28
	16:38	17:30	18:22	20:17	21:08	21:52	21:58	21:19	20:13	19:03	16:58	16:23
7	08:44	08:08	07:10	06:58	05:55	05:15	05:21	06:03	06:55	07:45	07:40	08:30
	16:39	17:32	18:24	20:18	21:10	21:53	21:58	21:17	20:11	19:01	16:57	16:23
8	08:43	08:06	07:08	06:56	05:53	05:15	05:22	06:05	06:56	07:47	07:42	08:31
	16:40	17:34	18:26	20:20	21:12	21:54	21:57	21:16	20:09	18:58	16:55	16:22
9	08:43	08:04	07:05	06:53	05:51	05:14	05:23	06:07	06:58	07:48	07:44	08:32
	16:42	17:35	18:27	20:22	21:13	21:55	21:56	21:14	20:06	18:56	16:53	16:22
10	08:42	08:02	07:03	06:51	05:49	05:14	05:24	06:08	07:00	07:50	07:46	08:33
	16:43	17:37	18:29	20:24	21:15	21:55	21:56	21:12	20:04	18:54	16:51	16:22
11	08:42	08:00	07:01	06:49	05:48	05:14	05:25	06:10	07:01	07:52	07:48	08:34
	16:44	17:39	18:31	20:25	21:17	21:56	21:55	21:10	20:02	18:51	16:50	16:22
12	08:41	07:59	06:59	06:46	05:46	05:13	05:27	06:12	07:03	07:54	07:50	08:35
	16:46	17:41	18:33	20:27	21:18	21:57	21:54	21:08	19:59	18:49	16:48	16:22
13	08:40	07:57	06:56	06:44	05:44	05:13	05:28	06:13	07:05	07:55	07:51	08:36
	16:47	17:43	18:35	20:29	21:20	21:57	21:53	21:06	19:57	18:47	16:47	16:22
14	08:40	07:55	06:54	06:42	05:43	05:13	05:29	06:15	07:06	07:57	07:53	08:37
	16:49	17:45	18:36	20:30	21:21	21:58	21:52	21:04	19:55	18:45	16:45	16:22
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	16:50	17:47	18:38	20:32	21:23	21:59	21:51	21:02	19:52	18:42	16:44	16:22
16	08:38	07:51	06:49	06:38	05:40	05:12	05:31	06:18	07:10	08:01	07:57	08:39
	16:52	17:49	18:40	20:34	21:25	21:59	21:50	21:00	19:50	18:40	16:42	16:22
17	08:37	07:49	06:47	06:35	05:38	05:12	05:33	06:20	07:11	08:02	07:58	08:40
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18	08:36	07:47	06:45	06:33	05:36	05:12	05:34	06:21	07:13	08:04	08:00	08:41
	16:55	17:52	18:43	20:37	21:28	22:00	21:48	20:56	19:45	18:36	16:40	16:22
19	08:35	07:45	06:42	06:31	05:35	05:12	05:35	06:23	07:15	08:06	08:02	08:41
	16:57	17:54	18:45	20:39	21:29	22:00	21:47	20:54	19:43	18:34	16:38	16:22
20	08:34	07:43	06:40	06:29	05:34	05:12	05:36	06:25	07:16	08:08	08:04	08:42
	16:59	17:56	18:47	20:41	21:31	22:01	21:46	20:51	19:40	18:32	16:37	16:23
21	08:33	07:41	06:38	06:27	05:32	05:13	05:38	06:26	07:18	08:10	08:05	08:43
	17:00	17:58	18:49	20:43	21:32	22:01	21:44	20:49	19:38	18:29	16:36	16:23
22	08:32	07:39	06:35	06:24	05:31	05:13	05:39	06:28	07:20	08:11	08:07	08:43
	17:02	18:00	18:50	20:44	21:34	22:01	21:43	20:47	19:36	18:27	16:35	16:24
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	17:13	18:11	19:01	20:55	21:42	22:01	21:34	20:34	19:22	17:15	16:29	16:28
29	08:22		07:19	06:10	05:23	05:15	05:49	06:40	07:31	07:24	08:18	08:45
	17:15		20:03	20:56	21:43	22:01	21:33	20:32	19:19	17:13	16:28	16:29
30	08:21		07:16	06:08	05:22	05:16	05:51	06:41	07:33	07:26	08:20	08:45
	17:17		20:04	20:58	21:44	22:01	21:31	20:29	19:17	17:11	16:27	16:29
31	08:19		07:14		05:21		05:52	06:43		07:28		08:45
	17:18		20:06		21:45		21:30	20:27		17:09		16:30
Potential sun hours	257	277	367	417	487	501	504	455	381	331	265	241
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

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SHADOW - Calendar

Calculation: 6839 Garrane WF Real Case - V150 **Shadow receptor:** CF - 122

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:45	08:18	07:23	07:12	06:06	05:20	05:17	05:54	06:45	07:35	07:30	08:21
	16:32	17:20	18:13	20:08	21:00	21:47	22:01	21:28	20:25	19:15	17:07	16:26
2	08:45	08:16	07:21	07:10	06:04	05:19	05:17	05:56	06:46	07:36	07:31	08:23
	16:33	17:22	18:15	20:10	21:02	21:48	22:00	21:26	20:23	19:12	17:06	16:26
3	08:45	08:15	07:19	07:07	06:02	05:18	05:18	05:57	06:48	07:38	07:33	08:24
	16:34	17:24	18:17	20:11	21:03	21:49	22:00	21:25	20:20	19:10	17:04	16:25
4	08:45	08:13	07:17	07:05	06:00	05:18	05:19	05:59	06:50	07:40	07:35	08:26
	16:35	17:26	18:18	20:13	21:05	21:50	22:00	21:23	20:18	19:08	17:02	16:24
5	08:45	08:11	07:15	07:03	05:58	05:17	05:20	06:00	06:51	07:42	07:37	08:27
	16:36	17:28	18:20	20:15	21:07	21:51	21:59	21:21	20:16	19:05	17:00	16:24
6	08:44	08:10	07:12	07:00	05:57	05:16	05:21	06:02	06:53	07:43	07:39	08:28
	16:38	17:30	18:22	20:17	21:08	21:52	21:59	21:19	20:13	19:03	16:58	16:23
7	08:44	08:08	07:10	06:58	05:55	05:16	05:22	06:04	06:55	07:45	07:41	08:30
	16:39	17:32	18:24	20:18	21:10	21:53	21:58	21:17	20:11	19:01	16:57	16:23
8	08:44	08:06	07:08	06:56	05:53	05:15	05:22	06:05	06:56	07:47	07:42	08:31
	16:40	17:34	18:26	20:20	21:12	21:54	21:57	21:16	20:09	18:58	16:55	16:23
9	08:43	08:04	07:05	06:53	05:51	05:14	05:23	06:07	06:58	07:48	07:44	08:32
	16:42	17:36	18:28	20:22	21:13	21:55	21:57	21:14	20:06	18:56	16:53	16:22
10	08:42	08:02	07:03	06:51	05:49	05:14	05:25	06:08	07:00	07:50	07:46	08:33
	16:43	17:37	18:29	20:24	21:15	21:55	21:56	21:12	20:04	18:54	16:52	16:22
11	08:42	08:01	07:01	06:49	05:48	05:14	05:26	06:10	07:01	07:52	07:48	08:34
	16:44	17:39	18:31	20:25	21:17	21:56	21:55	21:10	20:02	18:52	16:50	16:22
12	08:41	07:59	06:59	06:47	05:46	05:13	05:27	06:12	07:03	07:54	07:50	08:35
	16:46	17:41	18:33	20:27	21:18	21:57	21:54	21:08	19:59	18:49	16:48	16:22
13	08:40	07:57	06:56	06:44	05:44	05:13	05:28	06:13	07:05	07:55	07:51	08:36
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14	08:40	07:55	06:54	06:42	05:43	05:13	05:29	06:15	07:06	07:57	07:53	08:37
	16:49	17:45	18:36	20:31	21:21	21:58	21:52	21:04	19:55	18:45	16:45	16:22
15	08:39	07:53	06:52	06:40	05:41	05:13	05:30	06:17	07:08	07:59	07:55	08:38
	16:51	17:47	18:38	20:32	21:23	21:59	21:51	21:02	19:52	18:43	16:44	16:22
16	08:38	07:51	06:49	06:38	05:40	05:12	05:31	06:18	07:10	08:01	07:57	08:39
	16:52	17:49	18:40	20:34	21:25	21:59	21:50	21:00	19:50	18:40	16:42	16:22
17	08:37	07:49	06:47	06:35	05:38	05:12	05:33	06:20	07:11	08:02	07:59	08:40
	16:54	17:51	18:42	20:36	21:26	22:00	21:49	20:58	19:48	18:38	16:41	16:22
18	08:36	07:47	06:45	06:33	05:37	05:12	05:34	06:22	07:13	08:04	08:00	08:41
	16:55	17:53	18:44	20:37	21:28	22:00	21:48	20:56	19:45	18:36	16:40	16:22
19	08:35	07:45	06:42	06:31	05:35	05:12	05:35	06:23	07:15	08:06	08:02	08:41
	16:57	17:54	18:45	20:39	21:29	22:00	21:47	20:54	19:43	18:34	16:38	16:23
20	08:34	07:43	06:40	06:29	05:34	05:12	05:36	06:25	07:16	08:08	08:04	08:42
	16:59	17:56	18:47	20:41	21:31	22:01	21:46	20:52	19:41	18:32	16:37	16:23
21	08:33	07:41	06:38	06:27	05:32	05:13	05:38	06:27	07:18	08:10	08:05	08:43
	17:01	17:58	18:49	20:43	21:32	22:01	21:44	20:49	19:38	18:30	16:36	16:23
22	08:32	07:39	06:35	06:25	05:31	05:13	05:39	06:28	07:20	08:11	08:07	08:43
	17:02	18:00	18:51	20:44	21:34	22:01	21:43	20:47	19:36	18:27	16:35	16:24
23	08:30	07:36	06:33	06:22	05:30	05:13	05:41	06:30	07:21	08:13	08:09	08:44
	17:04	18:02	18:52	20:46	21:35	22:01	21:42	20:45	19:33	18:25	16:34	16:24
24	08:29	07:34	06:31	06:20	05:28	05:13	05:42	06:32	07:23	08:15	08:10	08:44
	17:06	18:04	18:54	20:48	21:36	22:02	21:40	20:43	19:31	18:23	16:32	16:25
25	08:28	07:32	06:28	06:18	05:27	05:14	05:43	06:33	07:25	07:17	08:12	08:44
	17:08	18:06	18:56	20:50	21:38	22:02	21:39	20:41	19:29	17:21	16:31	16:26
26	08:27	07:30	06:26	06:16	05:26	05:14	05:45	06:35	07:26	07:19	08:14	08:45
	17:09	18:07	18:58	20:51	21:39	22:02	21:38	20:38	19:26	17:19	16:30	16:26
27	08:25	07:28	06:24	06:14	05:25	05:14	05:46	06:36	07:28	07:20	08:15	08:45
	17:11	18:09	18:59	20:53	21:40	22:02	21:36	20:36	19:24	17:17	16:30	16:27
28	08:24	07:26	06:21	06:12	05:24	05:15	05:48	06:38	07:30	07:22	08:17	08:45
	17:13	18:11	19:01	20:55	21:42	22:01	21:35	20:34	19:22	17:15	16:29	16:28
29	08:22		07:19	06:10	05:23	05:16	05:49	06:40	07:31	07:24	08:18	08:45
	17:15		20:03	20:56	21:43	22:01	21:33	20:32	19:19	17:13	16:28	16:29
30	08:21		07:17	06:08	05:22	05:16	05:51	06:41	07:33	07:26	08:20	08:45
	17:17		20:04	20:58	21:44	22:01	21:31	20:30	19:17	17:11	16:27	16:30
31	08:19		07:14		05:21		05:52	06:43		07:28		08:45
	17:19		20:06		21:45		21:30	20:27		17:09		16:30
Potential sun hours	257	277	367	417	487	501	504	455	381	331	265	241
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

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padraig / podowd@jodireland.com
Calculated:
11/06/2025 09:22/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Real Case - V150 **Shadow receptor:** CG - 123

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:45	08:18	07:23	07:12	06:06	05:20	05:17	05:54	06:45	07:35	07:30	08:21
	16:32	17:20	18:13	20:08	21:00	21:47	22:01	21:28	20:25	19:15	17:07	16:26
2	08:45	08:16	07:21	07:10	06:04	05:19	05:17	05:56	06:46	07:36	07:31	08:23
	16:33	17:22	18:15	20:10	21:02	21:48	22:00	21:26	20:23	19:12	17:06	16:26
3	08:45	08:15	07:19	07:07	06:02	05:18	05:18	05:57	06:48	07:38	07:33	08:24
	16:34	17:24	18:17	20:11	21:03	21:49	22:00	21:25	20:20	19:10	17:04	16:25
4	08:45	08:13	07:17	07:05	06:00	05:18	05:19	05:59	06:50	07:40	07:35	08:26
	16:35	17:26	18:18	20:13	21:05	21:50	22:00	21:23	20:18	19:08	17:02	16:24
5	08:45	08:11	07:15	07:03	05:58	05:17	05:20	06:00	06:51	07:42	07:37	08:27
	16:36	17:28	18:20	20:15	21:07	21:51	21:59	21:21	20:16	19:05	17:00	16:24
6	08:44	08:10	07:12	07:00	05:57	05:16	05:21	06:02	06:53	07:43	07:39	08:28
	16:38	17:30	18:22	20:17	21:08	21:52	21:59	21:19	20:13	19:03	16:58	16:23
7	08:44	08:08	07:10	06:58	05:55	05:16	05:22	06:04	06:55	07:45	07:41	08:30
	16:39	17:32	18:24	20:18	21:10	21:53	21:58	21:17	20:11	19:01	16:57	16:23
8	08:44	08:06	07:08	06:56	05:53	05:15	05:22	06:05	06:56	07:47	07:42	08:31
	16:40	17:34	18:26	20:20	21:12	21:54	21:57	21:16	20:09	18:58	16:55	16:23
9	08:43	08:04	07:05	06:53	05:51	05:14	05:23	06:07	06:58	07:48	07:44	08:32
	16:42	17:36	18:28	20:22	21:13	21:55	21:57	21:14	20:06	18:56	16:53	16:22
10	08:42	08:02	07:03	06:51	05:49	05:14	05:25	06:08	07:00	07:50	07:46	08:33
	16:43	17:37	18:29	20:24	21:15	21:55	21:56	21:12	20:04	18:54	16:52	16:22
11	08:42	08:01	07:01	06:49	05:48	05:14	05:26	06:10	07:01	07:52	07:48	08:34
	16:44	17:39	18:31	20:25	21:17	21:56	21:55	21:10	20:02	18:52	16:50	16:22
12	08:41	07:59	06:59	06:47	05:46	05:13	05:27	06:12	07:03	07:54	07:50	08:35
	16:46	17:41	18:33	20:27	21:18	21:57	21:54	21:08	19:59	18:49	16:48	16:22
13	08:40	07:57	06:56	06:44	05:44	05:13	05:28	06:13	07:05	07:55	07:51	08:36
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14	08:40	07:55	06:54	06:42	05:43	05:13	05:29	06:15	07:06	07:57	07:53	08:37
	16:49	17:45	18:36	20:31	21:21	21:58	21:52	21:04	19:55	18:45	16:45	16:22
15	08:39	07:53	06:52	06:40	05:41	05:13	05:30	06:17	07:08	07:59	07:55	08:38
	16:51	17:47	18:38	20:32	21:23	21:59	21:51	21:02	19:52	18:43	16:44	16:22
16	08:38	07:51	06:49	06:38	05:40	05:12	05:31	06:18	07:10	08:01	07:57	08:39
	16:52	17:49	18:40	20:34	21:25	21:59	21:50	21:00	19:50	18:40	16:42	16:22
17	08:37	07:49	06:47	06:35	05:38	05:12	05:33	06:20	07:11	08:02	07:59	08:40
	16:54	17:51	18:42	20:36	21:26	22:00	21:49	20:58	19:48	18:38	16:41	16:22
18	08:36	07:47	06:45	06:33	05:37	05:12	05:34	06:22	07:13	08:04	08:00	08:41
	16:55	17:53	18:44	20:37	21:28	22:00	21:48	20:56	19:45	18:36	16:40	16:22
19	08:35	07:45	06:42	06:31	05:35	05:12	05:35	06:23	07:15	08:06	08:02	08:41
	16:57	17:54	18:45	20:39	21:29	22:00	21:47	20:54	19:43	18:34	16:38	16:23
20	08:34	07:43	06:40	06:29	05:34	05:12	05:36	06:25	07:16	08:08	08:04	08:42
	16:59	17:56	18:47	20:41	21:31	22:01	21:46	20:52	19:41	18:32	16:37	16:23
21	08:33	07:41	06:38	06:27	05:32	05:13	05:38	06:27	07:18	08:10	08:05	08:43
	17:01	17:58	18:49	20:43	21:32	22:01	21:44	20:49	19:38	18:30	16:36	16:23
22	08:32	07:39	06:35	06:25	05:31	05:13	05:39	06:28	07:20	08:11	08:07	08:43
	17:02	18:00	18:51	20:44	21:34	22:01	21:43	20:47	19:36	18:27	16:35	16:24
23	08:30	07:36	06:33	06:22	05:30	05:13	05:41	06:30	07:21	08:13	08:09	08:44
	17:04	18:02	18:52	20:46	21:35	22:01	21:42	20:45	19:33	18:25	16:34	16:24
24	08:29	07:34	06:31	06:20	05:28	05:13	05:42	06:32	07:23	08:15	08:10	08:44
	17:06	18:04	18:54	20:48	21:36	22:02	21:40	20:43	19:31	18:23	16:32	16:25
25	08:28	07:32	06:28	06:18	05:27	05:14	05:43	06:33	07:25	07:17	08:12	08:44
	17:08	18:06	18:56	20:50	21:38	22:02	21:39	20:41	19:29	17:21	16:31	16:26
26	08:27	07:30	06:26	06:16	05:26	05:14	05:45	06:35	07:26	07:19	08:14	08:45
	17:09	18:07	18:58	20:51	21:39	22:02	21:38	20:38	19:26	17:19	16:30	16:26
27	08:25	07:28	06:24	06:14	05:25	05:14	05:46	06:36	07:28	07:20	08:15	08:45
	17:11	18:09	18:59	20:53	21:40	22:02	21:36	20:36	19:24	17:17	16:30	16:27
28	08:24	07:26	06:21	06:12	05:24	05:15	05:48	06:38	07:30	07:22	08:17	08:45
	17:13	18:11	19:01	20:55	21:42	22:01	21:35	20:34	19:22	17:15	16:29	16:28
29	08:22		07:19	06:10	05:23	05:16	05:49	06:40	07:31	07:24	08:18	08:45
	17:15		20:03	20:56	21:43	22:01	21:33	20:32	19:19	17:13	16:28	16:29
30	08:21		07:17	06:08	05:22	05:16	05:51	06:41	07:33	07:26	08:20	08:45
	17:17		20:04	20:58	21:44	22:01	21:31	20:30	19:17	17:11	16:27	16:30
31	08:19		07:14		05:21		05:52	06:43		07:28		08:45
	17:19		20:06		21:45		21:30	20:27		17:09		16:30
Potential sun hours	257	277	367	417	487	501	504	455	381	331	265	241
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
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padraig / podowd@jodireland.com

Calculated:
11/06/2025 09:22/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Real Case - V150 **Shadow receptor:** CH - 124

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:45	08:18	07:23	07:12	06:06	05:20	05:17	05:54	06:45	07:35	07:30	08:21
	16:32	17:20	18:13	20:08	21:00	21:47	22:01	21:28	20:25	19:15	17:07	16:26
2	08:45	08:16	07:21	07:10	06:04	05:19	05:17	05:56	06:46	07:36	07:31	08:23
	16:33	17:22	18:15	20:10	21:02	21:48	22:00	21:26	20:23	19:12	17:06	16:26
3	08:45	08:15	07:19	07:07	06:02	05:18	05:18	05:57	06:48	07:38	07:33	08:24
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	16:54	17:51	18:42	20:36	21:26	22:00	21:49	20:58	19:48	18:38	16:41	16:22
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	17:01	17:58	18:49	20:43	21:32	22:01	21:44	20:49	19:38	18:30	16:36	16:23
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	17:09	18:07	18:58	20:51	21:39	22:02	21:38	20:38	19:26	17:19	16:30	16:26
27	08:25	07:28	06:24	06:14	05:25	05:14	05:46	06:36	07:28	07:20	08:15	08:45
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	17:13	18:11	19:01	20:55	21:42	22:01	21:35	20:34	19:22	17:15	16:29	16:28
29	08:22		07:19	06:10	05:23	05:16	05:49	06:40	07:31	07:24	08:18	08:45
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30	08:21		07:17	06:08	05:22	05:16	05:51	06:41	07:33	07:26	08:20	08:45
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31	08:19		07:14		05:21		05:52	06:43		07:28		08:45
	17:19		20:06		21:45		21:30	20:27		17:09		16:30
Potential sun hours	257	277	367	417	487	501	504	455	381	331	265	241
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

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SHADOW - Calendar

Calculation: 6839 Garrane WF Real Case - V150 **Shadow receptor:** CI - 125

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:45	08:18	07:23	07:12	06:06	05:20	05:17	05:54	06:45	07:35	07:30	08:21
	16:32	17:20	18:13	20:08	21:00	21:47	22:01	21:28	20:25	19:15	17:07	16:26
2	08:45	08:16	07:21	07:10	06:04	05:19	05:17	05:56	06:46	07:36	07:31	08:23
	16:33	17:22	18:15	20:10	21:02	21:48	22:00	21:26	20:23	19:12	17:06	16:26
3	08:45	08:15	07:19	07:07	06:02	05:18	05:18	05:57	06:48	07:38	07:33	08:24
	16:34	17:24	18:17	20:11	21:03	21:49	22:00	21:25	20:20	19:10	17:04	16:25
4	08:45	08:13	07:17	07:05	06:00	05:18	05:19	05:59	06:50	07:40	07:35	08:26
	16:35	17:26	18:18	20:13	21:05	21:50	22:00	21:23	20:18	19:08	17:02	16:24
5	08:45	08:11	07:15	07:03	05:58	05:17	05:20	06:00	06:51	07:42	07:37	08:27
	16:36	17:28	18:20	20:15	21:07	21:51	21:59	21:21	20:16	19:05	17:00	16:24
6	08:44	08:10	07:12	07:00	05:57	05:16	05:21	06:02	06:53	07:43	07:39	08:28
	16:38	17:30	18:22	20:17	21:08	21:52	21:59	21:19	20:13	19:03	16:58	16:23
7	08:44	08:08	07:10	06:58	05:55	05:16	05:22	06:04	06:55	07:45	07:41	08:30
	16:39	17:32	18:24	20:18	21:10	21:53	21:58	21:17	20:11	19:01	16:57	16:23
8	08:44	08:06	07:08	06:56	05:53	05:15	05:22	06:05	06:56	07:47	07:42	08:31
	16:40	17:34	18:26	20:20	21:12	21:54	21:57	21:16	20:09	18:58	16:55	16:23
9	08:43	08:04	07:06	06:53	05:51	05:14	05:23	06:07	06:58	07:48	07:44	08:32
	16:42	17:36	18:28	20:22	21:13	21:55	21:57	21:14	20:06	18:56	16:53	16:22
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	16:43	17:37	18:29	20:24	21:15	21:55	21:56	21:12	20:04	18:54	16:52	16:22
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12	08:41	07:59	06:59	06:47	05:46	05:13	05:27	06:12	07:03	07:54	07:50	08:35
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	16:51	17:47	18:38	20:32	21:23	21:59	21:51	21:02	19:52	18:43	16:44	16:22
16	08:38	07:51	06:49	06:38	05:40	05:12	05:31	06:18	07:10	08:01	07:57	08:39
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17	08:37	07:49	06:47	06:35	05:38	05:12	05:33	06:20	07:11	08:02	07:59	08:40
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18	08:36	07:47	06:45	06:33	05:37	05:12	05:34	06:22	07:13	08:04	08:00	08:41
	16:55	17:53	18:44	20:38	21:28	22:00	21:48	20:56	19:45	18:36	16:40	16:22
19	08:35	07:45	06:42	06:31	05:35	05:12	05:35	06:23	07:15	08:06	08:02	08:41
	16:57	17:54	18:45	20:39	21:29	22:01	21:47	20:54	19:43	18:34	16:38	16:23
20	08:34	07:43	06:40	06:29	05:34	05:12	05:36	06:25	07:16	08:08	08:04	08:42
	16:59	17:56	18:47	20:41	21:31	22:01	21:46	20:52	19:41	18:32	16:37	16:23
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	17:01	17:58	18:49	20:43	21:32	22:01	21:44	20:49	19:38	18:30	16:36	16:23
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	17:02	18:00	18:51	20:44	21:34	22:01	21:43	20:47	19:36	18:27	16:35	16:24
23	08:30	07:36	06:33	06:22	05:30	05:13	05:41	06:30	07:21	08:13	08:09	08:44
	17:04	18:02	18:52	20:46	21:35	22:01	21:42	20:45	19:33	18:25	16:34	16:24
24	08:29	07:34	06:31	06:20	05:28	05:13	05:42	06:32	07:23	08:15	08:10	08:44
	17:06	18:04	18:54	20:48	21:36	22:02	21:40	20:43	19:31	18:23	16:32	16:25
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	17:13	18:11	19:01	20:55	21:42	22:01	21:35	20:34	19:22	17:15	16:29	16:28
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	17:15		20:03	20:56	21:43	22:01	21:33	20:32	19:19	17:13	16:28	16:29
30	08:21		07:17	06:08	05:22	05:16	05:51	06:41	07:33	07:26	08:20	08:45
	17:17		20:04	20:58	21:44	22:01	21:31	20:30	19:17	17:11	16:27	16:30
31	08:19		07:14		05:21		05:52	06:43		07:28		08:45
	17:19		20:06		21:45		21:30	20:27		17:09		16:30
Potential sun hours	257	277	367	417	487	501	504	455	381	331	265	241
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

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Calculated:
11/06/2025 09:22/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Real Case - V150 **Shadow receptor:** CJ - 126

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:46	08:18	07:24	07:12	06:06	05:20	05:17	05:54	06:45	07:35	07:30	08:21
	16:32	17:20	18:13	20:08	21:00	21:47	22:01	21:28	20:25	19:15	17:07	16:26
2	08:45	08:16	07:21	07:10	06:04	05:19	05:17	05:56	06:46	07:36	07:31	08:23
	16:33	17:22	18:15	20:10	21:02	21:48	22:00	21:26	20:23	19:12	17:06	16:26
3	08:45	08:15	07:19	07:07	06:02	05:18	05:18	05:57	06:48	07:38	07:33	08:24
	16:34	17:24	18:17	20:11	21:03	21:49	22:00	21:25	20:20	19:10	17:04	16:25
4	08:45	08:13	07:17	07:05	06:00	05:18	05:19	05:59	06:50	07:40	07:35	08:26
	16:35	17:26	18:18	20:13	21:05	21:50	22:00	21:23	20:18	19:08	17:02	16:24
5	08:45	08:11	07:15	07:03	05:58	05:17	05:20	06:00	06:51	07:42	07:37	08:27
	16:36	17:28	18:20	20:15	21:07	21:51	21:59	21:21	20:16	19:05	17:00	16:24
6	08:44	08:10	07:12	07:00	05:57	05:16	05:21	06:02	06:53	07:43	07:39	08:28
	16:38	17:30	18:22	20:17	21:08	21:52	21:59	21:19	20:13	19:03	16:58	16:23
7	08:44	08:08	07:10	06:58	05:55	05:16	05:22	06:04	06:55	07:45	07:41	08:30
	16:39	17:32	18:24	20:18	21:10	21:53	21:58	21:18	20:11	19:01	16:57	16:23
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	16:40	17:34	18:26	20:20	21:12	21:54	21:57	21:16	20:09	18:58	16:55	16:23
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	16:42	17:36	18:28	20:22	21:13	21:55	21:57	21:14	20:06	18:56	16:53	16:22
10	08:42	08:02	07:03	06:51	05:49	05:14	05:25	06:08	07:00	07:50	07:46	08:33
	16:43	17:37	18:29	20:24	21:15	21:55	21:56	21:12	20:04	18:54	16:52	16:22
11	08:42	08:01	07:01	06:49	05:48	05:14	05:26	06:10	07:01	07:52	07:48	08:34
	16:44	17:39	18:31	20:25	21:17	21:56	21:55	21:10	20:02	18:52	16:50	16:22
12	08:41	07:59	06:59	06:47	05:46	05:13	05:27	06:12	07:03	07:54	07:50	08:35
	16:46	17:41	18:33	20:27	21:18	21:57	21:54	21:08	19:59	18:49	16:48	16:22
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14	08:40	07:55	06:54	06:42	05:43	05:13	05:29	06:15	07:06	07:57	07:53	08:37
	16:49	17:45	18:36	20:31	21:21	21:58	21:52	21:04	19:55	18:45	16:45	16:22
15	08:39	07:53	06:52	06:40	05:41	05:13	05:30	06:17	07:08	07:59	07:55	08:38
	16:51	17:47	18:38	20:32	21:23	21:59	21:51	21:02	19:52	18:43	16:44	16:22
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	16:52	17:49	18:40	20:34	21:25	21:59	21:50	21:00	19:50	18:40	16:42	16:22
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	16:54	17:51	18:42	20:36	21:26	22:00	21:49	20:58	19:48	18:38	16:41	16:22
18	08:36	07:47	06:45	06:33	05:37	05:12	05:34	06:22	07:13	08:04	08:00	08:41
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19	08:35	07:45	06:42	06:31	05:35	05:12	05:35	06:23	07:15	08:06	08:02	08:41
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21	08:33	07:41	06:38	06:27	05:32	05:13	05:38	06:27	07:18	08:10	08:05	08:43
	17:01	17:58	18:49	20:43	21:32	22:01	21:44	20:49	19:38	18:30	16:36	16:23
22	08:32	07:39	06:35	06:25	05:31	05:13	05:39	06:28	07:20	08:11	08:07	08:43
	17:02	18:00	18:51	20:44	21:34	22:01	21:43	20:47	19:36	18:27	16:35	16:24
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25	08:28	07:32	06:28	06:18	05:27	05:14	05:43	06:33	07:25	07:17	08:12	08:44
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29	08:22		07:19	06:10	05:23	05:16	05:49	06:40	07:31	07:24	08:18	08:45
	17:15		20:03	20:56	21:43	22:01	21:33	20:32	19:19	17:13	16:28	16:29
30	08:21		07:17	06:08	05:22	05:16	05:51	06:41	07:33	07:26	08:20	08:45
	17:17		20:05	20:58	21:44	22:01	21:31	20:30	19:17	17:11	16:27	16:30
31	08:19		07:14		05:21		05:52	06:43		07:28		08:46
	17:19		20:06		21:45		21:30	20:27		17:09		16:30
Potential sun hours	257	277	367	417	487	501	504	455	381	331	265	241
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
Jennings O'Donovan
Finisklin Business Park
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+353719161416
padraig / podowd@jodireland.com

Calculated:
11/06/2025 09:22/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Real Case - V150 **Shadow receptor:** CK - 127

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:46	08:18	07:24	07:12	06:06	05:20	05:17	05:54	06:45	07:35	07:30	08:21
	16:32	17:20	18:13	20:08	21:00	21:47	22:01	21:28	20:25	19:15	17:07	16:26
2	08:45	08:16	07:21	07:10	06:04	05:19	05:17	05:56	06:46	07:36	07:31	08:23
	16:33	17:22	18:15	20:10	21:02	21:48	22:00	21:26	20:23	19:12	17:06	16:26
3	08:45	08:15	07:19	07:07	06:02	05:18	05:18	05:57	06:48	07:38	07:33	08:24
	16:34	17:24	18:17	20:11	21:03	21:49	22:00	21:25	20:20	19:10	17:04	16:25
4	08:45	08:13	07:17	07:05	06:00	05:17	05:19	05:59	06:50	07:40	07:35	08:26
	16:35	17:26	18:18	20:13	21:05	21:50	22:00	21:23	20:18	19:08	17:02	16:24
5	08:45	08:11	07:15	07:03	05:58	05:17	05:20	06:00	06:51	07:42	07:37	08:27
	16:36	17:28	18:20	20:15	21:07	21:51	21:59	21:21	20:16	19:05	17:00	16:24
6	08:44	08:10	07:12	07:00	05:57	05:16	05:21	06:02	06:53	07:43	07:39	08:28
	16:38	17:30	18:22	20:17	21:08	21:52	21:59	21:19	20:13	19:03	16:58	16:23
7	08:44	08:08	07:10	06:58	05:55	05:16	05:22	06:04	06:55	07:45	07:41	08:30
	16:39	17:32	18:24	20:18	21:10	21:53	21:58	21:18	20:11	19:01	16:57	16:23
8	08:44	08:06	07:08	06:56	05:53	05:15	05:22	06:05	06:56	07:47	07:42	08:31
	16:40	17:34	18:26	20:20	21:12	21:54	21:57	21:16	20:09	18:58	16:55	16:23
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	16:42	17:36	18:28	20:22	21:13	21:55	21:57	21:14	20:06	18:56	16:53	16:22
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	16:43	17:37	18:29	20:24	21:15	21:55	21:56	21:12	20:04	18:54	16:52	16:22
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	16:44	17:39	18:31	20:25	21:17	21:56	21:55	21:10	20:02	18:52	16:50	16:22
12	08:41	07:59	06:59	06:47	05:46	05:13	05:27	06:12	07:03	07:54	07:50	08:35
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	16:51	17:47	18:38	20:32	21:23	21:59	21:51	21:02	19:52	18:43	16:44	16:22
16	08:38	07:51	06:49	06:38	05:40	05:12	05:31	06:18	07:10	08:01	07:57	08:39
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17	08:37	07:49	06:47	06:35	05:38	05:12	05:33	06:20	07:11	08:02	07:59	08:40
	16:54	17:51	18:42	20:36	21:26	22:00	21:49	20:58	19:48	18:38	16:41	16:22
18	08:36	07:47	06:45	06:33	05:37	05:12	05:34	06:22	07:13	08:04	08:00	08:41
	16:55	17:53	18:44	20:38	21:28	22:00	21:48	20:56	19:45	18:36	16:40	16:22
19	08:35	07:45	06:42	06:31	05:35	05:12	05:35	06:23	07:15	08:06	08:02	08:41
	16:57	17:54	18:45	20:39	21:29	22:01	21:47	20:54	19:43	18:34	16:38	16:23
20	08:34	07:43	06:40	06:29	05:34	05:12	05:36	06:25	07:16	08:08	08:04	08:42
	16:59	17:56	18:47	20:41	21:31	22:01	21:46	20:52	19:41	18:32	16:37	16:23
21	08:33	07:41	06:38	06:27	05:32	05:13	05:38	06:27	07:18	08:10	08:05	08:43
	17:01	17:58	18:49	20:43	21:32	22:01	21:44	20:49	19:38	18:30	16:36	16:23
22	08:32	07:39	06:35	06:25	05:31	05:13	05:39	06:28	07:20	08:11	08:07	08:43
	17:02	18:00	18:51	20:44	21:34	22:01	21:43	20:47	19:36	18:27	16:35	16:24
23	08:31	07:36	06:33	06:22	05:30	05:13	05:41	06:30	07:21	08:13	08:09	08:44
	17:04	18:02	18:52	20:46	21:35	22:01	21:42	20:45	19:33	18:25	16:34	16:24
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27	08:25	07:28	06:24	06:14	05:25	05:14	05:46	06:36	07:28	07:20	08:15	08:45
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28	08:24	07:26	06:21	06:12	05:24	05:15	05:48	06:38	07:30	07:22	08:17	08:45
	17:13	18:11	19:01	20:55	21:42	22:01	21:35	20:34	19:22	17:15	16:29	16:28
29	08:22		07:19	06:10	05:23	05:16	05:49	06:40	07:31	07:24	08:18	08:45
	17:15		20:03	20:56	21:43	22:01	21:33	20:32	19:19	17:13	16:28	16:29
30	08:21		07:17	06:08	05:22	05:16	05:51	06:41	07:33	07:26	08:20	08:45
	17:17		20:05	20:58	21:44	22:01	21:31	20:30	19:17	17:11	16:27	16:30
31	08:19		07:14		05:21		05:52	06:43		07:28		08:46
	17:19		20:06		21:45		21:30	20:27		17:09		16:30
Potential sun hours	257	277	367	417	487	501	504	455	381	331	265	241
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
Jennings O'Donovan
Finisklin Business Park
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+353719161416
padraig / podowd@jodireland.com

Calculated:
11/06/2025 09:22/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Real Case - V150 **Shadow receptor:** CL - 128

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:46	08:18	07:24	07:12	06:06	05:20	05:17	05:54	06:45	07:35	07:30	08:21
	16:32	17:20	18:13	20:08	21:00	21:47	22:01	21:28	20:25	19:15	17:07	16:26
2	08:45	08:16	07:21	07:10	06:04	05:19	05:17	05:56	06:46	07:36	07:31	08:23
	16:33	17:22	18:15	20:10	21:02	21:48	22:00	21:26	20:23	19:12	17:06	16:26
3	08:45	08:15	07:19	07:07	06:02	05:18	05:18	05:57	06:48	07:38	07:33	08:24
	16:34	17:24	18:17	20:11	21:03	21:49	22:00	21:25	20:20	19:10	17:04	16:25
4	08:45	08:13	07:17	07:05	06:00	05:17	05:19	05:59	06:50	07:40	07:35	08:26
	16:35	17:26	18:18	20:13	21:05	21:50	22:00	21:23	20:18	19:08	17:02	16:24
5	08:45	08:11	07:15	07:03	05:58	05:17	05:20	06:00	06:51	07:42	07:37	08:27
	16:36	17:28	18:20	20:15	21:07	21:51	21:59	21:21	20:16	19:05	17:00	16:24
6	08:44	08:10	07:12	07:00	05:57	05:16	05:21	06:02	06:53	07:43	07:39	08:28
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7	08:44	08:08	07:10	06:58	05:55	05:16	05:22	06:04	06:55	07:45	07:41	08:30
	16:39	17:32	18:24	20:18	21:10	21:53	21:58	21:18	20:11	19:01	16:57	16:23
8	08:44	08:06	07:08	06:56	05:53	05:15	05:22	06:05	06:56	07:47	07:42	08:31
	16:40	17:34	18:26	20:20	21:12	21:54	21:57	21:16	20:09	18:58	16:55	16:23
9	08:43	08:04	07:06	06:53	05:51	05:14	05:23	06:07	06:58	07:48	07:44	08:32
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10	08:43	08:02	07:03	06:51	05:49	05:14	05:24	06:08	07:00	07:50	07:46	08:33
	16:43	17:37	18:29	20:24	21:15	21:55	21:56	21:12	20:04	18:54	16:52	16:22
11	08:42	08:01	07:01	06:49	05:48	05:14	05:26	06:10	07:01	07:52	07:48	08:34
	16:44	17:39	18:31	20:25	21:17	21:56	21:55	21:10	20:02	18:52	16:50	16:22
12	08:41	07:59	06:59	06:47	05:46	05:13	05:27	06:12	07:03	07:54	07:50	08:35
	16:46	17:41	18:33	20:27	21:18	21:57	21:54	21:08	19:59	18:49	16:48	16:22
13	08:41	07:57	06:56	06:44	05:44	05:13	05:28	06:13	07:05	07:55	07:51	08:36
	16:47	17:43	18:35	20:29	21:20	21:58	21:53	21:06	19:57	18:47	16:47	16:22
14	08:40	07:55	06:54	06:42	05:43	05:13	05:29	06:15	07:06	07:57	07:53	08:37
	16:49	17:45	18:36	20:31	21:21	21:58	21:52	21:04	19:55	18:45	16:45	16:22
15	08:39	07:53	06:52	06:40	05:41	05:13	05:30	06:17	07:08	07:59	07:55	08:38
	16:51	17:47	18:38	20:32	21:23	21:59	21:51	21:02	19:52	18:43	16:44	16:22
16	08:38	07:51	06:49	06:38	05:40	05:12	05:31	06:18	07:10	08:01	07:57	08:39
	16:52	17:49	18:40	20:34	21:25	21:59	21:50	21:00	19:50	18:40	16:42	16:22
17	08:37	07:49	06:47	06:35	05:38	05:12	05:33	06:20	07:11	08:02	07:59	08:40
	16:54	17:51	18:42	20:36	21:26	22:00	21:49	20:58	19:48	18:38	16:41	16:22
18	08:36	07:47	06:45	06:33	05:37	05:12	05:34	06:22	07:13	08:04	08:00	08:41
	16:55	17:53	18:44	20:38	21:28	22:00	21:48	20:56	19:45	18:36	16:40	16:22
19	08:35	07:45	06:42	06:31	05:35	05:12	05:35	06:23	07:15	08:06	08:02	08:41
	16:57	17:54	18:45	20:39	21:29	22:01	21:47	20:54	19:43	18:34	16:38	16:23
20	08:34	07:43	06:40	06:29	05:34	05:12	05:36	06:25	07:16	08:08	08:04	08:42
	16:59	17:56	18:47	20:41	21:31	22:01	21:46	20:52	19:41	18:32	16:37	16:23
21	08:33	07:41	06:38	06:27	05:32	05:13	05:38	06:27	07:18	08:10	08:05	08:43
	17:01	17:58	18:49	20:43	21:32	22:01	21:44	20:49	19:38	18:30	16:36	16:23
22	08:32	07:39	06:35	06:25	05:31	05:13	05:39	06:28	07:20	08:11	08:07	08:43
	17:02	18:00	18:51	20:44	21:34	22:01	21:43	20:47	19:36	18:27	16:35	16:24
23	08:31	07:37	06:33	06:22	05:30	05:13	05:41	06:30	07:21	08:13	08:09	08:44
	17:04	18:02	18:52	20:46	21:35	22:01	21:42	20:45	19:33	18:25	16:34	16:24
24	08:29	07:34	06:31	06:20	05:28	05:13	05:42	06:32	07:23	08:15	08:11	08:44
	17:06	18:04	18:54	20:48	21:36	22:02	21:40	20:43	19:31	18:23	16:32	16:25
25	08:28	07:32	06:28	06:18	05:27	05:14	05:43	06:33	07:25	07:17	08:12	08:45
	17:08	18:06	18:56	20:50	21:38	22:02	21:39	20:41	19:29	17:21	16:31	16:26
26	08:27	07:30	06:26	06:16	05:26	05:14	05:45	06:35	07:26	07:19	08:14	08:45
	17:09	18:07	18:58	20:51	21:39	22:02	21:38	20:39	19:26	17:19	16:30	16:26
27	08:25	07:28	06:24	06:14	05:25	05:14	05:46	06:37	07:28	07:20	08:15	08:45
	17:11	18:09	18:59	20:53	21:41	22:02	21:36	20:36	19:24	17:17	16:30	16:27
28	08:24	07:26	06:21	06:12	05:24	05:15	05:48	06:38	07:30	07:22	08:17	08:45
	17:13	18:11	19:01	20:55	21:42	22:01	21:35	20:34	19:22	17:15	16:29	16:28
29	08:22		07:19	06:10	05:23	05:16	05:49	06:40	07:31	07:24	08:18	08:45
	17:15		20:03	20:57	21:43	22:01	21:33	20:32	19:19	17:13	16:28	16:29
30	08:21		07:17	06:08	05:22	05:16	05:51	06:41	07:33	07:26	08:20	08:46
	17:17		20:05	20:58	21:44	22:01	21:31	20:30	19:17	17:11	16:27	16:30
31	08:19		07:14		05:21		05:52	06:43		07:28		08:46
	17:19		20:06		21:45		21:30	20:27		17:09		16:30
Potential sun hours	257	277	367	417	487	501	504	455	381	331	265	241
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

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Finisklin Business Park
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padraig / podowd@jodireland.com

Calculated:
11/06/2025 09:22/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Real Case - V150 **Shadow receptor:** CM - 129

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:46	08:18	07:24	07:12	06:06	05:20	05:17	05:54	06:45	07:35	07:30	08:21
	16:32	17:20	18:13	20:08	21:00	21:47	22:01	21:28	20:25	19:15	17:07	16:26
2	08:45	08:16	07:21	07:10	06:04	05:19	05:17	05:56	06:46	07:36	07:31	08:23
	16:33	17:22	18:15	20:10	21:02	21:48	22:00	21:26	20:23	19:12	17:06	16:26
3	08:45	08:15	07:19	07:07	06:02	05:18	05:18	05:57	06:48	07:38	07:33	08:24
	16:34	17:24	18:17	20:11	21:03	21:49	22:00	21:25	20:20	19:10	17:04	16:25
4	08:45	08:13	07:17	07:05	06:00	05:17	05:19	05:59	06:50	07:40	07:35	08:26
	16:35	17:26	18:18	20:13	21:05	21:50	22:00	21:23	20:18	19:08	17:02	16:24
5	08:45	08:11	07:15	07:03	05:58	05:17	05:20	06:00	06:51	07:42	07:37	08:27
	16:36	17:28	18:20	20:15	21:07	21:51	21:59	21:21	20:16	19:05	17:00	16:24
6	08:44	08:10	07:12	07:00	05:57	05:16	05:21	06:02	06:53	07:43	07:39	08:28
	16:38	17:30	18:22	20:17	21:08	21:52	21:59	21:19	20:14	19:03	16:58	16:23
7	08:44	08:08	07:10	06:58	05:55	05:16	05:22	06:04	06:55	07:45	07:41	08:30
	16:39	17:32	18:24	20:18	21:10	21:53	21:58	21:18	20:11	19:01	16:57	16:23
8	08:44	08:06	07:08	06:56	05:53	05:15	05:22	06:05	06:56	07:47	07:42	08:31
	16:40	17:34	18:26	20:20	21:12	21:54	21:57	21:16	20:09	18:58	16:55	16:23
9	08:43	08:04	07:06	06:53	05:51	05:14	05:23	06:07	06:58	07:48	07:44	08:32
	16:42	17:36	18:28	20:22	21:13	21:55	21:57	21:14	20:07	18:56	16:53	16:22
10	08:43	08:02	07:03	06:51	05:49	05:14	05:24	06:08	07:00	07:50	07:46	08:33
	16:43	17:37	18:29	20:24	21:15	21:55	21:56	21:12	20:04	18:54	16:52	16:22
11	08:42	08:01	07:01	06:49	05:48	05:14	05:26	06:10	07:01	07:52	07:48	08:34
	16:44	17:39	18:31	20:25	21:17	21:56	21:55	21:10	20:02	18:52	16:50	16:22
12	08:41	07:59	06:59	06:47	05:46	05:13	05:27	06:12	07:03	07:54	07:50	08:35
	16:46	17:41	18:33	20:27	21:18	21:57	21:54	21:08	19:59	18:49	16:48	16:22
13	08:41	07:57	06:56	06:44	05:44	05:13	05:28	06:13	07:05	07:55	07:51	08:36
	16:47	17:43	18:35	20:29	21:20	21:58	21:53	21:06	19:57	18:47	16:47	16:22
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	16:49	17:45	18:36	20:31	21:21	21:58	21:52	21:04	19:55	18:45	16:45	16:22
15	08:39	07:53	06:52	06:40	05:41	05:13	05:30	06:17	07:08	07:59	07:55	08:38
	16:51	17:47	18:38	20:32	21:23	21:59	21:51	21:02	19:52	18:43	16:44	16:22
16	08:38	07:51	06:49	06:38	05:40	05:12	05:31	06:18	07:10	08:01	07:57	08:39
	16:52	17:49	18:40	20:34	21:25	21:59	21:50	21:00	19:50	18:40	16:42	16:22
17	08:37	07:49	06:47	06:35	05:38	05:12	05:33	06:20	07:11	08:02	07:59	08:40
	16:54	17:51	18:42	20:36	21:26	22:00	21:49	20:58	19:48	18:38	16:41	16:22
18	08:36	07:47	06:45	06:33	05:37	05:12	05:34	06:22	07:13	08:04	08:00	08:41
	16:55	17:53	18:44	20:38	21:28	22:00	21:48	20:56	19:45	18:36	16:40	16:22
19	08:35	07:45	06:42	06:31	05:35	05:12	05:35	06:23	07:15	08:06	08:02	08:41
	16:57	17:54	18:45	20:39	21:29	22:01	21:47	20:54	19:43	18:34	16:38	16:23
20	08:34	07:43	06:40	06:29	05:34	05:12	05:36	06:25	07:16	08:08	08:04	08:42
	16:59	17:56	18:47	20:41	21:31	22:01	21:46	20:52	19:41	18:32	16:37	16:23
21	08:33	07:41	06:38	06:27	05:32	05:13	05:38	06:27	07:18	08:10	08:05	08:43
	17:01	17:58	18:49	20:43	21:32	22:01	21:44	20:49	19:38	18:30	16:36	16:23
22	08:32	07:39	06:35	06:25	05:31	05:13	05:39	06:28	07:20	08:11	08:07	08:43
	17:02	18:00	18:51	20:44	21:34	22:01	21:43	20:47	19:36	18:27	16:35	16:24
23	08:31	07:37	06:33	06:22	05:30	05:13	05:41	06:30	07:21	08:13	08:09	08:44
	17:04	18:02	18:52	20:46	21:35	22:01	21:42	20:45	19:33	18:25	16:34	16:24
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	17:06	18:04	18:54	20:48	21:36	22:02	21:40	20:43	19:31	18:23	16:32	16:25
25	08:28	07:32	06:28	06:18	05:27	05:14	05:43	06:33	07:25	07:17	08:12	08:45
	17:08	18:06	18:56	20:50	21:38	22:02	21:39	20:41	19:29	17:21	16:31	16:26
26	08:27	07:30	06:26	06:16	05:26	05:14	05:45	06:35	07:26	07:19	08:14	08:45
	17:09	18:07	18:58	20:51	21:39	22:02	21:38	20:39	19:26	17:19	16:30	16:26
27	08:25	07:28	06:24	06:14	05:25	05:14	05:46	06:37	07:28	07:20	08:15	08:45
	17:11	18:09	18:59	20:53	21:41	22:02	21:36	20:36	19:24	17:17	16:30	16:27
28	08:24	07:26	06:21	06:12	05:24	05:15	05:48	06:38	07:30	07:22	08:17	08:45
	17:13	18:11	19:01	20:55	21:42	22:01	21:35	20:34	19:22	17:15	16:29	16:28
29	08:22		07:19	06:10	05:23	05:16	05:49	06:40	07:31	07:24	08:18	08:45
	17:15		20:03	20:57	21:43	22:01	21:33	20:32	19:19	17:13	16:28	16:29
30	08:21		07:17	06:08	05:22	05:16	05:51	06:41	07:33	07:26	08:20	08:46
	17:17		20:05	20:58	21:44	22:01	21:31	20:30	19:17	17:11	16:27	16:30
31	08:19		07:14		05:21		05:52	06:43		07:28		08:46
	17:19		20:06		21:45		21:30	20:27		17:09		16:30
Potential sun hours	257	277	367	417	487	501	504	455	381	331	265	241
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
Jennings O'Donovan
Finisklin Business Park
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padraig / podowd@jodireland.com

Calculated:
11/06/2025 09:22/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Real Case - V150 **Shadow receptor:** CN - 130

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:46	08:18	07:24	07:12	06:06	05:20	05:17	05:54	06:45	07:35	07:30	08:21
	16:32	17:20	18:13	20:08	21:00	21:47	22:01	21:28	20:25	19:15	17:07	16:26
2	08:45	08:16	07:21	07:10	06:04	05:19	05:17	05:56	06:46	07:36	07:31	08:23
	16:33	17:22	18:15	20:10	21:02	21:48	22:00	21:26	20:23	19:12	17:06	16:26
3	08:45	08:15	07:19	07:07	06:02	05:18	05:18	05:57	06:48	07:38	07:33	08:24
	16:34	17:24	18:17	20:11	21:03	21:49	22:00	21:25	20:20	19:10	17:04	16:25
4	08:45	08:13	07:17	07:05	06:00	05:17	05:19	05:59	06:50	07:40	07:35	08:26
	16:35	17:26	18:18	20:13	21:05	21:50	22:00	21:23	20:18	19:08	17:02	16:24
5	08:45	08:11	07:15	07:03	05:58	05:17	05:20	06:00	06:51	07:42	07:37	08:27
	16:36	17:28	18:20	20:15	21:07	21:51	21:59	21:21	20:16	19:05	17:00	16:24
6	08:44	08:10	07:12	07:00	05:57	05:16	05:21	06:02	06:53	07:43	07:39	08:28
	16:38	17:30	18:22	20:17	21:08	21:52	21:59	21:19	20:14	19:03	16:58	16:23
7	08:44	08:08	07:10	06:58	05:55	05:16	05:22	06:04	06:55	07:45	07:41	08:30
	16:39	17:32	18:24	20:18	21:10	21:53	21:58	21:18	20:11	19:01	16:57	16:23
8	08:44	08:06	07:08	06:56	05:53	05:15	05:22	06:05	06:56	07:47	07:42	08:31
	16:40	17:34	18:26	20:20	21:12	21:54	21:57	21:16	20:09	18:58	16:55	16:23
9	08:43	08:04	07:06	06:53	05:51	05:14	05:23	06:07	06:58	07:48	07:44	08:32
	16:42	17:36	18:28	20:22	21:13	21:55	21:57	21:14	20:07	18:56	16:53	16:22
10	08:43	08:02	07:03	06:51	05:49	05:14	05:24	06:08	07:00	07:50	07:46	08:33
	16:43	17:37	18:29	20:24	21:15	21:55	21:56	21:12	20:04	18:54	16:52	16:22
11	08:42	08:01	07:01	06:49	05:48	05:14	05:26	06:10	07:01	07:52	07:48	08:34
	16:44	17:39	18:31	20:25	21:17	21:56	21:55	21:10	20:02	18:52	16:50	16:22
12	08:41	07:59	06:59	06:47	05:46	05:13	05:27	06:12	07:03	07:54	07:50	08:35
	16:46	17:41	18:33	20:27	21:18	21:57	21:54	21:08	19:59	18:49	16:48	16:22
13	08:40	07:57	06:56	06:44	05:44	05:13	05:28	06:13	07:05	07:55	07:51	08:36
	16:47	17:43	18:35	20:29	21:20	21:58	21:53	21:06	19:57	18:47	16:47	16:22
14	08:40	07:55	06:54	06:42	05:43	05:13	05:29	06:15	07:06	07:57	07:53	08:37
	16:49	17:45	18:36	20:31	21:21	21:58	21:52	21:04	19:55	18:45	16:45	16:22
15	08:39	07:53	06:52	06:40	05:41	05:13	05:30	06:17	07:08	07:59	07:55	08:38
	16:51	17:47	18:38	20:32	21:23	21:59	21:51	21:02	19:52	18:43	16:44	16:22
16	08:38	07:51	06:49	06:38	05:40	05:12	05:31	06:18	07:10	08:01	07:57	08:39
	16:52	17:49	18:40	20:34	21:25	21:59	21:50	21:00	19:50	18:40	16:42	16:22
17	08:37	07:49	06:47	06:35	05:38	05:12	05:33	06:20	07:11	08:02	07:59	08:40
	16:54	17:51	18:42	20:36	21:26	22:00	21:49	20:58	19:48	18:38	16:41	16:22
18	08:36	07:47	06:45	06:33	05:37	05:12	05:34	06:22	07:13	08:04	08:00	08:41
	16:55	17:53	18:44	20:38	21:28	22:00	21:48	20:56	19:45	18:36	16:40	16:22
19	08:35	07:45	06:42	06:31	05:35	05:12	05:35	06:23	07:15	08:06	08:02	08:41
	16:57	17:54	18:45	20:39	21:29	22:01	21:47	20:54	19:43	18:34	16:38	16:23
20	08:34	07:43	06:40	06:29	05:34	05:12	05:36	06:25	07:16	08:08	08:04	08:42
	16:59	17:56	18:47	20:41	21:31	22:01	21:46	20:52	19:41	18:32	16:37	16:23
21	08:33	07:41	06:38	06:27	05:32	05:13	05:38	06:27	07:18	08:10	08:05	08:43
	17:01	17:58	18:49	20:43	21:32	22:01	21:44	20:49	19:38	18:30	16:36	16:23
22	08:32	07:39	06:35	06:25	05:31	05:13	05:39	06:28	07:20	08:11	08:07	08:43
	17:02	18:00	18:51	20:44	21:34	22:01	21:43	20:47	19:36	18:27	16:35	16:24
23	08:31	07:37	06:33	06:22	05:30	05:13	05:41	06:30	07:21	08:13	08:09	08:44
	17:04	18:02	18:52	20:46	21:35	22:01	21:42	20:45	19:33	18:25	16:34	16:24
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25	08:28	07:32	06:28	06:18	05:27	05:14	05:43	06:33	07:25	07:17	08:12	08:45
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27	08:25	07:28	06:24	06:14	05:25	05:14	05:46	06:37	07:28	07:20	08:15	08:45
	17:11	18:09	18:59	20:53	21:41	22:02	21:36	20:36	19:24	17:17	16:30	16:27
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	17:13	18:11	19:01	20:55	21:42	22:01	21:35	20:34	19:22	17:15	16:29	16:28
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	17:15		20:03	20:57	21:43	22:01	21:33	20:32	19:19	17:13	16:28	16:29
30	08:21		07:17	06:08	05:22	05:16	05:51	06:41	07:33	07:26	08:20	08:46
	17:17		20:05	20:58	21:44	22:01	21:31	20:30	19:17	17:11	16:27	16:30
31	08:19		07:14		05:21		05:52	06:43		07:28		08:46
	17:19		20:06		21:45		21:30	20:27		17:09		16:30
Potential sun hours	257	277	367	417	487	501	504	455	381	331	265	241
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

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padraig / podowd@jodireland.com

Calculated:
11/06/2025 09:22/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Real Case - V150 **Shadow receptor:** CO - 131

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:46	08:18	07:24	07:12	06:06	05:20	05:17	05:54	06:45	07:35	07:30	08:21
	16:32	17:20	18:13	20:08	21:00	21:47	22:01	21:28	20:25	19:15	17:07	16:26
2	08:45	08:16	07:21	07:10	06:04	05:19	05:17	05:56	06:46	07:36	07:31	08:23
	16:33	17:22	18:15	20:10	21:02	21:48	22:00	21:26	20:23	19:12	17:06	16:26
3	08:45	08:15	07:19	07:07	06:02	05:18	05:18	05:57	06:48	07:38	07:33	08:24
	16:34	17:24	18:17	20:11	21:03	21:49	22:00	21:25	20:20	19:10	17:04	16:25
4	08:45	08:13	07:17	07:05	06:00	05:17	05:19	05:59	06:50	07:40	07:35	08:26
	16:35	17:26	18:18	20:13	21:05	21:50	22:00	21:23	20:18	19:08	17:02	16:24
5	08:45	08:11	07:15	07:03	05:58	05:17	05:20	06:00	06:51	07:42	07:37	08:27
	16:36	17:28	18:20	20:15	21:07	21:51	21:59	21:21	20:16	19:05	17:00	16:24
6	08:44	08:10	07:12	07:00	05:57	05:16	05:21	06:02	06:53	07:43	07:39	08:28
	16:38	17:30	18:22	20:17	21:08	21:52	21:59	21:19	20:14	19:03	16:58	16:23
7	08:44	08:08	07:10	06:58	05:55	05:16	05:22	06:04	06:55	07:45	07:41	08:30
	16:39	17:32	18:24	20:18	21:10	21:53	21:58	21:18	20:11	19:01	16:57	16:23
8	08:44	08:06	07:08	06:56	05:53	05:15	05:22	06:05	06:56	07:47	07:42	08:31
	16:40	17:34	18:26	20:20	21:12	21:54	21:57	21:16	20:09	18:58	16:55	16:23
9	08:43	08:04	07:06	06:53	05:51	05:14	05:23	06:07	06:58	07:48	07:44	08:32
	16:42	17:36	18:28	20:22	21:13	21:55	21:57	21:14	20:07	18:56	16:53	16:22
10	08:43	08:02	07:03	06:51	05:49	05:14	05:24	06:08	07:00	07:50	07:46	08:33
	16:43	17:37	18:29	20:24	21:15	21:55	21:56	21:12	20:04	18:54	16:52	16:22
11	08:42	08:01	07:01	06:49	05:48	05:14	05:26	06:10	07:01	07:52	07:48	08:34
	16:44	17:39	18:31	20:25	21:17	21:56	21:55	21:10	20:02	18:52	16:50	16:22
12	08:41	07:59	06:59	06:47	05:46	05:13	05:27	06:12	07:03	07:54	07:50	08:35
	16:46	17:41	18:33	20:27	21:18	21:57	21:54	21:08	19:59	18:49	16:48	16:22
13	08:41	07:57	06:56	06:44	05:44	05:13	05:28	06:13	07:05	07:55	07:51	08:36
	16:47	17:43	18:35	20:29	21:20	21:58	21:53	21:06	19:57	18:47	16:47	16:22
14	08:40	07:55	06:54	06:42	05:43	05:13	05:29	06:15	07:06	07:57	07:53	08:37
	16:49	17:45	18:36	20:31	21:21	21:58	21:52	21:04	19:55	18:45	16:45	16:22
15	08:39	07:53	06:52	06:40	05:41	05:13	05:30	06:17	07:08	07:59	07:55	08:38
	16:51	17:47	18:38	20:32	21:23	21:59	21:51	21:02	19:52	18:43	16:44	16:22
16	08:38	07:51	06:49	06:38	05:40	05:12	05:31	06:18	07:10	08:01	07:57	08:39
	16:52	17:49	18:40	20:34	21:25	21:59	21:50	21:00	19:50	18:40	16:42	16:22
17	08:37	07:49	06:47	06:35	05:38	05:12	05:33	06:20	07:11	08:02	07:59	08:40
	16:54	17:51	18:42	20:36	21:26	22:00	21:49	20:58	19:48	18:38	16:41	16:22
18	08:36	07:47	06:45	06:33	05:37	05:12	05:34	06:22	07:13	08:04	08:00	08:41
	16:55	17:53	18:44	20:38	21:28	22:00	21:48	20:56	19:45	18:36	16:40	16:22
19	08:35	07:45	06:42	06:31	05:35	05:12	05:35	06:23	07:15	08:06	08:02	08:41
	16:57	17:54	18:45	20:39	21:29	22:01	21:47	20:54	19:43	18:34	16:38	16:23
20	08:34	07:43	06:40	06:29	05:34	05:12	05:36	06:25	07:16	08:08	08:04	08:42
	16:59	17:56	18:47	20:41	21:31	22:01	21:46	20:52	19:41	18:32	16:37	16:23
21	08:33	07:41	06:38	06:27	05:32	05:13	05:38	06:27	07:18	08:10	08:05	08:43
	17:01	17:58	18:49	20:43	21:32	22:01	21:44	20:49	19:38	18:30	16:36	16:23
22	08:32	07:39	06:35	06:25	05:31	05:13	05:39	06:28	07:20	08:11	08:07	08:43
	17:02	18:00	18:51	20:44	21:34	22:01	21:43	20:47	19:36	18:27	16:35	16:24
23	08:31	07:37	06:33	06:22	05:30	05:13	05:41	06:30	07:21	08:13	08:09	08:44
	17:04	18:02	18:52	20:46	21:35	22:01	21:42	20:45	19:33	18:25	16:34	16:24
24	08:29	07:34	06:31	06:20	05:28	05:13	05:42	06:32	07:23	08:15	08:11	08:44
	17:06	18:04	18:54	20:48	21:36	22:02	21:40	20:43	19:31	18:23	16:32	16:25
25	08:28	07:32	06:28	06:18	05:27	05:14	05:43	06:33	07:25	07:17	08:12	08:45
	17:08	18:06	18:56	20:50	21:38	22:02	21:39	20:41	19:29	17:21	16:31	16:26
26	08:27	07:30	06:26	06:16	05:26	05:14	05:45	06:35	07:26	07:19	08:14	08:45
	17:09	18:07	18:58	20:51	21:39	22:02	21:38	20:39	19:26	17:19	16:30	16:26
27	08:25	07:28	06:24	06:14	05:25	05:14	05:46	06:37	07:28	07:20	08:15	08:45
	17:11	18:09	18:59	20:53	21:41	22:02	21:36	20:36	19:24	17:17	16:30	16:27
28	08:24	07:26	06:21	06:12	05:24	05:15	05:48	06:38	07:30	07:22	08:17	08:45
	17:13	18:11	19:01	20:55	21:42	22:01	21:35	20:34	19:22	17:15	16:29	16:28
29	08:22		07:19	06:10	05:23	05:16	05:49	06:40	07:31	07:24	08:18	08:45
	17:15		20:03	20:57	21:43	22:01	21:33	20:32	19:19	17:13	16:28	16:29
30	08:21		07:17	06:08	05:22	05:16	05:51	06:41	07:33	07:26	08:20	08:46
	17:17		20:05	20:58	21:44	22:01	21:31	20:30	19:17	17:11	16:27	16:30
31	08:19		07:14		05:21		05:52	06:43		07:28		08:46
	17:19		20:06		21:45		21:30	20:27		17:09		16:30
Potential sun hours	257	277	367	417	487	501	504	455	381	331	265	241
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

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padraig / podowd@jodireland.com

Calculated:
11/06/2025 09:22/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Real Case - V150 **Shadow receptor:** CP - 132

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:46	08:18	07:24	07:12	06:06	05:20	05:17	05:54	06:45	07:35	07:30	08:21
	16:32	17:20	18:13	20:08	21:00	21:47	22:01	21:28	20:25	19:15	17:07	16:26
2	08:45	08:16	07:21	07:10	06:04	05:19	05:17	05:56	06:46	07:36	07:31	08:23
	16:33	17:22	18:15	20:10	21:02	21:48	22:00	21:26	20:23	19:12	17:06	16:26
3	08:45	08:15	07:19	07:07	06:02	05:18	05:18	05:57	06:48	07:38	07:33	08:24
	16:34	17:24	18:17	20:11	21:03	21:49	22:00	21:25	20:20	19:10	17:04	16:25
4	08:45	08:13	07:17	07:05	06:00	05:18	05:19	05:59	06:50	07:40	07:35	08:26
	16:35	17:26	18:18	20:13	21:05	21:50	22:00	21:23	20:18	19:08	17:02	16:24
5	08:45	08:11	07:15	07:03	05:58	05:17	05:20	06:00	06:51	07:42	07:37	08:27
	16:36	17:28	18:20	20:15	21:07	21:51	21:59	21:21	20:16	19:05	17:00	16:24
6	08:44	08:10	07:12	07:00	05:57	05:16	05:21	06:02	06:53	07:43	07:39	08:28
	16:38	17:30	18:22	20:17	21:08	21:52	21:59	21:19	20:13	19:03	16:58	16:23
7	08:44	08:08	07:10	06:58	05:55	05:16	05:22	06:04	06:55	07:45	07:41	08:30
	16:39	17:32	18:24	20:18	21:10	21:53	21:58	21:18	20:11	19:01	16:57	16:23
8	08:44	08:06	07:08	06:56	05:53	05:15	05:23	06:05	06:56	07:47	07:42	08:31
	16:40	17:34	18:26	20:20	21:12	21:54	21:57	21:16	20:09	18:58	16:55	16:23
9	08:43	08:04	07:06	06:53	05:51	05:14	05:23	06:07	06:58	07:48	07:44	08:32
	16:42	17:36	18:28	20:22	21:13	21:55	21:57	21:14	20:06	18:56	16:53	16:22
10	08:42	08:02	07:03	06:51	05:49	05:14	05:25	06:08	07:00	07:50	07:46	08:33
	16:43	17:37	18:29	20:24	21:15	21:55	21:56	21:12	20:04	18:54	16:52	16:22
11	08:42	08:01	07:01	06:49	05:48	05:14	05:26	06:10	07:01	07:52	07:48	08:34
	16:44	17:39	18:31	20:25	21:17	21:56	21:55	21:10	20:02	18:52	16:50	16:22
12	08:41	07:59	06:59	06:47	05:46	05:13	05:27	06:12	07:03	07:54	07:50	08:35
	16:46	17:41	18:33	20:27	21:18	21:57	21:54	21:08	19:59	18:49	16:48	16:22
13	08:40	07:57	06:56	06:44	05:44	05:13	05:28	06:13	07:05	07:55	07:51	08:36
	16:47	17:43	18:35	20:29	21:20	21:58	21:53	21:06	19:57	18:47	16:47	16:22
14	08:40	07:55	06:54	06:42	05:43	05:13	05:29	06:15	07:06	07:57	07:53	08:37
	16:49	17:45	18:36	20:31	21:21	21:58	21:52	21:04	19:55	18:45	16:45	16:22
15	08:39	07:53	06:52	06:40	05:41	05:13	05:30	06:17	07:08	07:59	07:55	08:38
	16:51	17:47	18:38	20:32	21:23	21:59	21:51	21:02	19:52	18:43	16:44	16:22
16	08:38	07:51	06:49	06:38	05:40	05:12	05:31	06:18	07:10	08:01	07:57	08:39
	16:52	17:49	18:40	20:34	21:25	21:59	21:50	21:00	19:50	18:40	16:42	16:22
17	08:37	07:49	06:47	06:35	05:38	05:12	05:33	06:20	07:11	08:02	07:59	08:40
	16:54	17:51	18:42	20:36	21:26	22:00	21:49	20:58	19:48	18:38	16:41	16:22
18	08:36	07:47	06:45	06:33	05:37	05:12	05:34	06:22	07:13	08:04	08:00	08:41
	16:55	17:53	18:44	20:38	21:28	22:00	21:48	20:56	19:45	18:36	16:40	16:22
19	08:35	07:45	06:42	06:31	05:35	05:12	05:35	06:23	07:15	08:06	08:02	08:41
	16:57	17:54	18:45	20:39	21:29	22:01	21:47	20:54	19:43	18:34	16:38	16:23
20	08:34	07:43	06:40	06:29	05:34	05:12	05:37	06:25	07:16	08:08	08:04	08:42
	16:59	17:56	18:47	20:41	21:31	22:01	21:46	20:52	19:41	18:32	16:37	16:23
21	08:33	07:41	06:38	06:27	05:32	05:13	05:38	06:27	07:18	08:10	08:05	08:43
	17:01	17:58	18:49	20:43	21:32	22:01	21:44	20:49	19:38	18:30	16:36	16:23
22	08:32	07:39	06:35	06:25	05:31	05:13	05:39	06:28	07:20	08:11	08:07	08:43
	17:02	18:00	18:51	20:44	21:34	22:01	21:43	20:47	19:36	18:27	16:35	16:24
23	08:31	07:37	06:33	06:22	05:30	05:13	05:41	06:30	07:21	08:13	08:09	08:44
	17:04	18:02	18:52	20:46	21:35	22:01	21:42	20:45	19:33	18:25	16:34	16:24
24	08:29	07:34	06:31	06:20	05:28	05:13	05:42	06:32	07:23	08:15	08:11	08:44
	17:06	18:04	18:54	20:48	21:36	22:02	21:40	20:43	19:31	18:23	16:33	16:25
25	08:28	07:32	06:28	06:18	05:27	05:14	05:43	06:33	07:25	07:17	08:12	08:44
	17:08	18:06	18:56	20:50	21:38	22:02	21:39	20:41	19:29	17:21	16:31	16:26
26	08:27	07:30	06:26	06:16	05:26	05:14	05:45	06:35	07:26	07:19	08:14	08:45
	17:09	18:07	18:58	20:51	21:39	22:02	21:38	20:39	19:26	17:19	16:30	16:26
27	08:25	07:28	06:24	06:14	05:25	05:15	05:46	06:37	07:28	07:20	08:15	08:45
	17:11	18:09	18:59	20:53	21:40	22:02	21:36	20:36	19:24	17:17	16:30	16:27
28	08:24	07:26	06:21	06:12	05:24	05:15	05:48	06:38	07:30	07:22	08:17	08:45
	17:13	18:11	19:01	20:55	21:42	22:01	21:35	20:34	19:22	17:15	16:29	16:28
29	08:22		07:19	06:10	05:23	05:16	05:49	06:40	07:31	07:24	08:18	08:45
	17:15		20:03	20:57	21:43	22:01	21:33	20:32	19:19	17:13	16:28	16:29
30	08:21		07:17	06:08	05:22	05:16	05:51	06:41	07:33	07:26	08:20	08:45
	17:17		20:05	20:58	21:44	22:01	21:31	20:30	19:17	17:11	16:27	16:30
31	08:19		07:14		05:21		05:53	06:43		07:28		08:46
	17:19		20:06		21:45		21:30	20:27		17:09		16:30
Potential sun hours	257	277	367	417	487	501	504	455	381	331	265	241
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
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padraig / podowd@jodireland.com

Calculated:
11/06/2025 09:22/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Real Case - V150 **Shadow receptor:** CQ - 141

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:46	08:18	07:24	07:12	06:06	06:31 (1)	05:20	06:18 (1)	05:17	05:54	06:23 (1)	06:45	07:35	07:30	08:21
	16:32	17:20	18:13	20:08	21:00	5 06:36 (1)	21:47	16 06:34 (1)	22:01	21:28	29 06:52 (1)	20:25	19:15	17:07	16:26
2	08:45	08:16	07:21	07:10	06:04	06:29 (1)	05:19	06:19 (1)	05:17	05:56	06:25 (1)	06:46	07:36	07:31	08:23
	16:33	17:22	18:15	20:10	21:02	8 06:37 (1)	21:48	13 06:32 (1)	22:00	21:26	27 06:52 (1)	20:23	19:12	17:06	16:26
3	08:45	08:15	07:19	07:07	06:02	06:27 (1)	05:18	06:21 (1)	05:18	05:57	06:26 (1)	06:48	07:38	07:33	08:24
	16:34	17:24	18:17	20:11	21:03	11 06:38 (1)	21:49	11 06:32 (1)	22:00	21:25	26 06:52 (1)	20:20	19:10	17:04	16:25
4	08:45	08:13	07:17	07:05	06:00	06:25 (1)	05:17	06:23 (1)	05:19	05:59	06:28 (1)	06:50	07:40	07:35	08:26
	16:35	17:26	18:18	20:13	21:05	13 06:38 (1)	21:50	6 06:29 (1)	22:00	21:23	24 06:52 (1)	20:18	19:08	17:02	16:24
5	08:45	08:11	07:15	07:03	05:58	06:24 (1)	05:17		05:20	06:00	06:29 (1)	06:51	07:42	07:37	08:27
	16:36	17:28	18:20	20:15	21:07	16 06:40 (1)	21:51		21:59	21:21	22 06:51 (1)	20:16	19:05	17:00	16:24
6	08:44	08:10	07:12	07:00	05:57	06:22 (1)	05:16		05:21	06:02	06:31 (1)	06:53	07:43	07:39	08:28
	16:38	17:30	18:22	20:17	21:08	18 06:40 (1)	21:52		21:59	21:19	20 06:51 (1)	20:14	19:03	16:58	16:23
7	08:44	08:08	07:10	06:58	05:55	06:20 (1)	05:16		05:22	06:04	06:32 (1)	06:55	07:45	07:41	08:30
	16:39	17:32	18:24	20:18	21:10	21 06:41 (1)	21:53		21:58	21:18	18 06:50 (1)	20:11	19:01	16:57	16:23
8	08:44	08:06	07:08	06:56	05:53	06:19 (1)	05:15		05:22	06:31 (1)	06:05	06:34 (1)	06:56	07:47	07:42	08:31
	16:40	17:34	18:26	20:20	21:12	23 06:42 (1)	21:54		21:57	3 06:34 (1)	21:16	15 06:49 (1)	20:09	18:58	16:55	16:23
9	08:43	08:04	07:06	06:53	05:51	06:17 (1)	05:14		05:23	06:28 (1)	06:07	06:35 (1)	06:58	07:49	07:44	08:32
	16:42	17:36	18:28	20:22	21:13	25 06:42 (1)	21:55		21:57	9 06:37 (1)	21:14	13 06:48 (1)	20:07	18:56	16:53	16:22
10	08:43	08:02	07:03	06:51	05:49	06:15 (1)	05:14		05:24	06:27 (1)	06:08	06:37 (1)	07:00	07:50	07:46	08:33
	16:43	17:37	18:29	20:24	21:15	26 06:41 (1)	21:55		21:56	12 06:39 (1)	21:12	10 06:47 (1)	20:04	18:54	16:52	16:22
11	08:42	08:01	07:01	06:49	05:48	06:14 (1)	05:14		05:26	06:26 (1)	06:10	06:38 (1)	07:01	07:52	07:48	08:34
	16:44	17:39	18:31	20:25	21:17	28 06:42 (1)	21:56		21:55	14 06:40 (1)	21:10	7 06:45 (1)	20:02	18:52	16:50	16:22
12	08:41	07:59	06:59	06:47	05:46	06:12 (1)	05:13		05:27	06:25 (1)	06:12	06:40 (1)	07:03	07:54	07:50	08:35
	16:46	17:41	18:33	20:27	21:18	30 06:42 (1)	21:57		21:54	17 06:42 (1)	21:08	4 06:44 (1)	19:59	18:49	16:48	16:22
13	08:41	07:57	06:56	06:44	05:44	06:11 (1)	05:13		05:28	06:24 (1)	06:13		07:05	07:55	07:51	08:36
	16:47	17:43	18:35	20:29	21:20	31 06:42 (1)	21:58		21:53	19 06:43 (1)	21:06		19:57	18:47	16:47	16:22
14	08:40	07:55	06:54	06:42	05:43	06:09 (1)	05:13		05:29	06:24 (1)	06:15		07:06	07:57	07:53	08:37
	16:49	17:45	18:36	20:31	21:22	33 06:42 (1)	21:58		21:52	21 06:45 (1)	21:04		19:55	18:45	16:45	16:22
15	08:39	07:53	06:52	06:40	05:41	06:08 (1)	05:13		05:30	06:23 (1)	06:17		07:08	07:59	07:55	08:38
	16:51	17:47	18:38	20:32	21:23	34 06:42 (1)	21:59		21:51	23 06:46 (1)	21:02		19:52	18:43	16:44	16:22
16	08:38	07:51	06:49	06:38	05:40	06:07 (1)	05:12		05:31	06:23 (1)	06:18		07:10	08:01	07:57	08:39
	16:52	17:49	18:40	20:34	21:25	34 06:41 (1)	21:59		21:50	23 06:46 (1)	21:00		19:50	18:40	16:42	16:22
17	08:37	07:49	06:47	06:35	05:38	06:08 (1)	05:12		05:33	06:22 (1)	06:20		07:11	08:03	07:59	08:40
	16:54	17:51	18:42	20:36	21:26	34 06:42 (1)	22:00		21:49	25 06:47 (1)	20:58		19:48	18:38	16:41	16:22
18	08:36	07:47	06:45	06:33	05:37	06:08 (1)	05:12		05:34	06:21 (1)	06:22		07:13	08:04	08:00	08:41
	16:55	17:53	18:44	20:38	21:28	34 06:42 (1)	22:00		21:48	27 06:48 (1)	20:56		19:45	18:36	16:40	16:22
19	08:35	07:45	06:42	06:31	05:35	06:08 (1)	05:12		05:35	06:20 (1)	06:23		07:15	08:06	08:02	08:41
	16:57	17:54	18:45	20:39	21:29	33 06:41 (1)	22:01		21:47	28 06:48 (1)	20:54		19:43	18:34	16:38	16:23
20	08:34	07:43	06:40	06:29	05:34	06:09 (1)	05:12		05:36	06:21 (1)	06:25		07:16	08:08	08:04	08:42
	16:59	17:56	18:47	20:41	21:31	32 06:41 (1)	22:01		21:46	28 06:49 (1)	20:52		19:41	18:32	16:37	16:23
21	08:33	07:41	06:38	06:27	05:32	06:09 (1)	05:13		05:38	06:20 (1)	06:27		07:18	08:10	08:06	08:43
	17:01	17:58	18:49	20:43	21:32	32 06:41 (1)	22:01		21:44	30 06:50 (1)	20:49		19:38	18:30	16:36	16:23
22	08:32	07:39	06:35	06:25	05:31	06:10 (1)	05:13		05:39	06:19 (1)	06:28		07:20	08:11	08:07	08:43
	17:02	18:00	18:51	20:44	21:34	30 06:40 (1)	22:01		21:43	31 06:50 (1)	20:47		19:36	18:27	16:35	16:24
23	08:31	07:37	06:33	06:22	05:30	06:10 (1)	05:13		05:41	06:20 (1)	06:30		07:21	08:13	08:09	08:44
	17:04	18:02	18:52	20:46	21:35	29 06:39 (1)	22:02		21:42	31 06:51 (1)	20:45		19:33	18:25	16:34	16:24
24	08:29	07:34	06:31	06:20	05:28	06:10 (1)	05:13		05:42	06:19 (1)	06:32		07:23	08:15	08:11	08:44
	17:06	18:04	18:54	20:48	21:36	29 06:39 (1)	22:02		21:40	32 06:51 (1)	20:43		19:31	18:23	16:32	16:25
25	08:28	07:32	06:28	06:18	05:27	06:11 (1)	05:14		05:43	06:18 (1)	06:33		07:25	07:17	08:12	08:45
	17:08	18:06	18:56	20:50	21:38	27 06:38 (1)	22:02		21:39	33 06:51 (1)	20:41		19:29	17:21	16:31	16:25
26	08:27	07:30	06:26	06:16	05:26	06:12 (1)	05:14		05:45	06:19 (1)	06:35		07:26	07:19	08:14	08:45
	17:09	18:07	18:58	20:51	21:39	26 06:38 (1)	22:02		21:38	33 06:52 (1)	20:39		19:26	17:19	16:30	16:26
27	08:25	07:28	06:24	06:14	05:25	06:13 (1)	05:14		05:46	06:18 (1)	06:37		07:28	07:20	08:15	08:45
	17:11	18:09	18:59	20:53	21:41	24 06:37 (1)	22:02		21:36	34 06:52 (1)	20:36		19:24	17:17	16:29	16:27
28	08:24	07:26	06:21	06:12	05:24	06:13 (1)	05:15		05:48	06:18 (1)	06:38		07:30	07:22	08:17	08:45
	17:13	18:11	19:01	20:55	21:42	23 06:36 (1)	22:01		21:35	34 06:52 (1)	20:34		19:22	17:15	16:29	16:28
29	08:22		07:19	06:10	05:23	06:14 (1)	05:16		05:49	06:19 (1)	06:40		07:31	07:24	08:18	08:45
	17:15		20:03	20:57	21:43	22 06:36 (1)	22:01		21:33	34 06:53 (1)	20:32		19:19	17:13	16:28	16:29
30	08:21		07:17	06:08	06:33 (1) 05:22	06:16 (1)	05:16		05:51	06:20 (1)	06:41		07:33	07:26	08:20	08:46
	17:17		20:05	20:58	1 06:34 (1) 21:44	20 06:36 (1)	22:01		21:31	32 06:52 (1)	20:30		19:17	17:11	16:27	16:30
31	08:19		07:14		05:21	06:17 (1)			05:52	06:22 (1)	06:43			07:28		08:46
	17:19		20:06		21:46	18 06:35 (1)			21:30	31 06:53 (1)	20:27			17:09		16:30
Potential sun hours	257	277	367	417	487		501		504		455		381	331	265	241
Total, worst case				1	769		46		604		215					
Sun reduction				0.38	0.39		0.35		0.33		0.35					
Oper. time red.				1.00	1.00		1.00		1.00		1.00					
Wind dir. red.				0.60	0.60		0.60		0.60		0.60					
Total reduction				0.23	0.24		0.21		0.20		0.21					
Total, real				0	183		10		121		46					

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
Jennings O'Donovan
Finisklin Business Park
F91 RHH9 Sligo
+353719161416
padraig / podowd@jodireland.com
Calculated:
11/06/2025 09:22/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Real Case - V150 **Shadow receptor:** CR - 142

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:46	08:18	07:24	07:12	06:06	06:31 (1)	05:20	05:17	05:54	06:23 (1)	06:45	07:35	07:30	08:21
	16:32	17:20	18:13	20:08	21:00 11	06:42 (1)	21:47	22:01	21:28 33	06:56 (1)	20:25	19:15	17:07	16:26
2	08:45	08:16	07:21	07:10	06:04	06:29 (1)	05:19	05:17	05:56	06:25 (1)	06:46	07:36	07:31	08:23
	16:33	17:22	18:15	20:10	21:02 14	06:43 (1)	21:48	22:00	21:26 31	06:56 (1)	20:23	19:12	17:06	16:26
3	08:45	08:15	07:19	07:07	06:02	06:27 (1)	05:18	05:18	05:57	06:26 (1)	06:48	07:38	07:33	08:24
	16:34	17:24	18:17	20:11	21:03 16	06:43 (1)	21:49	22:00	21:25 30	06:56 (1)	20:20	19:10	17:04	16:25
4	08:45	08:13	07:17	07:05	06:00	06:25 (1)	05:17	05:19	05:59	06:28 (1)	06:50	07:40	07:35	08:26
	16:35	17:26	18:18	20:13	21:05 19	06:44 (1)	21:50	22:00	21:23 28	06:56 (1)	20:18	19:08	17:02	16:24
5	08:45	08:11	07:15	07:03	05:58	06:24 (1)	05:17	05:20	06:00	06:29 (1)	06:51	07:42	07:37	08:27
	16:36	17:28	18:20	20:15	21:07 21	06:45 (1)	21:51	21:59	21:21 26	06:55 (1)	20:16	19:05	17:00	16:24
6	08:44	08:10	07:12	07:00	05:57	06:22 (1)	05:16	05:21	06:02	06:31 (1)	06:53	07:43	07:39	08:28
	16:38	17:30	18:22	20:17	21:08 23	06:45 (1)	21:52	21:59	21:19 24	06:55 (1)	20:14	19:03	16:58	16:23
7	08:44	08:08	07:10	06:58	05:55	06:20 (1)	05:16	05:22	06:04	06:32 (1)	06:55	07:45	07:41	08:30
	16:39	17:32	18:24	20:18	21:10 25	06:45 (1)	21:53	21:58	21:18 22	06:54 (1)	20:11	19:01	16:57	16:23
8	08:44	08:06	07:08	06:56	05:53	06:19 (1)	05:15	05:22	06:05	06:34 (1)	06:56	07:47	07:42	08:31
	16:40	17:34	18:26	20:20	21:12 27	06:46 (1)	21:54	21:57	21:16 20	06:54 (1)	20:09	18:58	16:55	16:23
9	08:43	08:04	07:06	06:53	05:51	06:17 (1)	05:14	05:23	06:07	06:35 (1)	06:58	07:49	07:44	08:32
	16:42	17:36	18:28	20:22	21:13 29	06:46 (1)	21:55	21:57	21:14 18	06:53 (1)	20:07	18:56	16:53	16:22
10	08:43	08:02	07:03	06:51	05:49	06:15 (1)	05:14	05:24	06:08	06:37 (1)	07:00	07:50	07:46	08:33
	16:43	17:37	18:29	20:24	21:15 30	06:45 (1)	21:55	21:56	21:12 16	06:53 (1)	20:04	18:54	16:52	16:22
11	08:42	08:01	07:01	06:49	05:48	06:14 (1)	05:14	05:26	06:10	06:38 (1)	07:01	07:52	07:48	08:34
	16:44	17:39	18:31	20:25	21:17 32	06:46 (1)	21:56	21:55	21:10 13	06:51 (1)	20:02	18:52	16:50	16:22
12	08:41	07:59	06:59	06:47	05:46	06:12 (1)	05:13	05:27	06:12	06:40 (1)	07:03	07:54	07:50	08:35
	16:46	17:41	18:33	20:27	21:18 33	06:45 (1)	21:57	21:54	21:08 10	06:50 (1)	19:59	18:49	16:48	16:22
13	08:41	07:57	06:56	06:44	05:44	06:11 (1)	05:13	05:28 06:34 (1)	06:13	06:41 (1)	07:05	07:55	07:51	08:36
	16:47	17:43	18:35	20:29	21:20 35	06:46 (1)	21:58	21:53 6 06:40 (1)	21:06 7	06:48 (1)	19:57	18:47	16:47	16:22
14	08:40	07:55	06:54	06:42	05:43	06:11 (1)	05:13	05:29 06:32 (1)	06:15	06:43 (1)	07:06	07:57	07:53	08:37
	16:49	17:45	18:36	20:31	21:22 34	06:45 (1)	21:58	21:52 12 06:44 (1)	21:04 4	06:47 (1)	19:55	18:45	16:45	16:22
15	08:39	07:53	06:52	06:40	05:41	06:12 (1)	05:13	05:30 06:31 (1)	06:17		07:08	07:59	07:55	08:38
	16:51	17:47	18:38	20:32	21:23 33	06:45 (1)	21:59	21:51 14 06:45 (1)	21:02		19:52	18:43	16:44	16:22
16	08:38	07:51	06:49	06:38	05:40	06:11 (1)	05:12	05:31 06:29 (1)	06:18		07:10	08:01	07:57	08:39
	16:52	17:49	18:40	20:34	21:25 33	06:44 (1)	21:59	21:50 17 06:46 (1)	21:00		19:50	18:40	16:42	16:22
17	08:37	07:49	06:47	06:35	05:38	06:12 (1)	05:12	05:33 06:28 (1)	06:20		07:11	08:03	07:59	08:40
	16:54	17:51	18:42	20:36	21:26 32	06:44 (1)	22:00	21:49 20 06:48 (1)	20:58		19:48	18:38	16:41	16:22
18	08:36	07:47	06:45	06:33	05:37	06:13 (1)	05:12	05:34 06:27 (1)	06:22		07:13	08:04	08:00	08:41
	16:55	17:53	18:44	20:38	21:28 31	06:44 (1)	22:00	21:48 21 06:48 (1)	20:56		19:45	18:36	16:40	16:22
19	08:35	07:45	06:42	06:31	05:35	06:13 (1)	05:12	05:35 06:26 (1)	06:23		07:15	08:06	08:02	08:41
	16:57	17:54	18:45	20:39	21:29 30	06:43 (1)	22:01	21:47 23 06:49 (1)	20:54		19:43	18:34	16:38	16:23
20	08:34	07:43	06:40	06:29	05:34	06:14 (1)	05:12	05:36 06:26 (1)	06:25		07:16	08:08	08:04	08:42
	16:59	17:56	18:47	20:41	21:31 29	06:43 (1)	22:01	21:46 25 06:51 (1)	20:52		19:41	18:32	16:37	16:23
21	08:33	07:41	06:38	06:27	05:32	06:14 (1)	05:13	05:38 06:25 (1)	06:27		07:18	08:10	08:06	08:43
	17:01	17:58	18:49	20:43	21:32 29	06:43 (1)	22:01	21:44 27 06:52 (1)	20:49		19:38	18:30	16:36	16:23
22	08:32	07:39	06:35	06:25	05:31	06:15 (1)	05:13	05:39 06:24 (1)	06:28		07:20	08:11	08:07	08:43
	17:02	18:00	18:51	20:44	21:34 27	06:42 (1)	22:01	21:43 28 06:52 (1)	20:47		19:36	18:27	16:35	16:24
23	08:31	07:37	06:33	06:22	05:30	06:15 (1)	05:13	05:41 06:25 (1)	06:30		07:21	08:13	08:09	08:44
	17:04	18:02	18:52	20:46	21:35 26	06:41 (1)	22:02	21:42 28 06:53 (1)	20:45		19:33	18:25	16:34	16:24
24	08:29	07:34	06:31	06:20	05:28	06:16 (1)	05:13	05:42 06:24 (1)	06:32		07:23	08:15	08:11	08:44
	17:06	18:04	18:54	20:48	21:36 24	06:40 (1)	22:02	21:40 30 06:54 (1)	20:43		19:31	18:23	16:32	16:25
25	08:28	07:32	06:28	06:18	05:27	06:17 (1)	05:14	05:43 06:23 (1)	06:33		07:25	07:17	08:12	08:45
	17:08	18:06	18:56	20:50	21:38 22	06:39 (1)	22:02	21:39 31 06:54 (1)	20:41		19:29	17:21	16:31	16:25
26	08:27	07:30	06:26	06:16	05:26	06:18 (1)	05:14	05:45 06:23 (1)	06:35		07:26	07:19	08:14	08:45
	17:09	18:07	18:58	20:51	21:39 21	06:39 (1)	22:02	21:38 32 06:55 (1)	20:39		19:26	17:19	16:30	16:26
27	08:25	07:28	06:24	06:14	05:25	06:19 (1)	05:14	05:46 06:22 (1)	06:37		07:28	07:20	08:15	08:45
	17:11	18:09	18:59	20:53	21:41 19	06:38 (1)	22:02	21:36 33 06:55 (1)	20:36		19:24	17:17	16:29	16:27
28	08:24	07:26	06:21	06:12 06:36 (1)	05:24	06:21 (1)	05:15	05:48 06:22 (1)	06:38		07:30	07:22	08:17	08:45
	17:13	18:11	19:01	20:55 1 06:37 (1)	21:42 15	06:36 (1)	22:01	21:35 33 06:55 (1)	20:34		19:22	17:15	16:29	16:28
29	08:22		07:19	06:10 06:35 (1)	05:23	06:22 (1)	05:16	05:49 06:22 (1)	06:40		07:31	07:24	08:18	08:45
	17:15		20:03	20:57 5 06:40 (1)	21:43 13	06:35 (1)	22:01	21:33 34 06:56 (1)	20:32		19:19	17:13	16:28	16:29
30	08:21		07:17	06:08 06:33 (1)	05:22	06:25 (1)	05:16	05:51 06:21 (1)	06:41		07:33	07:26	08:20	08:46
	17:17		20:05	20:58 8 06:41 (1)	21:44 9	06:34 (1)	22:01	21:31 35 06:56 (1)	20:30		19:17	17:11	16:27	16:30
31	08:19		07:14		05:21			05:52 06:22 (1)	06:43			07:28		08:46
	17:19		20:06		21:46			21:30 34 06:56 (1)	20:27			17:09		16:30
Potential sun hours	257	277	367	417	487	501	504	455	381	331	265	241
Total, worst case				14	742		483	282				
Sun reduction				0.38	0.39		0.33	0.35				
Oper. time red.				1.00	1.00		1.00	1.00				
Wind dir. red.				0.60	0.60		0.60	0.60				
Total reduction				0.23	0.24		0.20	0.21				
Total, real				3	177		97	60				

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
Jennings O'Donovan
Finisklin Business Park
F91 RHH9 Sligo
+353719161416
padraig / podowd@jodireland.com
Calculated:
11/06/2025 09:22/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Real Case - V150 **Shadow receptor:** CS - 143

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:46	08:18	07:24	07:12	06:06	06:31 (2)	05:20	05:17	05:54	06:23 (2)	06:45	07:11 (1)	07:35	07:30	08:22
	16:32	17:20	18:13	20:08	21:00	06:32 (2)	21:47	22:01	21:28	06:47 (2)	20:25	07:36 (1)	19:15	17:07	16:26
2	08:45	08:16	07:21	07:10	06:04	06:29 (2)	05:19	05:17	05:56	06:25 (2)	06:46	07:13 (1)	07:37	07:31	08:23
	16:33	17:22	18:15	20:10	21:02	06:33 (2)	21:48	22:00	21:26	06:47 (2)	20:23	07:36 (1)	19:12	17:06	16:26
3	08:45	08:15	07:19	07:07	06:02	06:27 (2)	05:18	05:18	05:57	06:26 (2)	06:48	07:14 (1)	07:38	07:33	08:24
	16:34	17:24	18:17	20:12	21:03	06:34 (2)	21:49	22:00	21:25	06:47 (2)	20:20	07:35 (1)	19:10	17:04	16:25
4	08:45	08:13	07:17	07:05	06:00	06:25 (2)	05:17	05:19	05:59	06:28 (2)	06:50	07:16 (1)	07:40	07:35	08:26
	16:35	17:26	18:18	20:13	21:05	06:34 (2)	21:50	22:00	21:23	06:47 (2)	20:18	07:35 (1)	19:08	17:02	16:24
5	08:45	08:11	07:15	07:03	05:58	06:24 (2)	05:17	05:20	06:00	06:29 (2)	06:51	07:17 (1)	07:42	07:37	08:27
	16:36	17:28	18:20	20:15	21:07	06:36 (2)	21:51	21:59	21:21	06:46 (2)	20:16	07:34 (1)	19:05	17:00	16:24
6	08:44	08:10	07:12	07:00	05:57	06:22 (2)	05:16	05:21	06:02	06:31 (2)	06:53	07:19 (1)	07:43	07:39	08:28
	16:38	17:30	18:22	20:17	21:08	06:36 (2)	21:52	21:59	21:19	06:46 (2)	20:14	07:33 (1)	19:03	16:58	16:23
7	08:44	08:08	07:10	06:58	05:55	06:20 (2)	05:16	05:22	06:04	06:32 (2)	06:55	07:21 (1)	07:45	07:41	08:30
	16:39	17:32	18:24	20:18	21:10	06:36 (2)	21:53	21:58	21:18	06:45 (2)	20:11	07:33 (1)	19:01	16:57	16:23
8	08:44	08:06	07:08	06:56	05:53	06:19 (2)	05:15	05:22	06:05	06:34 (2)	06:56	07:22 (1)	07:47	07:42	08:31
	16:40	17:34	18:26	20:20	21:12	06:37 (2)	21:54	21:57	21:16	06:45 (2)	20:09	07:31 (1)	18:58	16:55	16:23
9	08:43	08:04	07:06	06:53	05:51	06:17 (2)	05:14	05:23	06:07	06:35 (2)	06:58	07:24 (1)	07:49	07:44	08:32
	16:42	17:36	18:28	20:22	21:13	06:37 (2)	21:55	21:57	21:14	06:43 (2)	20:07	07:30 (1)	18:56	16:53	16:22
10	08:43	08:02	07:03	06:51	05:49	06:15 (2)	05:14	05:24	06:08	06:37 (2)	07:00	07:25 (1)	07:50	07:46	08:33
	16:43	17:37	18:29	20:24	21:15	06:36 (2)	21:55	21:56	21:12	06:43 (2)	20:04	07:27 (1)	18:54	16:52	16:22
11	08:42	08:01	07:01	06:49	05:48	06:14 (2)	05:14	05:26	06:10	06:38 (2)	07:01		07:52	07:48	08:34
	16:44	17:39	18:31	20:25	21:17	06:37 (2)	21:56	21:55	21:10	06:41 (2)	20:02		18:52	16:50	16:22
12	08:41	07:59	06:59	06:47	05:46	06:12 (2)	05:13	05:27	06:12		07:03		07:54	07:50	08:35
	16:46	17:41	18:33	20:27	21:18	06:36 (2)	21:57	21:54	21:08		19:59		18:49	16:48	16:22
13	08:41	07:57	06:56	06:44	05:44	06:11 (2)	05:13	05:28	06:13		07:05		07:55	07:51	08:36
	16:47	17:43	18:35	20:29	21:20	06:37 (2)	21:58	21:53	21:06		19:57		18:47	16:47	16:22
14	08:40	07:55	06:54	06:42	05:43	06:09 (2)	05:13	05:29	06:29 (2)	06:15	07:06		07:57	07:53	08:37
	16:49	17:45	18:36	20:31	21:22	06:36 (2)	21:58	21:52	3	06:32 (2)	21:04	19:55		18:45	16:45	16:22
15	08:39	07:53	06:52	06:40	05:41	06:08 (2)	05:13	05:30	06:26 (2)	06:17	07:08		07:59	07:55	08:38
	16:51	17:47	18:38	20:32	21:23	06:36 (2)	21:59	21:51	9	06:35 (2)	21:02	19:52		18:43	16:44	16:22
16	08:38	07:51	06:49	06:38	05:40	06:06 (2)	05:12	05:31	06:24 (2)	06:18	07:10		08:01	07:57	08:39
	16:52	17:49	18:40	20:34	21:25	06:35 (2)	21:59	21:50	13	06:37 (2)	21:00	19:50		18:40	16:42	16:22
17	08:37	07:49	06:47	06:35	05:38	06:06 (2)	05:12	05:33	06:22 (2)	06:20	07:11		08:03	07:59	08:40
	16:54	17:51	18:42	20:36	21:26	06:35 (2)	22:00	21:49	16	06:38 (2)	20:58	19:48		18:38	16:41	16:22
18	08:36	07:47	06:45	06:33	05:37	06:07 (2)	05:12	05:34	06:21 (2)	06:22	07:13		08:04	08:00	08:41
	16:55	17:53	18:44	20:38	21:28	06:35 (2)	22:00	21:48	18	06:39 (2)	20:56	19:45		18:36	16:40	16:22
19	08:35	07:45	06:42	06:31	05:35	06:06 (2)	05:12	05:35	06:20 (2)	06:23	07:15		08:06	08:02	08:41
	16:57	17:54	18:45	20:39	21:29	06:34 (2)	22:01	21:47	20	06:40 (2)	20:54	19:43		18:34	16:38	16:23
20	08:34	07:43	06:40	06:29	05:34	06:07 (2)	05:12	05:36	06:20 (2)	06:25	07:16		08:08	08:04	08:42
	16:59	17:56	18:47	20:41	21:31	06:34 (2)	22:01	21:46	22	06:42 (2)	20:52	19:41		18:32	16:37	16:23
21	08:33	07:41	06:38	06:27	05:32	06:08 (2)	05:13	05:38	06:19 (2)	06:27	07:18		08:10	08:06	08:43
	17:01	17:58	18:49	20:43	21:32	06:34 (2)	22:01	21:45	24	06:43 (2)	20:49	19:38		18:30	16:36	16:23
22	08:32	07:39	06:35	06:25	05:31	06:09 (2)	05:13	05:39	06:18 (2)	06:28	07:20		08:11	08:07	08:43
	17:02	18:00	18:51	20:44	21:34	06:33 (2)	22:01	21:43	25	06:43 (2)	20:47	19:36		18:27	16:35	16:24
23	08:31	07:37	06:33	06:22	05:30	06:09 (2)	05:13	05:41	06:18 (2)	06:30	07:21		08:13	08:09	08:44
	17:04	18:02	18:52	20:46	21:35	06:32 (2)	22:02	21:42	26	06:44 (2)	20:45	19:33		18:25	16:34	16:24
24	08:29	07:34	06:31	06:20	05:28	06:10 (2)	05:13	05:42	06:17 (2)	06:32	07:18 (1)	07:23		08:15	08:11	08:44
	17:06	18:04	18:54	20:48	21:36	06:31 (2)	22:02	21:40	28	06:45 (2)	20:43	9	07:27 (1)	19:31		18:23	16:32	16:25
25	08:28	07:32	06:28	06:18	05:27	06:11 (2)	05:14	05:43	06:17 (2)	06:33	07:16 (1)	07:25		07:17	08:12	08:45
	17:08	18:06	18:56	20:50	21:38	06:30 (2)	22:02	21:39	28	06:45 (2)	20:41	15	07:31 (1)	19:29		17:21	16:31	16:25
26	08:27	07:30	06:26	06:16	05:26	06:12 (2)	05:14	05:45	06:17 (2)	06:35	07:14 (1)	07:26		07:19	08:14	08:45
	17:09	18:07	18:58	20:51	21:39	06:29 (2)	22:02	21:38	29	06:46 (2)	20:39	19	07:33 (1)	19:26		17:19	16:30	16:26
27	08:25	07:28	06:24	06:14	05:25	06:14 (2)	05:14	05:46	06:16 (2)	06:37	07:12 (1)	07:28		07:20	08:15	08:45
	17:11	18:09	18:59	20:53	21:41	06:28 (2)	22:02	21:36	30	06:46 (2)	20:36	21	07:33 (1)	19:24		17:17	16:29	16:27
28	08:24	07:26	06:21	06:12	05:24	06:15 (2)	05:15	05:48	06:17 (2)	06:38	07:11 (1)	07:30		07:22	08:17	08:45
	17:13	18:11	19:01	20:55	21:42	06:27 (2)	22:01	21:35	29	06:46 (2)	20:34	24	07:35 (1)	19:22		17:15	16:29	16:28
29	08:22		07:19	06:10	05:23	06:17 (2)	05:16	05:49	06:19 (2)	06:40	07:09 (1)	07:31		07:24	08:19	08:45
	17:15		20:03	20:57	21:43	06:24 (2)	22:01	21:33	28	06:47 (2)	20:32	26	07:35 (1)	19:19		17:13	16:28	16:29
30	08:21		07:17	06:08	05:22		05:16	05:51	06:20 (2)	06:41	07:08 (1)	07:33		07:26	08:20	08:46
	17:17		20:05	20:58	21:44		22:01	21:31	27	06:47 (2)	20:30	27	07:35 (1)	19:17		17:11	16:27	16:30
31	08:19		07:14		05:21			05:52	06:22 (2)	06:43	07:10 (1)			07:28		08:46
	17:19		20:06		21:46			21:30	25	06:47 (2)	20:27	26	07:36 (1)			17:09		16:30
Potential sun hours	257	277	367	417	487	501	504	455	381	331	265	241
Total, worst case				313	554		400	326	148			
Sun reduction				0.38	0.39		0.33	0.35	0.34			
Oper. time red.				1.00	1.00		1.00	1.00	1.00			
Wind dir. red.				0.60	0.60		0.60	0.60	0.60			
Total reduction				0.23	0.24		0.20	0.21	0.20			
Total, real				71	132		80	69	30			

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
Jennings O'Donovan
Finisklin Business Park
F91 RHH9 Sligo
+353719161416
padraig / podowd@jodireland.com
Calculated:
11/06/2025 09:22/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Real Case - V150 **Shadow receptor:** CT - 144

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:46	08:18	07:24	07:12	06:06	06:31 (2)	05:20	05:17		05:54	06:23 (2)	06:45	07:11 (1)	07:35	07:30	08:22
	16:32	17:20	18:13	20:08	21:00 5	06:36 (2)	21:47	22:01		21:28 22	06:45 (2)	20:25 16	07:27 (1)	19:15	17:07	16:26
2	08:45	08:16	07:21	07:10	06:04	06:29 (2)	05:19	05:17		05:56	06:25 (2)	06:46	07:13 (1)	07:37	07:31	08:23
	16:33	17:22	18:15	20:10	21:02 7	06:36 (2)	21:48	22:00		21:26 21	06:46 (2)	20:23 14	07:27 (1)	19:12	17:06	16:26
3	08:45	08:15	07:19	07:07	06:02	06:27 (2)	05:18	05:18		05:57	06:26 (2)	06:48	07:14 (1)	07:38	07:33	08:24
	16:34	17:24	18:17	20:12	21:03 9	06:36 (2)	21:49	22:00		21:25 20	06:46 (2)	20:20 12	07:26 (1)	19:10	17:04	16:25
4	08:45	08:13	07:17	07:05	06:00	06:25 (2)	05:17	05:19		05:59	06:28 (2)	06:50	07:16 (1)	07:40	07:35	08:26
	16:35	17:26	18:18	20:13	21:05 11	06:36 (2)	21:50	22:00		21:23 19	06:47 (2)	20:18 10	07:26 (1)	19:08	17:02	16:24
5	08:45	08:11	07:15	07:03	05:58	06:24 (2)	05:17	05:20		06:00	06:29 (2)	06:51	07:17 (1)	07:42	07:37	08:27
	16:36	17:28	18:20	20:15 1	07:27 (1) 21:07 13	06:37 (2)	21:51	21:59		21:21 17	06:46 (2)	20:16 7	07:24 (1)	19:05	17:00	16:24
6	08:44	08:10	07:12	07:00	07:23 (1) 05:57	06:22 (2)	05:16	05:21		06:02	06:31 (2)	06:53	07:19 (1)	07:43	07:39	08:28
	16:38	17:30	18:22	20:17 4	07:27 (1) 21:08 15	06:37 (2)	21:52	21:59		21:19 16	06:47 (2)	20:14 4	07:23 (1)	19:03	16:58	16:23
7	08:44	08:08	07:10	06:58	07:21 (1) 05:55	06:20 (2)	05:16	05:22		06:04	06:32 (2)	06:55	07:21 (1)	07:45	07:41	08:30
	16:39	17:32	18:24	20:18 7	07:28 (1) 21:10 16	06:36 (2)	21:53	21:58		21:18 14	06:46 (2)	20:11 1	07:22 (1)	19:01	16:57	16:23
8	08:44	08:06	07:08	06:56	07:19 (1) 05:53	06:19 (2)	05:15	05:22		06:05	06:34 (2)	06:56		07:47	07:42	08:31
	16:40	17:34	18:26	20:20 10	07:29 (1) 21:12 18	06:37 (2)	21:54	21:57		21:16 13	06:47 (2)	20:09		18:58	16:55	16:23
9	08:43	08:04	07:06	06:53	07:16 (1) 05:51	06:17 (2)	05:14	05:23		06:07	06:35 (2)	06:58		07:49	07:44	08:32
	16:42	17:36	18:28	20:22 12	07:28 (1) 21:13 19	06:36 (2)	21:55	21:57		21:14 11	06:46 (2)	20:07		18:56	16:53	16:22
10	08:43	08:02	07:03	06:51	07:14 (1) 05:49	06:15 (2)	05:14	05:24		06:08	06:37 (2)	07:00		07:50	07:46	08:33
	16:43	17:37	18:29	20:24 14	07:28 (1) 21:15 21	06:36 (2)	21:56	21:56		21:12 9	06:46 (2)	20:04		18:54	16:52	16:22
11	08:42	08:01	07:01	06:49	07:12 (1) 05:48	06:14 (2)	05:14	05:26		06:10	06:38 (2)	07:01		07:52	07:48	08:34
	16:44	17:39	18:31	20:25 16	07:28 (1) 21:17 22	06:36 (2)	21:56	21:55		21:10 6	06:44 (2)	20:02		18:52	16:50	16:22
12	08:41	07:59	06:59	06:47	07:10 (1) 05:46	06:12 (2)	05:13	05:27		06:12	06:40 (2)	07:03		07:54	07:50	08:35
	16:46	17:41	18:33	20:27 18	07:28 (1) 21:18 23	06:35 (2)	21:57	21:54		21:08 4	06:44 (2)	19:59		18:49	16:48	16:22
13	08:41	07:57	06:56	06:44	07:08 (1) 05:44	06:13 (2)	05:13	05:28		06:13	06:41 (2)	07:05		07:55	07:52	08:36
	16:47	17:43	18:35	20:29 19	07:27 (1) 21:20 22	06:35 (2)	21:58	21:53		21:06 1	06:42 (2)	19:57		18:47	16:47	16:22
14	08:40	07:55	06:54	06:42	07:05 (1) 05:43	06:13 (2)	05:13	05:29		06:15		07:06		07:57	07:53	08:37
	16:49	17:45	18:36	20:31 21	07:26 (1) 21:22 20	06:33 (2)	21:58	21:52		21:04		19:55		18:45	16:45	16:22
15	08:39	07:53	06:52	06:40	07:04 (1) 05:41	06:14 (2)	05:13	05:30		06:17		07:08		07:59	07:55	08:38
	16:51	17:47	18:38	20:32 21	07:25 (1) 21:23 19	06:33 (2)	21:59	21:51		21:02		19:52		18:43	16:44	16:22
16	08:38	07:51	06:49	06:38	07:05 (1) 05:40	06:15 (2)	05:12	05:31		06:18		07:10		08:01	07:57	08:39
	16:52	17:49	18:40	20:34 18	07:23 (1) 21:25 16	06:31 (2)	21:59	21:50		21:00		19:50		18:40	16:42	16:22
17	08:37	07:49	06:47	06:35	07:06 (1) 05:38	06:16 (2)	05:12	05:33		06:20		07:11		08:03	07:59	08:40
	16:54	17:51	18:42	20:36 16	07:22 (1) 21:26 14	06:30 (2)	22:00	21:49		20:58		19:48		18:38	16:41	16:22
18	08:36	07:47	06:45	06:33	07:08 (1) 05:37	06:18 (2)	05:12	05:34		06:22		07:13		08:04	08:00	08:41
	16:55	17:53	18:44	20:38 11	07:19 (1) 21:28 11	06:29 (2)	22:00	21:48		20:56		19:45		18:36	16:40	16:22
19	08:35	07:45	06:42	06:31	05:35	06:21 (2)	05:12	05:35		06:23		07:15		08:06	08:02	08:41
	16:57	17:54	18:45	20:39	21:29 4	06:25 (2)	22:01	21:47		20:54		19:43		18:34	16:38	16:23
20	08:34	07:43	06:40	06:29	05:34		05:12	05:36		06:25		07:16		08:08	08:04	08:42
	16:59	17:56	18:47	20:41	21:31		22:01	21:46		20:52		19:41		18:32	16:37	16:23
21	08:33	07:41	06:38	06:27	05:32		05:13	05:38		06:27		07:18		08:10	08:06	08:43
	17:01	17:58	18:49	20:43	21:32		22:01	21:45		20:49		19:38		18:30	16:36	16:23
22	08:32	07:39	06:35	06:25	05:31		05:13	05:39		06:28		07:20		08:11	08:07	08:43
	17:02	18:00	18:51	20:44	21:34		22:01	21:43		20:47		19:36		18:27	16:35	16:24
23	08:31	07:37	06:33	06:22	05:30		05:13	05:41		06:30		07:21		08:13	08:09	08:44
	17:04	18:02	18:52	20:46	21:35		22:02	21:42		20:45		19:33		18:25	16:34	16:24
24	08:29	07:34	06:31	06:20	05:28		05:13	05:42		06:32	07:15 (1)	07:23		08:15	08:11	08:44
	17:06	18:04	18:54	20:48	21:37		22:02	21:40		20:43 3	07:18 (1)	19:31		18:23	16:32	16:25
25	08:28	07:32	06:28	06:18	05:27		05:14	05:43	06:29 (2)	06:33	07:11 (1)	07:25		07:17	08:12	08:45
	17:08	18:06	18:56	20:50	21:38		22:02	21:39 8	06:37 (2)	20:41 12	07:23 (1)	19:29		17:21	16:31	16:26
26	08:27	07:30	06:26	06:16	05:26		05:14	05:45	06:28 (2)	06:35	07:09 (1)	07:26		07:19	08:14	08:45
	17:09	18:07	18:58	20:51	21:39		22:02	21:38 12	06:40 (2)	20:39 16	07:25 (1)	19:26		17:19	16:30	16:26
27	08:25	07:28	06:24	06:14	05:25		05:14	05:46	06:26 (2)	06:37	07:07 (1)	07:28		07:21	08:15	08:45
	17:11	18:09	18:59	20:53	21:41		22:02	21:36 15	06:41 (2)	20:36 18	07:25 (1)	19:24		17:17	16:30	16:27
28	08:24	07:26	06:21	06:12	05:24		05:15	05:48	06:24 (2)	06:38	07:06 (1)	07:30		07:22	08:17	08:45
	17:13	18:11	19:01	20:55	21:42		22:01	21:35 18	06:42 (2)	20:34 21	07:27 (1)	19:22		17:15	16:29	16:28
29	08:22		07:19	06:10	05:23		05:16	05:49	06:24 (2)	06:40	07:06 (1)	07:31		07:24	08:19	08:45
	17:15		20:03	20:57	21:43		22:01	21:33 20	06:44 (2)	20:32 20	07:26 (1)	19:19		17:13	16:28	16:29
30	08:21		07:17	06:08	06:33 (2) 05:22		05:16	05:51	06:23 (2)	06:42	07:08 (1)	07:33		07:26	08:20	08:46
	17:17		20:05	20:58 2	06:35 (2) 21:44		22:01	21:31 21	06:44 (2)	20:30 19	07:27 (1)	19:17		17:11	16:27	16:30
31	08:19		07:14		05:21			05:52	06:23 (2)	06:43	07:10 (1)			07:28		08:46
	17:19		20:06		21:46			21:30 22	06:45 (2)	20:27 18	07:28 (1)			17:09		16:30
Potential sun hours	257	277	367	417	487	501	504	455	381	331	265	241
Total, worst case				190	285		116	300	64			
Sun reduction				0.38	0.39		0.33	0.35	0.34			
Oper. time red.				1.00	1.00		1.00	1.00	1.00			
Wind dir. red.				0.60	0.60		0.60	0.60	0.60			
Total reduction				0.23	0.24		0.20	0.21	0.20			
Total, real				43	68		23	64	13			

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

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SHADOW - Calendar

Calculation: 6839 Garrane WF Real Case - V150 **Shadow receptor:** CU - 145

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January	February	March	April		May		June		
1	08:46	08:18	07:24	07:12		06:06		06:31 (2)	05:20	
	16:32	17:20	18:13	20:08		21:00	4	06:35 (2)	21:47	
2	08:45	08:16	07:21	07:10		06:04		06:29 (2)	05:19	
	16:33	17:22	18:15	20:10		21:02	6	06:35 (2)	21:48	
3	08:45	08:15	07:19	07:07		06:02		06:27 (2)	05:18	
	16:34	17:24	18:17	20:12		21:03	9	06:36 (2)	21:49	
4	08:45	08:13	07:17	07:05		06:00		06:25 (2)	05:18	
	16:35	17:26	18:18	20:13		21:05	11	06:36 (2)	21:50	
5	08:45	08:11	07:15	07:03		05:58		06:24 (2)	05:17	
	16:36	17:28	18:20	20:15		21:07	12	06:36 (2)	21:51	
6	08:44	08:10	07:12	07:00	07:23 (1)	05:57		06:22 (2)	05:16	
	16:38	17:30	18:22	20:17	1 07:24 (1)	21:08	14	06:36 (2)	21:52	
7	08:44	08:08	07:10	06:58	07:21 (1)	05:55		06:20 (2)	05:16	
	16:39	17:32	18:24	20:18	4 07:25 (1)	21:10	16	06:36 (2)	21:53	
8	08:44	08:06	07:08	06:56	07:19 (1)	05:53		06:19 (2)	05:15	
	16:40	17:34	18:26	20:20	7 07:26 (1)	21:12	17	06:36 (2)	21:54	
9	08:43	08:04	07:06	06:53	07:16 (1)	05:51		06:17 (2)	05:14	
	16:42	17:36	18:28	20:22	9 07:25 (1)	21:13	19	06:36 (2)	21:55	
10	08:43	08:02	07:03	06:51	07:14 (1)	05:49		06:15 (2)	05:14	
	16:43	17:37	18:29	20:24	12 07:26 (1)	21:15	20	06:35 (2)	21:56	
11	08:42	08:01	07:01	06:49	07:12 (1)	05:48		06:14 (2)	05:14	
	16:44	17:39	18:31	20:25	14 07:26 (1)	21:17	21	06:35 (2)	21:56	
12	08:41	07:59	06:59	06:47	07:10 (1)	05:46		06:12 (2)	05:13	
	16:46	17:41	18:33	20:27	16 07:26 (1)	21:18	22	06:34 (2)	21:57	
13	08:41	07:57	06:56	06:44	07:08 (1)	05:44		06:13 (2)	05:13	
	16:47	17:43	18:35	20:29	17 07:25 (1)	21:20	21	06:34 (2)	21:58	
14	08:40	07:55	06:54	06:42	07:05 (1)	05:43		06:13 (2)	05:13	
	16:49	17:45	18:36	20:31	19 07:24 (1)	21:22	19	06:32 (2)	21:58	
15	08:39	07:53	06:52	06:40	07:03 (1)	05:41		06:15 (2)	05:13	
	16:51	17:47	18:38	20:32	20 07:23 (1)	21:23	17	06:32 (2)	21:59	
16	08:38	07:51	06:49	06:38	07:03 (1)	05:40		06:15 (2)	05:12	05:43 (4)
	16:52	17:49	18:40	20:34	19 07:22 (1)	21:25	15	06:30 (2)	21:59	1 05:44 (4)
17	08:37	07:49	06:47	06:35	07:04 (1)	05:38		06:17 (2)	05:12	05:43 (4)
	16:54	17:51	18:42	20:36	16 07:20 (1)	21:26	12	06:29 (2)	22:00	1 05:44 (4)
18	08:36	07:47	06:45	06:33	07:06 (1)	05:37		06:20 (2)	05:12	05:43 (3)
	16:55	17:53	18:44	20:38	13 07:19 (1)	21:28	6	06:26 (2)	22:00	1 05:44 (3)
19	08:35	07:45	06:42	06:31	07:09 (1)	05:35			05:12	05:43 (3)
	16:57	17:54	18:45	20:39	6 07:15 (1)	21:29			22:01	1 05:44 (3)
20	08:34	07:43	06:40	06:29		05:34			05:12	05:43 (3)
	16:59	17:56	18:47	20:41		21:31			22:01	1 05:44 (3)
21	08:33	07:41	06:38	06:27		05:32			05:13	05:44 (3)
	17:01	17:58	18:49	20:43		21:32			22:01	1 05:45 (3)
22	08:32	07:39	06:35	06:25		05:31			05:13	05:44 (3)
	17:02	18:00	18:51	20:45		21:34			22:01	1 05:45 (3)
23	08:31	07:37	06:33	06:22		05:30			05:13	05:44 (3)
	17:04	18:02	18:52	20:46		21:35			22:02	1 05:45 (3)
24	08:29	07:34	06:31	06:20		05:28			05:13	05:44 (3)
	17:06	18:04	18:54	20:48		21:37			22:02	1 05:45 (3)
25	08:28	07:32	06:28	06:18		05:27			05:14	05:45 (4)
	17:08	18:06	18:56	20:50		21:38			22:02	1 05:46 (4)
26	08:27	07:30	06:26	06:16		05:26			05:14	05:45 (4)
	17:09	18:07	18:58	20:51		21:39			22:02	1 05:46 (4)
27	08:25	07:28	06:24	06:14		05:25			05:14	
	17:11	18:09	18:59	20:53		21:41			22:02	
28	08:24	07:26	06:21	06:12		05:24			05:15	
	17:13	18:11	19:01	20:55		21:42			22:01	
29	08:22		07:19	06:10		05:23			05:16	
	17:15		20:03	20:57		21:43			22:01	
30	08:21		07:17	06:08	06:33 (2)	05:22			05:16	
	17:17		20:05	20:58	1 06:34 (2)	21:44			22:01	
31	08:19		07:14			05:21				
	17:19		20:06			21:46				
Potential sun hours	257	277	367	417		487			501	
Total, worst case					174		261			11
Sun reduction					0.38		0.39			0.35
Oper. time red.					1.00		1.00			1.00
Wind dir. red.					0.59		0.60			0.61
Total reduction					0.23		0.24			0.21
Total, real					39		62			2

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

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Calculated:
11/06/2025 09:22/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Real Case - V150 **Shadow receptor:** CU - 145

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	July		August		September		October	November	December
1	05:17		05:54		06:23 (2)	06:45	07:11 (1)	07:35	07:30	08:22
	22:01		21:28	22	06:45 (2)	20:25	14	07:25 (1)	19:15	17:07	16:26
2	05:17		05:56		06:25 (2)	06:46	07:13 (1)	07:37	07:31	08:23
	22:00		21:26	21	06:46 (2)	20:23	12	07:25 (1)	19:12	17:06	16:26
3	05:18		05:57		06:26 (2)	06:48	07:14 (1)	07:38	07:33	08:24
	22:00		21:25	19	06:45 (2)	20:20	10	07:24 (1)	19:10	17:04	16:25
4	05:19		05:59		06:28 (2)	06:50	07:16 (1)	07:40	07:35	08:26
	22:00		21:23	18	06:46 (2)	20:18	7	07:23 (1)	19:08	17:02	16:24
5	05:20		06:00		06:29 (2)	06:51	07:18 (1)	07:42	07:37	08:27
	21:59		21:21	17	06:46 (2)	20:16	4	07:22 (1)	19:05	17:00	16:24
6	05:21		06:02		06:31 (2)	06:53	07:19 (1)	07:43	07:39	08:28
	21:59		21:19	15	06:46 (2)	20:14	1	07:20 (1)	19:03	16:58	16:23
7	05:22		06:04		06:32 (2)	06:55			07:45	07:41	08:30
	21:58		21:18	14	06:46 (2)	20:11			19:01	16:57	16:23
8	05:22		06:05		06:34 (2)	06:56			07:47	07:42	08:31
	21:57		21:16	12	06:46 (2)	20:09			18:58	16:55	16:23
9	05:23		06:07		06:35 (2)	06:58			07:49	07:44	08:32
	21:57		21:14	10	06:45 (2)	20:07			18:56	16:53	16:22
10	05:24		06:08		06:37 (2)	07:00			07:50	07:46	08:33
	21:56		21:12	8	06:45 (2)	20:04			18:54	16:52	16:22
11	05:26		06:10		06:38 (2)	07:01			07:52	07:48	08:34
	21:55		21:10	6	06:44 (2)	20:02			18:52	16:50	16:22
12	05:27		06:12		06:40 (2)	07:03			07:54	07:50	08:35
	21:54		21:08	3	06:43 (2)	19:59			18:49	16:48	16:22
13	05:28		06:13		06:41 (2)	07:05			07:55	07:52	08:36
	21:53		21:06	1	06:42 (2)	19:57			18:47	16:47	16:22
14	05:29		06:15			07:06			07:57	07:53	08:37
	21:52		21:04			19:55			18:45	16:45	16:22
15	05:30		06:17			07:08			07:59	07:55	08:38
	21:51		21:02			19:52			18:43	16:44	16:22
16	05:31		06:18			07:10			08:01	07:57	08:39
	21:50		21:00			19:50			18:40	16:42	16:22
17	05:33		06:20			07:11			08:03	07:59	08:40
	21:49		20:58			19:48			18:38	16:41	16:22
18	05:34		06:22			07:13			08:04	08:00	08:41
	21:48		20:56			19:45			18:36	16:40	16:22
19	05:35		06:23			07:15			08:06	08:02	08:41
	21:47		20:54			19:43			18:34	16:38	16:23
20	05:36		06:25			07:16			08:08	08:04	08:42
	21:46		20:52			19:41			18:32	16:37	16:23
21	05:38		06:27			07:18			08:10	08:06	08:43
	21:45		20:49			19:38			18:30	16:36	16:23
22	05:39		06:28			07:20			08:11	08:07	08:43
	21:43		20:47			19:36			18:27	16:35	16:24
23	05:41		06:30			07:21			08:13	08:09	08:44
	21:42		20:45			19:33			18:25	16:34	16:24
24	05:42		06:32		07:11 (1)	07:23			08:15	08:11	08:44
	21:40		20:43	8	07:19 (1)	19:31			18:23	16:32	16:25
25	05:43		06:33		07:08 (1)	07:25			07:17	08:12	08:45
	21:39		20:41	14	07:22 (1)	19:29			17:21	16:31	16:26
26	05:45		06:29 (2)	06:35		07:07 (1)	07:26		07:19	08:14	08:45
	21:38	9	06:38 (2)	20:39	16	07:23 (1)	19:26		17:19	16:30	16:26
27	05:46		06:27 (2)	06:37		07:05 (1)	07:28		07:21	08:15	08:45
	21:36	13	06:40 (2)	20:36	19	07:24 (1)	19:24		17:17	16:30	16:27
28	05:48		06:25 (2)	06:38		07:05 (1)	07:30		07:22	08:17	08:45
	21:35	16	06:41 (2)	20:34	20	07:25 (1)	19:22		17:15	16:29	16:28
29	05:49		06:25 (2)	06:40		07:06 (1)	07:31		07:24	08:19	08:45
	21:33	18	06:43 (2)	20:32	19	07:25 (1)	19:19		17:13	16:28	16:29
30	05:51		06:23 (2)	06:42		07:08 (1)	07:33		07:26	08:20	08:46
	21:31	20	06:43 (2)	20:30	17	07:25 (1)	19:17		17:11	16:27	16:30
31	05:52		06:23 (2)	06:43		07:10 (1)			07:28		08:46
	21:30	21	06:44 (2)	20:27	16	07:26 (1)			17:09		16:30
Potential sun hours	504			455		381			331	265	241
Total, worst case		97			295		48				
Sun reduction		0.33			0.35		0.34				
Oper. time red.		1.00			1.00		1.00				
Wind dir. red.		0.60			0.60		0.59				
Total reduction		0.20			0.21		0.20				
Total, real		19			63		10				

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

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SHADOW - Calendar

Calculation: 6839 Garrane WF Real Case - V150 **Shadow receptor:** CV - 146

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January	February	March	April		May		June	
1	08:46	08:18	07:24	07:12		06:06	06:31 (2)	05:20	
	16:32	17:20	18:13	20:08		21:00	6 06:37 (2)	21:47	
2	08:45	08:16	07:21	07:10		06:04	06:29 (2)	05:19	
	16:33	17:22	18:15	20:10		21:02	9 06:38 (2)	21:48	
3	08:45	08:15	07:19	07:07		06:02	06:27 (2)	05:18	
	16:34	17:24	18:17	20:12		21:03	10 06:37 (2)	21:49	
4	08:45	08:13	07:17	07:05		06:00	06:25 (2)	05:18	
	16:35	17:26	18:19	20:13		21:05	12 06:37 (2)	21:50	
5	08:45	08:11	07:15	07:03		05:58	06:24 (2)	05:17	
	16:36	17:28	18:20	20:15		21:07	14 06:38 (2)	21:51	
6	08:44	08:10	07:12	07:00	07:23 (1)	05:57	06:22 (2)	05:16	
	16:38	17:30	18:22	20:17	1 07:24 (1)	21:08	15 06:37 (2)	21:52	
7	08:44	08:08	07:10	06:58	07:21 (1)	05:55	06:20 (2)	05:16	05:45 (3)
	16:39	17:32	18:24	20:18	4 07:25 (1)	21:10	17 06:37 (2)	21:53	1 05:46 (3)
8	08:44	08:06	07:08	06:56	07:19 (1)	05:53	06:19 (2)	05:15	05:45 (3)
	16:40	17:34	18:26	20:20	7 07:26 (1)	21:12	18 06:37 (2)	21:54	2 05:47 (3)
9	08:43	08:04	07:06	06:53	07:17 (1)	05:51	06:17 (2)	05:14	05:45 (3)
	16:42	17:36	18:28	20:22	9 07:26 (1)	21:13	19 06:36 (2)	21:55	3 05:48 (3)
10	08:43	08:02	07:03	06:51	07:14 (1)	05:49	06:15 (2)	05:14	05:44 (3)
	16:43	17:37	18:29	20:24	11 07:25 (1)	21:15	20 06:35 (2)	21:56	4 05:48 (3)
11	08:42	08:01	07:01	06:49	07:12 (1)	05:48	06:16 (2)	05:14	05:44 (3)
	16:44	17:39	18:31	20:25	13 07:25 (1)	21:17	19 06:35 (2)	21:56	4 05:48 (3)
12	08:41	07:59	06:59	06:47	07:10 (1)	05:46	06:16 (2)	05:13	05:44 (3)
	16:46	17:41	18:33	20:27	15 07:25 (1)	21:18	17 06:33 (2)	21:57	5 05:49 (3)
13	08:41	07:57	06:56	06:44	07:08 (1)	05:44	06:18 (2)	05:13	05:43 (3)
	16:47	17:43	18:35	20:29	17 07:25 (1)	21:20	15 06:33 (2)	21:58	5 05:48 (3)
14	08:40	07:55	06:54	06:42	07:05 (1)	05:43	06:19 (2)	05:13	05:43 (3)
	16:49	17:45	18:36	20:31	18 07:23 (1)	21:22	11 06:30 (2)	21:58	6 05:49 (3)
15	08:39	07:53	06:52	06:40	07:03 (1)	05:41	06:22 (2)	05:13	05:43 (3)
	16:51	17:47	18:38	20:32	19 07:22 (1)	21:23	6 06:28 (2)	21:59	6 05:49 (3)
16	08:38	07:51	06:49	06:38	07:04 (1)	05:40		05:12	05:43 (3)
	16:52	17:49	18:40	20:34	16 07:20 (1)	21:25		21:59	7 05:50 (3)
17	08:37	07:49	06:47	06:35	07:06 (1)	05:38		05:12	05:43 (3)
	16:54	17:51	18:42	20:36	13 07:19 (1)	21:26		22:00	7 05:50 (3)
18	08:36	07:47	06:45	06:33	07:09 (1)	05:37		05:12	05:43 (3)
	16:55	17:53	18:44	20:38	7 07:16 (1)	21:28		22:00	7 05:50 (3)
19	08:35	07:45	06:42	06:31		05:35		05:12	05:43 (3)
	16:57	17:54	18:45	20:39		21:29		22:01	7 05:50 (3)
20	08:34	07:43	06:40	06:29		05:34		05:12	05:43 (3)
	16:59	17:56	18:47	20:41		21:31		22:01	7 05:50 (3)
21	08:33	07:41	06:38	06:27		05:32		05:13	05:44 (3)
	17:01	17:58	18:49	20:43		21:32		22:01	7 05:51 (3)
22	08:32	07:39	06:35	06:25		05:31		05:13	05:44 (3)
	17:02	18:00	18:51	20:45		21:34		22:01	7 05:51 (3)
23	08:31	07:37	06:33	06:22		05:30		05:13	05:44 (3)
	17:04	18:02	18:52	20:46		21:35		22:02	7 05:51 (3)
24	08:29	07:34	06:31	06:20		05:28		05:13	05:44 (3)
	17:06	18:04	18:54	20:48		21:37		22:02	7 05:51 (3)
25	08:28	07:32	06:28	06:18		05:27		05:14	05:45 (3)
	17:08	18:06	18:56	20:50		21:38		22:02	7 05:52 (3)
26	08:27	07:30	06:26	06:16		05:26		05:14	05:45 (3)
	17:09	18:07	18:58	20:51		21:39		22:02	7 05:52 (3)
27	08:25	07:28	06:24	06:14		05:25		05:14	05:46 (3)
	17:11	18:09	18:59	20:53		21:41		22:02	6 05:52 (3)
28	08:24	07:26	06:21	06:12		05:24		05:15	05:46 (3)
	17:13	18:11	19:01	20:55		21:42		22:02	6 05:52 (3)
29	08:22		07:19	06:10	06:35 (2)	05:23		05:16	05:47 (3)
	17:15		20:03	20:57	2 06:37 (2)	21:43		22:01	6 05:53 (3)
30	08:21		07:17	06:08	06:33 (2)	05:22		05:16	05:47 (3)
	17:17		20:05	20:58	4 06:37 (2)	21:44		22:01	5 05:52 (3)
31	08:19		07:14			05:21			
	17:19		20:06			21:46			
Potential sun hours	257	277	367	417		487		501	
Total, worst case					156		208		136
Sun reduction					0.38		0.39		0.35
Oper. time red.					1.00		1.00		1.00
Wind dir. red.					0.59		0.60		0.60
Total reduction					0.23		0.24		0.21
Total, real					35		50		29

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
Jennings O'Donovan
Finisklin Business Park
F91 RHH9 Sligo
+353719161416
padraig / podowd@jodireland.com

Calculated:
11/06/2025 09:22/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Real Case - V150 **Shadow receptor:** CV - 146

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	July			August			September			October	November	December
1	05:17		05:48 (3)	05:54		06:26 (2)	06:45		07:11 (1)	07:35	07:30	08:22
	22:01	4	05:52 (3)	21:28	18	06:44 (2)	20:25	13	07:24 (1)	19:15	17:07	16:26
2	05:17		05:49 (3)	05:56		06:26 (2)	06:47		07:13 (1)	07:37	07:31	08:23
	22:00	4	05:53 (3)	21:26	20	06:46 (2)	20:23	11	07:24 (1)	19:12	17:06	16:26
3	05:18		05:49 (3)	05:57		06:26 (2)	06:48		07:14 (1)	07:38	07:33	08:24
	22:00	3	05:52 (3)	21:25	20	06:46 (2)	20:20	9	07:23 (1)	19:10	17:04	16:25
4	05:19		05:50 (3)	05:59		06:28 (2)	06:50		07:16 (1)	07:40	07:35	08:26
	22:00	2	05:52 (3)	21:23	19	06:47 (2)	20:18	7	07:23 (1)	19:08	17:02	16:24
5	05:20		05:51 (3)	06:00		06:29 (2)	06:51		07:18 (1)	07:42	07:37	08:27
	21:59	1	05:52 (3)	21:21	18	06:47 (2)	20:16	4	07:22 (1)	19:05	17:00	16:24
6	05:21			06:02		06:31 (2)	06:53		07:19 (1)	07:43	07:39	08:28
	21:59			21:19	16	06:47 (2)	20:14	1	07:20 (1)	19:03	16:58	16:23
7	05:22			06:04		06:32 (2)	06:55			07:45	07:41	08:30
	21:58			21:18	15	06:47 (2)	20:11			19:01	16:57	16:23
8	05:22			06:05		06:34 (2)	06:56			07:47	07:42	08:31
	21:57			21:16	13	06:47 (2)	20:09			18:58	16:55	16:23
9	05:23			06:07		06:35 (2)	06:58			07:49	07:44	08:32
	21:57			21:14	12	06:47 (2)	20:07			18:56	16:53	16:22
10	05:25			06:08		06:37 (2)	07:00			07:50	07:46	08:33
	21:56			21:12	10	06:47 (2)	20:04			18:54	16:52	16:22
11	05:26			06:10		06:38 (2)	07:01			07:52	07:48	08:34
	21:55			21:10	8	06:46 (2)	20:02			18:52	16:50	16:22
12	05:27			06:12		06:40 (2)	07:03			07:54	07:50	08:35
	21:54			21:08	6	06:46 (2)	19:59			18:49	16:48	16:22
13	05:28			06:13		06:41 (2)	07:05			07:55	07:52	08:36
	21:53			21:06	4	06:45 (2)	19:57			18:47	16:47	16:22
14	05:29			06:15		06:43 (2)	07:06			07:57	07:53	08:37
	21:52			21:04	1	06:44 (2)	19:55			18:45	16:45	16:22
15	05:30			06:17			07:08			07:59	07:55	08:38
	21:51			21:02			19:52			18:43	16:44	16:22
16	05:31			06:18			07:10			08:01	07:57	08:39
	21:50			21:00			19:50			18:40	16:42	16:22
17	05:33			06:20			07:11			08:03	07:59	08:40
	21:49			20:58			19:48			18:38	16:41	16:22
18	05:34			06:22			07:13			08:04	08:00	08:41
	21:48			20:56			19:45			18:36	16:40	16:22
19	05:35			06:23			07:15			08:06	08:02	08:41
	21:47			20:54			19:43			18:34	16:38	16:23
20	05:37			06:25			07:16			08:08	08:04	08:42
	21:46			20:52			19:41			18:32	16:37	16:23
21	05:38			06:27			07:18			08:10	08:06	08:43
	21:45			20:49			19:38			18:30	16:36	16:23
22	05:39			06:28			07:20			08:11	08:07	08:43
	21:43			20:47			19:36			18:27	16:35	16:24
23	05:41			06:30			07:21			08:13	08:09	08:44
	21:42			20:45			19:33			18:25	16:34	16:24
24	05:42			06:32			07:23			08:15	08:11	08:44
	21:40			20:43			19:31			18:23	16:32	16:25
25	05:43			06:33		07:11 (1)	07:25			07:17	08:12	08:45
	21:39			20:41	8	07:19 (1)	19:29			17:21	16:31	16:26
26	05:45			06:35		07:08 (1)	07:26			07:19	08:14	08:45
	21:38			20:39	14	07:22 (1)	19:26			17:19	16:30	16:26
27	05:46			06:37		07:06 (1)	07:28			07:21	08:15	08:45
	21:36			20:36	16	07:22 (1)	19:24			17:17	16:30	16:27
28	05:48			06:38		07:05 (1)	07:30			07:22	08:17	08:45
	21:35			20:34	19	07:24 (1)	19:22			17:15	16:29	16:28
29	05:49		06:31 (2)	06:40		07:06 (1)	07:31			07:24	08:19	08:45
	21:33	9	06:40 (2)	20:32	18	07:24 (1)	19:19			17:13	16:28	16:29
30	05:51		06:29 (2)	06:42		07:08 (1)	07:33			07:26	08:20	08:46
	21:31	13	06:42 (2)	20:30	16	07:24 (1)	19:17			17:11	16:27	16:30
31	05:53		06:28 (2)	06:43		07:10 (1)				07:28		08:46
	21:30	15	06:43 (2)	20:27	15	07:25 (1)				17:09		16:30
Potential sun hours	504			455			381			331	265	241
Total, worst case		51			286			45				
Sun reduction		0.33			0.35			0.34				
Oper. time red.		1.00			1.00			1.00				
Wind dir. red.		0.60			0.60			0.59				
Total reduction		0.20			0.21			0.20				
Total, real		10			61			9				

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
Jennings O'Donovan
Finisklin Business Park
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+353719161416
padraig / podowd@jodireland.com
Calculated:
11/06/2025 09:22/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Real Case - V150 **Shadow receptor:** CW - 147

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January	February	March	April			May			June		
1	08:46	08:18	07:24	07:12			06:06		06:31 (2)	05:20		
	16:32	17:20	18:13	20:08			21:00	8	06:39 (2)	21:47		
2	08:45	08:16	07:21	07:10			06:04		06:29 (2)	05:19		
	16:33	17:22	18:15	20:10			21:02	9	06:38 (2)	21:48		
3	08:45	08:15	07:19	07:07			06:02		06:27 (2)	05:18		
	16:34	17:24	18:17	20:12			21:03	11	06:38 (2)	21:49		
4	08:45	08:13	07:17	07:05			06:00		06:25 (2)	05:18		05:47 (3)
	16:35	17:26	18:19	20:13			21:05	13	06:38 (2)	21:50	1	05:48 (3)
5	08:45	08:11	07:15	07:03			05:58		06:24 (2)	05:17		05:46 (3)
	16:36	17:28	18:20	20:15			21:07	15	06:39 (2)	21:51	2	05:48 (3)
6	08:44	08:10	07:12	07:00		07:23 (1)	05:57		06:22 (2)	05:16		05:46 (3)
	16:38	17:30	18:22	20:17	1	07:24 (1)	21:08	16	06:38 (2)	21:52	3	05:49 (3)
7	08:44	08:08	07:10	06:58		07:21 (1)	05:55		06:20 (2)	05:16		05:45 (3)
	16:39	17:32	18:24	20:18	4	07:25 (1)	21:10	17	06:37 (2)	21:53	4	05:49 (3)
8	08:44	08:06	07:08	06:56		07:19 (1)	05:53		06:19 (2)	05:15		05:45 (3)
	16:40	17:34	18:26	20:20	7	07:26 (1)	21:12	18	06:37 (2)	21:54	5	05:50 (3)
9	08:43	08:04	07:06	06:53		07:17 (1)	05:51		06:17 (2)	05:14		05:45 (3)
	16:42	17:36	18:28	20:22	9	07:26 (1)	21:13	19	06:36 (2)	21:55	6	05:51 (3)
10	08:43	08:02	07:03	06:51		07:14 (1)	05:49		06:17 (2)	05:14		05:44 (3)
	16:43	17:37	18:29	20:24	11	07:25 (1)	21:15	18	06:35 (2)	21:56	7	05:51 (3)
11	08:42	08:01	07:01	06:49		07:12 (1)	05:48		06:18 (2)	05:14		05:44 (3)
	16:44	17:39	18:31	20:25	13	07:25 (1)	21:17	16	06:34 (2)	21:56	7	05:51 (3)
12	08:41	07:59	06:59	06:47		07:10 (1)	05:46		06:19 (2)	05:13		05:44 (3)
	16:46	17:41	18:33	20:27	15	07:25 (1)	21:18	14	06:33 (2)	21:57	8	05:52 (3)
13	08:41	07:57	06:56	06:44		07:08 (1)	05:44		06:21 (2)	05:13		05:43 (3)
	16:47	17:43	18:35	20:29	16	07:24 (1)	21:20	10	06:31 (2)	21:58	8	05:51 (3)
14	08:40	07:55	06:54	06:42		07:05 (1)	05:43		06:24 (2)	05:13		05:43 (3)
	16:49	17:45	18:36	20:31	17	07:22 (1)	21:22	3	06:27 (2)	21:58	9	05:52 (3)
15	08:39	07:53	06:52	06:40		07:04 (1)	05:41			05:13		05:43 (3)
	16:51	17:47	18:38	20:32	17	07:21 (1)	21:23			21:59	9	05:52 (3)
16	08:38	07:51	06:49	06:38		07:05 (1)	05:40			05:12		05:43 (3)
	16:52	17:49	18:40	20:34	15	07:20 (1)	21:25			21:59	10	05:53 (3)
17	08:37	07:49	06:47	06:35		07:07 (1)	05:38			05:12		05:43 (3)
	16:54	17:51	18:42	20:36	11	07:18 (1)	21:26			22:00	10	05:53 (3)
18	08:36	07:47	06:45	06:33			05:37			05:12		05:43 (3)
	16:55	17:53	18:44	20:38			21:28			22:00	10	05:53 (3)
19	08:35	07:45	06:42	06:31			05:35			05:12		05:43 (3)
	16:57	17:54	18:45	20:39			21:29			22:01	10	05:53 (3)
20	08:34	07:43	06:40	06:29			05:34			05:12		05:43 (3)
	16:59	17:56	18:47	20:41			21:31			22:01	10	05:53 (3)
21	08:33	07:41	06:38	06:27			05:32			05:13		05:44 (3)
	17:01	17:58	18:49	20:43			21:32			22:01	10	05:54 (3)
22	08:32	07:39	06:35	06:25			05:31			05:13		05:44 (3)
	17:02	18:00	18:51	20:45			21:34			22:01	10	05:54 (3)
23	08:31	07:37	06:33	06:22			05:30			05:13		05:44 (3)
	17:04	18:02	18:52	20:46			21:35			22:02	10	05:54 (3)
24	08:29	07:34	06:31	06:20			05:28			05:13		05:44 (3)
	17:06	18:04	18:54	20:48			21:37			22:02	10	05:54 (3)
25	08:28	07:32	06:28	06:18			05:27			05:14		05:45 (3)
	17:08	18:06	18:56	20:50			21:38			22:02	10	05:55 (3)
26	08:27	07:30	06:26	06:16			05:26			05:14		05:45 (3)
	17:09	18:07	18:58	20:51			21:39			22:02	10	05:55 (3)
27	08:25	07:28	06:24	06:14			05:25			05:14		05:46 (3)
	17:11	18:09	18:59	20:53			21:41			22:02	9	05:55 (3)
28	08:24	07:26	06:21	06:12			05:24			05:15		05:46 (3)
	17:13	18:11	19:01	20:55			21:42			22:02	9	05:55 (3)
29	08:22		07:19	06:10		06:35 (2)	05:23			05:16		05:47 (3)
	17:15		20:03	20:57	3	06:38 (2)	21:43			22:01	9	05:56 (3)
30	08:21		07:17	06:08		06:33 (2)	05:22			05:16		05:47 (3)
	17:17		20:05	20:58	5	06:38 (2)	21:44			22:01	8	05:55 (3)
31	08:19		07:14				05:21					
	17:19		20:06				21:46					
Potential sun hours	257	277	367	417			487			501		
Total, worst case					144			187			214	
Sun reduction					0.38			0.39			0.35	
Oper. time red.					1.00			1.00			1.00	
Wind dir. red.					0.60			0.60			0.60	
Total reduction					0.23			0.24			0.21	
Total, real					33			45			45	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

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Calculated:
11/06/2025 09:22/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Real Case - V150 **Shadow receptor:** CW - 147

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	July			August			September			October	November	December
1	05:17		05:48 (3)	05:54		06:29 (2)	06:45		07:11 (1)	07:35	07:30	08:22
	22:01	8	05:56 (3)	21:28	14	06:43 (2)	20:25	13	07:24 (1)	19:15	17:07	16:26
2	05:17		05:49 (3)	05:56		06:28 (2)	06:47		07:13 (1)	07:37	07:31	08:23
	22:00	7	05:56 (3)	21:26	17	06:45 (2)	20:23	11	07:24 (1)	19:12	17:06	16:26
3	05:18		05:49 (3)	05:57		06:27 (2)	06:48		07:14 (1)	07:38	07:33	08:24
	22:00	6	05:55 (3)	21:25	19	06:46 (2)	20:20	9	07:23 (1)	19:10	17:04	16:25
4	05:19		05:50 (3)	05:59		06:28 (2)	06:50		07:16 (1)	07:40	07:35	08:26
	22:00	6	05:56 (3)	21:23	19	06:47 (2)	20:18	7	07:23 (1)	19:08	17:02	16:24
5	05:20		05:51 (3)	06:00		06:29 (2)	06:51		07:18 (1)	07:42	07:37	08:27
	21:59	5	05:56 (3)	21:21	18	06:47 (2)	20:16	4	07:22 (1)	19:05	17:00	16:24
6	05:21		05:52 (3)	06:02		06:31 (2)	06:53		07:19 (1)	07:43	07:39	08:28
	21:59	4	05:56 (3)	21:19	17	06:48 (2)	20:14	1	07:20 (1)	19:03	16:58	16:23
7	05:22		05:53 (3)	06:04		06:32 (2)	06:55			07:45	07:41	08:30
	21:58	3	05:56 (3)	21:18	15	06:47 (2)	20:11			19:01	16:57	16:23
8	05:23		05:54 (3)	06:05		06:34 (2)	06:56			07:47	07:42	08:31
	21:57	2	05:56 (3)	21:16	14	06:48 (2)	20:09			18:58	16:55	16:23
9	05:23		05:54 (3)	06:07		06:35 (2)	06:58			07:49	07:44	08:32
	21:57	1	05:55 (3)	21:14	12	06:47 (2)	20:07			18:56	16:53	16:22
10	05:25			06:08		06:37 (2)	07:00			07:50	07:46	08:33
	21:56			21:12	11	06:48 (2)	20:04			18:54	16:52	16:22
11	05:26			06:10		06:38 (2)	07:01			07:52	07:48	08:34
	21:55			21:10	9	06:47 (2)	20:02			18:52	16:50	16:22
12	05:27			06:12		06:40 (2)	07:03			07:54	07:50	08:35
	21:54			21:08	7	06:47 (2)	19:59			18:49	16:48	16:22
13	05:28			06:13		06:41 (2)	07:05			07:55	07:52	08:36
	21:53			21:06	5	06:46 (2)	19:57			18:47	16:47	16:22
14	05:29			06:15		06:43 (2)	07:06			07:57	07:53	08:37
	21:52			21:04	2	06:45 (2)	19:55			18:45	16:45	16:22
15	05:30			06:17			07:08			07:59	07:55	08:38
	21:51			21:02			19:52			18:43	16:44	16:22
16	05:31			06:18			07:10			08:01	07:57	08:39
	21:50			21:00			19:50			18:40	16:42	16:22
17	05:33			06:20			07:11			08:03	07:59	08:40
	21:49			20:58			19:48			18:38	16:41	16:22
18	05:34			06:22			07:13			08:04	08:00	08:41
	21:48			20:56			19:45			18:36	16:40	16:22
19	05:35			06:23			07:15			08:06	08:02	08:41
	21:47			20:54			19:43			18:34	16:38	16:23
20	05:37			06:25			07:16			08:08	08:04	08:42
	21:46			20:52			19:41			18:32	16:37	16:23
21	05:38			06:27			07:18			08:10	08:06	08:43
	21:45			20:49			19:38			18:30	16:36	16:23
22	05:39			06:28			07:20			08:11	08:07	08:43
	21:43			20:47			19:36			18:27	16:35	16:24
23	05:41			06:30			07:21			08:13	08:09	08:44
	21:42			20:45			19:33			18:25	16:34	16:24
24	05:42			06:32			07:23			08:15	08:11	08:44
	21:40			20:43			19:31			18:23	16:33	16:25
25	05:43			06:33		07:13 (1)	07:25			07:17	08:12	08:45
	21:39			20:41	3	07:16 (1)	19:29			17:21	16:31	16:26
26	05:45			06:35		07:09 (1)	07:26			07:19	08:14	08:45
	21:38			20:39	12	07:21 (1)	19:26			17:19	16:30	16:26
27	05:46			06:37		07:07 (1)	07:28			07:21	08:15	08:45
	21:36			20:36	15	07:22 (1)	19:24			17:17	16:30	16:27
28	05:48			06:38		07:06 (1)	07:30			07:22	08:17	08:45
	21:35			20:34	17	07:23 (1)	19:22			17:15	16:29	16:28
29	05:49			06:40		07:06 (1)	07:31			07:24	08:19	08:45
	21:33			20:32	17	07:23 (1)	19:19			17:13	16:28	16:29
30	05:51		06:33 (2)	06:42		07:08 (1)	07:33			07:26	08:20	08:46
	21:31	6	06:39 (2)	20:30	16	07:24 (1)	19:17			17:11	16:27	16:30
31	05:53		06:31 (2)	06:43		07:10 (1)				07:28		08:46
	21:30	11	06:42 (2)	20:27	15	07:25 (1)				17:09		16:30
Potential sun hours	504			455			381			331	265	241
Total, worst case		59			274			45				
Sun reduction		0.33			0.35			0.34				
Oper. time red.		1.00			1.00			1.00				
Wind dir. red.		0.60			0.60			0.59				
Total reduction		0.20			0.21			0.20				
Total, real		12			58			9				

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

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SHADOW - Calendar

Calculation: 6839 Garrane WF Real Case - V150 **Shadow receptor:** CX - 148

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January	February	March	April		May		June	
1	08:46	08:18	07:24	07:12		06:06		05:20	
	16:32	17:20	18:13	20:08		21:00	9	06:40 (2)	1
2	08:45	08:16	07:21	07:10		06:04		06:29 (2)	05:19
	16:33	17:22	18:15	20:10		21:02	10	06:39 (2)	21:48
3	08:45	08:15	07:19	07:07		06:02		06:27 (2)	05:18
	16:34	17:24	18:17	20:12		21:03	12	06:39 (2)	21:49
4	08:45	08:13	07:17	07:05		06:00		06:25 (2)	05:18
	16:35	17:26	18:19	20:13		21:05	14	06:39 (2)	21:50
5	08:45	08:11	07:15	07:03		05:58		06:24 (2)	05:17
	16:36	17:28	18:20	20:15		21:07	15	06:39 (2)	21:51
6	08:44	08:10	07:12	07:00	07:23 (1)	05:57		06:22 (2)	05:16
	16:38	17:30	18:22	20:17	1 07:24 (1)	21:08	16	06:38 (2)	21:52
7	08:44	08:08	07:10	06:58	07:21 (1)	05:55		06:20 (2)	05:16
	16:39	17:32	18:24	20:18	4 07:25 (1)	21:10	17	06:37 (2)	21:53
8	08:44	08:06	07:08	06:56	07:19 (1)	05:53		06:19 (2)	05:15
	16:40	17:34	18:26	20:20	7 07:26 (1)	21:12	18	06:37 (2)	21:54
9	08:43	08:04	07:06	06:53	07:17 (1)	05:51		06:18 (2)	05:14
	16:42	17:36	18:28	20:22	9 07:26 (1)	21:13	18	06:36 (2)	21:55
10	08:43	08:02	07:03	06:51	07:14 (1)	05:49		06:19 (2)	05:14
	16:43	17:37	18:29	20:24	11 07:25 (1)	21:15	16	06:35 (2)	21:56
11	08:42	08:01	07:01	06:49	07:12 (1)	05:48		06:21 (2)	05:14
	16:44	17:39	18:31	20:25	13 07:25 (1)	21:17	13	06:34 (2)	21:56
12	08:41	07:59	06:59	06:47	07:10 (1)	05:46		06:22 (2)	05:13
	16:46	17:41	18:33	20:27	14 07:24 (1)	21:18	9	06:31 (2)	21:57
13	08:41	07:57	06:56	06:44	07:08 (1)	05:44			05:13
	16:47	17:43	18:35	20:29	16 07:24 (1)	21:20			21:58
14	08:40	07:55	06:54	06:42	07:05 (1)	05:43			05:13
	16:49	17:45	18:36	20:31	17 07:22 (1)	21:22			21:58
15	08:39	07:53	06:52	06:40	07:04 (1)	05:41			05:13
	16:51	17:47	18:38	20:32	17 07:21 (1)	21:23			21:59
16	08:38	07:51	06:49	06:38	07:06 (1)	05:40			05:12
	16:52	17:49	18:40	20:34	13 07:19 (1)	21:25			21:59
17	08:37	07:49	06:47	06:35	07:08 (1)	05:38			05:12
	16:54	17:51	18:42	20:36	8 07:16 (1)	21:26			22:00
18	08:36	07:47	06:45	06:33		05:37			05:12
	16:55	17:53	18:44	20:38		21:28			22:00
19	08:35	07:45	06:42	06:31		05:35			05:12
	16:57	17:54	18:45	20:39		21:29			22:01
20	08:34	07:43	06:40	06:29		05:34			05:12
	16:59	17:56	18:47	20:41		21:31			22:01
21	08:33	07:41	06:38	06:27		05:32			05:13
	17:01	17:58	18:49	20:43		21:32			22:01
22	08:32	07:39	06:35	06:25		05:31			05:13
	17:02	18:00	18:51	20:45		21:34			22:01
23	08:31	07:37	06:33	06:22		05:30			05:13
	17:04	18:02	18:52	20:46		21:35			22:02
24	08:29	07:34	06:31	06:20		05:28			05:13
	17:06	18:04	18:54	20:48		21:37			22:02
25	08:28	07:32	06:28	06:18		05:27			05:14
	17:08	18:06	18:56	20:50		21:38			22:02
26	08:27	07:30	06:26	06:16		05:26			05:14
	17:09	18:07	18:58	20:51		21:39			22:02
27	08:25	07:28	06:24	06:14		05:25			05:14
	17:11	18:09	18:59	20:53		21:41			22:02
28	08:24	07:26	06:21	06:12	06:37 (2)	05:24			05:15
	17:13	18:11	19:01	20:55	2 06:39 (2)	21:42			22:02
29	08:22		07:19	06:10	06:35 (2)	05:23			05:16
	17:15		20:03	20:57	4 06:39 (2)	21:43			22:01
30	08:21		07:17	06:08	06:33 (2)	05:22			05:16
	17:17		20:05	20:58	6 06:39 (2)	21:44			22:01
31	08:19		07:14			05:21			
	17:19		20:06			21:46			
Potential sun hours	257	277	367	417		487		501	
Total, worst case					142		167		293
Sun reduction					0.38		0.39		0.35
Oper. time red.					1.00		1.00		1.00
Wind dir. red.					0.60		0.60		0.60
Total reduction					0.23		0.24		0.21
Total, real					32		40		61

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

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Calculated:
11/06/2025 09:22/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Real Case - V150 **Shadow receptor:** CX - 148

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	July			August			September			October	November	December
1	05:17		05:48 (3)	05:54		06:32 (2)	06:45		07:11 (1)	07:35	07:30	08:22
	22:01	10	05:58 (3)	21:28	11	06:43 (2)	20:25	13	07:24 (1)	19:15	17:07	16:26
2	05:17		05:49 (3)	05:56		06:31 (2)	06:47		07:13 (1)	07:37	07:31	08:23
	22:01	10	05:59 (3)	21:26	14	06:45 (2)	20:23	11	07:24 (1)	19:12	17:06	16:26
3	05:18		05:49 (3)	05:57		06:29 (2)	06:48		07:14 (1)	07:38	07:33	08:24
	22:00	9	05:58 (3)	21:25	16	06:45 (2)	20:20	9	07:23 (1)	19:10	17:04	16:25
4	05:19		05:50 (3)	05:59		06:28 (2)	06:50		07:16 (1)	07:40	07:35	08:26
	22:00	8	05:58 (3)	21:23	19	06:47 (2)	20:18	7	07:23 (1)	19:08	17:02	16:24
5	05:20		05:51 (3)	06:00		06:29 (2)	06:51		07:18 (1)	07:42	07:37	08:27
	21:59	8	05:59 (3)	21:21	18	06:47 (2)	20:16	4	07:22 (1)	19:05	17:00	16:24
6	05:21		05:52 (3)	06:02		06:31 (2)	06:53		07:19 (1)	07:43	07:39	08:28
	21:59	7	05:59 (3)	21:19	17	06:48 (2)	20:14	1	07:20 (1)	19:03	16:58	16:23
7	05:22		05:53 (3)	06:04		06:32 (2)	06:55			07:45	07:41	08:30
	21:58	6	05:59 (3)	21:18	16	06:48 (2)	20:11			19:01	16:57	16:23
8	05:23		05:54 (3)	06:05		06:34 (2)	06:56			07:47	07:42	08:31
	21:57	5	05:59 (3)	21:16	15	06:49 (2)	20:09			18:58	16:55	16:23
9	05:23		05:54 (3)	06:07		06:35 (2)	06:58			07:49	07:44	08:32
	21:57	4	05:58 (3)	21:14	13	06:48 (2)	20:07			18:56	16:53	16:22
10	05:25		05:55 (3)	06:08		06:37 (2)	07:00			07:50	07:46	08:33
	21:56	3	05:58 (3)	21:12	12	06:49 (2)	20:04			18:54	16:52	16:22
11	05:26		05:56 (3)	06:10		06:38 (2)	07:01			07:52	07:48	08:34
	21:55	2	05:58 (3)	21:10	10	06:48 (2)	20:02			18:52	16:50	16:22
12	05:27			06:12		06:40 (2)	07:03			07:54	07:50	08:35
	21:54			21:08	8	06:48 (2)	19:59			18:49	16:48	16:22
13	05:28			06:13		06:41 (2)	07:05			07:56	07:52	08:36
	21:53			21:06	6	06:47 (2)	19:57			18:47	16:47	16:22
14	05:29			06:15		06:43 (2)	07:06			07:57	07:53	08:37
	21:52			21:04	4	06:47 (2)	19:55			18:45	16:45	16:22
15	05:30			06:17		06:44 (2)	07:08			07:59	07:55	08:38
	21:51			21:02	1	06:45 (2)	19:52			18:43	16:44	16:22
16	05:31			06:18			07:10			08:01	07:57	08:39
	21:50			21:00			19:50			18:40	16:42	16:22
17	05:33			06:20			07:11			08:03	07:59	08:40
	21:49			20:58			19:48			18:38	16:41	16:22
18	05:34			06:22			07:13			08:04	08:00	08:41
	21:48			20:56			19:45			18:36	16:40	16:22
19	05:35			06:23			07:15			08:06	08:02	08:41
	21:47			20:54			19:43			18:34	16:38	16:23
20	05:37			06:25			07:16			08:08	08:04	08:42
	21:46			20:52			19:41			18:32	16:37	16:23
21	05:38			06:27			07:18			08:10	08:06	08:43
	21:45			20:49			19:38			18:30	16:36	16:23
22	05:39			06:28			07:20			08:11	08:07	08:43
	21:43			20:47			19:36			18:27	16:35	16:24
23	05:41			06:30			07:21			08:13	08:09	08:44
	21:42			20:45			19:33			18:25	16:34	16:24
24	05:42			06:32			07:23			08:15	08:11	08:44
	21:41			20:43			19:31			18:23	16:33	16:25
25	05:43			06:33			07:25			07:17	08:12	08:45
	21:39			20:41			19:29			17:21	16:31	16:26
26	05:45			06:35		07:11 (1)	07:26			07:19	08:14	08:45
	21:38			20:39	9	07:20 (1)	19:26			17:19	16:30	16:26
27	05:46			06:37		07:08 (1)	07:28			07:21	08:15	08:45
	21:36			20:36	13	07:21 (1)	19:24			17:17	16:30	16:27
28	05:48			06:38		07:06 (1)	07:30			07:22	08:17	08:45
	21:35			20:34	17	07:23 (1)	19:22			17:15	16:29	16:28
29	05:49			06:40		07:06 (1)	07:31			07:24	08:19	08:45
	21:33			20:32	17	07:23 (1)	19:19			17:13	16:28	16:29
30	05:51			06:42		07:08 (1)	07:33			07:26	08:20	08:46
	21:31			20:30	16	07:24 (1)	19:17			17:11	16:27	16:30
31	05:53		06:35 (2)	06:43		07:10 (1)				07:28		08:46
	21:30	5	06:40 (2)	20:27	14	07:24 (1)				17:09		16:30
Potential sun hours	504			455			381			331	265	241
Total, worst case		77			266			45				
Sun reduction		0.33			0.35			0.34				
Oper. time red.		1.00			1.00			1.00				
Wind dir. red.		0.60			0.60			0.59				
Total reduction		0.20			0.21			0.20				
Total, real		15			57			9				

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

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Calculated:
11/06/2025 09:22/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Real Case - V150 **Shadow receptor:** CY - 149

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January	February	March	April		May		June	
1	08:46	08:18	07:24	07:12		06:06		06:31 (2)	05:20		05:49 (3)
	16:32	17:20	18:13	20:08		21:00	9	06:40 (2)	21:47	4	05:53 (3)
2	08:45	08:16	07:21	07:10		06:04		06:29 (2)	05:19		05:48 (3)
	16:33	17:22	18:15	20:10		21:02	11	06:40 (2)	21:48	5	05:53 (3)
3	08:45	08:15	07:19	07:07		06:02		06:27 (2)	05:18		05:48 (3)
	16:34	17:24	18:17	20:12		21:03	13	06:40 (2)	21:49	6	05:54 (3)
4	08:45	08:13	07:17	07:05		06:00		06:25 (2)	05:18		05:47 (3)
	16:35	17:26	18:19	20:13		21:05	14	06:39 (2)	21:50	7	05:54 (3)
5	08:45	08:11	07:15	07:03		05:58		06:24 (2)	05:17		05:46 (3)
	16:36	17:28	18:20	20:15		21:07	16	06:40 (2)	21:51	8	05:54 (3)
6	08:44	08:10	07:12	07:00	07:23 (1)	05:57		06:22 (2)	05:16		05:46 (3)
	16:38	17:30	18:22	20:17	1 07:24 (1)	21:08	17	06:39 (2)	21:52	9	05:55 (3)
7	08:44	08:08	07:10	06:58	07:21 (1)	05:55		06:20 (2)	05:16		05:45 (3)
	16:39	17:32	18:24	20:18	4 07:25 (1)	21:10	18	06:38 (2)	21:53	10	05:55 (3)
8	08:44	08:06	07:08	06:56	07:19 (1)	05:53		06:20 (2)	05:15		05:45 (3)
	16:40	17:34	18:26	20:20	7 07:26 (1)	21:12	17	06:37 (2)	21:54	11	05:56 (3)
9	08:43	08:04	07:06	06:53	07:17 (1)	05:51		06:21 (2)	05:14		05:45 (3)
	16:42	17:36	18:28	20:22	9 07:26 (1)	21:13	15	06:36 (2)	21:55	11	05:56 (3)
10	08:43	08:02	07:03	06:51	07:14 (1)	05:49		06:21 (2)	05:14		05:44 (3)
	16:43	17:37	18:29	20:24	11 07:25 (1)	21:15	13	06:34 (2)	21:56	12	05:56 (3)
11	08:42	08:01	07:01	06:49	07:12 (1)	05:48		06:24 (2)	05:14		05:44 (3)
	16:44	17:39	18:31	20:25	13 07:25 (1)	21:17	8	06:32 (2)	21:56	12	05:56 (3)
12	08:41	07:59	06:59	06:47	07:10 (1)	05:46			05:13		05:44 (3)
	16:46	17:41	18:33	20:27	14 07:24 (1)	21:18			21:57	13	05:57 (3)
13	08:41	07:57	06:56	06:44	07:08 (1)	05:44			05:13		05:43 (3)
	16:47	17:43	18:35	20:29	16 07:24 (1)	21:20			21:58	13	05:56 (3)
14	08:40	07:55	06:54	06:42	07:05 (1)	05:43			05:13		05:43 (3)
	16:49	17:45	18:37	20:31	17 07:22 (1)	21:22			21:58	14	05:57 (3)
15	08:39	07:53	06:52	06:40	07:05 (1)	05:41			05:13		05:43 (3)
	16:51	17:47	18:38	20:32	15 07:20 (1)	21:23			21:59	14	05:57 (3)
16	08:38	07:51	06:49	06:38	07:07 (1)	05:40			05:12		05:43 (3)
	16:52	17:49	18:40	20:34	11 07:18 (1)	21:25			21:59	14	05:57 (3)
17	08:37	07:49	06:47	06:35	07:10 (1)	05:38			05:12		05:43 (3)
	16:54	17:51	18:42	20:36	5 07:15 (1)	21:26			22:00	14	05:57 (3)
18	08:36	07:47	06:45	06:33		05:37			05:12		05:43 (3)
	16:55	17:53	18:44	20:38		21:28			22:00	15	05:58 (3)
19	08:35	07:45	06:42	06:31		05:35			05:12		05:43 (3)
	16:57	17:54	18:45	20:39		21:29			22:01	15	05:58 (3)
20	08:34	07:43	06:40	06:29		05:34			05:12		05:43 (3)
	16:59	17:56	18:47	20:41		21:31			22:01	15	05:58 (3)
21	08:33	07:41	06:38	06:27		05:32			05:13		05:44 (3)
	17:01	17:58	18:49	20:43		21:32			22:01	15	05:59 (3)
22	08:32	07:39	06:35	06:25		05:31			05:13		05:44 (3)
	17:02	18:00	18:51	20:45		21:34			22:01	15	05:59 (3)
23	08:31	07:37	06:33	06:22		05:30			05:13		05:44 (3)
	17:04	18:02	18:52	20:46		21:35			22:02	15	05:59 (3)
24	08:29	07:34	06:31	06:20		05:28			05:13		05:44 (3)
	17:06	18:04	18:54	20:48		21:37			22:02	15	05:59 (3)
25	08:28	07:32	06:28	06:18		05:27			05:14		05:45 (3)
	17:08	18:06	18:56	20:50		21:38			22:02	15	06:00 (3)
26	08:27	07:30	06:26	06:16		05:26			05:14		05:45 (3)
	17:09	18:07	18:58	20:51		21:39			22:02	14	05:59 (3)
27	08:25	07:28	06:24	06:14	06:38 (2)	05:25			05:14		05:46 (3)
	17:11	18:09	18:59	20:53	1 06:39 (2)	21:41			22:02	14	06:00 (3)
28	08:24	07:26	06:21	06:12	06:37 (2)	05:24			05:15		05:46 (3)
	17:13	18:11	19:01	20:55	3 06:40 (2)	21:42			22:02	14	06:00 (3)
29	08:22		07:19	06:10	06:35 (2)	05:23			05:16		05:47 (3)
	17:15		20:03	20:57	5 06:40 (2)	21:43			22:01	13	06:00 (3)
30	08:21		07:17	06:08	06:33 (2)	05:22		05:51 (3)	05:16		05:47 (3)
	17:17		20:05	20:58	7 06:40 (2)	21:44	1	05:52 (3)	22:01	13	06:00 (3)
31	08:19		07:14			05:21		05:50 (3)			
	17:19		20:06			21:46	3	05:53 (3)			
Potential sun hours	257	277	367	417		487			501		
Total, worst case					139		155			365	
Sun reduction					0.38		0.39			0.35	
Oper. time red.					1.00		1.00			1.00	
Wind dir. red.					0.60		0.60			0.60	
Total reduction					0.23		0.24			0.21	
Total, real					32		37			76	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

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Calculated:
11/06/2025 09:22/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Real Case - V150 **Shadow receptor:** CY - 149

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	July			August			September			October	November	December
1	05:17		05:48 (3)	05:54		06:36 (2)	06:45		07:11 (1)	07:35	07:30	08:22
	22:01	13	06:01 (3)	21:28	4	06:40 (2)	20:25	13	07:24 (1)	19:15	17:07	16:26
2	05:17		05:49 (3)	05:56		06:34 (2)	06:47		07:13 (1)	07:37	07:31	08:23
	22:01	12	06:01 (3)	21:26	10	06:44 (2)	20:23	11	07:24 (1)	19:12	17:06	16:26
3	05:18		05:49 (3)	05:57		06:31 (2)	06:48		07:14 (1)	07:38	07:33	08:24
	22:00	11	06:00 (3)	21:25	14	06:45 (2)	20:20	9	07:23 (1)	19:10	17:04	16:25
4	05:19		05:50 (3)	05:59		06:31 (2)	06:50		07:16 (1)	07:40	07:35	08:26
	22:00	11	06:01 (3)	21:23	16	06:47 (2)	20:18	7	07:23 (1)	19:08	17:02	16:24
5	05:20		05:51 (3)	06:00		06:29 (2)	06:51		07:18 (1)	07:42	07:37	08:27
	21:59	10	06:01 (3)	21:21	18	06:47 (2)	20:16	4	07:22 (1)	19:05	17:00	16:24
6	05:21		05:52 (3)	06:02		06:31 (2)	06:53		07:19 (1)	07:43	07:39	08:28
	21:59	9	06:01 (3)	21:19	17	06:48 (2)	20:14	1	07:20 (1)	19:03	16:58	16:23
7	05:22		05:53 (3)	06:04		06:32 (2)	06:55			07:45	07:41	08:30
	21:58	9	06:02 (3)	21:18	16	06:48 (2)	20:11			19:01	16:57	16:23
8	05:23		05:54 (3)	06:05		06:34 (2)	06:56			07:47	07:42	08:31
	21:57	8	06:02 (3)	21:16	15	06:49 (2)	20:09			18:58	16:55	16:23
9	05:23		05:54 (3)	06:07		06:35 (2)	06:58			07:49	07:44	08:32
	21:57	7	06:01 (3)	21:14	14	06:49 (2)	20:07			18:56	16:53	16:22
10	05:25		05:55 (3)	06:08		06:37 (2)	07:00			07:50	07:46	08:33
	21:56	6	06:01 (3)	21:12	12	06:49 (2)	20:04			18:54	16:52	16:22
11	05:26		05:56 (3)	06:10		06:38 (2)	07:01			07:52	07:48	08:34
	21:55	5	06:01 (3)	21:10	11	06:49 (2)	20:02			18:52	16:50	16:22
12	05:27		05:57 (3)	06:12		06:40 (2)	07:03			07:54	07:50	08:35
	21:54	3	06:00 (3)	21:08	9	06:49 (2)	20:00			18:49	16:48	16:22
13	05:28		05:59 (3)	06:13		06:41 (2)	07:05			07:56	07:52	08:36
	21:53	2	06:01 (3)	21:06	7	06:48 (2)	19:57			18:47	16:47	16:22
14	05:29		06:00 (3)	06:15		06:43 (2)	07:06			07:57	07:53	08:37
	21:52	1	06:01 (3)	21:04	5	06:48 (2)	19:55			18:45	16:45	16:22
15	05:30			06:17		06:44 (2)	07:08			07:59	07:55	08:38
	21:51			21:02	2	06:46 (2)	19:52			18:43	16:44	16:22
16	05:31			06:18			07:10			08:01	07:57	08:39
	21:50			21:00			19:50			18:40	16:42	16:22
17	05:33			06:20			07:11			08:03	07:59	08:40
	21:49			20:58			19:48			18:38	16:41	16:22
18	05:34			06:22			07:13			08:04	08:00	08:41
	21:48			20:56			19:45			18:36	16:40	16:22
19	05:35			06:23			07:15			08:06	08:02	08:41
	21:47			20:54			19:43			18:34	16:38	16:23
20	05:37			06:25			07:16			08:08	08:04	08:42
	21:46			20:52			19:41			18:32	16:37	16:23
21	05:38			06:27			07:18			08:10	08:06	08:43
	21:45			20:49			19:38			18:30	16:36	16:23
22	05:39			06:28			07:20			08:11	08:07	08:43
	21:43			20:47			19:36			18:27	16:35	16:24
23	05:41			06:30			07:21			08:13	08:09	08:44
	21:42			20:45			19:33			18:25	16:34	16:24
24	05:42			06:32			07:23			08:15	08:11	08:44
	21:41			20:43			19:31			18:23	16:33	16:25
25	05:44			06:33			07:25			07:17	08:12	08:45
	21:39			20:41			19:29			17:21	16:31	16:26
26	05:45			06:35		07:12 (1)	07:26			07:19	08:14	08:45
	21:38			20:39	6	07:18 (1)	19:26			17:19	16:30	16:26
27	05:46			06:37		07:08 (1)	07:28			07:21	08:15	08:45
	21:36			20:36	12	07:20 (1)	19:24			17:17	16:30	16:27
28	05:48			06:38		07:07 (1)	07:30			07:22	08:17	08:45
	21:35			20:34	15	07:22 (1)	19:22			17:15	16:29	16:28
29	05:49			06:40		07:06 (1)	07:31			07:24	08:19	08:45
	21:33			20:32	16	07:22 (1)	19:19			17:13	16:28	16:29
30	05:51			06:42		07:08 (1)	07:33			07:26	08:20	08:46
	21:31			20:30	15	07:23 (1)	19:17			17:11	16:27	16:30
31	05:53			06:43		07:10 (1)				07:28		08:46
	21:30			20:27	14	07:24 (1)				17:09		16:30
Potential sun hours	504			455			381			331	265	241
Total, worst case		107			248			45				
Sun reduction		0.33			0.35			0.34				
Oper. time red.		1.00			1.00			1.00				
Wind dir. red.		0.60			0.60			0.59				
Total reduction		0.20			0.21			0.20				
Total, real		21			53			9				

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

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SHADOW - Calendar

Calculation: 6839 Garrane WF Real Case - V150 **Shadow receptor:** CZ - 150

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January	February	March	April		May		June	
1	08:46	08:18	07:24	07:12		06:06	06:31 (2)	05:20	05:49 (3)
	16:32	17:20	18:13	20:08		21:00	10 06:41 (2)	21:47	6 05:55 (3)
2	08:45	08:16	07:21	07:10		06:04	06:29 (2)	05:19	05:48 (3)
	16:33	17:22	18:15	20:10		21:02	11 06:40 (2)	21:48	7 05:55 (3)
3	08:45	08:15	07:19	07:07		06:02	06:27 (2)	05:18	05:48 (3)
	16:34	17:24	18:17	20:12		21:03	13 06:40 (2)	21:49	8 05:56 (3)
4	08:45	08:13	07:17	07:05		06:00	06:25 (2)	05:18	05:47 (3)
	16:35	17:26	18:19	20:13		21:05	14 06:39 (2)	21:50	9 05:56 (3)
5	08:45	08:11	07:15	07:03		05:58	06:24 (2)	05:17	05:46 (3)
	16:36	17:28	18:20	20:15		21:07	16 06:40 (2)	21:51	10 05:56 (3)
6	08:44	08:10	07:12	07:00	07:23 (1)	05:57	06:22 (2)	05:16	05:46 (3)
	16:38	17:30	18:22	20:17	1 07:24 (1)	21:08	17 06:39 (2)	21:52	11 05:57 (3)
7	08:44	08:08	07:10	06:58	07:21 (1)	05:55	06:20 (2)	05:16	05:45 (3)
	16:39	17:32	18:24	20:18	3 07:24 (1)	21:10	17 06:37 (2)	21:53	12 05:57 (3)
8	08:44	08:06	07:08	06:56	07:19 (1)	05:53	06:21 (2)	05:15	05:45 (3)
	16:40	17:34	18:26	20:20	6 07:25 (1)	21:12	16 06:37 (2)	21:54	12 05:57 (3)
9	08:43	08:04	07:06	06:53	07:17 (1)	05:51	06:22 (2)	05:14	05:45 (3)
	16:42	17:36	18:28	20:22	8 07:25 (1)	21:13	13 06:35 (2)	21:55	13 05:58 (3)
10	08:43	08:02	07:03	06:51	07:14 (1)	05:49	06:24 (2)	05:14	05:44 (3)
	16:43	17:37	18:29	20:24	10 07:24 (1)	21:15	9 06:33 (2)	21:56	14 05:58 (3)
11	08:42	08:01	07:01	06:49	07:12 (1)	05:48		05:14	05:44 (3)
	16:44	17:39	18:31	20:25	12 07:24 (1)	21:17		21:56	14 05:58 (3)
12	08:41	07:59	06:59	06:47	07:10 (1)	05:46		05:13	05:44 (3)
	16:46	17:41	18:33	20:27	14 07:24 (1)	21:18		21:57	14 05:58 (3)
13	08:41	07:57	06:56	06:44	07:08 (1)	05:44		05:13	05:43 (3)
	16:47	17:43	18:35	20:29	15 07:23 (1)	21:20		21:58	15 05:58 (3)
14	08:40	07:55	06:54	06:42	07:05 (1)	05:43		05:13	05:43 (3)
	16:49	17:45	18:37	20:31	16 07:21 (1)	21:22		21:58	15 05:58 (3)
15	08:39	07:53	06:52	06:40	07:05 (1)	05:41		05:13	05:43 (3)
	16:51	17:47	18:38	20:32	15 07:20 (1)	21:23		21:59	16 05:59 (3)
16	08:38	07:51	06:49	06:38	07:07 (1)	05:40		05:12	05:43 (3)
	16:52	17:49	18:40	20:34	11 07:18 (1)	21:25		21:59	16 05:59 (3)
17	08:37	07:49	06:47	06:35	07:11 (1)	05:38		05:12	05:43 (3)
	16:54	17:51	18:42	20:36	2 07:13 (1)	21:26		22:00	16 05:59 (3)
18	08:36	07:47	06:45	06:33		05:37		05:12	05:43 (3)
	16:55	17:53	18:44	20:38		21:28		22:00	16 05:59 (3)
19	08:35	07:45	06:42	06:31		05:35		05:12	05:43 (3)
	16:57	17:54	18:45	20:39		21:29		22:01	16 05:59 (3)
20	08:34	07:43	06:40	06:29		05:34		05:12	05:43 (3)
	16:59	17:56	18:47	20:41		21:31		22:01	16 05:59 (3)
21	08:33	07:41	06:38	06:27		05:32		05:13	05:44 (3)
	17:01	17:58	18:49	20:43		21:32		22:01	16 06:00 (3)
22	08:32	07:39	06:35	06:25		05:31		05:13	05:44 (3)
	17:02	18:00	18:51	20:45		21:34		22:01	16 06:00 (3)
23	08:31	07:37	06:33	06:22		05:30		05:13	05:44 (3)
	17:04	18:02	18:52	20:46		21:35		22:02	16 06:00 (3)
24	08:29	07:34	06:31	06:20		05:28		05:13	05:44 (3)
	17:06	18:04	18:54	20:48		21:37		22:02	16 06:00 (3)
25	08:28	07:32	06:28	06:18		05:27		05:14	05:45 (3)
	17:08	18:06	18:56	20:50		21:38		22:02	16 06:01 (3)
26	08:27	07:30	06:26	06:16		05:26		05:14	05:45 (3)
	17:09	18:07	18:58	20:51		21:39		22:02	16 06:01 (3)
27	08:25	07:28	06:24	06:14	06:38 (2)	05:25		05:14	05:46 (3)
	17:11	18:09	18:59	20:53	1 06:39 (2)	21:41		22:02	16 06:02 (3)
28	08:24	07:26	06:21	06:12	06:37 (2)	05:24	05:52 (3)	05:15	05:46 (3)
	17:13	18:11	19:01	20:55	4 06:41 (2)	21:42	1 05:53 (3)	22:02	15 06:01 (3)
29	08:22		07:19	06:10	06:35 (2)	05:23	05:51 (3)	05:16	05:47 (3)
	17:15		20:03	20:57	6 06:41 (2)	21:43	2 05:53 (3)	22:01	15 06:02 (3)
30	08:21		07:17	06:08	06:33 (2)	05:22	05:51 (3)	05:16	05:47 (3)
	17:17		20:05	20:58	8 06:41 (2)	21:44	4 05:55 (3)	22:01	15 06:02 (3)
31	08:19		07:14			05:21	05:50 (3)		
	17:19		20:06			21:46	5 05:55 (3)		
Potential sun hours	257	277	367	417		487		501	
Total, worst case					132		148		413
Sun reduction					0.38		0.39		0.35
Oper. time red.					1.00		1.00		1.00
Wind dir. red.					0.60		0.60		0.60
Total reduction					0.23		0.24		0.21
Total, real					30		35		86

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

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Calculated:
11/06/2025 09:22/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Real Case - V150 **Shadow receptor:** CZ - 150

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	July			August			September			October	November	December
1	05:17		05:48 (3)	05:54			06:45		07:11 (1)	07:35	07:30	08:22
	22:01	14	06:02 (3)	21:28			20:25	12	07:23 (1)	19:15	17:07	16:26
2	05:17		05:49 (3)	05:56		06:37 (2)	06:47		07:13 (1)	07:37	07:31	08:23
	22:01	14	06:03 (3)	21:26	5	06:42 (2)	20:23	10	07:23 (1)	19:12	17:06	16:26
3	05:18		05:49 (3)	05:57		06:33 (2)	06:48		07:14 (1)	07:38	07:33	08:24
	22:00	13	06:02 (3)	21:25	11	06:44 (2)	20:20	8	07:22 (1)	19:10	17:04	16:25
4	05:19		05:50 (3)	05:59		06:32 (2)	06:50		07:16 (1)	07:40	07:35	08:26
	22:00	13	06:03 (3)	21:23	14	06:46 (2)	20:18	6	07:22 (1)	19:08	17:02	16:24
5	05:20		05:51 (3)	06:00		06:31 (2)	06:51		07:18 (1)	07:42	07:37	08:27
	21:59	12	06:03 (3)	21:21	16	06:47 (2)	20:16	4	07:22 (1)	19:05	17:00	16:24
6	05:21		05:52 (3)	06:02		06:31 (2)	06:53		07:19 (1)	07:43	07:39	08:28
	21:59	11	06:03 (3)	21:19	17	06:48 (2)	20:14	1	07:20 (1)	19:03	16:58	16:23
7	05:22		05:53 (3)	06:04		06:32 (2)	06:55			07:45	07:41	08:30
	21:58	11	06:04 (3)	21:18	16	06:48 (2)	20:11			19:01	16:57	16:23
8	05:23		05:54 (3)	06:05		06:34 (2)	06:56			07:47	07:42	08:31
	21:57	10	06:04 (3)	21:16	15	06:49 (2)	20:09			18:58	16:55	16:23
9	05:23		05:54 (3)	06:07		06:35 (2)	06:58			07:49	07:44	08:32
	21:57	9	06:03 (3)	21:14	14	06:49 (2)	20:07			18:56	16:53	16:22
10	05:25		05:55 (3)	06:08		06:37 (2)	07:00			07:50	07:46	08:33
	21:56	8	06:03 (3)	21:12	13	06:50 (2)	20:04			18:54	16:52	16:22
11	05:26		05:56 (3)	06:10		06:38 (2)	07:01			07:52	07:48	08:34
	21:55	7	06:03 (3)	21:10	11	06:49 (2)	20:02			18:52	16:50	16:22
12	05:27		05:57 (3)	06:12		06:40 (2)	07:03			07:54	07:50	08:35
	21:54	6	06:03 (3)	21:08	9	06:49 (2)	20:00			18:49	16:48	16:22
13	05:28		05:59 (3)	06:13		06:41 (2)	07:05			07:56	07:52	08:36
	21:53	4	06:03 (3)	21:06	7	06:48 (2)	19:57			18:47	16:47	16:22
14	05:29		06:00 (3)	06:15		06:43 (2)	07:06			07:57	07:53	08:37
	21:52	3	06:03 (3)	21:04	5	06:48 (2)	19:55			18:45	16:45	16:22
15	05:30		06:01 (3)	06:17		06:44 (2)	07:08			07:59	07:55	08:38
	21:51	2	06:03 (3)	21:02	3	06:47 (2)	19:52			18:43	16:44	16:22
16	05:31			06:18		06:46 (2)	07:10			08:01	07:57	08:39
	21:50			21:00	1	06:47 (2)	19:50			18:40	16:42	16:22
17	05:33			06:20			07:11			08:03	07:59	08:40
	21:49			20:58			19:48			18:38	16:41	16:22
18	05:34			06:22			07:13			08:04	08:00	08:41
	21:48			20:56			19:45			18:36	16:40	16:22
19	05:35			06:23			07:15			08:06	08:02	08:41
	21:47			20:54			19:43			18:34	16:38	16:23
20	05:37			06:25			07:16			08:08	08:04	08:42
	21:46			20:52			19:41			18:32	16:37	16:23
21	05:38			06:27			07:18			08:10	08:06	08:43
	21:45			20:49			19:38			18:30	16:36	16:23
22	05:39			06:28			07:20			08:11	08:07	08:43
	21:43			20:47			19:36			18:27	16:35	16:24
23	05:41			06:30			07:21			08:13	08:09	08:44
	21:42			20:45			19:33			18:25	16:34	16:24
24	05:42			06:32			07:23			08:15	08:11	08:44
	21:41			20:43			19:31			18:23	16:33	16:25
25	05:44			06:33			07:25			07:17	08:12	08:45
	21:39			20:41			19:29			17:21	16:31	16:26
26	05:45			06:35		07:13 (1)	07:26			07:19	08:14	08:45
	21:38			20:39	4	07:17 (1)	19:26			17:19	16:30	16:26
27	05:46			06:37		07:09 (1)	07:28			07:21	08:15	08:45
	21:36			20:36	11	07:20 (1)	19:24			17:17	16:30	16:27
28	05:48			06:38		07:07 (1)	07:30			07:22	08:17	08:45
	21:35			20:34	15	07:22 (1)	19:22			17:15	16:29	16:28
29	05:49			06:40		07:06 (1)	07:31			07:24	08:19	08:45
	21:33			20:32	16	07:22 (1)	19:19			17:13	16:28	16:29
30	05:51			06:42		07:08 (1)	07:33			07:26	08:20	08:46
	21:31			20:30	15	07:23 (1)	19:17			17:11	16:27	16:30
31	05:53			06:43		07:10 (1)				07:28		08:46
	21:30			20:27	14	07:24 (1)				17:09		16:30
Potential sun hours	504			455			381			331	265	241
Total, worst case		137			232			41				
Sun reduction		0.33			0.35			0.34				
Oper. time red.		1.00			1.00			1.00				
Wind dir. red.		0.60			0.60			0.59				
Total reduction		0.20			0.21			0.20				
Total, real		27			49			8				

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

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Calculated:
11/06/2025 09:22/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Real Case - V150 **Shadow receptor:** DA - 170

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January	February	March	April		May		June	
1	08:46	08:18	07:24	07:12		06:06		06:31 (2)	05:20		05:49 (3)
	16:32	17:20	18:13	20:08		21:00	15	06:46 (2)	21:47	10	05:59 (3)
2	08:45	08:16	07:21	07:10		06:04		06:29 (2)	05:19		05:48 (3)
	16:33	17:22	18:15	20:10		21:02	16	06:45 (2)	21:48	11	05:59 (3)
3	08:45	08:15	07:19	07:07	07:30 (1)	06:02		06:27 (2)	05:18		05:48 (3)
	16:34	17:24	18:17	20:12	2 07:32 (1)	21:03	17	06:44 (2)	21:49	12	06:00 (3)
4	08:45	08:13	07:17	07:05	07:28 (1)	06:00		06:25 (2)	05:18		05:47 (3)
	16:35	17:26	18:19	20:13	4 07:32 (1)	21:05	18	06:43 (2)	21:50	13	06:00 (3)
5	08:45	08:11	07:15	07:03	07:26 (1)	05:58		06:25 (2)	05:17		05:46 (3)
	16:36	17:28	18:20	20:15	7 07:33 (1)	21:07	18	06:43 (2)	21:51	14	06:00 (3)
6	08:44	08:10	07:12	07:00	07:23 (1)	05:57		06:26 (2)	05:16		05:46 (3)
	16:38	17:30	18:22	20:17	9 07:32 (1)	21:08	15	06:41 (2)	21:52	15	06:01 (3)
7	08:44	08:08	07:10	06:58	07:21 (1)	05:55		06:27 (2)	05:16		05:45 (3)
	16:39	17:32	18:24	20:18	11 07:32 (1)	21:10	12	06:39 (2)	21:53	15	06:00 (3)
8	08:44	08:06	07:08	06:56	07:19 (1)	05:53		06:30 (2)	05:15		05:45 (3)
	16:40	17:34	18:26	20:20	13 07:32 (1)	21:12	8	06:38 (2)	21:54	16	06:01 (3)
9	08:43	08:04	07:06	06:53	07:17 (1)	05:51			05:14		05:45 (3)
	16:42	17:36	18:28	20:22	15 07:32 (1)	21:13			21:55	17	06:02 (3)
10	08:43	08:02	07:03	06:51	07:14 (1)	05:49			05:14		05:44 (3)
	16:43	17:37	18:29	20:24	16 07:30 (1)	21:15			21:56	17	06:01 (3)
11	08:42	08:01	07:01	06:49	07:12 (1)	05:48			05:14		05:44 (3)
	16:44	17:39	18:31	20:25	17 07:29 (1)	21:17			21:56	18	06:02 (3)
12	08:41	07:59	06:59	06:47	07:12 (1)	05:46			05:13		05:44 (3)
	16:46	17:41	18:33	20:27	16 07:28 (1)	21:18			21:57	18	06:02 (3)
13	08:41	07:57	06:56	06:44	07:14 (1)	05:44			05:13		05:43 (3)
	16:47	17:43	18:35	20:29	12 07:26 (1)	21:20			21:58	18	06:01 (3)
14	08:40	07:55	06:54	06:42	07:17 (1)	05:43			05:13		05:43 (3)
	16:49	17:45	18:36	20:31	4 07:21 (1)	21:22			21:58	19	06:02 (3)
15	08:39	07:53	06:52	06:40		05:41			05:13		05:43 (3)
	16:51	17:47	18:38	20:32		21:23			21:59	19	06:02 (3)
16	08:38	07:51	06:49	06:38		05:40			05:12		05:43 (3)
	16:52	17:49	18:40	20:34		21:25			21:59	19	06:02 (3)
17	08:37	07:49	06:47	06:35		05:38			05:12		05:43 (3)
	16:54	17:51	18:42	20:36		21:26			22:00	19	06:02 (3)
18	08:36	07:47	06:45	06:33		05:37			05:12		05:43 (3)
	16:55	17:53	18:44	20:38		21:28			22:00	20	06:03 (3)
19	08:35	07:45	06:42	06:31		05:35			05:12		05:43 (3)
	16:57	17:54	18:45	20:39		21:29			22:01	20	06:03 (3)
20	08:34	07:43	06:40	06:29		05:34			05:12		05:43 (3)
	16:59	17:56	18:47	20:41		21:31			22:01	20	06:03 (3)
21	08:33	07:41	06:38	06:27		05:32			05:13		05:44 (3)
	17:01	17:58	18:49	20:43		21:32			22:01	20	06:04 (3)
22	08:32	07:39	06:35	06:25		05:31			05:13		05:44 (3)
	17:02	18:00	18:51	20:45		21:34			22:01	20	06:04 (3)
23	08:31	07:37	06:33	06:22		05:30			05:13		05:44 (3)
	17:04	18:02	18:52	20:46		21:35			22:02	20	06:04 (3)
24	08:29	07:34	06:31	06:20	06:44 (2)	05:28			05:13		05:44 (3)
	17:06	18:04	18:54	20:48	1 06:45 (2)	21:37			22:02	20	06:04 (3)
25	08:28	07:32	06:28	06:18	06:42 (2)	05:27		05:55 (3)	05:14		05:45 (3)
	17:08	18:06	18:56	20:50	3 06:45 (2)	21:38	1	05:56 (3)	22:02	19	06:04 (3)
26	08:27	07:30	06:26	06:16	06:40 (2)	05:26		05:54 (3)	05:14		05:45 (3)
	17:09	18:07	18:58	20:51	6 06:46 (2)	21:39	2	05:56 (3)	22:02	19	06:04 (3)
27	08:25	07:28	06:24	06:14	06:38 (2)	05:25		05:53 (3)	05:14		05:46 (3)
	17:11	18:09	18:59	20:53	8 06:46 (2)	21:41	4	05:57 (3)	22:02	19	06:05 (3)
28	08:24	07:26	06:21	06:12	06:37 (2)	05:24		05:52 (3)	05:15		05:46 (3)
	17:13	18:11	19:01	20:55	10 06:47 (2)	21:42	5	05:57 (3)	22:02	19	06:05 (3)
29	08:22		07:19	06:10	06:35 (2)	05:23		05:51 (3)	05:16		05:47 (3)
	17:15		20:03	20:57	12 06:47 (2)	21:43	7	05:58 (3)	22:01	18	06:05 (3)
30	08:21		07:17	06:08	06:33 (2)	05:22		05:51 (3)	05:16		05:47 (3)
	17:17		20:05	20:58	13 06:46 (2)	21:44	8	05:59 (3)	22:01	18	06:05 (3)
31	08:19		07:14			05:21		05:50 (3)			
	17:19		20:06			21:46	9	05:59 (3)			
Potential sun hours	257	277	367	417		487			501		
Total, worst case					179		155			522	
Sun reduction					0.38		0.39			0.35	
Oper. time red.					1.00		1.00			1.00	
Wind dir. red.					0.60		0.60			0.60	
Total reduction					0.23		0.24			0.21	
Total, real					41		37			108	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

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padraig / podowd@jodireland.com
Calculated:
11/06/2025 09:22/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Real Case - V150 **Shadow receptor:** DA - 170

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	July		August			September		October	November	December
1	05:17		05:48 (3)	05:54		06:45		07:11 (1)	07:35	07:30	08:22
	22:01	18	06:06 (3)	21:28		20:25	17	07:28 (1)	19:15	17:07	16:26
2	05:17		05:49 (3)	05:56		06:47		07:13 (1)	07:37	07:31	08:23
	22:01	17	06:06 (3)	21:26		20:23	16	07:29 (1)	19:12	17:06	16:26
3	05:18		05:49 (3)	05:57		06:48		07:14 (1)	07:38	07:33	08:24
	22:00	17	06:06 (3)	21:25		20:20	15	07:29 (1)	19:10	17:04	16:25
4	05:19		05:50 (3)	05:59		06:50		07:16 (1)	07:40	07:35	08:26
	22:00	16	06:06 (3)	21:23		20:18	13	07:29 (1)	19:08	17:02	16:24
5	05:20		05:51 (3)	06:00	06:39 (2)	06:51		07:18 (1)	07:42	07:37	08:27
	21:59	16	06:07 (3)	21:21	9 06:48 (2)	20:16	11	07:29 (1)	19:05	17:00	16:24
6	05:21		05:52 (3)	06:02	06:37 (2)	06:53		07:19 (1)	07:43	07:39	08:28
	21:59	15	06:07 (3)	21:19	13 06:50 (2)	20:14	9	07:28 (1)	19:03	16:58	16:23
7	05:22		05:53 (3)	06:04	06:35 (2)	06:55		07:21 (1)	07:45	07:41	08:30
	21:58	14	06:07 (3)	21:18	16 06:51 (2)	20:11	7	07:28 (1)	19:01	16:57	16:23
8	05:23		05:54 (3)	06:05	06:35 (2)	06:56		07:22 (1)	07:47	07:42	08:31
	21:57	13	06:07 (3)	21:16	18 06:53 (2)	20:09	5	07:27 (1)	18:58	16:55	16:23
9	05:23		05:54 (3)	06:07	06:35 (2)	06:58		07:24 (1)	07:49	07:44	08:32
	21:57	13	06:07 (3)	21:14	18 06:53 (2)	20:07	2	07:26 (1)	18:56	16:53	16:22
10	05:25		05:55 (3)	06:08	06:37 (2)	07:00			07:50	07:46	08:33
	21:56	12	06:07 (3)	21:12	17 06:54 (2)	20:04			18:54	16:52	16:22
11	05:26		05:56 (3)	06:10	06:38 (2)	07:01			07:52	07:48	08:34
	21:55	11	06:07 (3)	21:10	16 06:54 (2)	20:02			18:52	16:50	16:22
12	05:27		05:57 (3)	06:12	06:40 (2)	07:03			07:54	07:50	08:35
	21:54	10	06:07 (3)	21:08	14 06:54 (2)	19:59			18:49	16:48	16:22
13	05:28		05:59 (3)	06:13	06:41 (2)	07:05			07:56	07:52	08:36
	21:53	9	06:08 (3)	21:06	13 06:54 (2)	19:57			18:47	16:47	16:22
14	05:29		06:00 (3)	06:15	06:43 (2)	07:06			07:57	07:53	08:37
	21:52	7	06:07 (3)	21:04	11 06:54 (2)	19:55			18:45	16:45	16:22
15	05:30		06:01 (3)	06:17	06:44 (2)	07:08			07:59	07:55	08:38
	21:51	6	06:07 (3)	21:02	9 06:53 (2)	19:52			18:43	16:44	16:22
16	05:31		06:02 (3)	06:18	06:46 (2)	07:10			08:01	07:57	08:39
	21:50	5	06:07 (3)	21:00	7 06:53 (2)	19:50			18:40	16:42	16:22
17	05:33		06:03 (3)	06:20	06:48 (2)	07:11			08:03	07:59	08:40
	21:49	3	06:06 (3)	20:58	5 06:53 (2)	19:48			18:38	16:41	16:22
18	05:34		06:04 (3)	06:22	06:49 (2)	07:13			08:04	08:00	08:41
	21:48	2	06:06 (3)	20:56	3 06:52 (2)	19:45			18:36	16:40	16:22
19	05:35			06:23		07:15			08:06	08:02	08:41
	21:47			20:54		19:43			18:34	16:38	16:23
20	05:37			06:25		07:16			08:08	08:04	08:42
	21:46			20:52		19:41			18:32	16:37	16:23
21	05:38			06:27		07:18			08:10	08:06	08:43
	21:45			20:49		19:38			18:30	16:36	16:23
22	05:39			06:28		07:20			08:11	08:07	08:43
	21:43			20:47		19:36			18:27	16:35	16:24
23	05:41			06:30		07:21			08:13	08:09	08:44
	21:42			20:45		19:33			18:25	16:34	16:24
24	05:42			06:32		07:23			08:15	08:11	08:44
	21:41			20:43		19:31			18:23	16:33	16:25
25	05:43			06:33		07:25			07:17	08:12	08:45
	21:39			20:41		19:29			17:21	16:31	16:26
26	05:45			06:35		07:26			07:19	08:14	08:45
	21:38			20:39		19:26			17:19	16:30	16:26
27	05:46			06:37		07:28			07:21	08:15	08:45
	21:36			20:36		19:24			17:17	16:30	16:27
28	05:48			06:38		07:30			07:22	08:17	08:45
	21:35			20:34		19:22			17:15	16:29	16:28
29	05:49			06:40	07:17 (1)	07:31			07:24	08:19	08:45
	21:33			20:32	5 07:22 (1)	19:19			17:13	16:28	16:29
30	05:51			06:42	07:14 (1)	07:33			07:26	08:20	08:46
	21:31			20:30	12 07:26 (1)	19:17			17:11	16:27	16:30
31	05:53			06:43	07:12 (1)				07:28		08:46
	21:30			20:27	16 07:28 (1)				17:09		16:30
Potential sun hours	504			455		381			331	265	241
Total, worst case		204			202		95				
Sun reduction		0.33			0.35		0.34				
Oper. time red.		1.00			1.00		1.00				
Wind dir. red.		0.60			0.60		0.60				
Total reduction		0.20			0.21		0.20				
Total, real		40			43		19				

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
Jennings O'Donovan
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padraig / podowd@jodireland.com
Calculated:
11/06/2025 09:22/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Real Case - V150 **Shadow receptor:** DB - 171

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January	February	March	April		May		June	
1	08:46	08:18	07:24	07:12		06:06	06:31 (2)	05:20	05:49 (3)
	16:32	17:20	18:13	20:08		21:00 14	06:45 (2)	21:47 6	05:55 (3)
2	08:45	08:16	07:21	07:10		06:04	06:29 (2)	05:19	05:48 (3)
	16:33	17:22	18:15	20:10		21:02 16	06:45 (2)	21:48 7	05:55 (3)
3	08:45	08:15	07:19	07:07	07:30 (1)	06:02	06:27 (2)	05:18	05:48 (3)
	16:34	17:24	18:17	20:12 2	07:32 (1)	21:03 17	06:44 (2)	21:49 9	05:57 (3)
4	08:45	08:13	07:17	07:05	07:28 (1)	06:00	06:25 (2)	05:18	05:47 (3)
	16:35	17:26	18:19	20:13 5	07:33 (1)	21:05 18	06:43 (2)	21:50 10	05:57 (3)
5	08:45	08:11	07:15	07:03	07:26 (1)	05:58	06:24 (2)	05:17	05:46 (3)
	16:36	17:28	18:20	20:15 7	07:33 (1)	21:07 19	06:43 (2)	21:51 10	05:56 (3)
6	08:44	08:10	07:12	07:00	07:23 (1)	05:57	06:23 (2)	05:16	05:46 (3)
	16:38	17:30	18:22	20:17 10	07:33 (1)	21:08 19	06:42 (2)	21:52 11	05:57 (3)
7	08:44	08:08	07:10	06:58	07:21 (1)	05:55	06:24 (2)	05:16	05:45 (3)
	16:39	17:32	18:24	20:18 12	07:33 (1)	21:10 17	06:41 (2)	21:53 12	05:57 (3)
8	08:44	08:06	07:08	06:56	07:19 (1)	05:53	06:26 (2)	05:15	05:45 (3)
	16:40	17:34	18:26	20:20 14	07:33 (1)	21:12 14	06:40 (2)	21:54 13	05:58 (3)
9	08:43	08:04	07:06	06:53	07:17 (1)	05:51	06:27 (2)	05:14	05:45 (3)
	16:42	17:36	18:28	20:22 15	07:32 (1)	21:13 11	06:38 (2)	21:55 13	05:58 (3)
10	08:43	08:02	07:03	06:51	07:14 (1)	05:49	06:30 (2)	05:14	05:44 (3)
	16:43	17:37	18:29	20:24 17	07:31 (1)	21:15 3	06:33 (2)	21:56 14	05:58 (3)
11	08:42	08:01	07:01	06:49	07:12 (1)	05:48		05:14	05:44 (3)
	16:44	17:39	18:31	20:25 18	07:30 (1)	21:17		21:56 15	05:59 (3)
12	08:41	07:59	06:59	06:47	07:12 (1)	05:46		05:13	05:44 (3)
	16:46	17:41	18:33	20:27 17	07:29 (1)	21:18		21:57 15	05:59 (3)
13	08:41	07:57	06:56	06:44	07:13 (1)	05:44		05:13	05:43 (3)
	16:47	17:43	18:35	20:29 14	07:27 (1)	21:20		21:58 15	05:58 (3)
14	08:40	07:55	06:54	06:42	07:15 (1)	05:43		05:13	05:43 (3)
	16:49	17:45	18:36	20:31 8	07:23 (1)	21:22		21:58 16	05:59 (3)
15	08:39	07:53	06:52	06:40		05:41		05:13	05:43 (3)
	16:51	17:47	18:38	20:32		21:23		21:59 16	05:59 (3)
16	08:38	07:51	06:49	06:38		05:40		05:12	05:43 (3)
	16:52	17:49	18:40	20:34		21:25		21:59 16	05:59 (3)
17	08:37	07:49	06:47	06:35		05:38		05:12	05:43 (3)
	16:54	17:51	18:42	20:36		21:26		22:00 17	06:00 (3)
18	08:36	07:47	06:45	06:33		05:37		05:12	05:43 (3)
	16:55	17:53	18:44	20:38		21:28		22:00 17	06:00 (3)
19	08:35	07:45	06:42	06:31		05:35		05:12	05:43 (3)
	16:57	17:54	18:45	20:39		21:29		22:01 17	06:00 (3)
20	08:34	07:43	06:40	06:29		05:34		05:12	05:43 (3)
	16:59	17:56	18:47	20:41		21:31		22:01 17	06:00 (3)
21	08:33	07:41	06:38	06:27		05:32		05:13	05:44 (3)
	17:01	17:58	18:49	20:43		21:32		22:01 17	06:01 (3)
22	08:32	07:39	06:35	06:25		05:31		05:13	05:44 (3)
	17:02	18:00	18:51	20:45		21:34		22:01 17	06:01 (3)
23	08:31	07:37	06:33	06:22		05:30		05:13	05:44 (3)
	17:04	18:02	18:52	20:46		21:35		22:02 17	06:01 (3)
24	08:29	07:34	06:31	06:20		05:28		05:13	05:44 (3)
	17:06	18:04	18:54	20:48		21:37		22:02 17	06:01 (3)
25	08:28	07:32	06:28	06:18	06:42 (2)	05:27		05:14	05:45 (3)
	17:08	18:06	18:56	20:50 2	06:44 (2)	21:38		22:02 17	06:02 (3)
26	08:27	07:30	06:26	06:16	06:40 (2)	05:26		05:14	05:45 (3)
	17:09	18:07	18:58	20:51 4	06:44 (2)	21:39		22:02 17	06:02 (3)
27	08:25	07:28	06:24	06:14	06:38 (2)	05:25		05:14	05:46 (3)
	17:11	18:09	18:59	20:53 7	06:45 (2)	21:41		22:02 16	06:02 (3)
28	08:24	07:26	06:21	06:12	06:37 (2)	05:24	05:52 (3)	05:15	05:46 (3)
	17:13	18:11	19:01	20:55 9	06:46 (2)	21:42 1	05:53 (3)	22:02 16	06:02 (3)
29	08:22		07:19	06:10	06:35 (2)	05:23	05:51 (3)	05:16	05:47 (3)
	17:15		20:03	20:57 11	06:46 (2)	21:43 2	05:53 (3)	22:01 16	06:03 (3)
30	08:21		07:17	06:08	06:33 (2)	05:22	05:51 (3)	05:16	05:47 (3)
	17:17		20:05	20:58 13	06:46 (2)	21:44 4	05:55 (3)	22:01 15	06:02 (3)
31	08:19		07:14			05:21	05:50 (3)		
	17:19		20:06			21:46 5	05:55 (3)		
Potential sun hours	257	277	367	417		487		501	
Total, worst case				185		160		431	
Sun reduction				0.38		0.39		0.35	
Oper. time red.				1.00		1.00		1.00	
Wind dir. red.				0.60		0.60		0.60	
Total reduction				0.23		0.24		0.21	
Total, real				42		38		90	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
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padraig / podowd@jodireland.com
Calculated:
11/06/2025 09:22/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Real Case - V150 **Shadow receptor:** DB - 171

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	July		August		September		October	November	December
1	05:17		05:48 (3)	05:54		06:45	07:11 (1)	07:35	07:30	08:22
	22:01	15	06:03 (3)	21:28		20:25	18	07:29 (1)	19:15	17:07	16:26
2	05:17		05:49 (3)	05:56		06:47	07:13 (1)	07:37	07:31	08:23
	22:01	14	06:03 (3)	21:26		20:23	17	07:30 (1)	19:12	17:06	16:26
3	05:18		05:49 (3)	05:57	06:39 (2)	06:48	07:14 (1)	07:38	07:33	08:24
	22:00	14	06:03 (3)	21:25	7	06:46 (2)	20:20	15	07:29 (1)	19:10	17:04	16:25
4	05:19		05:50 (3)	05:59	06:37 (2)	06:50	07:16 (1)	07:40	07:35	08:26
	22:00	13	06:03 (3)	21:23	12	06:49 (2)	20:18	14	07:30 (1)	19:08	17:02	16:24
5	05:20		05:51 (3)	06:00	06:35 (2)	06:51	07:18 (1)	07:42	07:37	08:27
	21:59	12	06:03 (3)	21:21	15	06:50 (2)	20:16	12	07:30 (1)	19:05	17:00	16:24
6	05:21		05:52 (3)	06:02	06:34 (2)	06:53	07:19 (1)	07:43	07:39	08:28
	21:59	12	06:04 (3)	21:19	17	06:51 (2)	20:14	10	07:29 (1)	19:03	16:58	16:23
7	05:22		05:53 (3)	06:04	06:32 (2)	06:55	07:21 (1)	07:45	07:41	08:30
	21:58	11	06:04 (3)	21:18	20	06:52 (2)	20:11	7	07:28 (1)	19:01	16:57	16:23
8	05:22		05:54 (3)	06:05	06:34 (2)	06:56	07:22 (1)	07:47	07:42	08:31
	21:57	10	06:04 (3)	21:16	19	06:53 (2)	20:09	5	07:27 (1)	18:58	16:55	16:23
9	05:23		05:54 (3)	06:07	06:35 (2)	06:58	07:24 (1)	07:49	07:44	08:32
	21:57	9	06:03 (3)	21:14	18	06:53 (2)	20:07	2	07:26 (1)	18:56	16:53	16:22
10	05:25		05:55 (3)	06:08	06:37 (2)	07:00		07:50	07:46	08:33
	21:56	8	06:03 (3)	21:12	17	06:54 (2)	20:04		18:54	16:52	16:22
11	05:26		05:56 (3)	06:10	06:38 (2)	07:01		07:52	07:48	08:34
	21:55	7	06:03 (3)	21:10	15	06:53 (2)	20:02		18:52	16:50	16:22
12	05:27		05:57 (3)	06:12	06:40 (2)	07:03		07:54	07:50	08:35
	21:54	6	06:03 (3)	21:08	14	06:54 (2)	19:59		18:49	16:48	16:22
13	05:28		05:59 (3)	06:13	06:41 (2)	07:05		07:55	07:52	08:36
	21:53	4	06:03 (3)	21:06	12	06:53 (2)	19:57		18:47	16:47	16:22
14	05:29		06:00 (3)	06:15	06:43 (2)	07:06		07:57	07:53	08:37
	21:52	3	06:03 (3)	21:04	10	06:53 (2)	19:55		18:45	16:45	16:22
15	05:30		06:01 (3)	06:17	06:44 (2)	07:08		07:59	07:55	08:38
	21:51	2	06:03 (3)	21:02	8	06:52 (2)	19:52		18:43	16:44	16:22
16	05:31			06:18	06:46 (2)	07:10		08:01	07:57	08:39
	21:50			21:00	6	06:52 (2)	19:50		18:40	16:42	16:22
17	05:33			06:20	06:48 (2)	07:11		08:03	07:59	08:40
	21:49			20:58	4	06:52 (2)	19:48		18:38	16:41	16:22
18	05:34			06:22	06:49 (2)	07:13		08:04	08:00	08:41
	21:48			20:56	1	06:50 (2)	19:45		18:36	16:40	16:22
19	05:35			06:23		07:15		08:06	08:02	08:41
	21:47			20:54			19:43		18:34	16:38	16:23
20	05:37			06:25			07:16		08:08	08:04	08:42
	21:46			20:52			19:41		18:32	16:37	16:23
21	05:38			06:27			07:18		08:10	08:06	08:43
	21:45			20:49			19:38		18:30	16:36	16:23
22	05:39			06:28			07:20		08:11	08:07	08:43
	21:43			20:47			19:36		18:27	16:35	16:24
23	05:41			06:30			07:21		08:13	08:09	08:44
	21:42			20:45			19:33		18:25	16:34	16:24
24	05:42			06:32			07:23		08:15	08:11	08:44
	21:41			20:43			19:31		18:23	16:32	16:25
25	05:43			06:33			07:25		07:17	08:12	08:45
	21:39			20:41			19:29		17:21	16:31	16:26
26	05:45			06:35			07:26		07:19	08:14	08:45
	21:38			20:39			19:26		17:19	16:30	16:26
27	05:46			06:37			07:28		07:21	08:15	08:45
	21:36			20:36			19:24		17:17	16:30	16:27
28	05:48			06:38			07:30		07:22	08:17	08:45
	21:35			20:34			19:22		17:15	16:29	16:28
29	05:49			06:40	07:15 (1)	07:31		07:24	08:19	08:45
	21:33			20:32	9	07:24 (1)	19:19		17:13	16:28	16:29
30	05:51			06:42	07:13 (1)	07:33		07:26	08:20	08:46
	21:31			20:30	14	07:27 (1)	19:17		17:11	16:27	16:30
31	05:53			06:43	07:12 (1)			07:28		08:46
	21:30			20:27	16	07:28 (1)			17:09		16:30
Potential sun hours	504			455		381			331	265	241
Total, worst case		140			234		100				
Sun reduction		0.33			0.35		0.34				
Oper. time red.		1.00			1.00		1.00				
Wind dir. red.		0.60			0.60		0.60				
Total reduction		0.20			0.21		0.20				
Total, real		28			50		20				

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

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Calculated:
11/06/2025 09:22/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Real Case - V150 **Shadow receptor:** DC - 172

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January	February	March	April		May		June	
1	08:46	08:18	07:24	07:12		06:06	06:31 (2)	05:20	05:49 (3)
	16:32	17:20	18:13	20:08		21:00 14	06:45 (2)	21:47 3	05:52 (3)
2	08:45	08:16	07:21	07:10		06:04	06:29 (2)	05:19	05:48 (3)
	16:33	17:22	18:15	20:10		21:02 16	06:45 (2)	21:48 4	05:52 (3)
3	08:45	08:15	07:19	07:07	07:30 (1)	06:02	06:27 (2)	05:18	05:48 (3)
	16:34	17:24	18:17	20:12 3	07:33 (1)	21:03 17	06:44 (2)	21:49 5	05:53 (3)
4	08:45	08:13	07:17	07:05	07:28 (1)	06:00	06:25 (2)	05:17	05:47 (3)
	16:35	17:26	18:18	20:13 6	07:34 (1)	21:05 19	06:44 (2)	21:50 6	05:53 (3)
5	08:45	08:11	07:15	07:03	07:26 (1)	05:58	06:24 (2)	05:17	05:46 (3)
	16:36	17:28	18:20	20:15 9	07:35 (1)	21:07 20	06:44 (2)	21:51 7	05:53 (3)
6	08:44	08:10	07:12	07:00	07:23 (1)	05:57	06:22 (2)	05:16	05:46 (3)
	16:38	17:30	18:22	20:17 11	07:34 (1)	21:08 21	06:43 (2)	21:52 8	05:54 (3)
7	08:44	08:08	07:10	06:58	07:21 (1)	05:55	06:22 (2)	05:16	05:45 (3)
	16:39	17:32	18:24	20:18 13	07:34 (1)	21:10 20	06:42 (2)	21:53 9	05:54 (3)
8	08:44	08:06	07:08	06:56	07:19 (1)	05:53	06:23 (2)	05:15	05:45 (3)
	16:40	17:34	18:26	20:20 15	07:34 (1)	21:12 18	06:41 (2)	21:54 10	05:55 (3)
9	08:43	08:04	07:06	06:53	07:16 (1)	05:51	06:24 (2)	05:14	05:45 (3)
	16:42	17:36	18:28	20:22 17	07:33 (1)	21:13 15	06:39 (2)	21:55 11	05:56 (3)
10	08:43	08:02	07:03	06:51	07:14 (1)	05:49	06:25 (2)	05:14	05:44 (3)
	16:43	17:37	18:29	20:24 18	07:32 (1)	21:15 12	06:37 (2)	21:56 11	05:55 (3)
11	08:42	08:01	07:01	06:49	07:12 (1)	05:48	06:28 (2)	05:14	05:44 (3)
	16:44	17:39	18:31	20:25 19	07:31 (1)	21:17 7	06:35 (2)	21:56 12	05:56 (3)
12	08:41	07:59	06:59	06:47	07:12 (1)	05:46		05:13	05:44 (3)
	16:46	17:41	18:33	20:27 18	07:30 (1)	21:18		21:57 12	05:56 (3)
13	08:41	07:57	06:56	06:44	07:14 (1)	05:44		05:13	05:43 (3)
	16:47	17:43	18:35	20:29 14	07:28 (1)	21:20		21:58 13	05:56 (3)
14	08:40	07:55	06:54	06:42	07:15 (1)	05:43		05:13	05:43 (3)
	16:49	17:45	18:36	20:31 10	07:25 (1)	21:22		21:58 13	05:56 (3)
15	08:39	07:53	06:52	06:40		05:41		05:13	05:43 (3)
	16:51	17:47	18:38	20:32		21:23		21:59 14	05:57 (3)
16	08:38	07:51	06:49	06:38		05:40		05:12	05:43 (3)
	16:52	17:49	18:40	20:34		21:25		21:59 14	05:57 (3)
17	08:37	07:49	06:47	06:35		05:38		05:12	05:43 (3)
	16:54	17:51	18:42	20:36		21:26		22:00 14	05:57 (3)
18	08:36	07:47	06:45	06:33		05:37		05:12	05:43 (3)
	16:55	17:53	18:44	20:38		21:28		22:00 14	05:57 (3)
19	08:35	07:45	06:42	06:31		05:35		05:12	05:43 (3)
	16:57	17:54	18:45	20:39		21:29		22:01 15	05:58 (3)
20	08:34	07:43	06:40	06:29		05:34		05:12	05:43 (3)
	16:59	17:56	18:47	20:41		21:31		22:01 15	05:58 (3)
21	08:33	07:41	06:38	06:27		05:32		05:13	05:44 (3)
	17:01	17:58	18:49	20:43		21:32		22:01 15	05:59 (3)
22	08:32	07:39	06:35	06:25		05:31		05:13	05:44 (3)
	17:02	18:00	18:51	20:45		21:34		22:01 15	05:59 (3)
23	08:31	07:37	06:33	06:22		05:30		05:13	05:44 (3)
	17:04	18:02	18:52	20:46		21:35		22:02 15	05:59 (3)
24	08:29	07:34	06:31	06:20		05:28		05:13	05:44 (3)
	17:06	18:04	18:54	20:48		21:37		22:02 14	05:58 (3)
25	08:28	07:32	06:28	06:18	06:42 (2)	05:27		05:14	05:45 (3)
	17:08	18:06	18:56	20:50 1	06:43 (2)	21:38		22:02 14	05:59 (3)
26	08:27	07:30	06:26	06:16	06:40 (2)	05:26		05:14	05:45 (3)
	17:09	18:07	18:58	20:51 4	06:44 (2)	21:39		22:02 14	05:59 (3)
27	08:25	07:28	06:24	06:14	06:38 (2)	05:25		05:14	05:46 (3)
	17:11	18:09	18:59	20:53 6	06:44 (2)	21:41		22:02 14	06:00 (3)
28	08:24	07:26	06:21	06:12	06:37 (2)	05:24		05:15	05:46 (3)
	17:13	18:11	19:01	20:55 8	06:45 (2)	21:42		22:02 13	05:59 (3)
29	08:22		07:19	06:10	06:35 (2)	05:23		05:16	05:47 (3)
	17:15		20:03	20:57 11	06:46 (2)	21:43		22:01 13	06:00 (3)
30	08:21		07:17	06:08	06:33 (2)	05:22		05:16	05:47 (3)
	17:17		20:05	20:58 12	06:45 (2)	21:44		22:01 13	06:00 (3)
31	08:19		07:14			05:21	05:50 (3)		
	17:19		20:06			21:46 1	05:51 (3)		
Potential sun hours	257	277	367	417		487		501	
Total, worst case				195		180		350	
Sun reduction				0.38		0.39		0.35	
Oper. time red.				1.00		1.00		1.00	
Wind dir. red.				0.60		0.60		0.60	
Total reduction				0.23		0.24		0.21	
Total, real				45		43		73	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
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Calculated:
11/06/2025 09:22/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Real Case - V150 **Shadow receptor:** DC - 172

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	July			August			September			October	November	December
1	05:17		05:48 (3)	05:54			06:45		07:11 (1)	07:35	07:30	08:22
	22:01	12	06:00 (3)	21:28			20:25	19	07:30 (1)	19:15	17:07	16:26
2	05:17		05:49 (3)	05:56		06:37 (2)	06:46		07:13 (1)	07:37	07:31	08:23
	22:00	11	06:00 (3)	21:26	10	06:47 (2)	20:23	18	07:31 (1)	19:12	17:06	16:26
3	05:18		05:49 (3)	05:57		06:35 (2)	06:48		07:14 (1)	07:38	07:33	08:24
	22:00	11	06:00 (3)	21:25	14	06:49 (2)	20:20	17	07:31 (1)	19:10	17:04	16:25
4	05:19		05:50 (3)	05:59		06:34 (2)	06:50		07:16 (1)	07:40	07:35	08:26
	22:00	10	06:00 (3)	21:23	16	06:50 (2)	20:18	15	07:31 (1)	19:08	17:02	16:24
5	05:20		05:51 (3)	06:00		06:32 (2)	06:51		07:18 (1)	07:42	07:37	08:27
	21:59	9	06:00 (3)	21:21	19	06:51 (2)	20:16	13	07:31 (1)	19:05	17:00	16:24
6	05:21		05:52 (3)	06:02		06:32 (2)	06:53		07:19 (1)	07:43	07:39	08:28
	21:59	9	06:01 (3)	21:19	20	06:52 (2)	20:14	11	07:30 (1)	19:03	16:58	16:23
7	05:22		05:53 (3)	06:04		06:32 (2)	06:55		07:21 (1)	07:45	07:41	08:30
	21:58	8	06:01 (3)	21:18	20	06:52 (2)	20:11	9	07:30 (1)	19:01	16:57	16:23
8	05:22		05:54 (3)	06:05		06:34 (2)	06:56		07:22 (1)	07:47	07:42	08:31
	21:57	7	06:01 (3)	21:16	19	06:53 (2)	20:09	6	07:28 (1)	18:58	16:55	16:23
9	05:23		05:54 (3)	06:07		06:35 (2)	06:58		07:24 (1)	07:49	07:44	08:32
	21:57	6	06:00 (3)	21:14	18	06:53 (2)	20:07	4	07:28 (1)	18:56	16:53	16:22
10	05:24		05:55 (3)	06:08		06:37 (2)	07:00		07:25 (1)	07:50	07:46	08:33
	21:56	4	05:59 (3)	21:12	17	06:54 (2)	20:04	1	07:26 (1)	18:54	16:52	16:22
11	05:26		05:56 (3)	06:10		06:38 (2)	07:01			07:52	07:48	08:34
	21:55	3	05:59 (3)	21:10	15	06:53 (2)	20:02			18:52	16:50	16:22
12	05:27		05:57 (3)	06:12		06:40 (2)	07:03			07:54	07:50	08:35
	21:54	2	05:59 (3)	21:08	14	06:54 (2)	19:59			18:49	16:48	16:22
13	05:28		05:59 (3)	06:13		06:41 (2)	07:05			07:55	07:52	08:36
	21:53	1	06:00 (3)	21:06	12	06:53 (2)	19:57			18:47	16:47	16:22
14	05:29			06:15		06:43 (2)	07:06			07:57	07:53	08:37
	21:52			21:04	10	06:53 (2)	19:55			18:45	16:45	16:22
15	05:30			06:17		06:44 (2)	07:08			07:59	07:55	08:38
	21:51			21:02	8	06:52 (2)	19:52			18:43	16:44	16:22
16	05:31			06:18		06:46 (2)	07:10			08:01	07:57	08:39
	21:50			21:00	6	06:52 (2)	19:50			18:40	16:42	16:22
17	05:33			06:20		06:48 (2)	07:11			08:03	07:59	08:40
	21:49			20:58	3	06:51 (2)	19:48			18:38	16:41	16:22
18	05:34			06:22			07:13			08:04	08:00	08:41
	21:48			20:56			19:45			18:36	16:40	16:22
19	05:35			06:23			07:15			08:06	08:02	08:41
	21:47			20:54			19:43			18:34	16:38	16:23
20	05:36			06:25			07:16			08:08	08:04	08:42
	21:46			20:52			19:41			18:32	16:37	16:23
21	05:38			06:27			07:18			08:10	08:06	08:43
	21:45			20:49			19:38			18:30	16:36	16:23
22	05:39			06:28			07:20			08:11	08:07	08:43
	21:43			20:47			19:36			18:27	16:35	16:24
23	05:41			06:30			07:21			08:13	08:09	08:44
	21:42			20:45			19:33			18:25	16:34	16:24
24	05:42			06:32			07:23			08:15	08:11	08:44
	21:40			20:43			19:31			18:23	16:32	16:25
25	05:43			06:33			07:25			07:17	08:12	08:45
	21:39			20:41			19:29			17:21	16:31	16:26
26	05:45			06:35			07:26			07:19	08:14	08:45
	21:38			20:39			19:26			17:19	16:30	16:26
27	05:46			06:37			07:28			07:21	08:15	08:45
	21:36			20:36			19:24			17:17	16:30	16:27
28	05:48			06:38			07:30			07:22	08:17	08:45
	21:35			20:34			19:22			17:15	16:29	16:28
29	05:49			06:40		07:15 (1)	07:31			07:24	08:19	08:45
	21:33			20:32	11	07:26 (1)	19:19			17:13	16:28	16:29
30	05:51			06:42		07:13 (1)	07:33			07:26	08:20	08:46
	21:31			20:30	15	07:28 (1)	19:17			17:11	16:27	16:30
31	05:52			06:43		07:12 (1)				07:28		08:46
	21:30			20:27	18	07:30 (1)				17:09		16:30
Potential sun hours	504			455			381			331	265	241
Total, worst case		93			265			113				
Sun reduction		0.33			0.35			0.34				
Oper. time red.		1.00			1.00			1.00				
Wind dir. red.		0.60			0.60			0.60				
Total reduction		0.20			0.21			0.20				
Total, real		19			57			23				

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
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padraig / podowd@jodireland.com
Calculated:
11/06/2025 09:22/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Real Case - V150 **Shadow receptor:** DD - 173

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January	February	March	April		May		June	
1	08:46	08:18	07:24	07:12		06:06	06:31 (2)	05:20	
	16:32	17:20	18:13	20:08		21:00	14 06:45 (2)	21:47	
2	08:45	08:16	07:21	07:10	07:32 (1)	06:04	06:29 (2)	05:19	05:48 (3)
	16:33	17:22	18:15	20:10	1 07:33 (1)	21:02	16 06:45 (2)	21:48	1 05:49 (3)
3	08:45	08:15	07:19	07:07	07:30 (1)	06:02	06:27 (2)	05:18	05:48 (3)
	16:34	17:24	18:17	20:12	4 07:34 (1)	21:03	17 06:44 (2)	21:49	2 05:50 (3)
4	08:45	08:13	07:17	07:05	07:28 (1)	06:00	06:25 (2)	05:17	05:47 (3)
	16:35	17:26	18:18	20:13	7 07:35 (1)	21:05	19 06:44 (2)	21:50	4 05:51 (3)
5	08:45	08:11	07:15	07:03	07:26 (1)	05:58	06:24 (2)	05:17	05:46 (3)
	16:36	17:28	18:20	20:15	10 07:36 (1)	21:07	20 06:44 (2)	21:51	5 05:51 (3)
6	08:44	08:10	07:12	07:00	07:23 (1)	05:57	06:22 (2)	05:16	05:46 (3)
	16:38	17:30	18:22	20:17	12 07:35 (1)	21:08	21 06:43 (2)	21:52	6 05:52 (3)
7	08:44	08:08	07:10	06:58	07:21 (1)	05:55	06:20 (2)	05:16	05:45 (3)
	16:39	17:32	18:24	20:18	14 07:35 (1)	21:10	22 06:42 (2)	21:53	7 05:52 (3)
8	08:44	08:06	07:08	06:56	07:19 (1)	05:53	06:22 (2)	05:15	05:45 (3)
	16:40	17:34	18:26	20:20	16 07:35 (1)	21:12	20 06:42 (2)	21:54	8 05:53 (3)
9	08:43	08:04	07:06	06:53	07:16 (1)	05:51	06:22 (2)	05:14	05:45 (3)
	16:42	17:36	18:28	20:22	17 07:33 (1)	21:13	18 06:40 (2)	21:55	8 05:53 (3)
10	08:43	08:02	07:03	06:51	07:14 (1)	05:49	06:23 (2)	05:14	05:44 (3)
	16:43	17:37	18:29	20:24	19 07:33 (1)	21:15	16 06:39 (2)	21:56	9 05:53 (3)
11	08:42	08:01	07:01	06:49	07:12 (1)	05:48	06:25 (2)	05:14	05:44 (3)
	16:44	17:39	18:31	20:25	20 07:32 (1)	21:17	13 06:38 (2)	21:56	10 05:54 (3)
12	08:41	07:59	06:59	06:47	07:12 (1)	05:46	06:27 (2)	05:13	05:44 (3)
	16:46	17:41	18:33	20:27	19 07:31 (1)	21:18	8 06:35 (2)	21:57	10 05:54 (3)
13	08:41	07:57	06:56	06:44	07:14 (1)	05:44		05:13	05:43 (3)
	16:47	17:43	18:35	20:29	15 07:29 (1)	21:20		21:58	11 05:54 (3)
14	08:40	07:55	06:54	06:42	07:15 (1)	05:43		05:13	05:43 (3)
	16:49	17:45	18:36	20:31	11 07:26 (1)	21:22		21:58	11 05:54 (3)
15	08:39	07:53	06:52	06:40		05:41		05:13	05:43 (3)
	16:51	17:47	18:38	20:32		21:23		21:59	12 05:55 (3)
16	08:38	07:51	06:49	06:38		05:40		05:12	05:43 (3)
	16:52	17:49	18:40	20:34		21:25		21:59	12 05:55 (3)
17	08:37	07:49	06:47	06:35		05:38		05:12	05:43 (3)
	16:54	17:51	18:42	20:36		21:26		22:00	12 05:55 (3)
18	08:36	07:47	06:45	06:33		05:37		05:12	05:43 (3)
	16:55	17:53	18:44	20:38		21:28		22:00	12 05:55 (3)
19	08:35	07:45	06:42	06:31		05:35		05:12	05:43 (3)
	16:57	17:54	18:45	20:39		21:29		22:01	13 05:56 (3)
20	08:34	07:43	06:40	06:29		05:34		05:12	05:43 (3)
	16:59	17:56	18:47	20:41		21:31		22:01	13 05:56 (3)
21	08:33	07:41	06:38	06:27		05:32		05:13	05:44 (3)
	17:01	17:58	18:49	20:43		21:32		22:01	13 05:57 (3)
22	08:32	07:39	06:35	06:25		05:31		05:13	05:44 (3)
	17:02	18:00	18:51	20:45		21:34		22:01	13 05:57 (3)
23	08:31	07:37	06:33	06:22		05:30		05:13	05:44 (3)
	17:04	18:02	18:52	20:46		21:35		22:02	13 05:57 (3)
24	08:29	07:34	06:31	06:20		05:28		05:13	05:44 (3)
	17:06	18:04	18:54	20:48		21:37		22:02	12 05:56 (3)
25	08:28	07:32	06:28	06:18		05:27		05:14	05:45 (3)
	17:08	18:06	18:56	20:50		21:38		22:02	12 05:57 (3)
26	08:27	07:30	06:26	06:16	06:40 (2)	05:26		05:14	05:45 (3)
	17:09	18:07	18:58	20:51	3 06:43 (2)	21:39		22:02	12 05:57 (3)
27	08:25	07:28	06:24	06:14	06:38 (2)	05:25		05:14	05:46 (3)
	17:11	18:09	18:59	20:53	6 06:44 (2)	21:41		22:02	12 05:58 (3)
28	08:24	07:26	06:21	06:12	06:37 (2)	05:24		05:15	05:46 (3)
	17:13	18:11	19:01	20:55	8 06:45 (2)	21:42		22:02	11 05:57 (3)
29	08:22		07:19	06:10	06:35 (2)	05:23		05:16	05:47 (3)
	17:15		20:03	20:57	10 06:45 (2)	21:43		22:01	11 05:58 (3)
30	08:21		07:17	06:08	06:33 (2)	05:22		05:16	05:47 (3)
	17:17		20:05	20:58	12 06:45 (2)	21:44		22:01	10 05:57 (3)
31	08:19		07:14			05:21			
	17:19		20:06			21:46			
Potential sun hours	257	277	367	417		487		501	
Total, worst case					204		204		285
Sun reduction					0.38		0.39		0.35
Oper. time red.					1.00		1.00		1.00
Wind dir. red.					0.60		0.60		0.60
Total reduction					0.23		0.24		0.21
Total, real					47		49		60

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

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Calculated:
11/06/2025 09:22/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Real Case - V150 **Shadow receptor:** DD - 173

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	July		August		September		October	November	December
1	05:17		05:48 (3)	05:54		06:36 (2)	06:45	07:11 (1)	07:35	07:30	08:22
	22:01	10	05:58 (3)	21:28	10	06:46 (2)	20:25	20	07:31 (1)	19:15	17:07	16:26
2	05:17		05:49 (3)	05:56		06:35 (2)	06:46		07:13 (1)	07:37	07:31	08:23
	22:00	9	05:58 (3)	21:26	14	06:49 (2)	20:23	19	07:32 (1)	19:12	17:06	16:26
3	05:18		05:49 (3)	05:57		06:33 (2)	06:48		07:14 (1)	07:38	07:33	08:24
	22:00	9	05:58 (3)	21:25	17	06:50 (2)	20:20	17	07:31 (1)	19:10	17:04	16:25
4	05:19		05:50 (3)	05:59		06:32 (2)	06:50		07:16 (1)	07:40	07:35	08:26
	22:00	8	05:58 (3)	21:23	19	06:51 (2)	20:18	16	07:32 (1)	19:08	17:02	16:24
5	05:20		05:51 (3)	06:00		06:31 (2)	06:51		07:18 (1)	07:42	07:37	08:27
	21:59	7	05:58 (3)	21:21	21	06:52 (2)	20:16	14	07:32 (1)	19:05	17:00	16:24
6	05:21		05:52 (3)	06:02		06:31 (2)	06:53		07:19 (1)	07:43	07:39	08:28
	21:59	6	05:58 (3)	21:19	22	06:53 (2)	20:14	12	07:31 (1)	19:03	16:58	16:23
7	05:22		05:53 (3)	06:04		06:32 (2)	06:55		07:21 (1)	07:45	07:41	08:30
	21:58	5	05:58 (3)	21:18	21	06:53 (2)	20:11	10	07:31 (1)	19:01	16:57	16:23
8	05:22		05:54 (3)	06:05		06:34 (2)	06:56		07:22 (1)	07:47	07:42	08:31
	21:57	4	05:58 (3)	21:16	20	06:54 (2)	20:09	7	07:29 (1)	18:58	16:55	16:23
9	05:23		05:54 (3)	06:07		06:35 (2)	06:58		07:24 (1)	07:49	07:44	08:32
	21:57	3	05:57 (3)	21:14	18	06:53 (2)	20:07	5	07:29 (1)	18:56	16:53	16:22
10	05:24		05:55 (3)	06:08		06:37 (2)	07:00		07:25 (1)	07:50	07:46	08:33
	21:56	2	05:57 (3)	21:12	17	06:54 (2)	20:04	1	07:26 (1)	18:54	16:52	16:22
11	05:26			06:10		06:38 (2)	07:01			07:52	07:48	08:34
	21:55			21:10	15	06:53 (2)	20:02			18:52	16:50	16:22
12	05:27			06:12		06:40 (2)	07:03			07:54	07:50	08:35
	21:54			21:08	14	06:54 (2)	19:59			18:49	16:48	16:22
13	05:28			06:13		06:41 (2)	07:05			07:55	07:52	08:36
	21:53			21:06	12	06:53 (2)	19:57			18:47	16:47	16:22
14	05:29			06:15		06:43 (2)	07:06			07:57	07:53	08:37
	21:52			21:04	10	06:53 (2)	19:55			18:45	16:45	16:22
15	05:30			06:17		06:44 (2)	07:08			07:59	07:55	08:38
	21:51			21:02	7	06:51 (2)	19:52			18:43	16:44	16:22
16	05:31			06:18		06:46 (2)	07:10			08:01	07:57	08:39
	21:50			21:00	5	06:51 (2)	19:50			18:40	16:42	16:22
17	05:33			06:20		06:48 (2)	07:11			08:03	07:59	08:40
	21:49			20:58	3	06:51 (2)	19:48			18:38	16:41	16:22
18	05:34			06:22			07:13			08:04	08:00	08:41
	21:48			20:56			19:45			18:36	16:40	16:22
19	05:35			06:23			07:15			08:06	08:02	08:41
	21:47			20:54			19:43			18:34	16:38	16:23
20	05:36			06:25			07:16			08:08	08:04	08:42
	21:46			20:52			19:41			18:32	16:37	16:23
21	05:38			06:27			07:18			08:10	08:06	08:43
	21:45			20:49			19:38			18:30	16:36	16:23
22	05:39			06:28			07:20			08:11	08:07	08:43
	21:43			20:47			19:36			18:27	16:35	16:24
23	05:41			06:30			07:21			08:13	08:09	08:44
	21:42			20:45			19:33			18:25	16:34	16:24
24	05:42			06:32			07:23			08:15	08:11	08:44
	21:40			20:43			19:31			18:23	16:32	16:25
25	05:43			06:33			07:25			07:17	08:12	08:45
	21:39			20:41			19:29			17:21	16:31	16:26
26	05:45			06:35			07:26			07:19	08:14	08:45
	21:38			20:39			19:26			17:19	16:30	16:26
27	05:46			06:37			07:28			07:21	08:15	08:45
	21:36			20:36			19:24			17:17	16:30	16:27
28	05:48			06:38		07:21 (1)	07:30			07:22	08:17	08:45
	21:35			20:34	3	07:24 (1)	19:22			17:15	16:29	16:28
29	05:49			06:40		07:15 (1)	07:31			07:24	08:19	08:45
	21:33			20:32	12	07:27 (1)	19:19			17:13	16:28	16:29
30	05:51			06:42		07:14 (1)	07:33			07:26	08:20	08:46
	21:31			20:30	15	07:29 (1)	19:17			17:11	16:27	16:30
31	05:52			06:43		07:12 (1)				07:28		08:46
	21:30			20:27	19	07:31 (1)				17:09		16:30
Potential sun hours	504			455			381			331	265	241
Total, worst case		63			294			121				
Sun reduction		0.33			0.35			0.34				
Oper. time red.		1.00			1.00			1.00				
Wind dir. red.		0.60			0.60			0.60				
Total reduction		0.20			0.21			0.20				
Total, real		13			63			25				

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
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padraig / podowd@jodireland.com
Calculated:
11/06/2025 09:22/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Real Case - V150 **Shadow receptor:** DE - 174

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January	February	March	April		May		June	
1	08:46	08:18	07:24	07:12		06:06		06:31 (2)	05:20		
	16:32	17:20	18:13	20:08		21:00	14	06:45 (2)	21:47		
2	08:45	08:16	07:21	07:10		07:32 (1)	06:04		06:29 (2)	05:19		
	16:33	17:22	18:15	20:10	2	07:34 (1)	21:02	15	06:44 (2)	21:48		
3	08:45	08:15	07:19	07:07		07:30 (1)	06:02		06:27 (2)	05:18		
	16:34	17:24	18:17	20:12	5	07:35 (1)	21:03	17	06:44 (2)	21:49		
4	08:45	08:13	07:17	07:05		07:28 (1)	06:00		06:25 (2)	05:17		05:47 (3)
	16:35	17:26	18:18	20:13	7	07:35 (1)	21:05	19	06:44 (2)	21:50	1	05:48 (3)
5	08:45	08:11	07:15	07:03		07:26 (1)	05:58		06:24 (2)	05:17		05:46 (3)
	16:36	17:28	18:20	20:15	10	07:36 (1)	21:07	20	06:44 (2)	21:51	2	05:48 (3)
6	08:44	08:10	07:12	07:00		07:23 (1)	05:57		06:22 (2)	05:16		05:46 (3)
	16:38	17:30	18:22	20:17	12	07:35 (1)	21:08	21	06:43 (2)	21:52	3	05:49 (3)
7	08:44	08:08	07:10	06:58		07:21 (1)	05:55		06:20 (2)	05:16		05:45 (3)
	16:39	17:32	18:24	20:18	14	07:35 (1)	21:10	22	06:42 (2)	21:53	4	05:49 (3)
8	08:44	08:06	07:08	06:56		07:19 (1)	05:53		06:20 (2)	05:15		05:45 (3)
	16:40	17:34	18:26	20:20	16	07:35 (1)	21:12	22	06:42 (2)	21:54	5	05:50 (3)
9	08:43	08:04	07:06	06:53		07:16 (1)	05:51		06:21 (2)	05:14		05:45 (3)
	16:42	17:36	18:28	20:22	18	07:34 (1)	21:13	20	06:41 (2)	21:55	6	05:51 (3)
10	08:43	08:02	07:03	06:51		07:14 (1)	05:49		06:21 (2)	05:14		05:44 (3)
	16:43	17:37	18:29	20:24	19	07:33 (1)	21:15	18	06:39 (2)	21:56	7	05:51 (3)
11	08:42	08:01	07:01	06:49		07:12 (1)	05:48		06:23 (2)	05:14		05:44 (3)
	16:44	17:39	18:31	20:25	20	07:32 (1)	21:17	15	06:38 (2)	21:56	8	05:52 (3)
12	08:41	07:59	06:59	06:47		07:12 (1)	05:46		06:24 (2)	05:13		05:44 (3)
	16:46	17:41	18:33	20:27	19	07:31 (1)	21:18	12	06:36 (2)	21:57	8	05:52 (3)
13	08:41	07:57	06:56	06:44		07:14 (1)	05:44		06:28 (2)	05:13		05:43 (3)
	16:47	17:43	18:35	20:29	16	07:30 (1)	21:20	6	06:34 (2)	21:58	9	05:52 (3)
14	08:40	07:55	06:54	06:42		07:14 (1)	05:43			05:13		05:43 (3)
	16:49	17:45	18:36	20:31	13	07:27 (1)	21:22			21:58	9	05:52 (3)
15	08:39	07:53	06:52	06:40		07:18 (1)	05:41			05:13		05:43 (3)
	16:51	17:47	18:38	20:32	5	07:23 (1)	21:23			21:59	10	05:53 (3)
16	08:38	07:51	06:49	06:38			05:40			05:12		05:43 (3)
	16:52	17:49	18:40	20:34			21:25			21:59	10	05:53 (3)
17	08:37	07:49	06:47	06:35			05:38			05:12		05:43 (3)
	16:54	17:51	18:42	20:36			21:26			22:00	10	05:53 (3)
18	08:36	07:47	06:45	06:33			05:37			05:12		05:43 (3)
	16:55	17:53	18:44	20:38			21:28			22:00	10	05:53 (3)
19	08:35	07:45	06:42	06:31			05:35			05:12		05:43 (3)
	16:57	17:54	18:45	20:39			21:29			22:01	11	05:54 (3)
20	08:34	07:43	06:40	06:29			05:34			05:12		05:43 (3)
	16:59	17:56	18:47	20:41			21:31			22:01	11	05:54 (3)
21	08:33	07:41	06:38	06:27			05:32			05:13		05:44 (3)
	17:01	17:58	18:49	20:43			21:32			22:01	11	05:55 (3)
22	08:32	07:39	06:35	06:25			05:31			05:13		05:44 (3)
	17:02	18:00	18:51	20:45			21:34			22:01	11	05:55 (3)
23	08:31	07:37	06:33	06:22			05:30			05:13		05:44 (3)
	17:04	18:02	18:52	20:46			21:35			22:02	11	05:55 (3)
24	08:29	07:34	06:31	06:20			05:28			05:13		05:44 (3)
	17:06	18:04	18:54	20:48			21:37			22:02	10	05:54 (3)
25	08:28	07:32	06:28	06:18			05:27			05:14		05:45 (3)
	17:08	18:06	18:56	20:50			21:38			22:02	10	05:55 (3)
26	08:27	07:30	06:26	06:16		06:40 (2)	05:26			05:14		05:45 (3)
	17:09	18:07	18:58	20:51	2	06:42 (2)	21:39			22:02	10	05:55 (3)
27	08:25	07:28	06:24	06:14		06:38 (2)	05:25			05:14		05:46 (3)
	17:11	18:09	18:59	20:53	5	06:43 (2)	21:41			22:02	10	05:56 (3)
28	08:24	07:26	06:21	06:12		06:37 (2)	05:24			05:15		05:46 (3)
	17:13	18:11	19:01	20:55	7	06:44 (2)	21:42			22:02	9	05:55 (3)
29	08:22		07:19	06:10		06:35 (2)	05:23			05:16		05:47 (3)
	17:15		20:03	20:57	10	06:45 (2)	21:43			22:01	9	05:56 (3)
30	08:21		07:17	06:08		06:33 (2)	05:22			05:16		05:47 (3)
	17:17		20:05	20:58	12	06:45 (2)	21:44			22:01	8	05:55 (3)
31	08:19		07:14				05:21					
	17:19		20:06				21:46					
Potential sun hours	257	277	367	417			487			501		
Total, worst case					212			221			223	
Sun reduction					0.38			0.39			0.35	
Oper. time red.					1.00			1.00			1.00	
Wind dir. red.					0.60			0.60			0.60	
Total reduction					0.23			0.24			0.21	
Total, real					48			53			47	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
Jennings O'Donovan
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padraig / podowd@jodireland.com
Calculated:
11/06/2025 09:22/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Real Case - V150 **Shadow receptor:** DE - 174

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	July			August			September			October	November	December
1	05:17		05:48 (3)	05:54		06:34 (2)	06:45		07:11 (1)	07:35	07:30	08:22
	22:01	8	05:56 (3)	21:28	13	06:47 (2)	20:25	20	07:31 (1)	19:15	17:07	16:26
2	05:17		05:49 (3)	05:56		06:33 (2)	06:46		07:13 (1)	07:37	07:31	08:23
	22:00	7	05:56 (3)	21:26	16	06:49 (2)	20:23	19	07:32 (1)	19:12	17:06	16:26
3	05:18		05:49 (3)	05:57		06:31 (2)	06:48		07:14 (1)	07:38	07:33	08:24
	22:00	6	05:55 (3)	21:25	19	06:50 (2)	20:20	18	07:32 (1)	19:10	17:04	16:25
4	05:19		05:50 (3)	05:59		06:31 (2)	06:50		07:16 (1)	07:40	07:35	08:26
	22:00	6	05:56 (3)	21:23	21	06:52 (2)	20:18	16	07:32 (1)	19:08	17:02	16:24
5	05:20		05:51 (3)	06:00		06:30 (2)	06:51		07:18 (1)	07:42	07:37	08:27
	21:59	5	05:56 (3)	21:21	22	06:52 (2)	20:16	14	07:32 (1)	19:05	17:00	16:24
6	05:21		05:52 (3)	06:02		06:31 (2)	06:53		07:19 (1)	07:43	07:39	08:28
	21:59	4	05:56 (3)	21:19	22	06:53 (2)	20:14	12	07:31 (1)	19:03	16:58	16:23
7	05:22		05:53 (3)	06:04		06:32 (2)	06:55		07:21 (1)	07:45	07:41	08:30
	21:58	3	05:56 (3)	21:18	21	06:53 (2)	20:11	10	07:31 (1)	19:01	16:57	16:23
8	05:22		05:54 (3)	06:05		06:34 (2)	06:56		07:22 (1)	07:47	07:42	08:31
	21:57	2	05:56 (3)	21:16	19	06:53 (2)	20:09	8	07:30 (1)	18:58	16:55	16:23
9	05:23			06:07		06:35 (2)	06:58		07:24 (1)	07:49	07:44	08:32
	21:57			21:14	18	06:53 (2)	20:07	5	07:29 (1)	18:56	16:53	16:22
10	05:24			06:08		06:37 (2)	07:00		07:25 (1)	07:50	07:46	08:33
	21:56			21:12	17	06:54 (2)	20:04	2	07:27 (1)	18:54	16:52	16:22
11	05:26			06:10		06:38 (2)	07:01			07:52	07:48	08:34
	21:55			21:10	15	06:53 (2)	20:02			18:52	16:50	16:22
12	05:27			06:12		06:40 (2)	07:03			07:54	07:50	08:35
	21:54			21:08	13	06:53 (2)	19:59			18:49	16:48	16:22
13	05:28			06:13		06:41 (2)	07:05			07:55	07:52	08:36
	21:53			21:06	11	06:52 (2)	19:57			18:47	16:47	16:22
14	05:29			06:15		06:43 (2)	07:06			07:57	07:53	08:37
	21:52			21:04	9	06:52 (2)	19:55			18:45	16:45	16:22
15	05:30			06:17		06:44 (2)	07:08			07:59	07:55	08:38
	21:51			21:02	7	06:51 (2)	19:52			18:43	16:44	16:22
16	05:31			06:18		06:46 (2)	07:10			08:01	07:57	08:39
	21:50			21:00	4	06:50 (2)	19:50			18:40	16:42	16:22
17	05:33			06:20		06:48 (2)	07:11			08:03	07:59	08:40
	21:49			20:58	2	06:50 (2)	19:48			18:38	16:41	16:22
18	05:34			06:22			07:13			08:04	08:00	08:41
	21:48			20:56			19:45			18:36	16:40	16:22
19	05:35			06:23			07:15			08:06	08:02	08:41
	21:47			20:54			19:43			18:34	16:38	16:23
20	05:36			06:25			07:16			08:08	08:04	08:42
	21:46			20:52			19:41			18:32	16:37	16:23
21	05:38			06:27			07:18			08:10	08:06	08:43
	21:45			20:49			19:38			18:30	16:36	16:23
22	05:39			06:28			07:20			08:11	08:07	08:43
	21:43			20:47			19:36			18:27	16:35	16:24
23	05:41			06:30			07:21			08:13	08:09	08:44
	21:42			20:45			19:33			18:25	16:34	16:24
24	05:42			06:32			07:23			08:15	08:11	08:44
	21:40			20:43			19:31			18:23	16:32	16:25
25	05:43			06:33			07:25			07:17	08:12	08:45
	21:39			20:41			19:29			17:21	16:31	16:26
26	05:45			06:35			07:26			07:19	08:14	08:45
	21:38			20:39			19:26			17:19	16:30	16:26
27	05:46			06:37			07:28			07:21	08:15	08:45
	21:36			20:36			19:24			17:17	16:30	16:27
28	05:48			06:38		07:19 (1)	07:30			07:22	08:17	08:45
	21:35			20:34	6	07:25 (1)	19:22			17:15	16:29	16:28
29	05:49			06:40		07:15 (1)	07:31			07:24	08:19	08:45
	21:33			20:32	13	07:28 (1)	19:19			17:13	16:28	16:29
30	05:51			06:42		07:13 (1)	07:33			07:26	08:20	08:46
	21:31			20:30	17	07:30 (1)	19:17			17:11	16:27	16:30
31	05:52		06:37 (2)	06:43		07:12 (1)				07:28		08:46
	21:30	9	06:46 (2)	20:27	19	07:31 (1)				17:09		16:30
Potential sun hours	504			455			381			331	265	241
Total, worst case		50			304			124				
Sun reduction		0.33			0.35			0.34				
Oper. time red.		1.00			1.00			1.00				
Wind dir. red.		0.60			0.60			0.60				
Total reduction		0.20			0.21			0.20				
Total, real		10			65			25				

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
Jennings O'Donovan
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padraig / podowd@jodireland.com
Calculated:
11/06/2025 09:22/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Real Case - V150 **Shadow receptor:** DF - 177

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January	February		March		April		May		June		
1	08:46	08:18		07:24		07:12		07:35 (4)	06:06	06:35 (5)	05:20	05:58 (7)
	16:32	17:20		18:13		20:08	13	08:02 (3)	21:00	22 06:57 (5)	21:47	8 06:06 (7)
2	08:46	08:16		07:21		07:10		07:33 (4)	06:04	06:35 (5)	05:19	06:00 (7)
	16:33	17:22		18:15		20:10	7	07:40 (4)	21:02	20 06:55 (5)	21:48	4 06:04 (7)
3	08:45	08:15		07:19		07:07		07:30 (4)	06:02	06:36 (5)	05:18	
	16:34	17:24		18:17		20:12	9	07:39 (4)	21:03	18 06:54 (5)	21:49	
4	08:45	08:13		07:17	07:41 (2)	07:05		07:28 (4)	06:00	06:38 (5)	05:17	
	16:35	17:26		18:19	1 07:42 (2)	20:13	11	07:39 (4)	21:05	14 06:52 (5)	21:50	
5	08:45	08:11		07:15	07:38 (2)	07:03		07:26 (4)	05:58	06:41 (5)	05:17	
	16:36	17:28		18:20	4 07:42 (2)	20:15	13	07:39 (4)	21:07	9 06:50 (5)	21:51	
6	08:45	08:10		07:12	07:36 (2)	07:00		07:23 (4)	05:57		05:16	
	16:38	17:30		18:22	7 07:43 (2)	20:17	15	07:38 (4)	21:08		21:52	
7	08:44	08:08		07:10	07:34 (2)	06:58		07:21 (4)	05:55		05:15	
	16:39	17:32		18:24	9 07:43 (2)	20:18	16	07:37 (4)	21:10		21:53	
8	08:44	08:06		07:08	07:31 (2)	06:56		07:19 (4)	05:53		05:15	
	16:40	17:34		18:26	11 07:42 (2)	20:20	18	07:37 (4)	21:12		21:54	
9	08:43	08:04		07:06	07:29 (2)	06:53		07:18 (4)	05:51		05:14	
	16:42	17:36		18:28	13 07:42 (2)	20:22	17	07:35 (4)	21:13		21:55	
10	08:43	08:03		07:03	07:27 (2)	06:51		07:19 (4)	05:49		05:14	
	16:43	17:37		18:29	15 07:42 (2)	20:24	14	07:33 (4)	21:15		21:56	
11	08:42	08:01		07:01	07:24 (2)	06:49		07:21 (4)	05:48		05:14	
	16:44	17:39		18:31	17 07:41 (2)	20:25	9	07:30 (4)	21:17		21:56	
12	08:41	07:59		06:59	07:22 (2)	06:47			05:46		05:13	
	16:46	17:41		18:33	18 07:40 (2)	20:27			21:18		21:57	
13	08:41	07:57		06:56	07:23 (2)	06:44			05:44		05:13	
	16:47	17:43		18:35	16 07:39 (2)	20:29			21:20		21:58	
14	08:40	07:55		06:54	07:24 (2)	06:42			05:43	06:09 (7)	05:13	
	16:49	17:45		18:37	12 07:36 (2)	20:31			21:22	1 06:10 (7)	21:58	
15	08:39	07:53		06:52	07:27 (2)	06:40			05:41	06:08 (7)	05:13	
	16:51	17:47		18:38	5 07:32 (2)	20:32			21:23	3 06:11 (7)	21:59	
16	08:38	07:51		06:49		06:38			05:40	06:06 (7)	05:12	
	16:52	17:49		18:40		20:34			21:25	4 06:10 (7)	21:59	
17	08:37	07:49		06:47	07:10 (3)	06:35			05:38	06:05 (7)	05:12	
	16:54	17:51		18:42	2 07:12 (3)	20:36			21:26	6 06:11 (7)	22:00	
18	08:36	07:47	08:12 (1)	06:45	07:08 (3)	06:33			05:37	06:04 (7)	05:12	
	16:55	17:53	1 08:13 (1)	18:44	5 07:13 (3)	20:38			21:28	7 06:11 (7)	22:00	
19	08:35	07:45	08:09 (1)	06:42	07:05 (3)	06:31		06:55 (5)	05:35	06:02 (7)	05:12	
	16:57	17:54	3 08:12 (1)	18:45	8 07:13 (3)	20:39	3	06:58 (5)	21:29	9 06:11 (7)	22:01	
20	08:34	07:43	08:07 (1)	06:40	07:03 (3)	06:29		06:53 (5)	05:34	06:01 (7)	05:12	
	16:59	17:56	6 08:13 (1)	18:47	11 07:14 (3)	20:41	6	06:59 (5)	21:31	10 06:11 (7)	22:01	
21	08:33	07:41	08:05 (1)	06:38	07:01 (3)	06:27		06:50 (5)	05:32	06:00 (7)	05:13	
	17:01	17:58	8 08:13 (1)	18:49	14 07:15 (3)	20:43	9	06:59 (5)	21:32	11 06:11 (7)	22:01	
22	08:32	07:39	08:03 (1)	06:35	06:58 (3)	06:25		06:48 (5)	05:31	05:59 (7)	05:13	
	17:02	18:00	10 08:13 (1)	18:51	16 07:14 (3)	20:45	11	06:59 (5)	21:34	12 06:11 (7)	22:01	
23	08:31	07:37	08:01 (1)	06:33	06:56 (3)	06:22		06:46 (5)	05:30	05:57 (7)	05:13	
	17:04	18:02	12 08:13 (1)	18:52	19 07:15 (3)	20:46	14	07:00 (5)	21:35	13 06:10 (7)	22:02	
24	08:29	07:34	07:59 (1)	06:31	06:54 (3)	06:20		06:44 (5)	05:28	05:56 (7)	05:13	
	17:06	18:04	13 08:12 (1)	18:54	21 07:15 (3)	20:48	16	07:00 (5)	21:37	14 06:10 (7)	22:02	
25	08:28	07:32	07:56 (1)	06:28	06:51 (3)	06:18		06:42 (5)	05:27	05:55 (7)	05:14	
	17:08	18:06	14 08:10 (1)	18:56	22 07:13 (3)	20:50	17	06:59 (5)	21:38	15 06:10 (7)	22:02	
26	08:27	07:30	07:56 (1)	06:26	06:49 (3)	06:16		06:40 (5)	05:26	05:54 (7)	05:14	
	17:09	18:07	13 08:09 (1)	18:58	24 07:13 (3)	20:51	19	06:59 (5)	21:39	16 06:10 (7)	22:02	
27	08:25	07:28	07:58 (1)	06:24	06:47 (3)	06:14		06:38 (5)	05:25	05:53 (7)	05:14	
	17:11	18:09	9 08:07 (1)	18:59	26 07:13 (3)	20:53	21	06:59 (5)	21:41	16 06:09 (7)	22:02	
28	08:24	07:26		06:21	06:47 (3)	06:12		06:37 (5)	05:24	05:53 (7)	05:15	
	17:13	18:11		19:01	24 07:11 (3)	20:55	22	06:59 (5)	21:42	16 06:09 (7)	22:02	
29	08:23			07:19	07:48 (3)	06:10		06:35 (5)	05:23	05:54 (7)	05:15	
	17:15			20:03	22 08:10 (3)	20:57	24	06:59 (5)	21:43	14 06:08 (7)	22:01	
30	08:21			07:17	07:48 (3)	06:08		06:34 (5)	05:22	05:56 (7)	05:16	
	17:17			20:05	19 08:07 (3)	20:58	24	06:58 (5)	21:44	12 06:08 (7)	22:01	
31	08:20			07:14	07:37 (4)				05:21	05:57 (7)		
	17:19			20:06	16 08:05 (3)				21:46	10 06:07 (7)		
Potential sun hours	257	277		367		417			487		501	
Total, worst case			89		377		328			272		12
Sun reduction			0.24		0.28		0.38			0.39		0.35
Oper. time red.			1.00		1.00		1.00			1.00		1.00
Wind dir. red.			0.63		0.61		0.60			0.60		0.60
Total reduction			0.15		0.17		0.23			0.24		0.21
Total, real			14		64		75			64		2

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
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Calculated:
11/06/2025 09:22/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Real Case - V150 **Shadow receptor:** DF - 177

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	July		August		September		October		November	December
1	05:17		05:54		06:45		07:20 (4)	07:35	08:01 (2)	07:30	08:22
	22:01		21:28		20:25	9	07:29 (4)	19:15	17	08:18 (2)	17:07	16:26
2	05:17		05:56		06:46		07:18 (4)	07:37		08:02 (2)	07:32	08:23
	22:01		21:27		20:23	14	07:32 (4)	19:12	17	08:19 (2)	17:06	16:26
3	05:18		05:57		06:48		07:15 (4)	07:38		08:04 (2)	07:33	08:24
	22:00		21:25		20:21	17	07:32 (4)	19:10	16	08:20 (2)	17:04	16:25
4	05:19		05:59		06:50		07:16 (4)	07:40		08:05 (2)	07:35	08:26
	22:00		21:23		20:18	18	07:34 (4)	19:08	14	08:19 (2)	17:02	16:24
5	05:20		06:00		06:51		07:18 (4)	07:42		08:07 (2)	07:37	08:27
	21:59		21:21		20:16	16	07:34 (4)	19:05	12	08:19 (2)	17:00	16:24
6	05:21		06:02		06:53		07:19 (4)	07:43		08:09 (2)	07:39	08:28
	21:59		21:19		20:14	15	07:34 (4)	19:03	10	08:19 (2)	16:58	16:23
7	05:22		06:04	06:53 (5)	06:55		07:21 (4)	07:45		08:11 (2)	07:41	08:30
	21:58		21:18	2 06:55 (5)	20:11	13	07:34 (4)	19:01	8	08:19 (2)	16:57	16:23
8	05:22		06:05	06:49 (5)	06:56		07:22 (4)	07:47		08:12 (2)	07:42	08:31
	21:57		21:16	11 07:00 (5)	20:09	11	07:33 (4)	18:58	5	08:17 (2)	16:55	16:23
9	05:23		06:07	06:47 (5)	06:58		07:24 (4)	07:49		08:14 (2)	07:44	08:32
	21:57		21:14	15 07:02 (5)	20:07	9	07:33 (4)	18:56	2	08:16 (2)	16:53	16:22
10	05:24		06:08	06:45 (5)	07:00		07:25 (4)	07:50			07:46	08:33
	21:56		21:12	19 07:04 (5)	20:04	7	07:32 (4)	18:54			16:52	16:22
11	05:26	06:06 (7)	06:10	06:44 (5)	07:01		07:27 (4)	07:52			07:48	08:34
	21:55	6 06:12 (7)	21:10	20 07:04 (5)	20:02	12	07:54 (3)	18:52			16:50	16:22
12	05:27	06:05 (7)	06:12	06:43 (5)	07:03		07:29 (4)	07:54			07:50	08:35
	21:54	9 06:14 (7)	21:08	22 07:05 (5)	20:00	16	07:57 (3)	18:49			16:48	16:22
13	05:28	06:04 (7)	06:13	06:42 (5)	07:05		07:40 (3)	07:56			07:52	08:37
	21:53	11 06:15 (7)	21:06	23 07:05 (5)	19:57	18	07:58 (3)	18:47			16:47	16:22
14	05:29	06:04 (7)	06:15	06:43 (5)	07:06		07:38 (3)	07:57		08:33 (1)	07:53	08:37
	21:52	13 06:17 (7)	21:04	23 07:06 (5)	19:55	22	08:00 (3)	18:45	4	08:37 (1)	16:45	16:22
15	05:30	06:03 (7)	06:17	06:44 (5)	07:08		07:37 (3)	07:59		08:29 (1)	07:55	08:38
	21:51	15 06:18 (7)	21:02	22 07:06 (5)	19:52	24	08:01 (3)	18:43	11	08:40 (1)	16:44	16:22
16	05:31	06:02 (7)	06:18	06:46 (5)	07:10		07:36 (3)	08:01		08:28 (1)	07:57	08:39
	21:50	16 06:18 (7)	21:00	20 07:06 (5)	19:50	25	08:01 (3)	18:40	14	08:42 (1)	16:42	16:22
17	05:33	06:03 (7)	06:20	06:48 (5)	07:11		07:37 (3)	08:03		08:29 (1)	07:59	08:40
	21:49	16 06:19 (7)	20:58	19 07:07 (5)	19:48	24	08:01 (3)	18:38	14	08:43 (1)	16:41	16:22
18	05:34	06:04 (7)	06:22	06:49 (5)	07:13		07:38 (3)	08:04		08:31 (1)	08:00	08:41
	21:48	15 06:19 (7)	20:56	17 07:06 (5)	19:45	23	08:01 (3)	18:36	13	08:44 (1)	16:40	16:22
19	05:35	06:05 (7)	06:23	06:51 (5)	07:15		07:40 (3)	08:06		08:33 (1)	08:02	08:42
	21:47	15 06:20 (7)	20:54	15 07:06 (5)	19:43	21	08:01 (3)	18:34	11	08:44 (1)	16:38	16:22
20	05:36	06:07 (7)	06:25	06:52 (5)	07:16		07:42 (3)	08:08		08:34 (1)	08:04	08:42
	21:46	14 06:21 (7)	20:52	13 07:05 (5)	19:41	19	08:01 (3)	18:32	9	08:43 (1)	16:37	16:23
21	05:38	06:08 (7)	06:27	06:54 (5)	07:18		07:43 (3)	08:10		08:36 (1)	08:06	08:43
	21:45	13 06:21 (7)	20:49	11 07:05 (5)	19:38	17	08:00 (3)	18:30	7	08:43 (1)	16:36	16:23
22	05:39	06:09 (7)	06:28	06:55 (5)	07:20		07:45 (3)	08:11		08:38 (1)	08:07	08:43
	21:43	12 06:21 (7)	20:47	8 07:03 (5)	19:36	15	08:00 (3)	18:27	5	08:43 (1)	16:35	16:24
23	05:41	06:11 (7)	06:30	06:57 (5)	07:21		07:47 (3)	08:13		08:40 (1)	08:09	08:44
	21:42	11 06:22 (7)	20:45	6 07:03 (5)	19:33	12	07:59 (3)	18:25	3	08:43 (1)	16:34	16:24
24	05:42	06:12 (7)	06:32	06:58 (5)	07:23		07:48 (3)	08:15			08:11	08:44
	21:41	10 06:22 (7)	20:43	3 07:01 (5)	19:31	9	07:57 (3)	18:23			16:32	16:25
25	05:43	06:13 (7)	06:33		07:25		07:50 (3)	07:17			08:12	08:45
	21:39	8 06:21 (7)	20:41		19:29	6	07:56 (3)	17:21			16:31	16:25
26	05:45	06:15 (7)	06:35		07:26		07:52 (3)	07:19			08:14	08:45
	21:38	7 06:22 (7)	20:39		19:26	3	07:55 (3)	17:19			16:30	16:26
27	05:46	06:16 (7)	06:37		07:28			07:21			08:15	08:45
	21:36	5 06:21 (7)	20:36		19:24			17:17			16:29	16:27
28	05:48	06:17 (7)	06:38		07:30			07:22			08:17	08:45
	21:35	4 06:21 (7)	20:34		19:22			17:15			16:29	16:28
29	05:49	06:19 (7)	06:40		07:31		08:05 (2)	07:24			08:19	08:46
	21:33	2 06:21 (7)	20:32		19:19	10	08:15 (2)	17:13			16:28	16:29
30	05:51		06:42		07:33		08:02 (2)	07:26			08:20	08:46
	21:31		20:30		19:17	15	08:17 (2)	17:11			16:27	16:29
31	05:52		06:43					07:28				08:46
	21:30		20:27					17:09				16:30
Potential sun hours	504		455		381			331			264	241
Total, worst case		202		269		420			192			
Sun reduction		0.33		0.35		0.34			0.28			
Oper. time red.		1.00		1.00		1.00			1.00			
Wind dir. red.		0.60		0.60		0.61			0.61			
Total reduction		0.20		0.21		0.20			0.17			
Total, real		40		57		86			33			

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
Jennings O'Donovan
Finisklin Business Park
F91 RHH9 Sligo
+353719161416
padraig / podowd@jodireland.com

Calculated:
11/06/2025 09:22/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Real Case - V150 **Shadow receptor:** DG - 178

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:46	08:18	07:24	07:12	06:06	05:20	05:17	05:54	06:45	07:35	07:30	08:21
	16:32	17:20	18:13	20:08	21:00	21:47	22:01	21:28	20:25	19:15	17:07	16:26
2	08:45	08:16	07:21	07:10	06:04	05:19	05:17	05:56	06:46	07:36	07:31	08:23
	16:33	17:22	18:15	20:10	21:02	21:48	22:00	21:26	20:23	19:12	17:06	16:26
3	08:45	08:15	07:19	07:07	06:02	05:18	05:18	05:57	06:48	07:38	07:33	08:24
	16:34	17:24	18:17	20:11	21:03	21:49	22:00	21:25	20:20	19:10	17:04	16:25
4	08:45	08:13	07:17	07:05	06:00	05:18	05:19	05:59	06:50	07:40	07:35	08:26
	16:35	17:26	18:18	20:13	21:05	21:50	22:00	21:23	20:18	19:08	17:02	16:24
5	08:45	08:11	07:15	07:03	05:58	05:17	05:20	06:00	06:51	07:42	07:37	08:27
	16:36	17:28	18:20	20:15	21:07	21:51	21:59	21:21	20:16	19:05	17:00	16:24
6	08:44	08:10	07:12	07:00	05:57	05:16	05:21	06:02	06:53	07:43	07:39	08:28
	16:38	17:30	18:22	20:17	21:08	21:52	21:59	21:19	20:13	19:03	16:58	16:23
7	08:44	08:08	07:10	06:58	05:55	05:16	05:22	06:04	06:55	07:45	07:41	08:30
	16:39	17:32	18:24	20:18	21:10	21:53	21:58	21:18	20:11	19:01	16:57	16:23
8	08:44	08:06	07:08	06:56	05:53	05:15	05:23	06:05	06:56	07:47	07:42	08:31
	16:40	17:34	18:26	20:20	21:12	21:54	21:57	21:16	20:09	18:58	16:55	16:23
9	08:43	08:04	07:06	06:53	05:51	05:14	05:23	06:07	06:58	07:48	07:44	08:32
	16:42	17:36	18:28	20:22	21:13	21:55	21:57	21:14	20:06	18:56	16:53	16:22
10	08:42	08:02	07:03	06:51	05:49	05:14	05:25	06:08	07:00	07:50	07:46	08:33
	16:43	17:37	18:29	20:24	21:15	21:55	21:56	21:12	20:04	18:54	16:52	16:22
11	08:42	08:01	07:01	06:49	05:48	05:14	05:26	06:10	07:01	07:52	07:48	08:34
	16:44	17:39	18:31	20:25	21:17	21:56	21:55	21:10	20:02	18:52	16:50	16:22
12	08:41	07:59	06:59	06:47	05:46	05:13	05:27	06:12	07:03	07:54	07:50	08:35
	16:46	17:41	18:33	20:27	21:18	21:57	21:54	21:08	19:59	18:49	16:48	16:22
13	08:40	07:57	06:56	06:44	05:44	05:13	05:28	06:13	07:05	07:55	07:51	08:36
	16:47	17:43	18:35	20:29	21:20	21:58	21:53	21:06	19:57	18:47	16:47	16:22
14	08:40	07:55	06:54	06:42	05:43	05:13	05:29	06:15	07:06	07:57	07:53	08:37
	16:49	17:45	18:36	20:31	21:21	21:58	21:52	21:04	19:55	18:45	16:45	16:22
15	08:39	07:53	06:52	06:40	05:41	05:13	05:30	06:17	07:08	07:59	07:55	08:38
	16:51	17:47	18:38	20:32	21:23	21:59	21:51	21:02	19:52	18:43	16:44	16:22
16	08:38	07:51	06:49	06:38	05:40	05:12	05:31	06:18	07:10	08:01	07:57	08:39
	16:52	17:49	18:40	20:34	21:25	21:59	21:50	21:00	19:50	18:40	16:42	16:22
17	08:37	07:49	06:47	06:35	05:38	05:12	05:33	06:20	07:11	08:02	07:59	08:40
	16:54	17:51	18:42	20:36	21:26	22:00	21:49	20:58	19:48	18:38	16:41	16:22
18	08:36	07:47	06:45	06:33	05:37	05:12	05:34	06:22	07:13	08:04	08:00	08:41
	16:55	17:53	18:44	20:38	21:28	22:00	21:48	20:56	19:45	18:36	16:40	16:22
19	08:35	07:45	06:42	06:31	05:35	05:12	05:35	06:23	07:15	08:06	08:02	08:41
	16:57	17:54	18:45	20:39	21:29	22:01	21:47	20:54	19:43	18:34	16:38	16:23
20	08:34	07:43	06:40	06:29	05:34	05:12	05:37	06:25	07:16	08:08	08:04	08:42
	16:59	17:56	18:47	20:41	21:31	22:01	21:46	20:52	19:41	18:32	16:37	16:23
21	08:33	07:41	06:38	06:27	05:32	05:13	05:38	06:27	07:18	08:10	08:05	08:43
	17:01	17:58	18:49	20:43	21:32	22:01	21:44	20:49	19:38	18:30	16:36	16:23
22	08:32	07:39	06:35	06:25	05:31	05:13	05:39	06:28	07:20	08:11	08:07	08:43
	17:02	18:00	18:51	20:44	21:34	22:01	21:43	20:47	19:36	18:27	16:35	16:24
23	08:31	07:36	06:33	06:22	05:30	05:13	05:41	06:30	07:21	08:13	08:09	08:44
	17:04	18:02	18:52	20:46	21:35	22:01	21:42	20:45	19:33	18:25	16:34	16:24
24	08:29	07:34	06:31	06:20	05:28	05:13	05:42	06:32	07:23	08:15	08:11	08:44
	17:06	18:04	18:54	20:48	21:36	22:02	21:40	20:43	19:31	18:23	16:32	16:25
25	08:28	07:32	06:28	06:18	05:27	05:14	05:43	06:33	07:25	07:17	08:12	08:44
	17:08	18:06	18:56	20:50	21:38	22:02	21:39	20:41	19:29	17:21	16:31	16:26
26	08:27	07:30	06:26	06:16	05:26	05:14	05:45	06:35	07:26	07:19	08:14	08:45
	17:09	18:07	18:58	20:51	21:39	22:02	21:38	20:39	19:26	17:19	16:30	16:26
27	08:25	07:28	06:24	06:14	05:25	05:14	05:46	06:37	07:28	07:20	08:15	08:45
	17:11	18:09	18:59	20:53	21:40	22:02	21:36	20:36	19:24	17:17	16:30	16:27
28	08:24	07:26	06:21	06:12	05:24	05:15	05:48	06:38	07:30	07:22	08:17	08:45
	17:13	18:11	19:01	20:55	21:42	22:01	21:35	20:34	19:22	17:15	16:29	16:28
29	08:22		07:19	06:10	05:23	05:16	05:49	06:40	07:31	07:24	08:18	08:45
	17:15		20:03	20:57	21:43	22:01	21:33	20:32	19:19	17:13	16:28	16:29
30	08:21		07:17	06:08	05:22	05:16	05:51	06:41	07:33	07:26	08:20	08:45
	17:17		20:05	20:58	21:44	22:01	21:31	20:30	19:17	17:11	16:27	16:30
31	08:19		07:14		05:21		05:52	06:43		07:28		08:46
	17:19		20:06		21:45		21:30	20:27		17:09		16:30
Potential sun hours	257	277	367	417	487	501	504	455	381	331	265	241
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
Jennings O'Donovan
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padraig / podowd@jodireland.com
Calculated:
11/06/2025 09:22/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Real Case - V150 **Shadow receptor:** DH - 179

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January		February		March		April		May		June	
1	08:46		15:34 (1)	08:18		07:23		07:12		18:59 (4)	06:06	19:56 (6)	05:20	20:55 (7)
	16:32	22	15:56 (1)	17:20		18:13		20:08	28	19:27 (4)	21:00	35	20:31 (8)	21:47	19	21:14 (7)
2	08:45		15:34 (1)	08:16		07:21		07:09		19:00 (4)	06:04	19:55 (6)	05:19	20:55 (7)
	16:33	23	15:57 (1)	17:22		18:15		20:10	24	19:24 (4)	21:02	38	20:33 (8)	21:48	20	21:15 (7)
3	08:45		15:35 (1)	08:15	16:50 (2)	07:19	17:47 (3)	07:07		19:02 (4)	06:02	19:55 (6)	05:18	20:55 (7)
	16:34	24	15:59 (1)	17:24	4	16:54 (2)	18:17	3	17:50 (3)	20:11	21	19:23 (4)	21:03	39	20:34 (8)	21:49	20	21:15 (7)
4	08:45		15:36 (1)	08:13		16:49 (2)	07:17		17:45 (3)	07:05		19:04 (4)	06:00	19:55 (6)	05:17	20:55 (7)
	16:35	24	16:00 (1)	17:26	7	16:56 (2)	18:18	7	17:52 (3)	20:13	19	19:47 (5)	21:05	41	20:36 (8)	21:50	22	21:17 (7)
5	08:45		15:36 (1)	08:11		16:48 (2)	07:15		17:44 (3)	07:02		19:08 (4)	05:58	19:55 (6)	05:17	20:55 (7)
	16:36	25	16:01 (1)	17:28	10	16:58 (2)	18:20	10	17:54 (3)	20:15	14	19:48 (5)	21:07	42	20:37 (8)	21:51	22	21:17 (7)
6	08:44		15:37 (1)	08:10		16:47 (2)	07:12		17:44 (3)	07:00		19:40 (5)	05:56	19:56 (6)	05:16	20:56 (7)
	16:37	26	16:03 (1)	17:30	12	16:59 (2)	18:22	12	17:56 (3)	20:17	10	19:50 (5)	21:08	43	20:39 (8)	21:52	23	21:19 (7)
7	08:44		15:37 (1)	08:08		16:48 (2)	07:10		17:42 (3)	06:58		19:40 (5)	05:55	19:56 (6)	05:15	20:55 (7)
	16:39	27	16:04 (1)	17:32	14	17:02 (2)	18:24	15	17:57 (3)	20:18	12	19:52 (5)	21:10	44	20:40 (8)	21:53	24	21:19 (7)
8	08:44		15:37 (1)	08:06		16:47 (2)	07:08		17:42 (3)	06:56		19:39 (5)	05:53	19:56 (6)	05:15	20:56 (7)
	16:40	28	16:05 (1)	17:33	17	17:04 (2)	18:26	17	17:59 (3)	20:20	15	19:54 (5)	21:12	44	20:40 (8)	21:54	24	21:20 (7)
9	08:43		15:38 (1)	08:04		16:47 (2)	07:05		17:42 (3)	06:53		19:38 (5)	05:51	19:57 (6)	05:14	20:55 (7)
	16:41	29	16:07 (1)	17:35	19	17:06 (2)	18:27	20	18:02 (3)	20:22	17	19:55 (5)	21:13	42	20:39 (8)	21:55	26	21:21 (7)
10	08:42		15:38 (1)	08:02		16:46 (2)	07:03		17:41 (3)	06:51		19:37 (5)	05:49	19:58 (6)	05:14	20:56 (7)
	16:43	30	16:08 (1)	17:37	22	17:08 (2)	18:29	22	18:03 (3)	20:24	20	19:57 (5)	21:15	39	20:37 (8)	21:55	26	21:22 (7)
11	08:42		15:38 (1)	08:01		16:46 (2)	07:01		17:42 (3)	06:49		19:37 (5)	05:48	19:59 (6)	05:13	20:57 (7)
	16:44	31	16:09 (1)	17:39	24	17:10 (2)	18:31	23	18:05 (3)	20:25	22	19:59 (5)	21:17	36	20:35 (8)	21:56	26	21:23 (7)
12	08:41		15:39 (1)	07:59		16:46 (2)	06:59		17:42 (3)	06:46		19:37 (5)	05:46	19:59 (6)	05:13	20:56 (7)
	16:46	30	16:09 (1)	17:41	27	17:13 (2)	18:33	25	18:07 (3)	20:27	24	20:01 (5)	21:18	29	20:28 (6)	21:57	27	21:23 (7)
13	08:40		15:39 (1)	07:57		16:46 (2)	06:56		17:42 (3)	06:44		19:36 (5)	05:44	20:00 (6)	05:13	20:56 (7)
	16:47	30	16:09 (1)	17:43	29	17:15 (2)	18:35	24	18:06 (3)	20:29	25	20:01 (5)	21:20	27	20:27 (6)	21:58	27	21:23 (7)
14	08:40		15:40 (1)	07:55		16:46 (2)	06:54		17:43 (3)	06:42		19:37 (5)	05:43	20:02 (6)	05:13	20:57 (7)
	16:49	29	16:09 (1)	17:45	31	17:17 (2)	18:36	22	18:05 (3)	20:31	26	20:03 (5)	21:21	24	20:26 (6)	21:58	27	21:24 (7)
15	08:39		15:40 (1)	07:53		16:47 (2)	06:52		17:45 (3)	06:40		19:37 (5)	05:41	20:03 (6)	05:12	20:57 (7)
	16:50	30	16:10 (1)	17:47	31	17:18 (2)	18:38	24	18:13 (4)	20:32	26	20:03 (5)	21:23	22	20:25 (6)	21:59	28	21:25 (7)
16	08:38		15:41 (1)	07:51		16:47 (2)	06:49		17:46 (3)	06:37		19:38 (5)	05:39	20:04 (6)	05:12	20:57 (7)
	16:52	29	16:10 (1)	17:49	30	17:17 (2)	18:40	24	18:14 (4)	20:34	24	20:02 (5)	21:25	19	20:23 (6)	21:59	28	21:25 (7)
17	08:37		15:42 (1)	07:49		16:48 (2)	06:47		17:49 (3)	06:35		19:39 (5)	05:38	20:07 (6)	05:12	20:58 (7)
	16:54	28	16:10 (1)	17:51	29	17:17 (2)	18:42	21	18:16 (4)	20:36	22	20:01 (5)	21:26	15	20:22 (6)	22:00	28	21:26 (7)
18	08:36		15:43 (1)	07:47		16:48 (2)	06:45		18:02 (4)	06:33		19:40 (5)	05:36	20:09 (6)	05:12	20:58 (7)
	16:55	27	16:10 (1)	17:52	27	17:15 (2)	18:43	16	18:18 (4)	20:37	20	20:10 (6)	21:28	9	20:18 (6)	22:00	28	21:26 (7)
19	08:35		15:44 (1)	07:45		16:49 (2)	06:42		18:01 (4)	06:31		19:42 (5)	05:35		05:12	20:58 (7)
	16:57	26	16:10 (1)	17:54	25	17:14 (2)	18:45	18	18:19 (4)	20:39	20	20:12 (6)	21:29		22:01	28	21:26 (7)
20	08:34		15:45 (1)	07:43		16:50 (2)	06:40		18:00 (4)	06:29		19:44 (5)	05:34		05:12	20:58 (7)
	16:59	25	16:10 (1)	17:56	23	17:13 (2)	18:47	21	18:21 (4)	20:41	18	20:13 (6)	21:31		22:01	28	21:26 (7)
21	08:33		15:46 (1)	07:41		16:52 (2)	06:38		17:59 (4)	06:27		20:02 (6)	05:32	21:00 (7)	05:12	20:58 (7)
	17:00	23	16:09 (1)	17:58	20	17:12 (2)	18:49	24	18:23 (4)	20:43	13	20:15 (6)	21:32	1	21:01 (7)	22:01	28	21:26 (7)
22	08:32		15:47 (1)	07:39		16:54 (2)	06:35		17:58 (4)	06:24		20:01 (6)	05:31	20:58 (7)	05:13	20:59 (7)
	17:02	21	16:08 (1)	18:00	16	17:10 (2)	18:50	27	18:25 (4)	20:44	15	20:16 (6)	21:34	4	21:02 (7)	22:01	28	21:27 (7)
23	08:30		15:49 (1)	07:36		16:58 (2)	06:33		17:58 (4)	06:22		20:00 (6)	05:30	20:57 (7)	05:13	20:59 (7)
	17:04	19	16:08 (1)	18:02	8	17:06 (2)	18:52	29	18:27 (4)	20:46	18	20:18 (6)	21:35	6	21:03 (7)	22:01	28	21:27 (7)
24	08:29		15:50 (1)	07:34			06:31		17:56 (4)	06:20		19:59 (6)	05:28	20:57 (7)	05:13	20:59 (7)
	17:06	16	16:06 (1)	18:04			18:54	32	18:28 (4)	20:48	21	20:20 (6)	21:36	7	21:04 (7)	22:02	28	21:27 (7)
25	08:28		15:53 (1)	07:32			06:28		17:57 (4)	06:18		19:58 (6)	05:27	20:56 (7)	05:13	21:00 (7)
	17:07	11	16:04 (1)	18:05			18:56	33	18:30 (4)	20:50	23	20:21 (6)	21:38	10	21:06 (7)	22:02	28	21:28 (7)
26	08:27		15:58 (1)	07:30			06:26		17:57 (4)	06:16		19:57 (6)	05:26	20:56 (7)	05:14	20:59 (7)
	17:09	1	15:59 (1)	18:07			18:57	35	18:32 (4)	20:51	26	20:23 (6)	21:39	11	21:07 (7)	22:02	28	21:27 (7)
27	08:25			07:28			06:23		17:56 (4)	06:14		19:56 (6)	05:25	20:56 (7)	05:14	21:00 (7)
	17:11			18:09			18:59	35	18:31 (4)	20:53	28	20:24 (6)	21:40	12	21:08 (7)	22:02	28	21:28 (7)
28	08:24			07:26			06:21		17:57 (4)	06:12		19:56 (6)	05:24	20:55 (7)	05:15	21:00 (7)
	17:13			18:11			19:01	34	18:31 (4)	20:55	30	20:26 (8)	21:42	14	21:09 (7)	22:01	27	21:27 (7)
29	08:22						07:19		18:57 (4)	06:10		19:55 (6)	05:23	20:55 (7)	05:15	21:01 (7)
	17:15						20:03	34	19:31 (4)	20:56	32	20:27 (8)	21:43	15	21:10 (7)	22:01	27	21:28 (7)
30	08:21						07:16		18:57 (4)	06:08		19:56 (6)	05:22	20:55 (7)	05:16	21:00 (7)
	17:17						20:04	32	19:29 (4)	20:58	34	20:30 (8)	21:44	16	21:11 (7)	22:01	27	21:27 (7)
31	08:19						07:14		18:58 (4)				05:21	20:56 (7)				
	17:18						20:06	30	19:28 (4)				21:45	17	21:13 (7)			
Potential sun hours	257		277		367		417		487		501	
Total, worst case		634		425		669		647		701		778
Sun reduction		0.22		0.24		0.28		0.38		0.39		0.35
Oper. time red.		1.00		1.00		1.00		1.00		1.00		1.00
Wind dir. red.		0.62		0.60		0.60		0.61		0.62		0.64
Total reduction		0.13		0.15		0.17		0.23		0.25		0.22
Total, real		85		62		112		151		173		172

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
Jennings O'Donovan
Finisklin Business Park
F91 RHH9 Sligo
+353719161416
padraig / podowd@jodireland.com
Calculated:
11/06/2025 09:22/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Real Case - V150 **Shadow receptor:** DH - 179

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	July		August		September		October		November		December		
1	05:17		21:01 (7)	05:54		20:10 (6)	06:45		19:36 (5)	07:35		18:21 (3)	07:30		16:16 (2)	08:21		15:20 (1)
	22:01	26	21:27 (7)	21:28	29	20:39 (6)	20:25	22	19:58 (5)	19:14	25	18:46 (3)	17:07	22	16:38 (2)	16:26	31	15:51 (1)
2	05:17		21:00 (7)	05:55		20:08 (6)	06:46		19:36 (5)	07:36		18:21 (3)	07:31		16:16 (2)	08:23		15:21 (1)
	22:00	26	21:26 (7)	21:26	38	20:46 (8)	20:23	20	19:56 (5)	19:12	24	18:45 (3)	17:05	20	16:36 (2)	16:25	31	15:52 (1)
3	05:18		21:01 (7)	05:57		20:08 (6)	06:48		19:36 (5)	07:38		18:19 (3)	07:33		16:17 (2)	08:24		15:21 (1)
	22:00	25	21:26 (7)	21:25	40	20:48 (8)	20:20	17	19:53 (5)	19:10	23	18:42 (3)	17:04	17	16:34 (2)	16:25	29	15:50 (1)
4	05:19		21:01 (7)	05:59		20:07 (6)	06:50		19:36 (5)	07:40		18:19 (3)	07:35		16:17 (2)	08:26		15:22 (1)
	22:00	25	21:26 (7)	21:23	42	20:49 (8)	20:18	15	19:51 (5)	19:07	21	18:40 (3)	17:02	15	16:32 (2)	16:24	28	15:50 (1)
5	05:20		21:02 (7)	06:00		20:06 (6)	06:51		19:36 (5)	07:42		18:19 (3)	07:37		16:18 (2)	08:27		15:22 (1)
	21:59	24	21:26 (7)	21:21	44	20:50 (8)	20:16	12	19:48 (5)	19:05	18	18:37 (3)	17:00	12	16:30 (2)	16:24	27	15:49 (1)
6	05:20		21:02 (7)	06:02		20:05 (6)	06:53		19:36 (5)	07:43		18:19 (3)	07:39		16:19 (2)	08:28		15:22 (1)
	21:59	23	21:25 (7)	21:19	44	20:49 (8)	20:13	10	19:46 (5)	19:03	16	18:35 (3)	16:58	9	16:28 (2)	16:23	26	15:48 (1)
7	05:21		21:01 (7)	06:03		20:05 (6)	06:55		19:04 (4)	07:45		18:19 (3)	07:41		16:20 (2)	08:30		15:23 (1)
	21:58	23	21:24 (7)	21:17	43	20:48 (8)	20:11	12	19:44 (5)	19:01	14	18:33 (3)	16:56	6	16:26 (2)	16:23	25	15:48 (1)
8	05:22		21:02 (7)	06:05		20:04 (6)	06:56		18:59 (4)	07:47		18:19 (3)	07:42		16:21 (2)	08:31		15:23 (1)
	21:57	22	21:24 (7)	21:16	42	20:46 (8)	20:09	18	19:41 (5)	18:58	11	18:30 (3)	16:55	3	16:24 (2)	16:22	24	15:47 (1)
9	05:23		21:02 (7)	06:07		20:04 (6)	06:58		18:56 (4)	07:48		18:20 (3)	07:44			08:32		15:23 (1)
	21:57	21	21:23 (7)	21:14	40	20:44 (8)	20:06	21	19:17 (4)	18:56	8	18:28 (3)	16:53			16:22	24	15:47 (1)
10	05:24		21:02 (7)	06:08		20:05 (6)	07:00		18:53 (4)	07:50		18:21 (3)	07:46			08:33		15:24 (1)
	21:56	20	21:22 (7)	21:12	38	20:43 (8)	20:04	24	19:17 (4)	18:54	5	18:26 (3)	16:51			16:22	23	15:47 (1)
11	05:25		21:03 (7)	06:10		20:04 (6)	07:01		18:52 (4)	07:52		18:22 (3)	07:48			08:34		15:25 (1)
	21:55	19	21:22 (7)	21:10	37	20:41 (8)	20:02	27	19:19 (4)	18:51	2	18:24 (3)	16:50			16:22	22	15:47 (1)
12	05:26		21:03 (7)	06:12		20:04 (6)	07:03		18:50 (4)	07:54			07:50			08:35		15:25 (1)
	21:54	18	21:21 (7)	21:08	35	20:39 (8)	19:59	30	19:20 (4)	18:49			16:48			16:22	21	15:46 (1)
13	05:28		21:03 (7)	06:13		20:03 (6)	07:05		18:48 (4)	07:55			07:51			08:36		15:26 (1)
	21:53	17	21:20 (7)	21:06	34	20:37 (8)	19:57	32	19:20 (4)	18:47			16:47			16:21	20	15:46 (1)
14	05:29		21:03 (7)	06:15		20:04 (6)	07:06		18:48 (4)	07:57			07:53			08:37		15:26 (1)
	21:52	16	21:19 (7)	21:04	32	20:36 (8)	19:55	33	19:21 (4)	18:45			16:45			16:21	20	15:46 (1)
15	05:30		21:05 (7)	06:16		20:03 (6)	07:08		18:46 (4)	07:59			07:55			08:38		15:27 (1)
	21:51	14	21:19 (7)	21:02	30	20:33 (8)	19:52	34	19:20 (4)	18:42			16:44			16:22	19	15:46 (1)
16	05:31		21:05 (7)	06:18		20:04 (6)	07:10		18:46 (4)	08:01			07:57		15:31 (1)	08:39		15:27 (1)
	21:50	13	21:18 (7)	21:00	28	20:32 (6)	19:50	35	19:21 (4)	18:40			16:42	2	15:33 (1)	16:22	19	15:46 (1)
17	05:32		21:05 (7)	06:20		20:04 (6)	07:11		18:45 (4)	08:02			07:59		15:26 (1)	08:40		15:27 (1)
	21:49	12	21:17 (7)	20:58	25	20:29 (6)	19:48	36	19:21 (4)	18:38			16:41	12	15:38 (1)	16:22	19	15:46 (1)
18	05:34		21:06 (7)	06:21		20:04 (6)	07:13		18:44 (4)	08:04			08:00		15:24 (1)	08:41		15:28 (1)
	21:48	10	21:16 (7)	20:56	24	20:28 (6)	19:45	34	19:18 (4)	18:36			16:40	16	15:40 (1)	16:22	18	15:46 (1)
19	05:35		21:06 (7)	06:23		20:04 (6)	07:15		18:44 (4)	08:06		17:27 (2)	08:02		15:23 (1)	08:41		15:29 (1)
	21:47	9	21:15 (7)	20:54	21	20:25 (6)	19:43	32	19:16 (4)	18:34	11	17:38 (2)	16:38	19	15:42 (1)	16:22	18	15:47 (1)
20	05:36		21:08 (7)	06:25		20:05 (6)	07:16		18:44 (4)	08:08		17:24 (2)	08:04		15:22 (1)	08:42		15:29 (1)
	21:46	6	21:14 (7)	20:51	18	20:23 (6)	19:40	30	19:14 (4)	18:32	17	17:41 (2)	16:37	21	15:43 (1)	16:23	18	15:47 (1)
21	05:38		21:08 (7)	06:26		20:07 (6)	07:18		18:43 (4)	08:10		17:22 (2)	08:05		15:22 (1)	08:43		15:30 (1)
	21:44	5	21:13 (7)	20:49	15	20:22 (6)	19:38	28	19:11 (4)	18:29	21	17:43 (2)	16:36	23	15:45 (1)	16:23	17	15:47 (1)
22	05:39		21:09 (7)	06:28		20:07 (6)	07:20		18:44 (4)	08:11		17:20 (2)	08:07		15:21 (1)	08:43		15:30 (1)
	21:43	2	21:11 (7)	20:47	12	20:19 (6)	19:36	25	19:09 (4)	18:27	24	17:44 (2)	16:35	25	15:46 (1)	16:24	17	15:47 (1)
23	05:40		21:09 (7)	06:30		19:48 (5)	07:21		18:44 (4)	08:13		17:19 (2)	08:09		15:20 (1)	08:44		15:31 (1)
	21:42	1	21:10 (7)	20:45	19	20:17 (6)	19:33	23	19:07 (4)	18:25	26	17:45 (2)	16:33	26	15:46 (1)	16:24	17	15:48 (1)
24	05:42			06:31		19:45 (5)	07:23		18:44 (4)	08:15		17:18 (2)	08:10		15:20 (1)	08:44		15:31 (1)
	21:40			20:43	20	20:15 (6)	19:31	19	19:03 (4)	18:23	28	17:46 (2)	16:32	27	15:47 (1)	16:25	18	15:49 (1)
25	05:43		20:23 (6)	06:33		19:43 (5)	07:25		18:45 (4)	07:17		16:17 (2)	08:12		15:20 (1)	08:44		15:31 (1)
	21:39	3	20:26 (6)	20:41	20	20:13 (6)	19:29	16	19:01 (4)	17:21	30	16:47 (2)	16:31	28	15:48 (1)	16:25	18	15:49 (1)
26	05:45		20:18 (6)	06:35		19:41 (5)	07:26		18:34 (3)	07:19		16:17 (2)	08:14		15:20 (1)	08:45		15:32 (1)
	21:38	12	20:30 (6)	20:38	22	20:03 (5)	19:26	17	18:59 (4)	17:19	30	16:47 (2)	16:30	29	15:49 (1)	16:26	19	15:51 (1)
27	05:46		20:16 (6)	06:36		19:40 (5)	07:28		18:28 (3)	07:20		16:16 (2)	08:15		15:20 (1)	08:45		15:32 (1)
	21:36	17	20:33 (6)	20:36	24	20:04 (5)	19:24	24	18:56 (4)	17:17	31	16:47 (2)	16:29	30	15:50 (1)	16:27	19	15:51 (1)
28	05:48		20:14 (6)	06:38		19:39 (5)	07:30		18:26 (3)	07:22		16:16 (2)	08:17		15:20 (1)	08:45		15:33 (1)
	21:35	20	20:34 (6)	20:34	26	20:05 (5)	19:22	24	18:54 (4)	17:15	30	16:46 (2)	16:28	30	15:50 (1)	16:28	19	15:52 (1)
29	05:49		20:13 (6)	06:40		19:38 (5)	07:31		18:25 (3)	07:24		16:16 (2)	08:18		15:20 (1)	08:45		15:33 (1)
	21:33	23	20:36 (6)	20:32	26	20:04 (5)	19:19	22	18:52 (4)	17:13	28	16:44 (2)	16:28	30	15:50 (1)	16:28	20	15:53 (1)
30	05:51		20:12 (6)	06:41		19:37 (5)	07:33		18:22 (3)	07:26		16:16 (2)	08:20		15:21 (1)	08:45		15:34 (1)
	21:31	25	20:37 (6)	20:29	25	20:02 (5)	19:17	23	18:45 (3)	17:11	26	16:42 (2)	16:27	30	15:51 (1)	16:29	20	15:54 (1)
31	05:52		20:11 (6)	06:43		19:36 (5)				07:28		16:16 (2)				08:46		15:34 (1)
	21:30	28	20:39 (6)	20:27	23	19:59 (5)				17:09	24	16:40 (2)				16:30	21	15:55 (1)
Potential sun hours	504			455			381			331			264			241		
Total, worst case		505			916			715			493			452			667	
Sun reduction		0.33			0.35			0.34			0.28			0.26			0.22	
Oper. time red.		1.00			1.00			1.00			1.00			1.00			1.00	
Wind dir. red.		0.63			0.62			0.60			0.60			0.61			0.62	
Total reduction		0.21			0.22			0.20			0.17			0.16			0.13	
Total, real		106			201			146			83			72			90	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

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+353719161416
padraig / podowd@jodireland.com

Calculated:
11/06/2025 09:22/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Real Case - V150 **Shadow receptor:** DI - 180

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:45	08:18	07:23	07:12	06:06	05:20	05:17	05:54	06:45	07:35	07:30	08:21
	16:32	17:20	18:13	20:08	21:00	21:47	22:01	21:28	20:25	19:15	17:07	16:26
2	08:45	08:16	07:21	07:10	06:04	05:19	05:17	05:56	06:46	07:36	07:31	08:23
	16:33	17:22	18:15	20:10	21:02	21:48	22:00	21:26	20:23	19:12	17:06	16:26
3	08:45	08:15	07:19	07:07	06:02	05:18	05:18	05:57	06:48	07:38	07:33	08:24
	16:34	17:24	18:17	20:11	21:03	21:49	22:00	21:25	20:20	19:10	17:04	16:25
4	08:45	08:13	07:17	07:05	06:00	05:17	05:19	05:59	06:50	07:40	07:35	08:26
	16:35	17:26	18:18	20:13	21:05	21:50	22:00	21:23	20:18	19:08	17:02	16:24
5	08:45	08:11	07:15	07:03	05:58	05:17	05:20	06:00	06:51	07:42	07:37	08:27
	16:36	17:28	18:20	20:15	21:07	21:51	21:59	21:21	20:16	19:05	17:00	16:24
6	08:44	08:10	07:12	07:00	05:57	05:16	05:21	06:02	06:53	07:43	07:39	08:28
	16:38	17:30	18:22	20:17	21:08	21:52	21:59	21:19	20:13	19:03	16:58	16:23
7	08:44	08:08	07:10	06:58	05:55	05:15	05:22	06:04	06:55	07:45	07:41	08:30
	16:39	17:32	18:24	20:18	21:10	21:53	21:58	21:17	20:11	19:01	16:57	16:23
8	08:44	08:06	07:08	06:56	05:53	05:15	05:22	06:05	06:56	07:47	07:42	08:31
	16:40	17:34	18:26	20:20	21:12	21:54	21:57	21:16	20:09	18:58	16:55	16:23
9	08:43	08:04	07:05	06:53	05:51	05:14	05:23	06:07	06:58	07:48	07:44	08:32
	16:42	17:35	18:27	20:22	21:13	21:55	21:57	21:14	20:06	18:56	16:53	16:22
10	08:42	08:02	07:03	06:51	05:49	05:14	05:24	06:08	07:00	07:50	07:46	08:33
	16:43	17:37	18:29	20:24	21:15	21:55	21:56	21:12	20:04	18:54	16:52	16:22
11	08:42	08:01	07:01	06:49	05:48	05:14	05:26	06:10	07:01	07:52	07:48	08:34
	16:44	17:39	18:31	20:25	21:17	21:56	21:55	21:10	20:02	18:51	16:50	16:22
12	08:41	07:59	06:59	06:47	05:46	05:13	05:27	06:12	07:03	07:54	07:50	08:35
	16:46	17:41	18:33	20:27	21:18	21:57	21:54	21:08	19:59	18:49	16:48	16:22
13	08:40	07:57	06:56	06:44	05:44	05:13	05:28	06:13	07:05	07:55	07:51	08:36
	16:47	17:43	18:35	20:29	21:20	21:58	21:53	21:06	19:57	18:47	16:47	16:22
14	08:40	07:55	06:54	06:42	05:43	05:13	05:29	06:15	07:06	07:57	07:53	08:37
	16:49	17:45	18:36	20:31	21:21	21:58	21:52	21:04	19:55	18:45	16:45	16:22
15	08:39	07:53	06:52	06:40	05:41	05:13	05:30	06:17	07:08	07:59	07:55	08:38
	16:51	17:47	18:38	20:32	21:23	21:59	21:51	21:02	19:52	18:43	16:44	16:22
16	08:38	07:51	06:49	06:38	05:40	05:12	05:31	06:18	07:10	08:01	07:57	08:39
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17	08:37	07:49	06:47	06:35	05:38	05:12	05:33	06:20	07:11	08:02	07:59	08:40
	16:54	17:51	18:42	20:36	21:26	22:00	21:49	20:58	19:48	18:38	16:41	16:22
18	08:36	07:47	06:45	06:33	05:37	05:12	05:34	06:22	07:13	08:04	08:00	08:41
	16:55	17:53	18:43	20:37	21:28	22:00	21:48	20:56	19:45	18:36	16:40	16:22
19	08:35	07:45	06:42	06:31	05:35	05:12	05:35	06:23	07:15	08:06	08:02	08:41
	16:57	17:54	18:45	20:39	21:29	22:01	21:47	20:54	19:43	18:34	16:38	16:22
20	08:34	07:43	06:40	06:29	05:34	05:12	05:36	06:25	07:16	08:08	08:04	08:42
	16:59	17:56	18:47	20:41	21:31	22:01	21:46	20:52	19:40	18:32	16:37	16:23
21	08:33	07:41	06:38	06:27	05:32	05:13	05:38	06:27	07:18	08:10	08:05	08:43
	17:00	17:58	18:49	20:43	21:32	22:01	21:44	20:49	19:38	18:30	16:36	16:23
22	08:32	07:39	06:35	06:25	05:31	05:13	05:39	06:28	07:20	08:11	08:07	08:43
	17:02	18:00	18:51	20:44	21:34	22:01	21:43	20:47	19:36	18:27	16:35	16:24
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	17:04	18:02	18:52	20:46	21:35	22:01	21:42	20:45	19:33	18:25	16:34	16:24
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	17:06	18:04	18:54	20:48	21:36	22:02	21:40	20:43	19:31	18:23	16:32	16:25
25	08:28	07:32	06:28	06:18	05:27	05:14	05:43	06:33	07:25	07:17	08:12	08:44
	17:08	18:06	18:56	20:50	21:38	22:02	21:39	20:41	19:29	17:21	16:31	16:25
26	08:27	07:30	06:26	06:16	05:26	05:14	05:45	06:35	07:26	07:19	08:14	08:45
	17:09	18:07	18:58	20:51	21:39	22:02	21:38	20:38	19:26	17:19	16:30	16:26
27	08:25	07:28	06:24	06:14	05:25	05:14	05:46	06:36	07:28	07:20	08:15	08:45
	17:11	18:09	18:59	20:53	21:40	22:02	21:36	20:36	19:24	17:17	16:29	16:27
28	08:24	07:26	06:21	06:12	05:24	05:15	05:48	06:38	07:30	07:22	08:17	08:45
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29	08:22		07:19	06:10	05:23	05:15	05:49	06:40	07:31	07:24	08:18	08:45
	17:15		20:03	20:56	21:43	22:01	21:33	20:32	19:19	17:13	16:28	16:29
30	08:21		07:17	06:08	05:22	05:16	05:51	06:41	07:33	07:26	08:20	08:45
	17:17		20:04	20:58	21:44	22:01	21:31	20:30	19:17	17:11	16:27	16:29
31	08:19		07:14		05:21		05:52	06:43		07:28		08:46
	17:19		20:06		21:45		21:30	20:27		17:09		16:30
Potential sun hours	257	277	367	417	487	501	504	455	381	331	265	241
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

Table layout: For each day in each month the following matrix apply

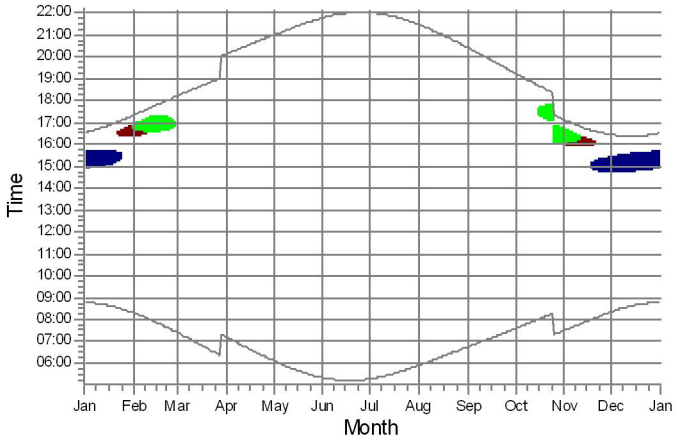
Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

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padraig / podowd@jodireland.com
Calculated:
11/06/2025 09:22/4.0.552

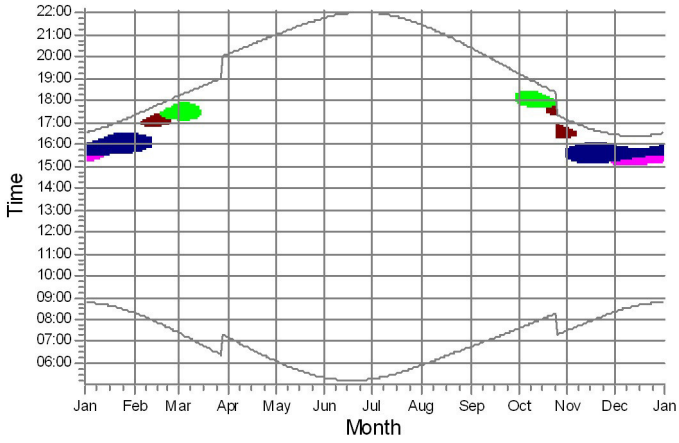
SHADOW - Calendar, graphical

Calculation: 6839 Garrane WF Real Case - V150

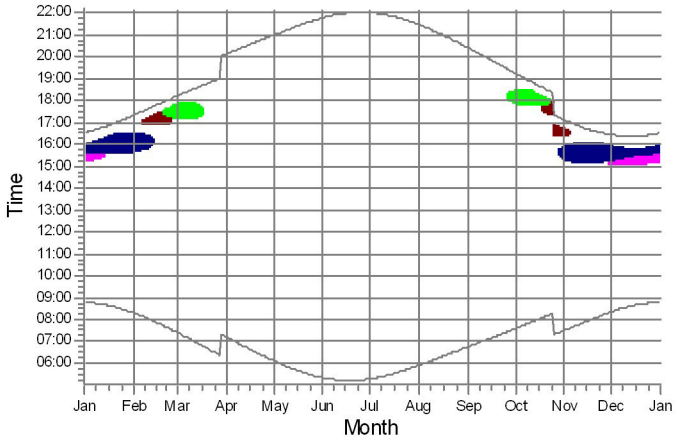
A: 1



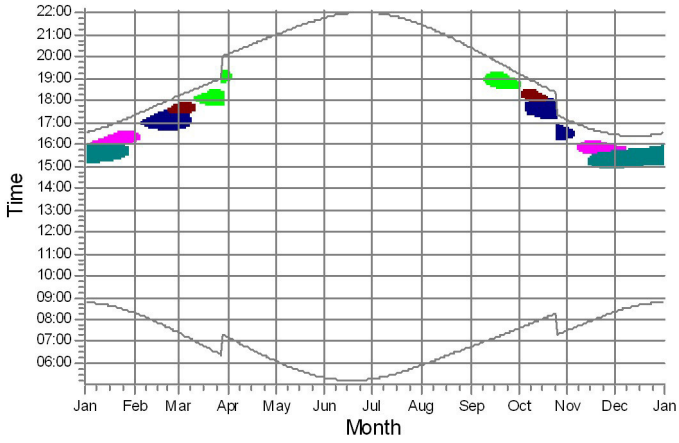
B: 2



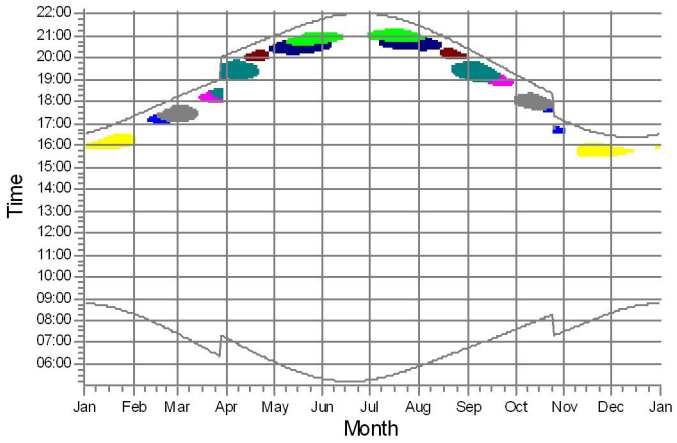
C: 3



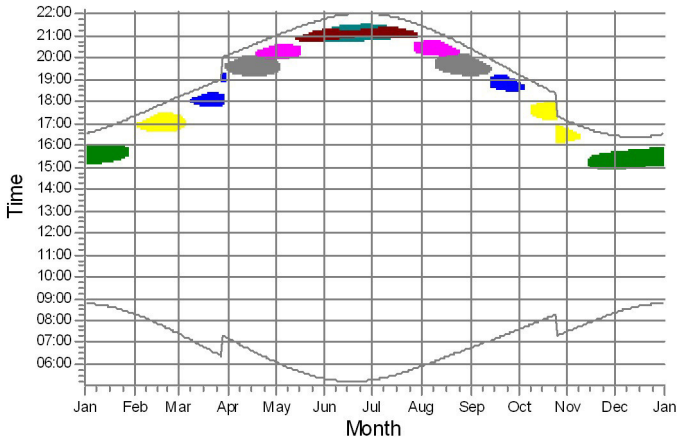
D: 4



E: 5



F: 6



WTGs

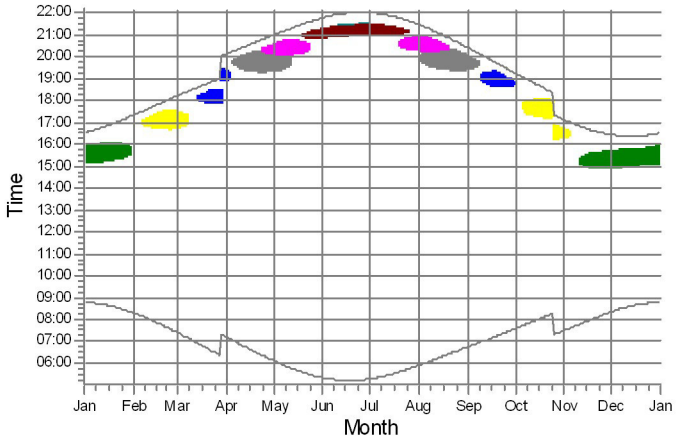
1: T01	3: T03	5: T05	7: T07	9: T09
2: T02	4: T04	6: T06	8: T08	

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Calculated:
11/06/2025 09:22/4.0.552

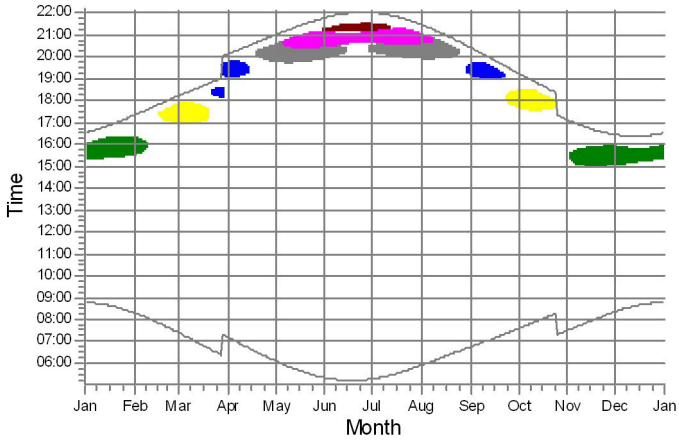
SHADOW - Calendar, graphical

Calculation: 6839 Garrane WF Real Case - V150

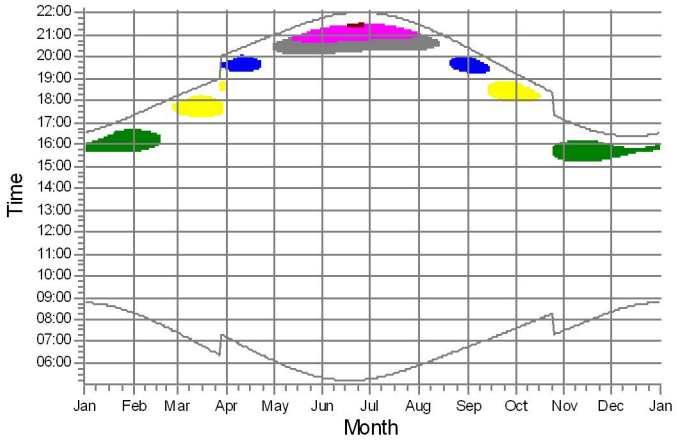
G: 7



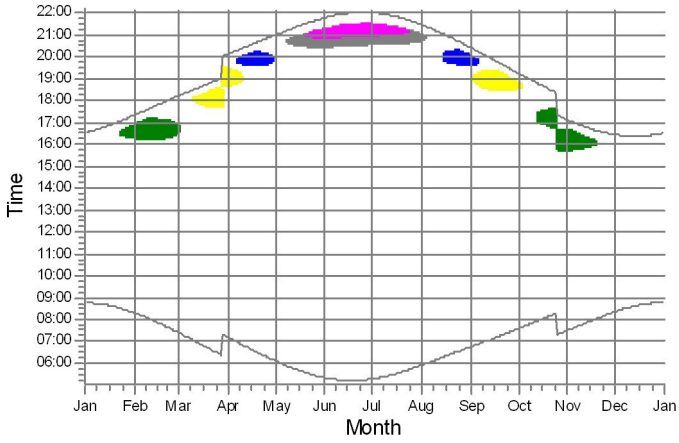
H: 8



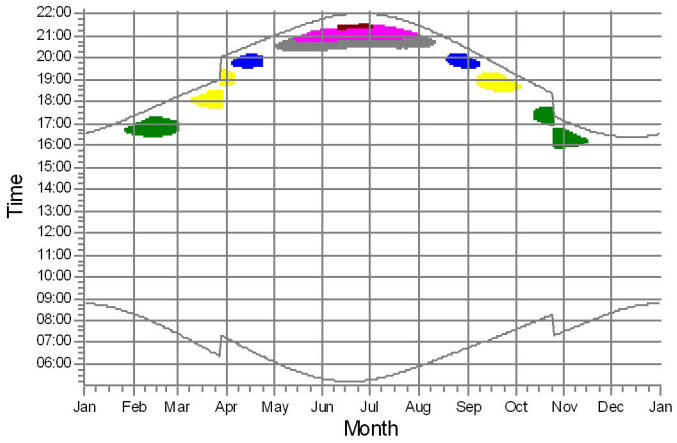
I: 9



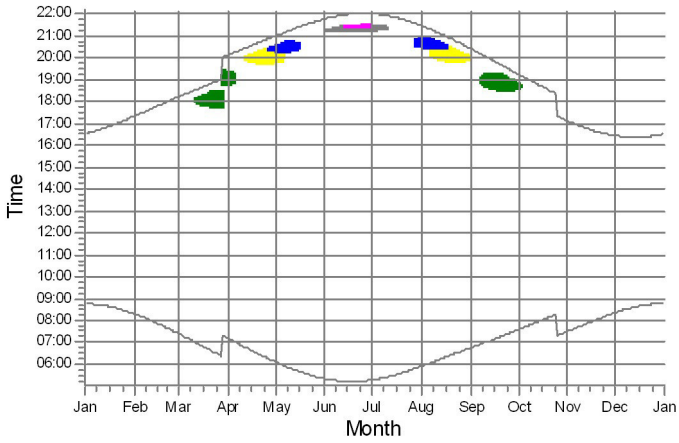
J: 10



K: 11



L: 12



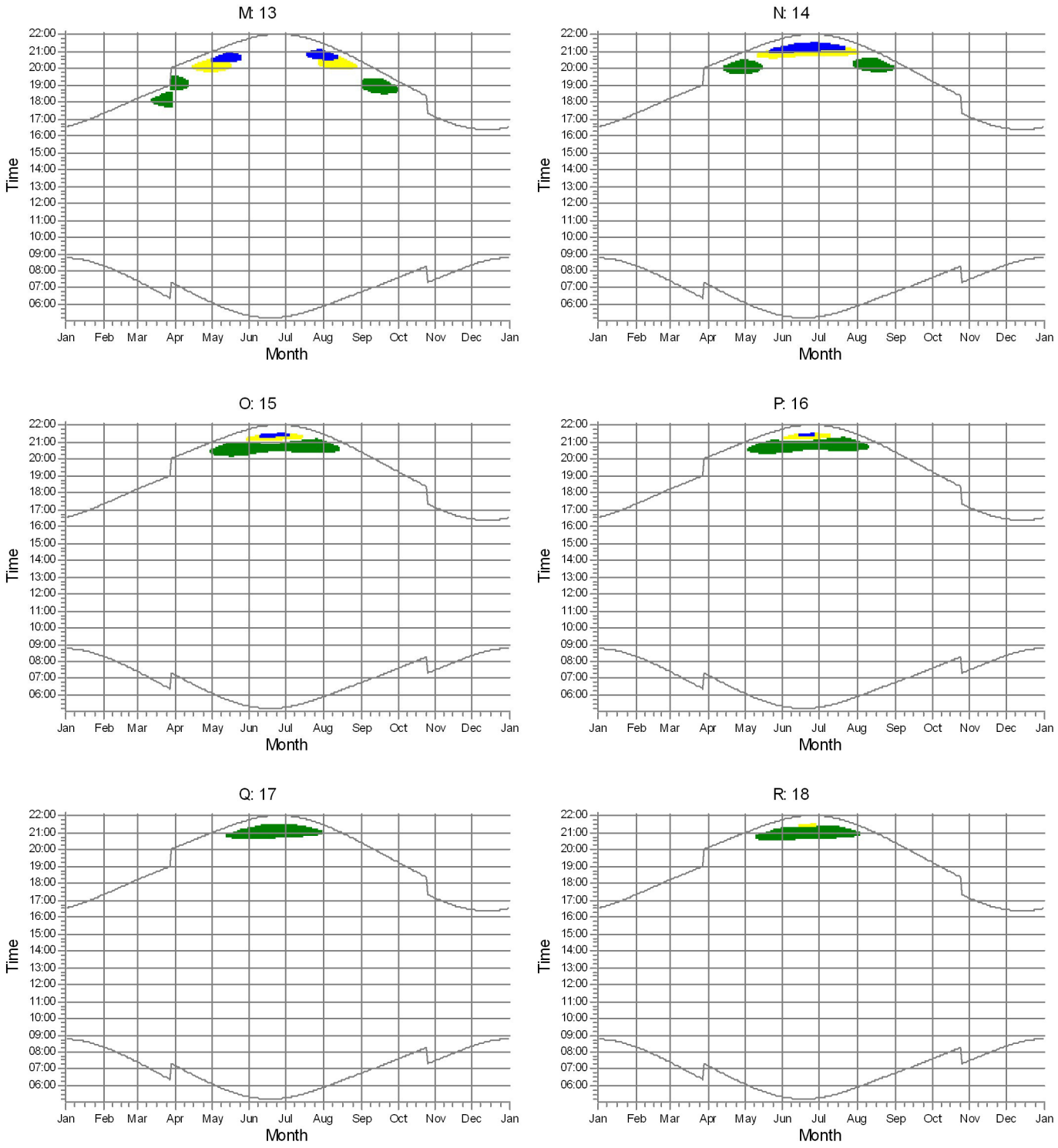
WTGs

	1: T01		3: T03		5: T05		8: T08
	2: T02		4: T04		6: T06		

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Calculated:
11/06/2025 09:22/4.0.552

SHADOW - Calendar, graphical

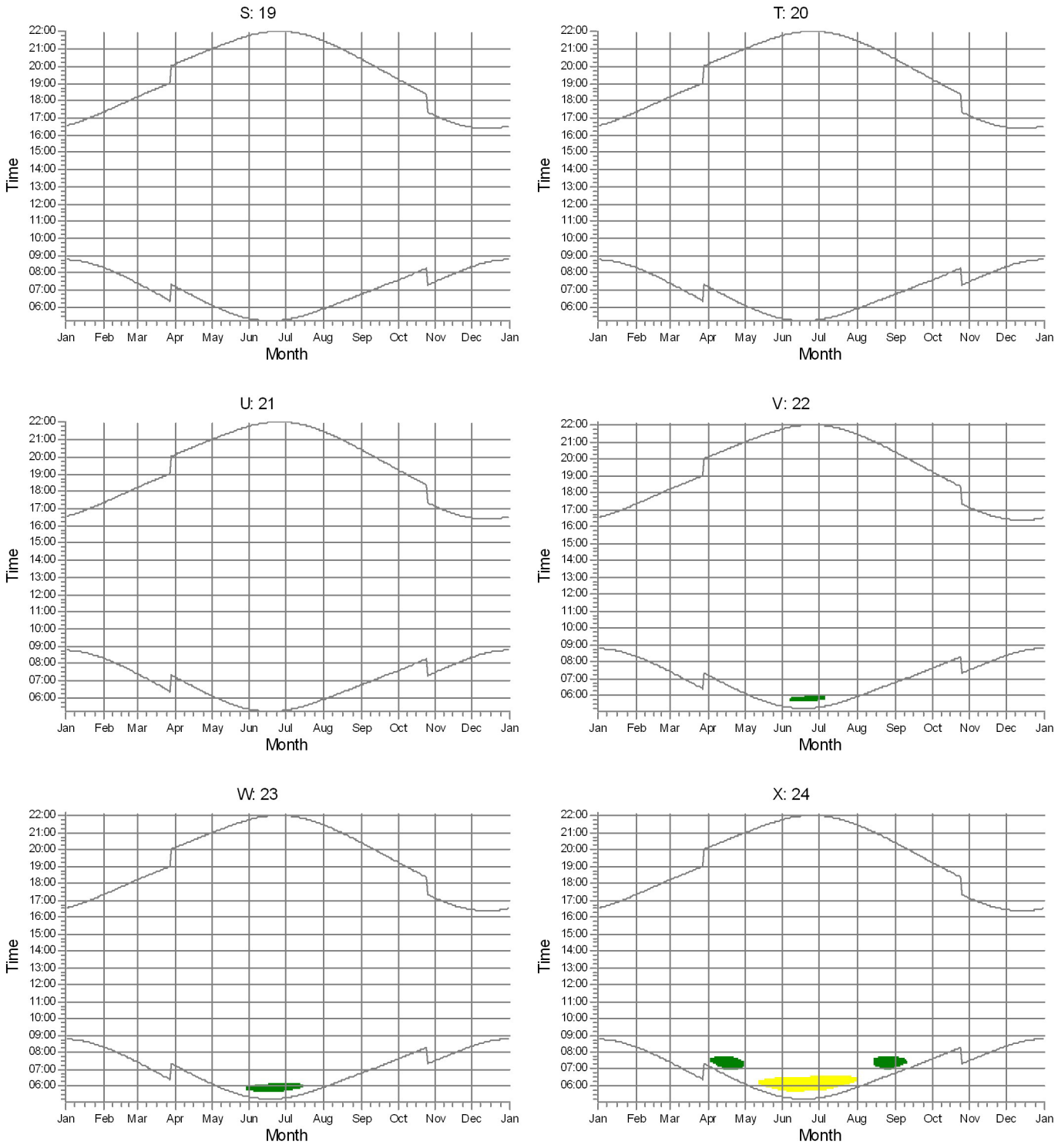
Calculation: 6839 Garrane WF Real Case - V150



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Calculated:
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SHADOW - Calendar, graphical

Calculation: 6839 Garrane WF Real Case - V150

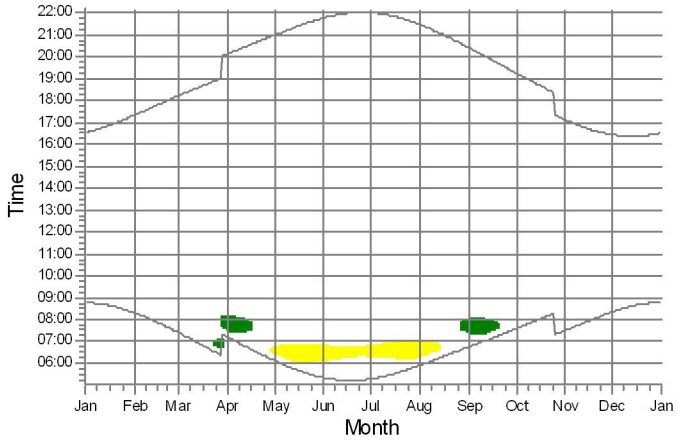


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Calculated:
11/06/2025 09:22/4.0.552

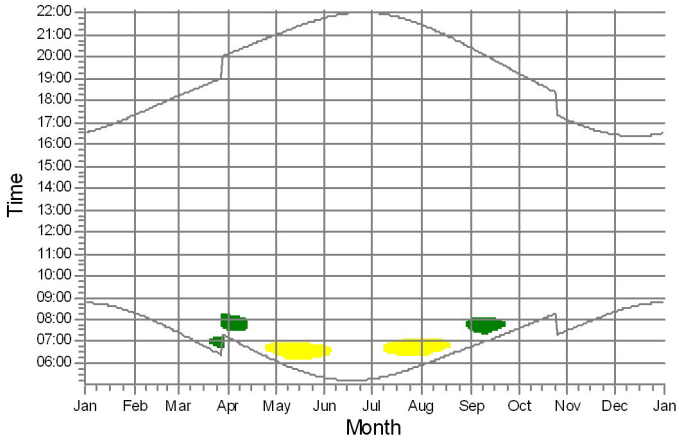
SHADOW - Calendar, graphical

Calculation: 6839 Garrane WF Real Case - V150

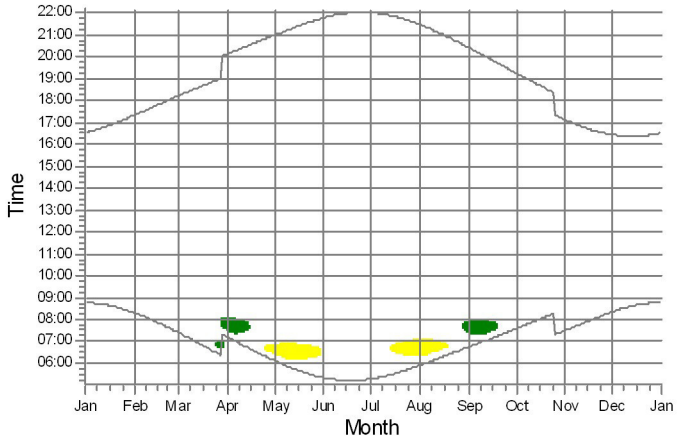
Y: 25



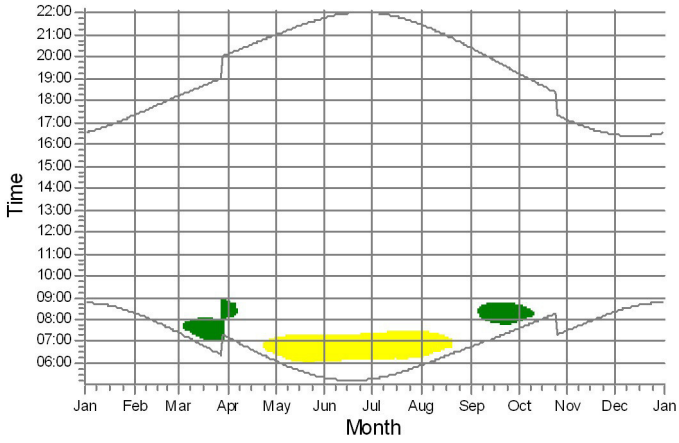
Z: 26



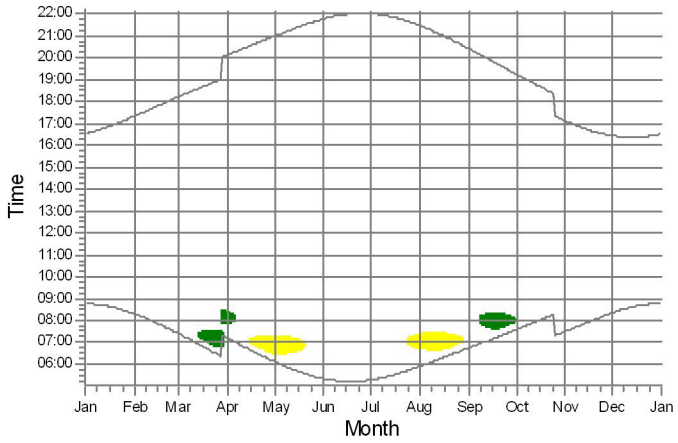
AA: 27



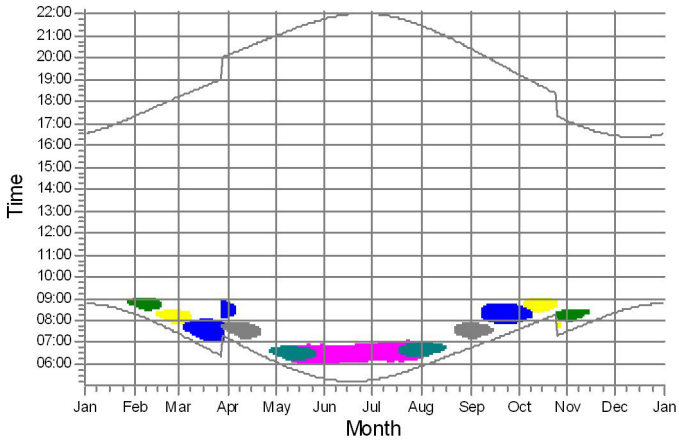
AB: 28



AC: 29



AD: 30



WTGs

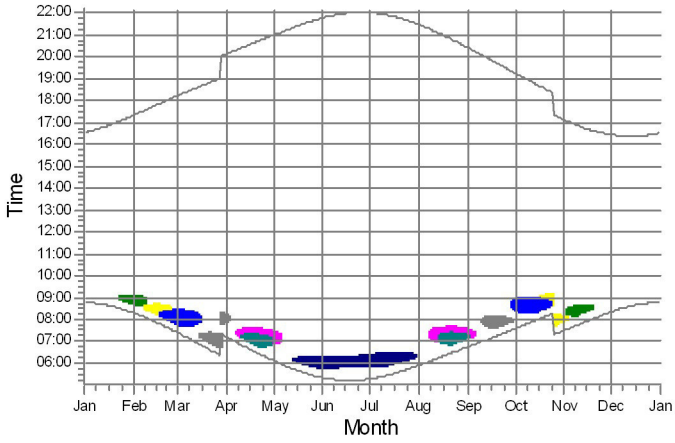
1: T01	3: T03	5: T05
2: T02	4: T04	6: T06

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Calculated:
11/06/2025 09:22/4.0.552

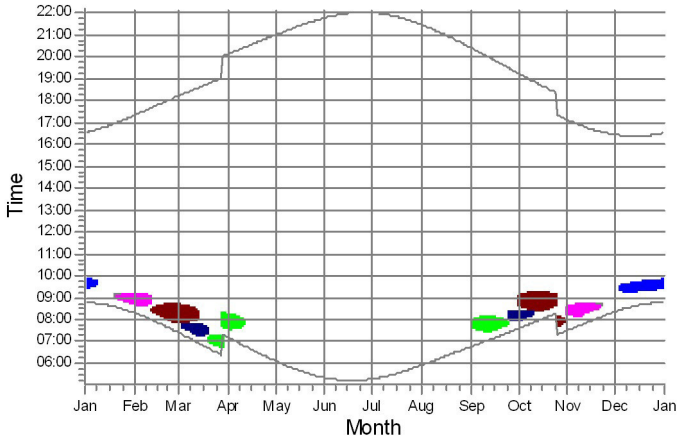
SHADOW - Calendar, graphical

Calculation: 6839 Garrane WF Real Case - V150

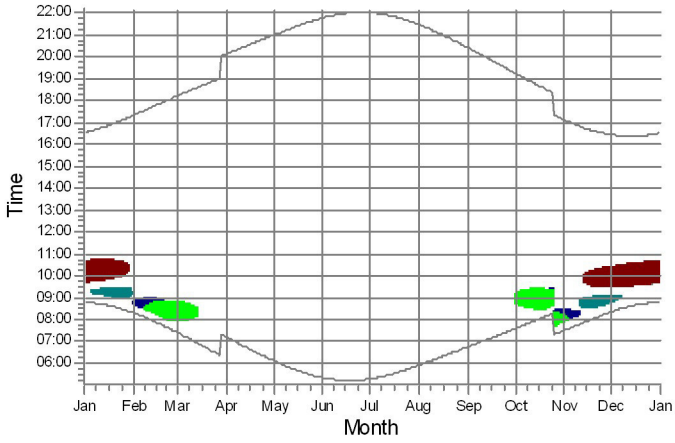
AE: 31



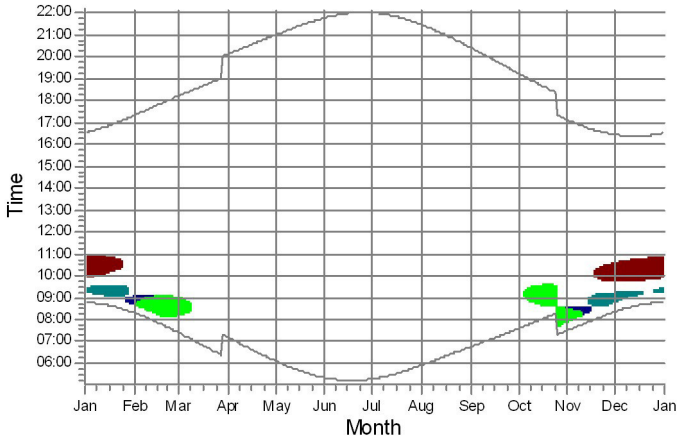
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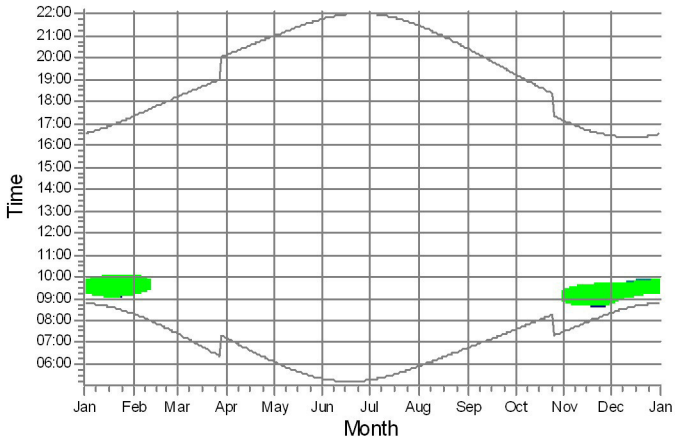
AG: 33



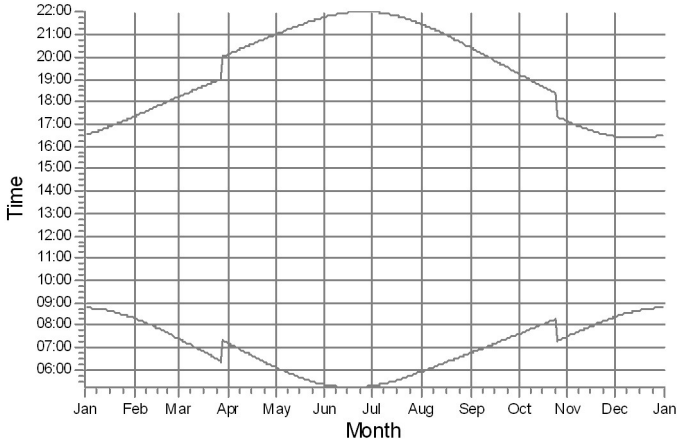
AH: 34



AI: 35



AJ: 36



WTGs

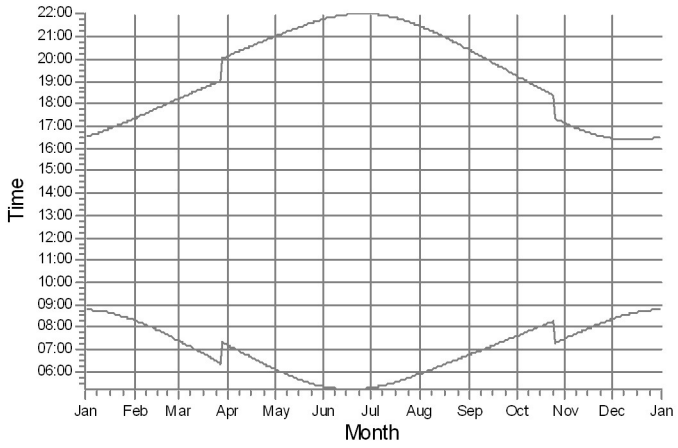
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2: T02	4: T04	6: T06	8: T08	

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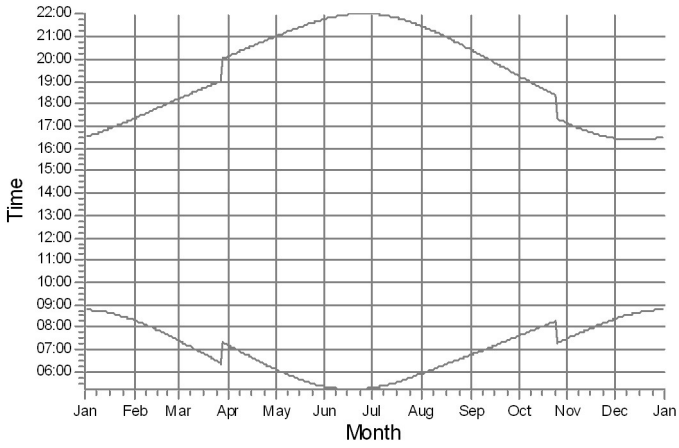
SHADOW - Calendar, graphical

Calculation: 6839 Garrane WF Real Case - V150

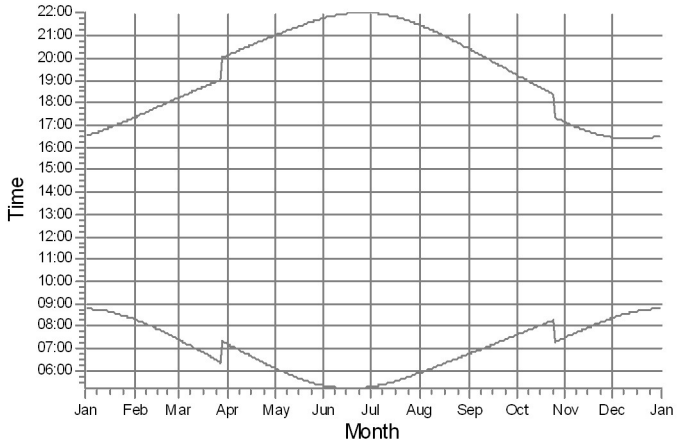
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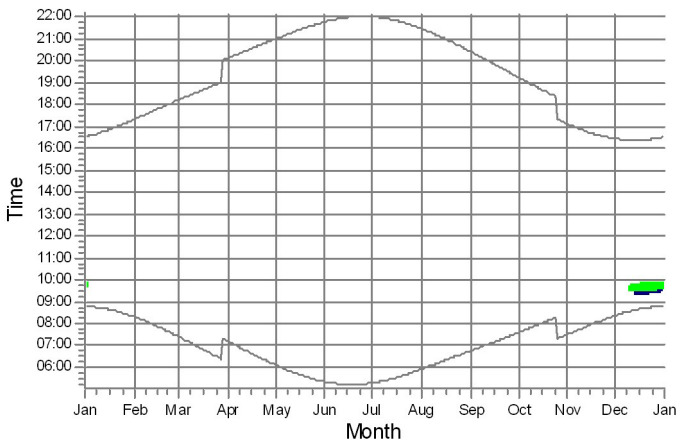
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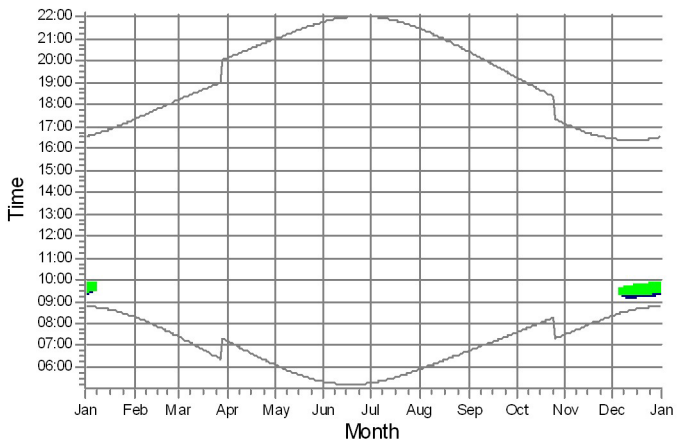
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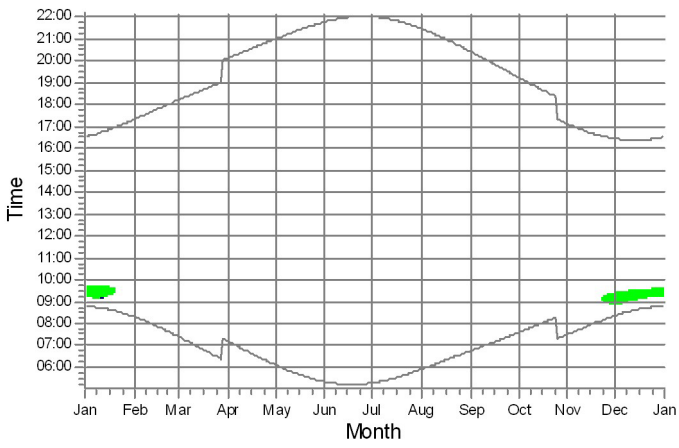
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AO: 41



AP: 42



WTGs

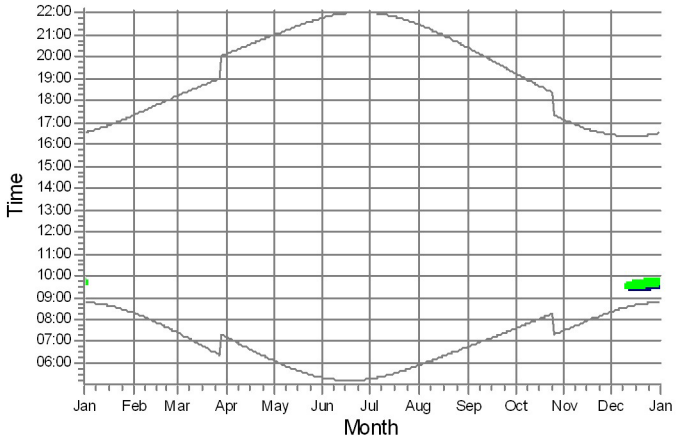
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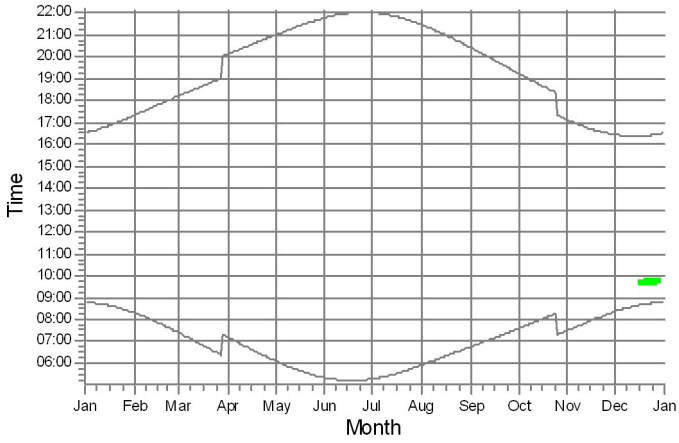
SHADOW - Calendar, graphical

Calculation: 6839 Garrane WF Real Case - V150

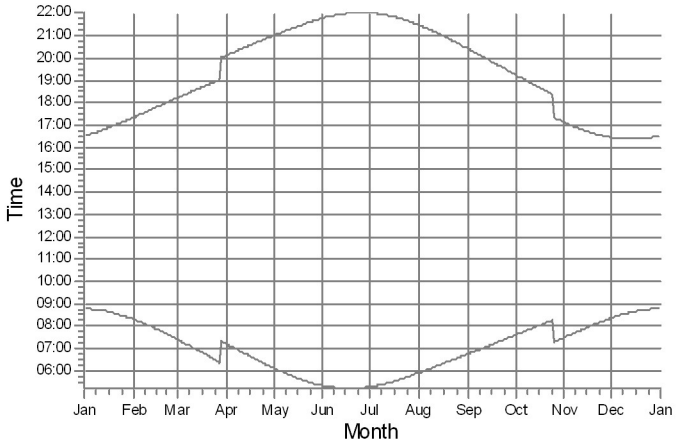
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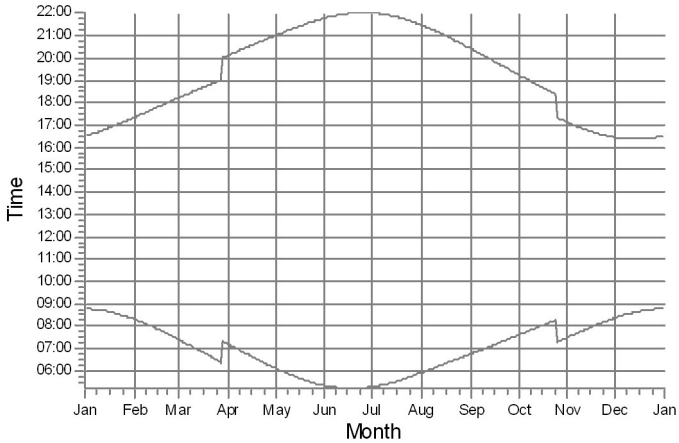
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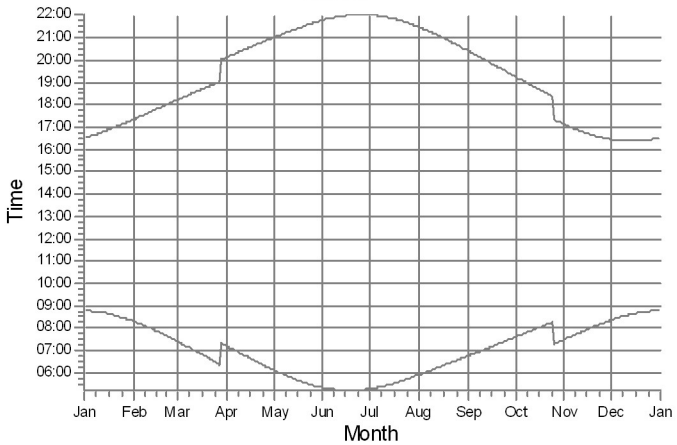
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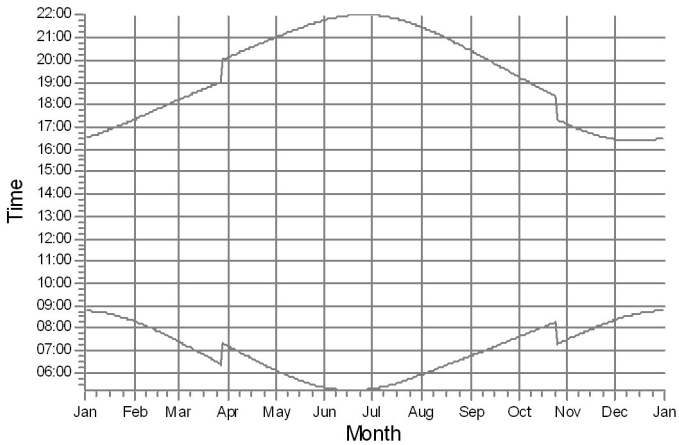
AT: 49



AU: 50



AV: 51



WTGs

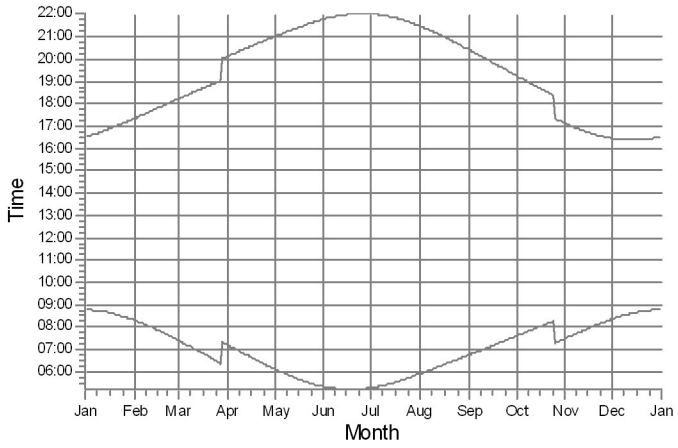
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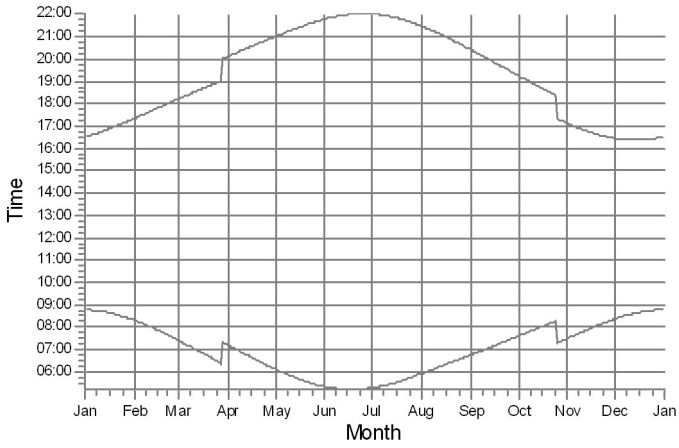
SHADOW - Calendar, graphical

Calculation: 6839 Garrane WF Real Case - V150

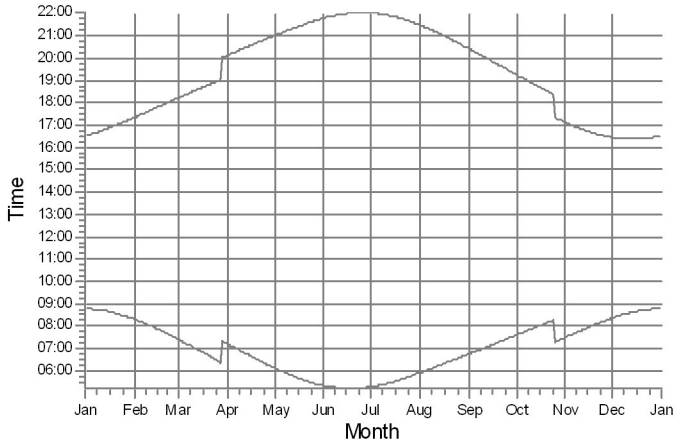
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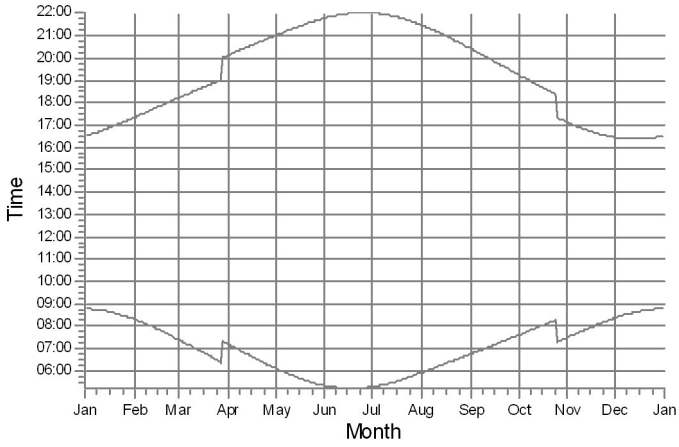
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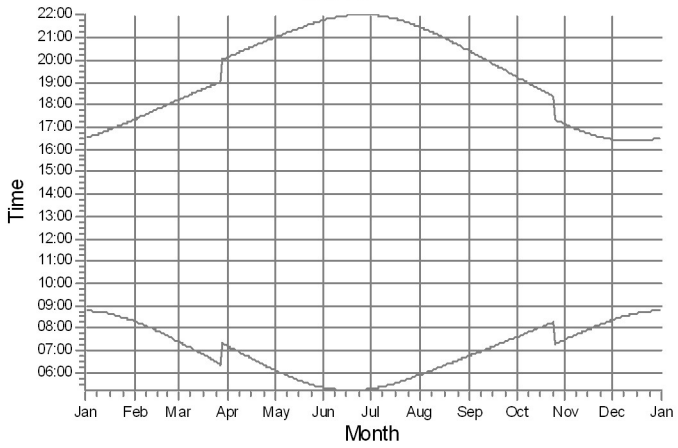
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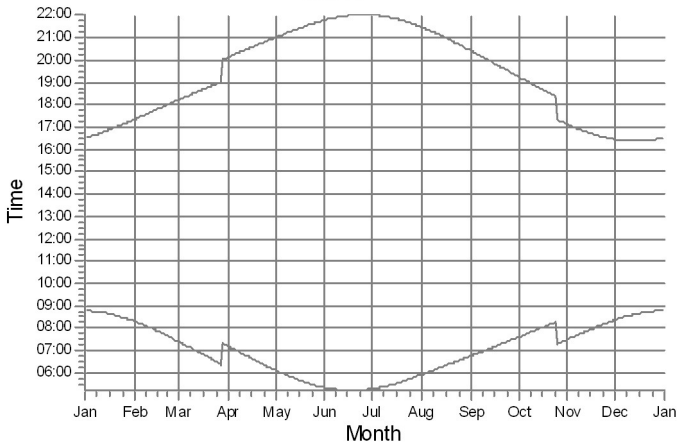
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BA: 66



BB: 67



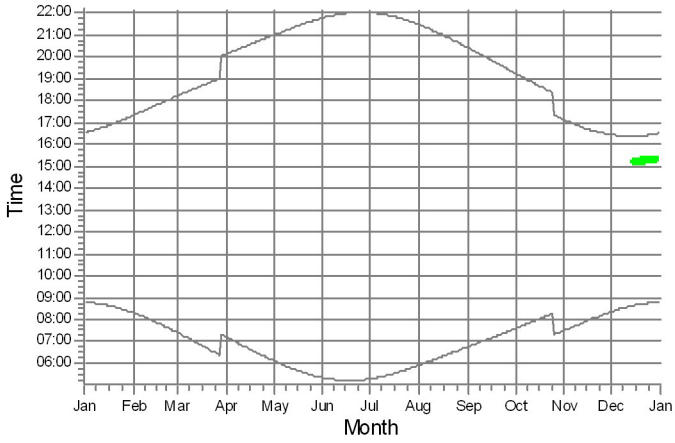
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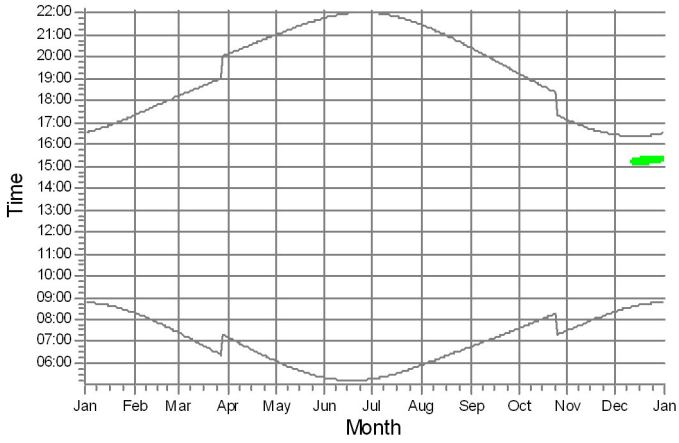
SHADOW - Calendar, graphical

Calculation: 6839 Garrane WF Real Case - V150

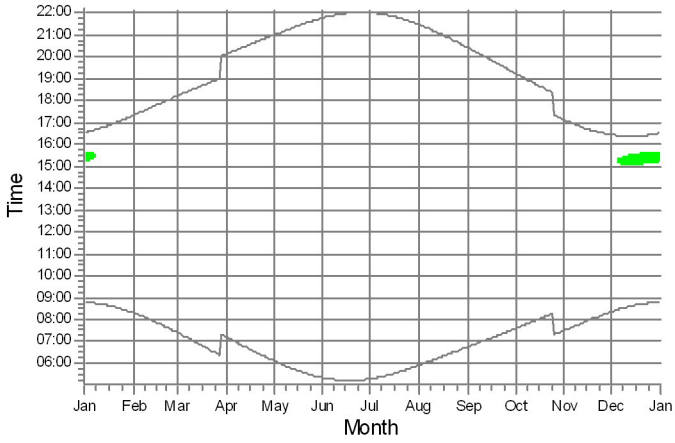
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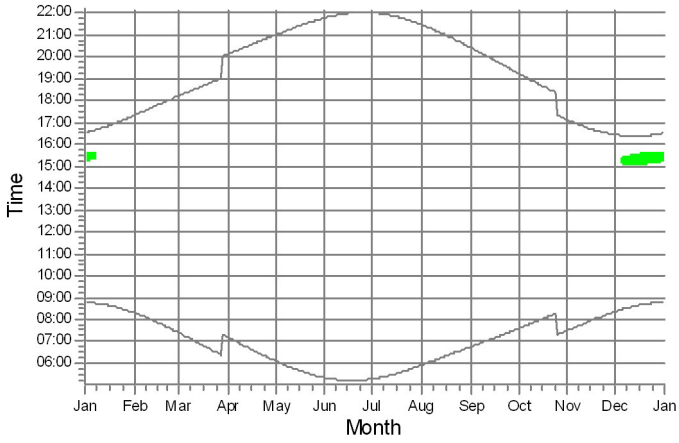
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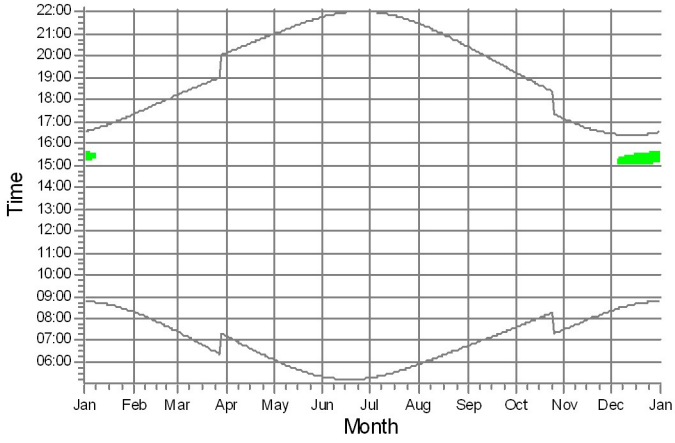
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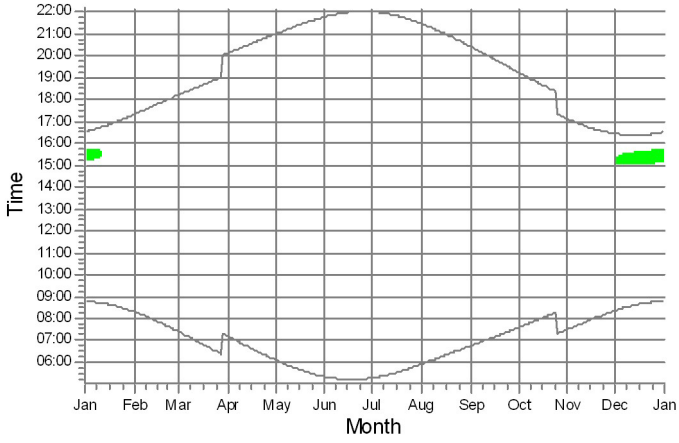
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BG: 72



BH: 73



WTGs

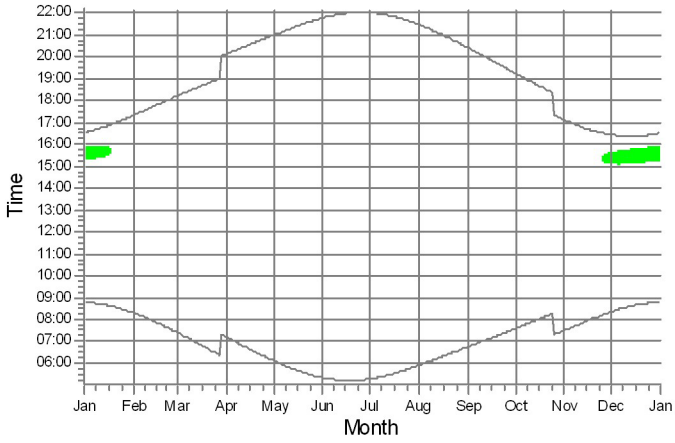
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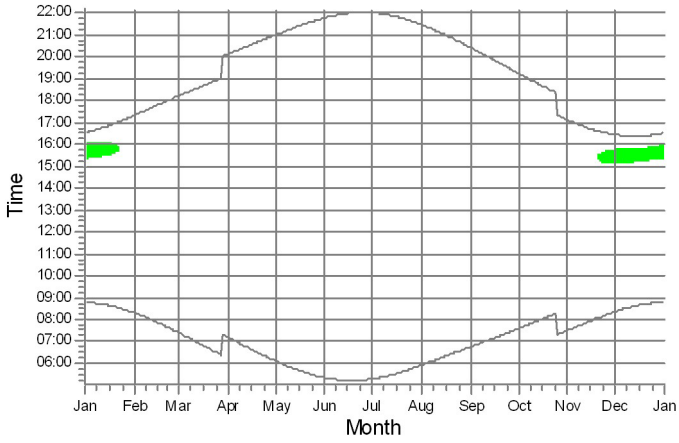
SHADOW - Calendar, graphical

Calculation: 6839 Garrane WF Real Case - V150

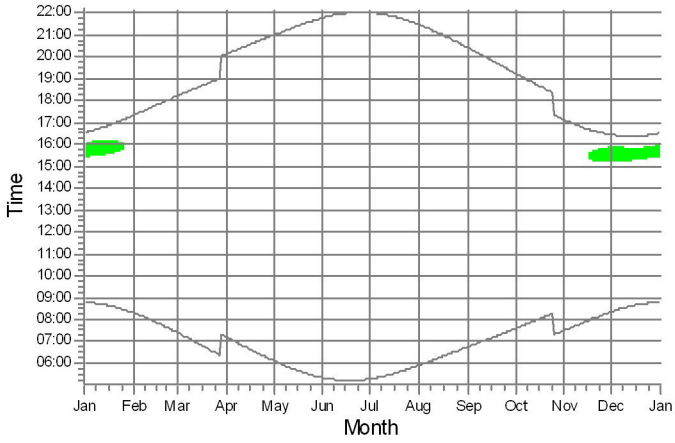
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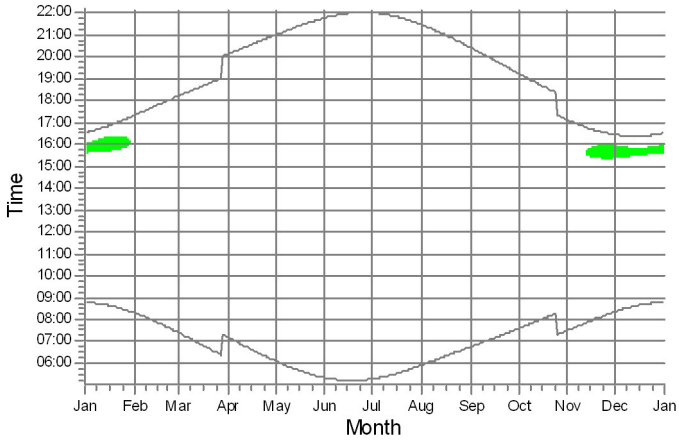
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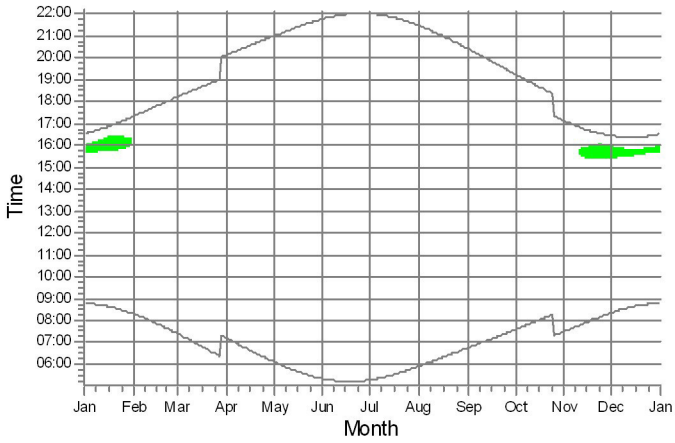
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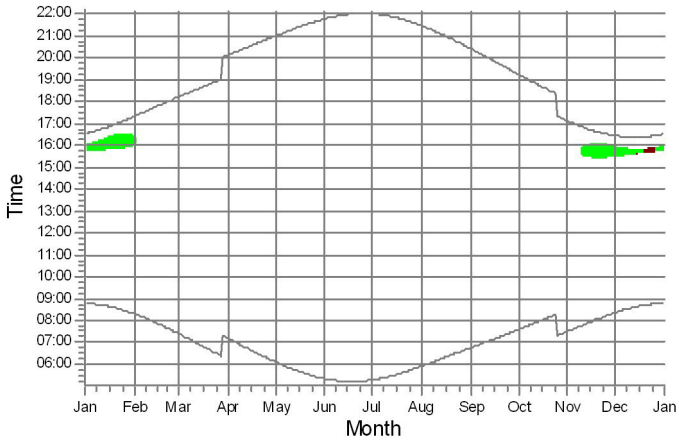
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BM: 78



BN: 79



WTGs

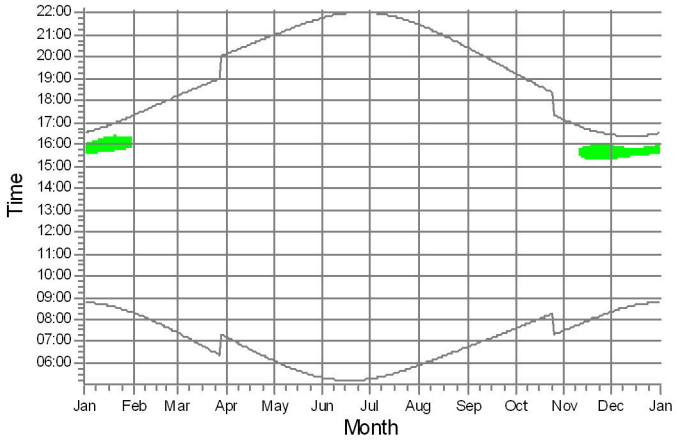
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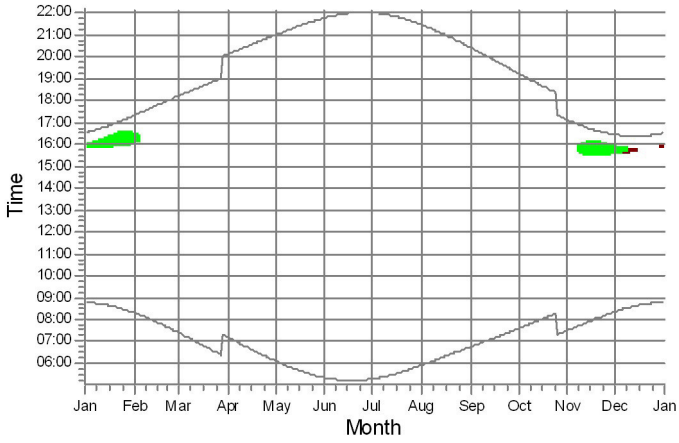
SHADOW - Calendar, graphical

Calculation: 6839 Garrane WF Real Case - V150

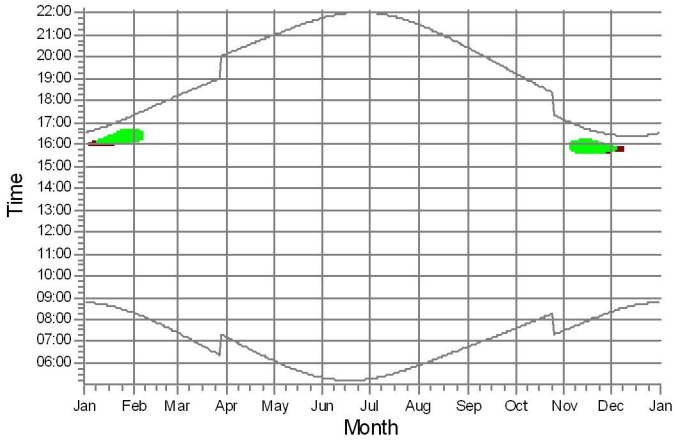
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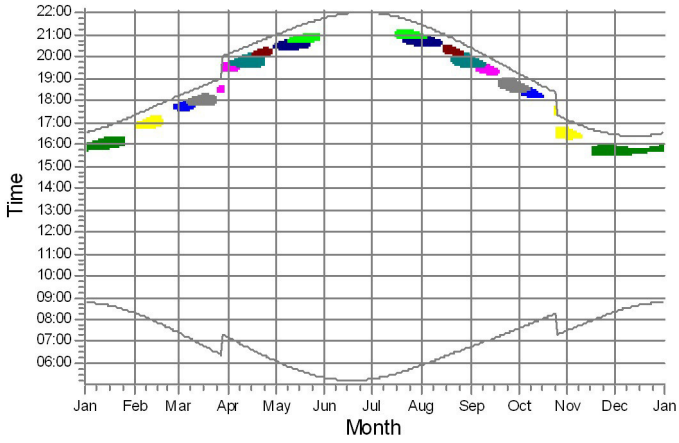
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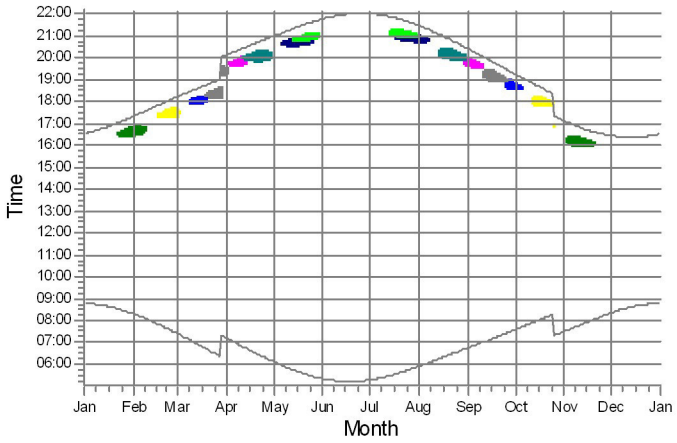
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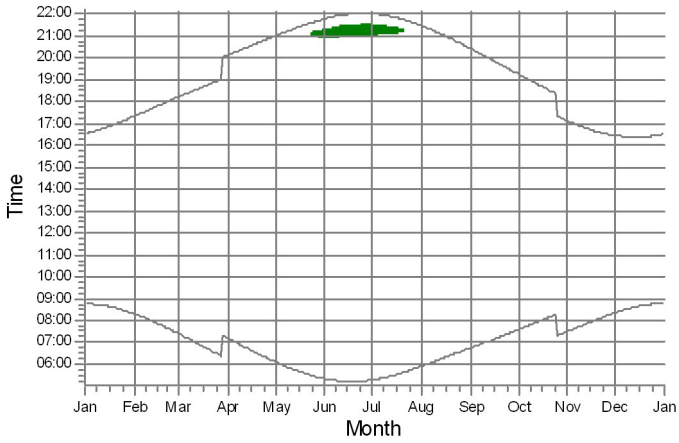
BR: 83



BS: 84



BT: 85



WTGs

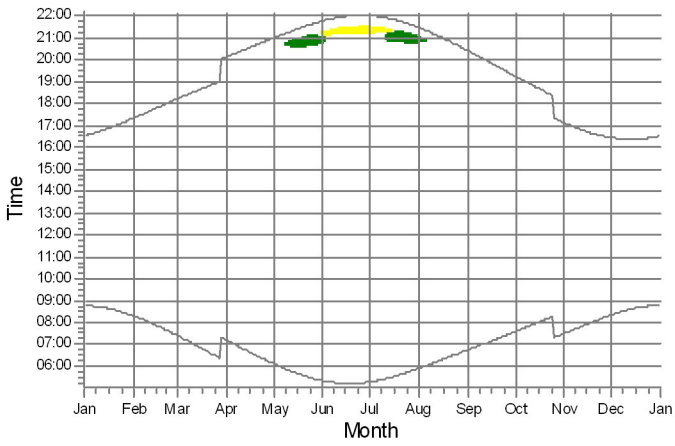
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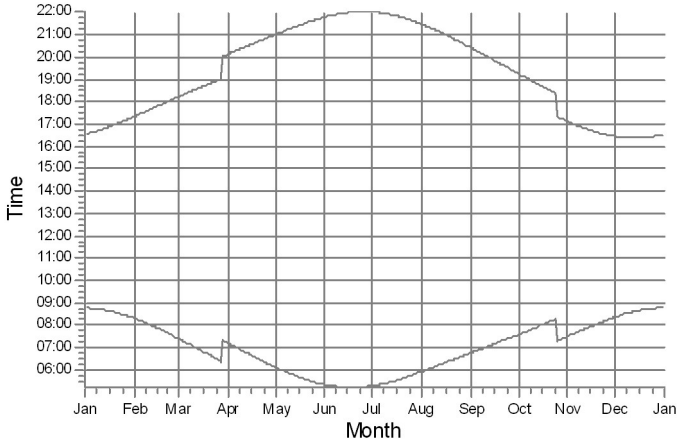
SHADOW - Calendar, graphical

Calculation: 6839 Garrane WF Real Case - V150

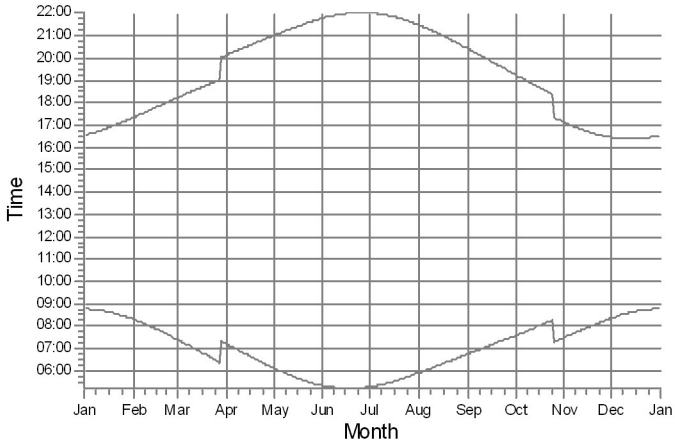
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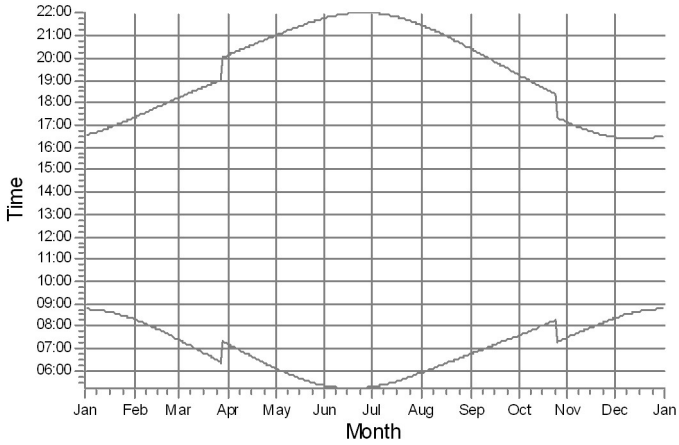
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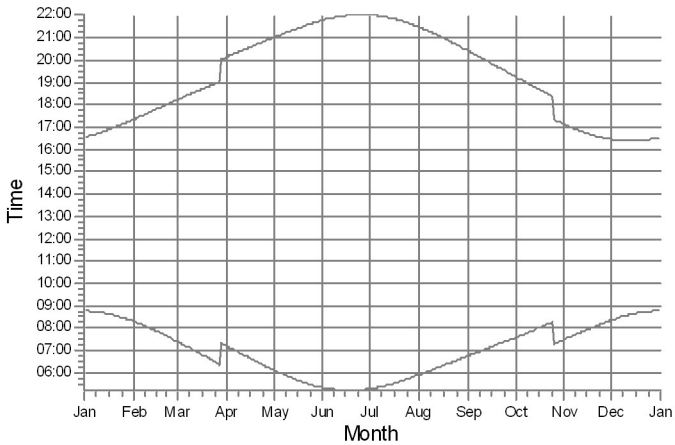
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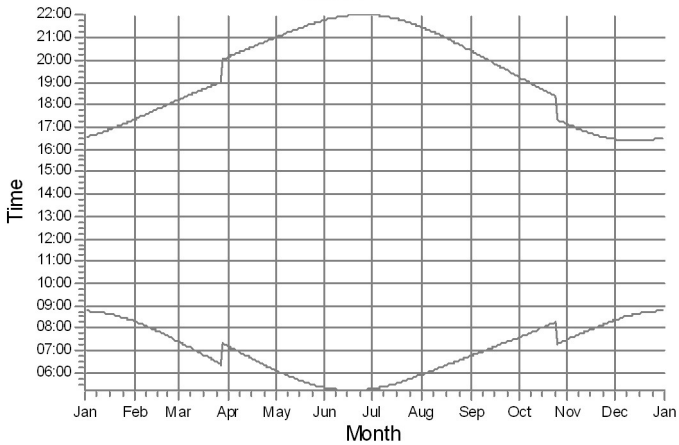
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BY: 90



BZ: 91



WTGs

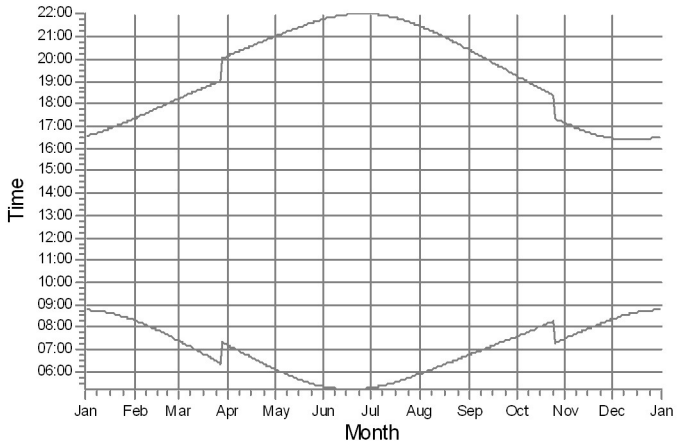
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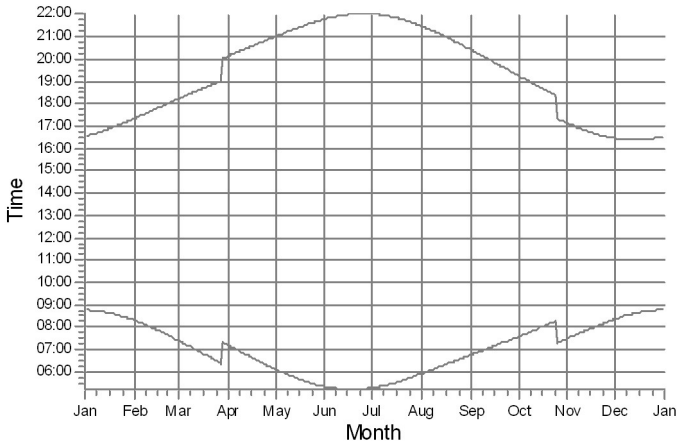
SHADOW - Calendar, graphical

Calculation: 6839 Garrane WF Real Case - V150

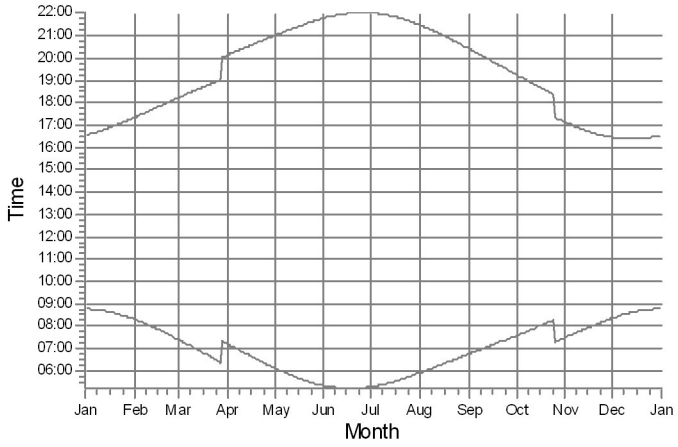
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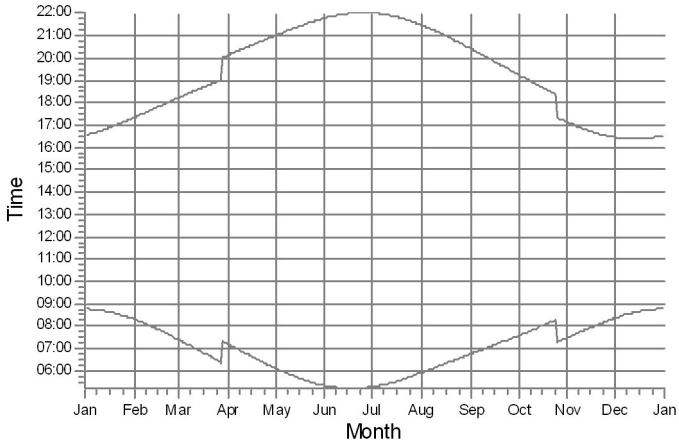
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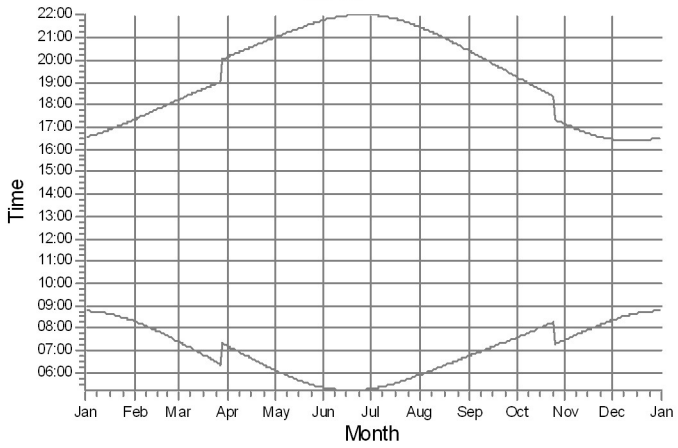
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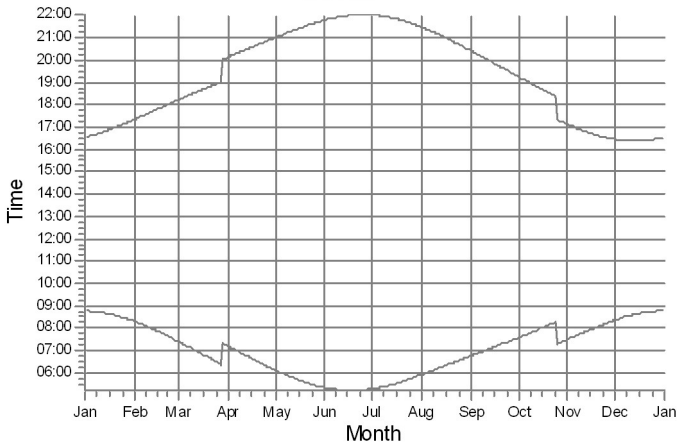
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CE: 96



CF: 122



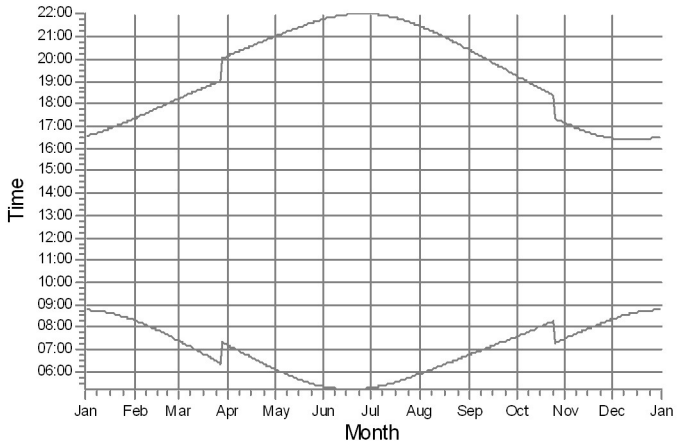
WTGs

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padraig / podowd@jodireland.com
Calculated:
11/06/2025 09:22/4.0.552

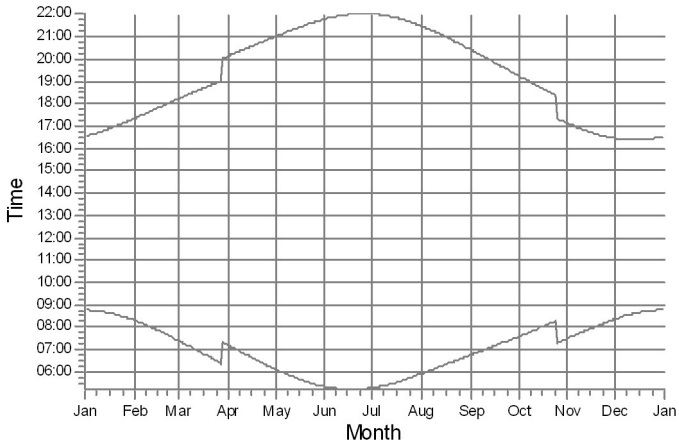
SHADOW - Calendar, graphical

Calculation: 6839 Garrane WF Real Case - V150

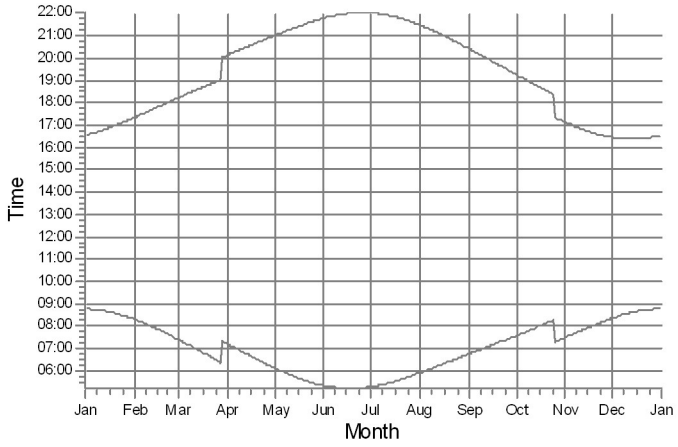
CG: 123



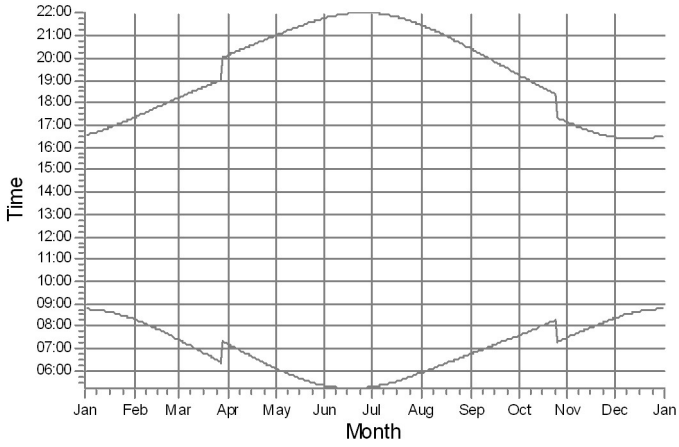
CH: 124



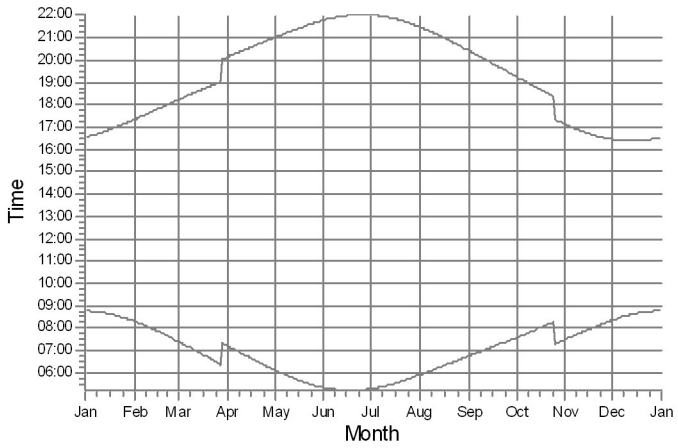
CI: 125



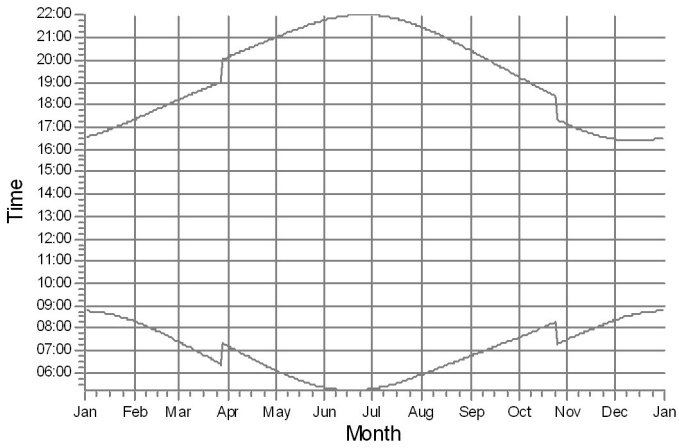
CJ: 126



CK: 127



CL: 128

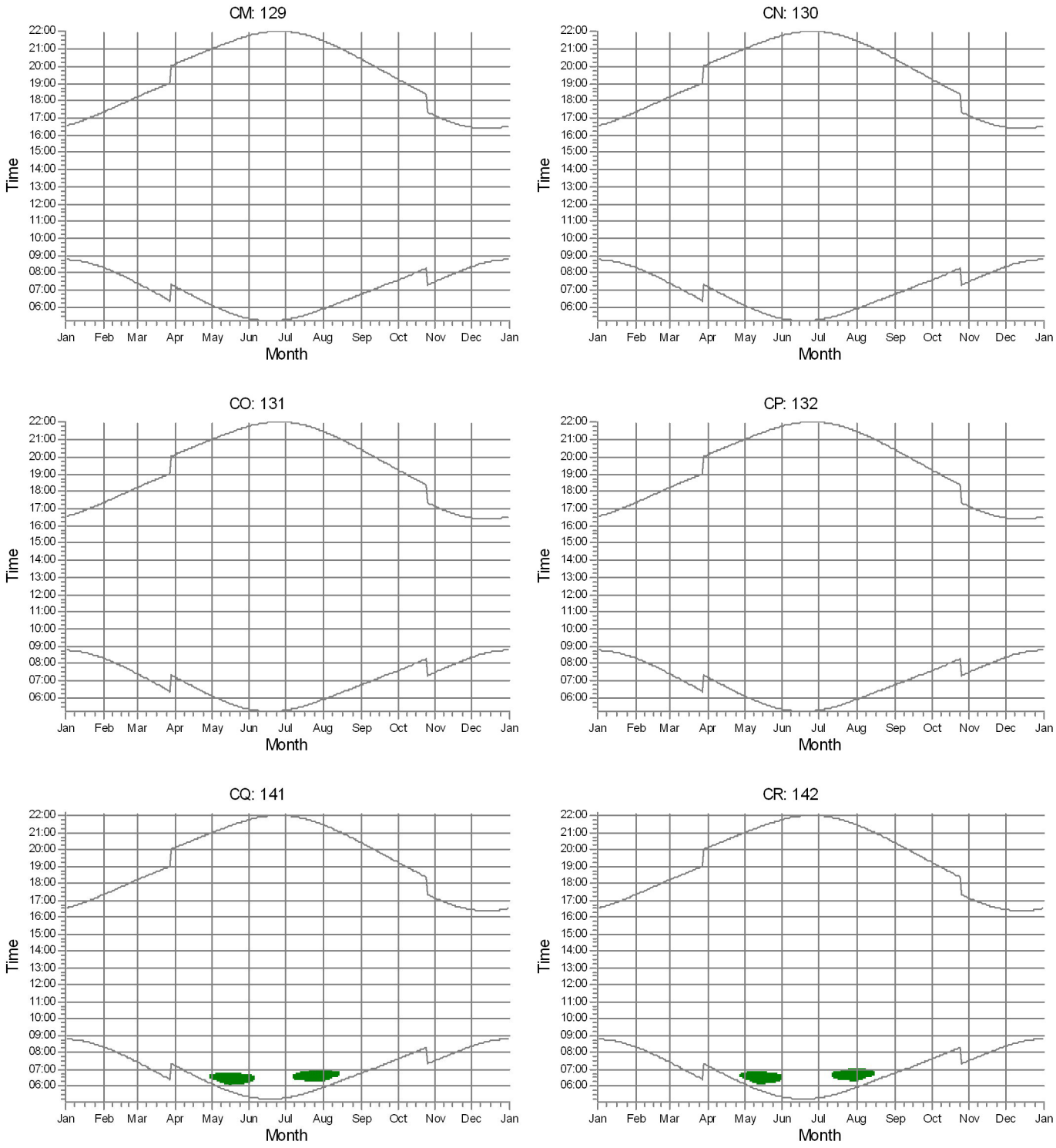


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SHADOW - Calendar, graphical

Calculation: 6839 Garrane WF Real Case - V150

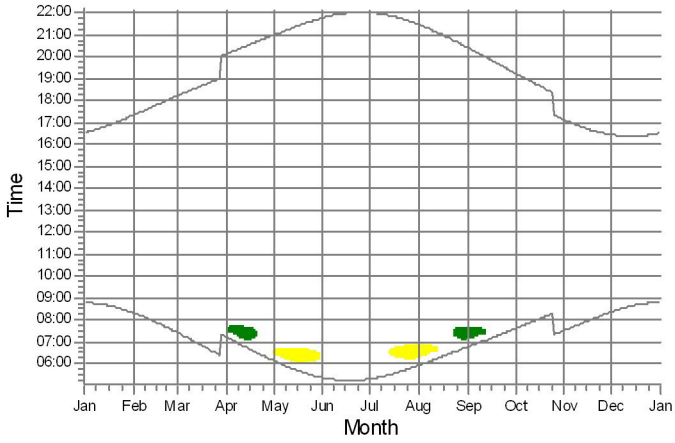


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Calculated:
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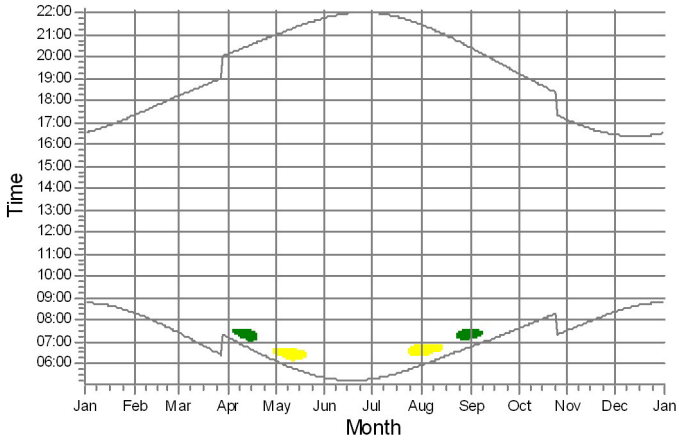
SHADOW - Calendar, graphical

Calculation: 6839 Garrane WF Real Case - V150

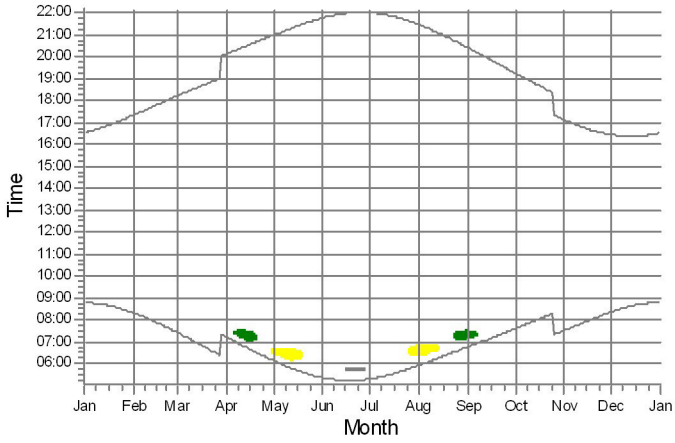
CS: 143



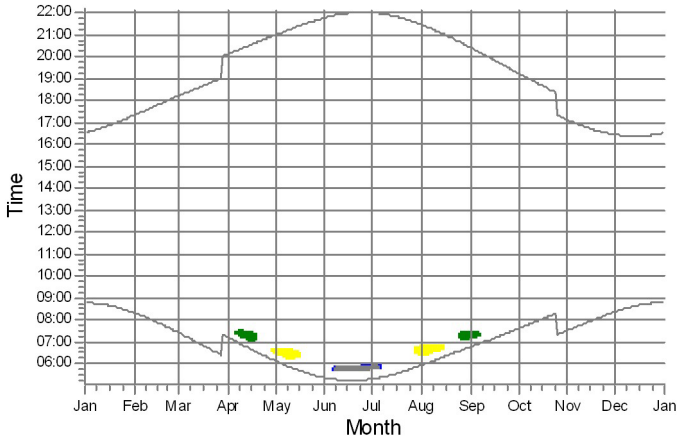
CT: 144



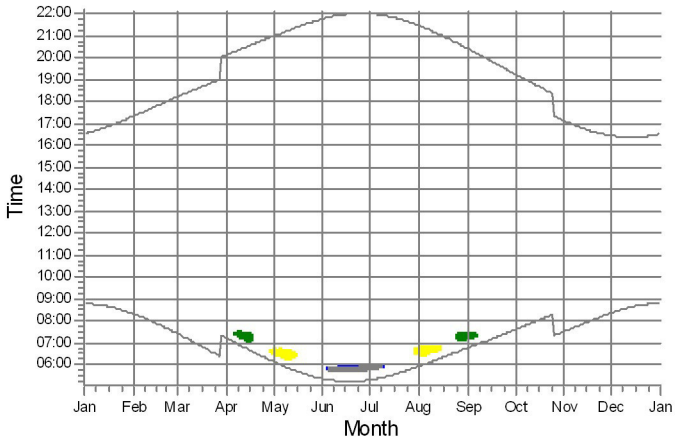
CU: 145



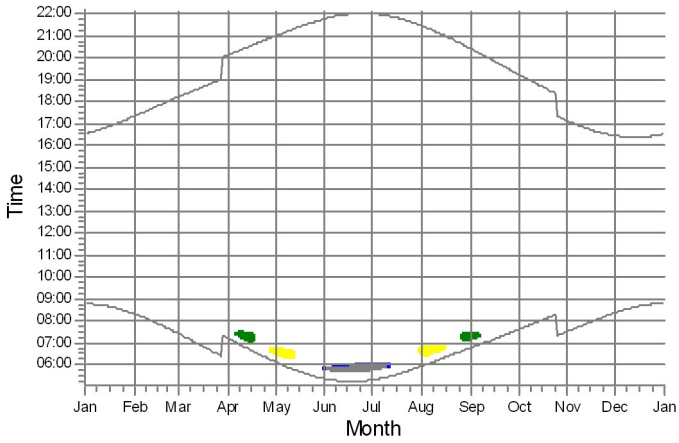
CV: 146



CW: 147



CX: 148



WTGs

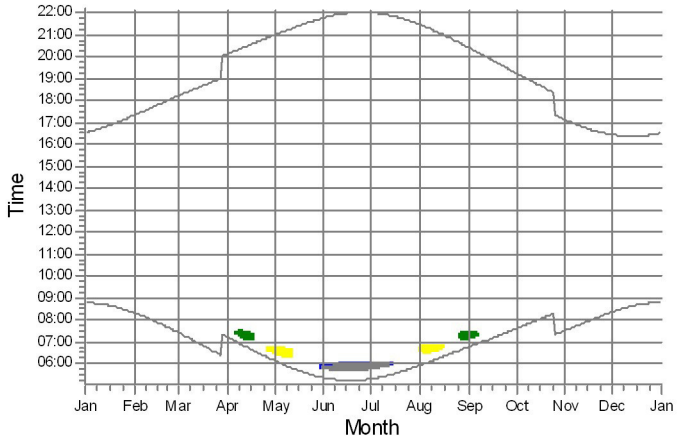
1: T01 2: T02 3: T03 4: T04

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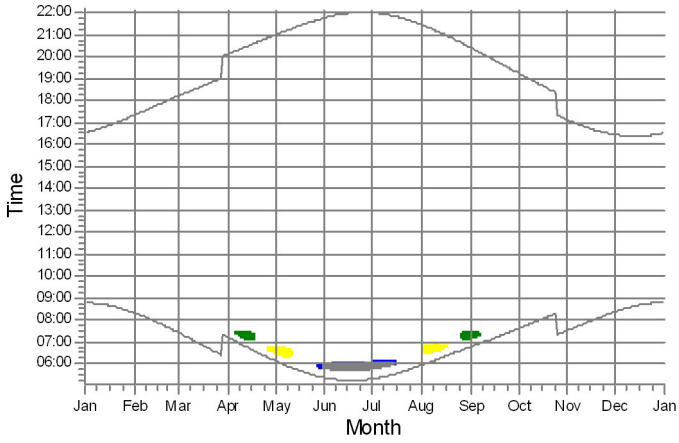
SHADOW - Calendar, graphical

Calculation: 6839 Garrane WF Real Case - V150

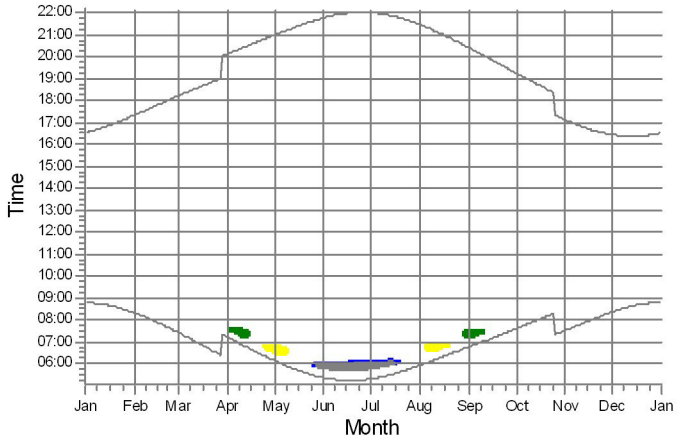
CY: 149



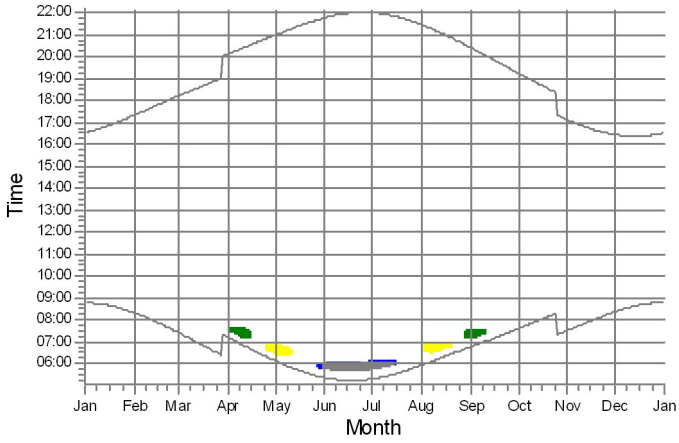
CZ: 150



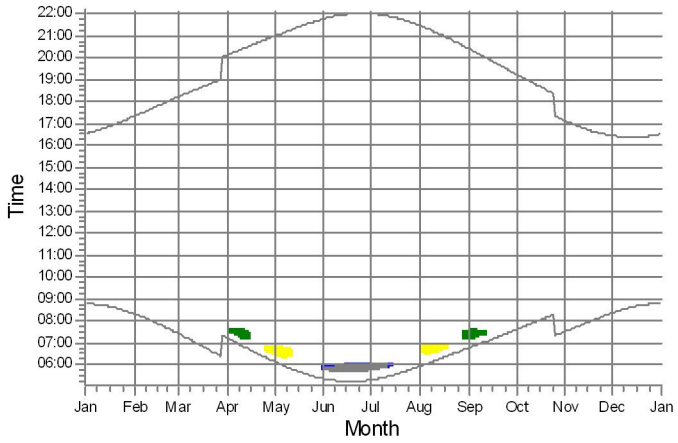
DA: 170



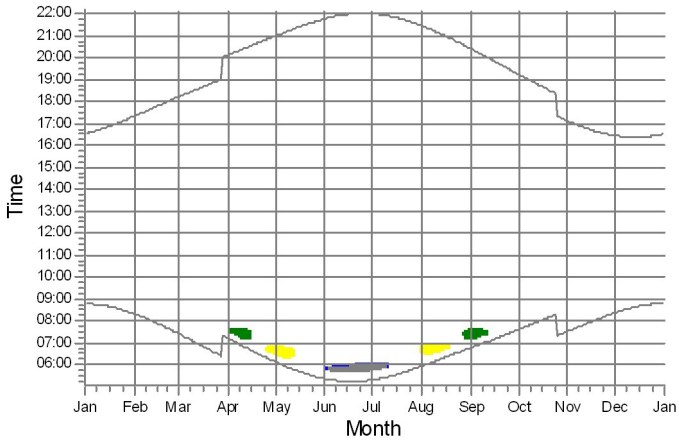
DB: 171



DC: 172



DD: 173



WTGs

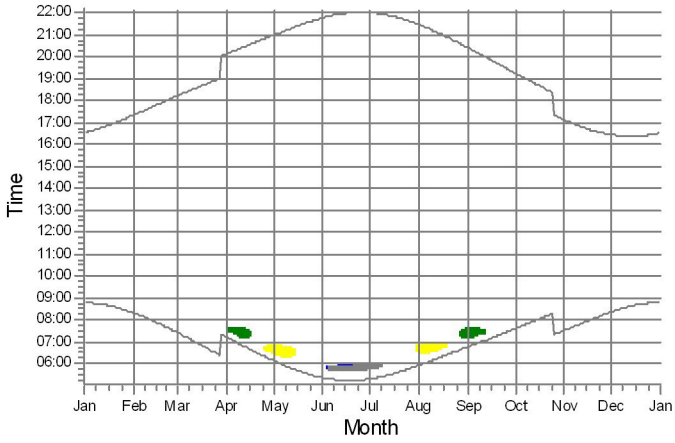
1: T01 2: T02 3: T03 4: T04

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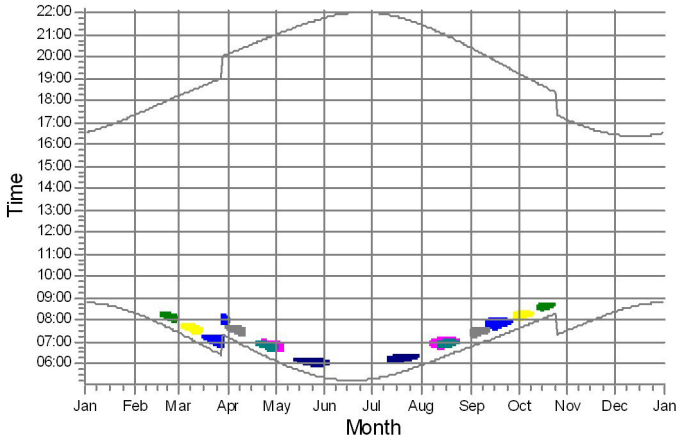
SHADOW - Calendar, graphical

Calculation: 6839 Garrane WF Real Case - V150

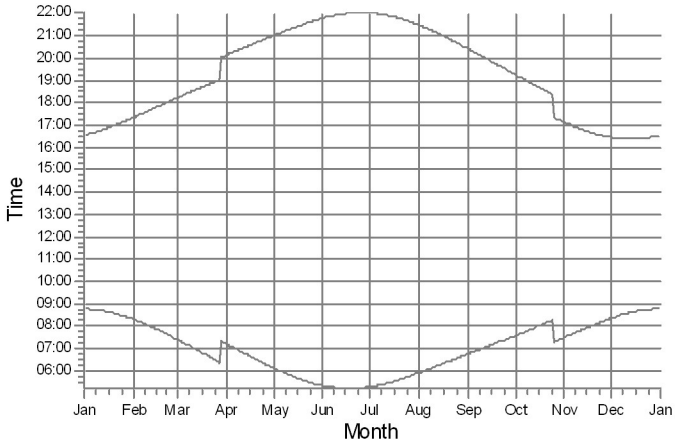
DE: 174



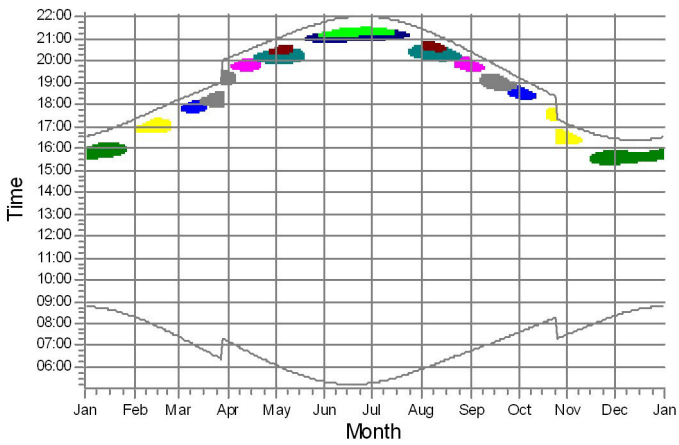
DF: 177



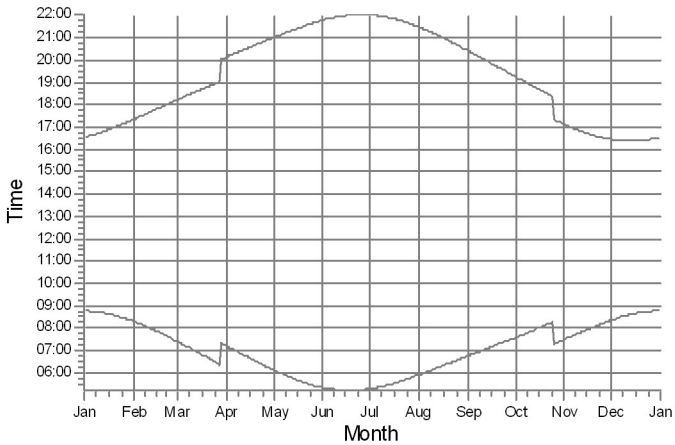
DG: 178



DH: 179



DI: 180



WTGs

	1: T01		3: T03		5: T05		7: T07		9: T09
	2: T02		4: T04		6: T06		8: T08		

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Calculated:
11/06/2025 09:22/4.0.552

SHADOW - Calendar per WTG

Calculation: 6839 Garrane WF Real Case - V150 **WTG:** 1 - T01

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January	February	March	April	May	June
1	08:46 15:11-15:56/45 16:32	08:18 15:36-16:49/73 17:20 08:45-09:04/19	07:23 18:13	07:12 07:35-08:46/71 20:08 18:47-19:30/43	06:06 06:31-06:42/11 21:00 19:46-20:31/45	05:20 06:18-06:34/16 05:49-05:54/5 21:47 20:21-21:14/53
2	08:45 15:12-15:57/45 16:33	08:16 15:38-16:52/74 17:22 08:43-09:03/20	07:21 18:15	07:09 07:32-08:43/71 20:10 18:46-19:28/42	06:04 06:29-06:43/14 21:02 19:46-20:33/47	05:19 06:19-06:32/13 05:48-05:54/6 21:48 20:21-21:15/54
3	08:45 15:13-15:59/46 16:34	08:15 15:40-16:54/74 17:24 08:41-09:03/22	07:19 18:17	07:07 07:30-08:41/71 20:11 18:47-19:27/40	06:02 06:27-06:43/16 21:03 19:46-20:34/48	05:18 06:21-06:32/11 05:48-05:56/8 21:49 20:22-21:15/53
4	08:45 15:14-16:00/46 16:35	08:13 15:41-16:56/75 17:26 08:39-09:02/23	07:17 18:18	07:05 07:28-08:12/44 18:48-19:26/38 20:13 08:14-08:39/25	06:00 06:25-06:44/19 21:05 19:47-20:35/48	05:17 06:23-06:29/6 05:47-05:56/9 21:50 20:23-21:17/54
5	08:45 15:14-16:01/47 16:36	08:11 15:43-16:58/75 17:28 08:37-09:01/24	07:15 07:38-07:43/5 18:20	07:03 07:26-08:06/40 18:48-19:24/36 20:15 08:17-08:35/18	05:58 06:24-06:45/21 21:07 19:48-20:38/50	05:17 20:23-21:17/54 21:51 05:46-05:56/10
6	08:44 15:15-16:03/48 16:38	08:10 15:45-17:00/75 17:30 08:36-09:01/25	07:12 07:36-07:47/11 18:22	07:00 07:23-08:04/41 18:50-19:23/33 20:17 08:22-08:28/6	05:56 06:22-06:45/23 21:08 19:48-20:39/51	05:16 20:25-21:19/54 21:52 05:46-05:58/12
7	08:44 15:15-16:04/49 16:39	08:08 15:48-17:02/74 17:32 08:34-08:59/25	07:10 07:34-07:50/16 18:24	06:58 07:21-08:03/42 20:18 18:51-19:21/30	05:55 06:20-06:45/25 21:10 19:49-20:40/51	05:15 20:25-21:19/54 21:53 05:45-05:58/13
8	08:44 15:15-16:05/50 16:40	08:06 15:51-17:04/73 17:34 08:32-08:58/26	07:08 07:31-07:51/20 18:26	06:56 07:19-08:02/43 20:20 18:53-19:20/27	05:53 06:19-06:46/27 21:12 19:50-20:41/51	05:15 20:26-21:20/54 21:54 05:45-05:59/14
9	08:43 15:16-16:07/51 16:42	08:04 08:31-08:58/27 17:35 15:52-17:06/74	07:05 07:29-07:53/24 18:27	06:53 07:16-08:00/44 20:22 18:54-19:16/22	05:51 06:17-06:46/29 21:13 19:51-20:44/53	05:14 20:26-21:20/54 21:55 05:45-05:59/14
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11	08:42 15:16-16:10/54 16:44	08:01 08:33-08:57/24 17:39 15:54-17:10/76	07:01 07:24-07:55/31 18:31	06:49 07:12-07:57/45 20:25	05:48 06:14-06:46/32 21:17 19:54-20:47/53	05:14 20:28-21:23/55 21:56 05:44-06:00/16
12	08:41 15:17-16:11/54 16:46	07:59 08:34-08:56/22 17:41 15:55-17:13/78	06:59 07:22-07:56/34 18:33 18:01-18:07/6	06:47 07:10-07:56/46 20:27	05:46 06:12-06:45/33 19:56-20:14/18 21:18 20:15-20:48/33	05:13 20:29-21:23/54 21:57 05:44-06:01/17
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14	08:40 15:18-16:14/56 16:49	07:55 08:36-08:53/17 17:45 15:59-17:14/75	06:54 07:17-07:57/40 18:36 17:56-18:11/15	06:42 07:05-07:51/46 20:31 19:58-20:03/5	05:43 06:09-06:45/36 20:03-20:07/4 21:21 20:15-20:51/36	05:13 20:30-21:24/54 21:58 05:43-06:01/18
15	08:39 15:18-16:16/58 16:50	07:53 08:38-08:51/13 17:47 16:02-17:14/72	06:52 07:15-07:57/42 18:38 17:55-18:13/18	06:40 07:03-07:48/45 20:32 19:56-20:05/9	05:41 06:08-06:45/37 21:23 20:15-20:53/38	05:12 20:30-21:25/55 21:59 05:43-06:01/18
16	08:38 15:19-16:18/59 16:52	07:51 08:43-08:47/4 17:49 16:06-17:13/67	06:49 07:12-07:57/45 18:40 17:52-18:14/22	06:38 07:01-07:39/38 20:34 19:54-20:07/13	05:39 06:07-06:44/37 21:25 20:14-20:54/40	05:12 20:31-21:25/54 21:59 05:43-06:01/18
17	08:37 15:20-16:20/60 16:54	07:49 16:19-17:13/54 17:51	06:47 07:10-07:58/48 18:42 17:52-18:16/24	06:35 07:01-07:38/37 20:36 19:53-20:09/16	05:38 06:08-06:44/36 21:26 20:15-20:55/40	05:12 20:31-21:26/55 22:00 05:43-06:02/19
18	08:36 15:21-16:22/61 16:55	07:47 08:12-08:13/1 17:52 16:18-17:12/54	06:45 07:08-07:58/50 18:43 17:51-18:18/27	06:33 07:01-07:38/37 20:37 19:51-20:10/19	05:36 06:08-06:44/36 21:28 20:14-20:56/42	05:12 20:32-21:26/54 22:00 05:43-06:02/19
19	08:35 15:22-16:24/62 16:57	07:45 08:09-08:12/3 17:54 16:19-17:11/52	06:42 07:05-07:57/52 18:45 17:49-18:19/30	06:31 07:02-07:37/35 20:39 19:50-20:12/22	05:35 06:08-06:43/35 21:29 20:15-20:58/43	05:12 20:32-21:26/54 22:01 05:43-06:02/19
20	08:34 15:23-16:26/63 16:59	07:43 08:07-08:13/6 17:56 16:20-17:11/51	06:40 07:03-07:57/54 18:47 17:49-18:21/32	06:29 07:02-07:37/35 20:41 19:48-20:13/25	05:34 06:09-06:43/34 21:31 20:15-20:59/44	05:12 20:32-21:26/54 22:01 05:43-06:02/19
21	08:33 15:23-16:27/64 17:00	07:41 08:05-08:13/8 17:58 16:21-17:10/49	06:38 07:01-07:57/56 18:49 17:48-18:23/35	06:27 07:02-07:35/33 20:43 19:48-20:15/27	05:32 06:09-06:43/34 21:32 20:16-21:01/45	05:12 20:32-21:26/54 22:01 05:44-06:03/19
22	08:32 15:24-16:30/66 17:02	07:39 08:03-08:13/10 18:00 16:22-17:09/47	06:35 06:58-07:56/58 18:51 17:47-18:25/38	06:24 07:02-07:34/32 20:44 19:47-20:16/29	05:31 06:10-06:42/32 21:34 20:15-21:01/46	05:13 20:33-21:27/54 22:01 05:44-06:03/19
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26	08:27 15:29-16:37/68 17:09 08:54-09:01/7	07:30 07:56-08:09/13 18:07 16:28-17:03/35	06:26 06:49-07:54/65 18:58 17:47-18:32/45	06:16 07:07-07:27/20 20:51 19:45-20:23/38	05:26 06:12-06:39/27 21:39 20:17-21:07/50	05:14 20:33-21:27/54 22:02 05:45-06:04/19
27	08:25 15:31-16:40/69 17:11 08:53-09:02/9	07:28 07:58-08:07/9 18:09 16:31-17:01/30	06:24 06:46-07:52/66 18:59 17:46-18:32/46	06:14 07:09-07:25/16 20:53 19:45-20:24/39	05:25 06:13-06:38/25 21:40 20:18-21:08/50	05:14 20:34-21:28/54 22:02 05:46-06:04/18
28	08:24 15:33-16:41/68 17:13 08:51-09:02/11	07:26 16:36-16:57/21 18:11	06:21 06:44-07:52/68 19:01 17:46-18:32/46	06:12 06:36-06:37/1 19:45-20:26/41 20:55 07:12-07:21/9	05:24 06:13-06:36/23 21:42 20:18-21:09/51	05:15 20:33-21:27/54 22:01 05:46-06:04/18
29	08:22 15:34-16:43/69 17:15 08:50-09:03/13		07:19 07:42-08:51/69 20:03 18:46-19:32/46	06:10 06:35-06:40/5 20:56 19:45-20:26/41	05:23 06:14-06:36/22 21:43 20:19-21:10/51	05:15 20:33-21:28/55 22:01 05:47-06:04/17
30	08:21 15:35-16:46/71 17:17 08:48-09:03/15		07:16 07:39-08:49/70 20:04 18:46-19:30/44	06:08 06:33-06:41/8 20:58 19:46-20:30/44	05:22 06:16-06:36/20 05:51-05:52/1 21:44 20:19-21:11/52	05:16 20:32-21:27/55 22:01 05:47-06:04/17
31	08:19 15:36-16:47/71 17:18 08:46-09:03/17		07:14 07:37-08:47/70 20:06 18:46-19:30/44		05:21 06:17-06:35/18 05:50-05:53/3 21:45 20:21-21:13/52	
Potential sun hours	257	277	367	417	487	501
Sum of minutes with flicker	1889	2130	1897	1971	2337	2140

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

Licensed user:
Jennings O'Donovan
Finisklin Business Park
F91 RHH9 Sligo
+353719161416
padraig / podowd@jodireland.com
Calculated:
11/06/2025 09:22/4.0.552

SHADOW - Calendar per WTG

Calculation: 6839 Garrane WF Real Case - V150 **WTG:** 1 - T01

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	July	August	September	October	November	December
1	05:17 20:32-21:27/55 22:01 05:48-06:04/16	05:54 06:23-06:56/33 21:28 20:05-20:58/53	06:45 07:11-07:56/45 20:25	07:35 08:00-08:35/35 19:15 18:39-18:47/8	07:30 08:02-08:27/25 17:07 15:22-16:38/76	08:21 14:59-15:52/53 16:26
2	05:17 20:32-21:27/55 22:00 05:49-06:05/16	05:56 06:25-06:56/31 21:26 20:03-20:57/54	06:46 07:13-07:58/45 20:23 18:57-19:12/15	07:36 08:02-08:34/32 19:12 18:42-18:45/3	07:31 08:01-08:27/26 17:05 15:21-16:36/75	08:23 14:59-15:52/53 16:25
3	05:18 20:31-21:26/55 22:00 05:49-06:04/15	05:57 06:26-06:56/30 21:25 20:02-20:55/53	06:48 07:14-07:58/44 20:20 18:52-19:14/22	07:38 08:04-08:33/29 19:10	07:33 15:20-16:34/74 17:04 08:02-08:28/26	08:24 14:59-15:50/51 16:25
4	05:19 20:31-21:26/55 22:00 05:50-06:04/14	05:59 06:28-06:56/28 21:23 20:00-20:53/53	06:50 07:16-07:59/43 20:18 18:50-19:17/27	07:40 08:05-08:30/25 19:08	07:35 15:18-16:32/74 17:02 08:04-08:29/25	08:26 15:00-15:50/50 16:24
5	05:20 20:31-21:26/55 21:59 05:51-06:04/13	06:00 06:29-06:55/26 21:21 20:00-20:51/51	06:51 07:17-07:59/42 20:16 18:47-19:17/30	07:42 08:07-08:29/22 19:05	07:37 15:15-16:30/75 17:00 08:06-08:31/25	08:27 15:00-15:49/49 16:24
6	05:21 20:31-21:25/54 21:59 05:52-06:04/12	06:02 06:31-06:55/24 21:19 19:58-20:49/51	06:53 07:19-08:00/41 18:46-19:19/33 20:13 08:18-08:24/6	07:43 08:09-08:27/18 19:03	07:39 15:13-16:28/75 16:58 08:08-08:32/24	08:28 15:00-15:48/48 16:23
7	05:21 20:30-21:24/54 21:58 05:53-06:04/11	06:03 06:32-06:54/22 21:17 19:58-20:48/50	06:55 07:21-08:01/40 18:44-19:20/36 20:11 08:12-08:30/18	07:45 08:11-08:25/14 19:01	07:41 15:11-16:26/75 16:57 08:10-08:33/23	08:30 15:01-15:48/47 16:23
8	05:22 06:31-06:34/3 05:53-06:03/10 21:57 20:30-21:23/53	06:05 06:34-06:54/20 21:16 19:56-20:46/50	06:56 07:22-08:05/43 18:42-19:20/38 20:09 08:08-08:33/25	07:47 08:12-08:20/8 18:58	07:42 15:10-16:24/74 16:55 08:12-08:34/22	08:31 15:01-15:47/46 16:22
9	05:23 06:28-06:37/9 05:54-06:03/9 21:57 20:29-21:23/54	06:07 06:35-06:53/18 21:14 19:56-20:44/48	06:58 07:24-08:35/71 20:06 18:41-19:21/40	07:48 08:14-08:15/1 18:56	07:44 15:09-16:23/74 16:53 08:14-08:34/20	08:32 15:01-15:47/46 16:22
10	05:24 06:27-06:39/12 05:55-06:02/7 21:56 20:29-21:22/53	06:08 06:37-06:53/16 21:12 19:56-20:43/47	07:00 07:25-08:36/71 20:04 18:40-19:21/41	07:50 18:54	07:46 15:08-16:21/73 16:51 08:16-08:35/19	08:33 15:02-15:47/45 16:22
11	05:25 06:26-06:40/14 05:56-06:02/6 21:55 20:29-21:22/53	06:10 06:38-06:51/13 21:10 19:55-20:41/46	07:01 07:27-08:38/71 20:02 18:39-19:22/43	07:52 18:51	07:48 15:07-16:19/72 16:50 08:18-08:35/17	08:34 15:03-15:47/44 16:22
12	05:27 06:25-06:42/17 05:57-06:01/4 21:54 20:28-21:21/53	06:12 06:40-06:50/10 21:08 19:54-20:39/45	07:03 07:29-08:39/70 19:59 18:38-19:22/44	07:54 18:49	07:50 15:06-16:16/70 16:48 08:20-08:35/15	08:35 15:03-15:46/43 16:22
13	05:28 06:24-06:43/19 05:58-06:00/2 21:53 20:28-21:20/52	06:13 06:41-06:48/7 21:06 19:53-20:37/44	07:05 07:30-08:40/70 19:57 18:37-19:22/45	07:55 17:22-17:24/2 18:47	07:51 15:05-16:15/70 16:47 08:22-08:35/13	08:36 15:03-15:46/43 16:22
14	05:29 06:24-06:45/21 21:52 20:27-21:19/52	06:15 06:43-06:47/4 21:04 19:53-20:34/41	07:06 07:32-08:41/69 19:55 18:37-19:22/45	07:57 08:33-08:37/4 18:45 17:06-17:31/25	07:53 15:05-16:13/68 16:45 08:24-08:35/11	08:37 15:04-15:46/42 16:22
15	05:30 06:23-06:46/23 21:51 20:28-21:19/51	06:17 07:19-07:30/11 21:02 19:53-20:33/40	07:08 07:34-08:41/67 19:52 18:35-19:21/46	07:59 08:29-08:40/11 18:43 17:02-17:34/32	07:55 15:03-16:12/69 16:44 08:25-08:34/9	08:38 15:04-15:46/42 16:22
16	05:31 06:23-06:46/23 21:50 20:27-21:18/51	06:18 07:16-07:33/17 21:00 19:53-20:32/39	07:10 07:35-08:42/67 19:50 18:35-19:21/46	08:01 08:28-08:42/14 18:40 17:00-17:36/36	07:57 15:02-16:10/68 16:42 08:27-08:34/7	08:39 15:05-15:46/41 16:22
17	05:32 06:22-06:48/26 21:49 20:27-21:17/50	06:20 07:13-07:34/21 20:58 19:52-20:29/37	07:11 07:37-08:42/65 19:48 18:35-19:21/46	08:02 08:29-08:43/14 18:38 16:58-17:38/40	07:59 15:01-16:09/68 16:41 08:29-08:34/5	08:40 15:05-15:46/41 16:22
18	05:34 06:21-06:48/27 21:48 20:27-21:16/49	06:22 07:12-07:36/24 20:56 19:52-20:27/35	07:13 07:38-08:42/64 19:45 18:34-19:18/44	08:04 08:31-08:44/13 18:36 16:56-17:39/43	08:00 15:00-16:07/67 16:40 08:31-08:34/3	08:41 15:05-15:46/41 16:22
19	05:35 06:20-06:49/29 21:47 20:26-21:14/48	06:23 07:11-07:38/27 20:54 19:53-20:26/33	07:15 07:40-08:42/62 19:43 18:34-19:16/42	08:06 08:33-08:44/11 18:34 16:53-17:39/46	08:02 15:00-16:06/66 16:38	08:41 15:06-15:47/41 16:22
20	05:36 06:21-06:51/30 21:46 20:27-21:14/47	06:25 07:09-07:38/29 20:52 19:52-20:23/31	07:16 07:42-08:43/61 19:40 18:34-19:14/40	08:08 08:34-08:43/9 18:32 16:52-17:40/48	08:04 14:59-16:05/66 16:37	08:42 15:06-15:47/41 16:23
21	05:38 06:20-06:52/32 21:44 20:26-21:13/47	06:26 07:08-07:40/32 20:49 19:53-20:22/29	07:18 07:43-08:42/59 19:38 18:33-19:11/38	08:10 08:36-08:43/7 18:29 16:51-17:41/50	08:05 14:59-16:03/64 16:36	08:43 15:07-15:47/40 16:23
22	05:39 06:19-06:52/33 21:43 20:26-21:11/45	06:28 07:06-07:40/34 20:47 19:53-20:19/26	07:20 07:45-08:42/57 19:36 18:33-19:09/36	08:11 08:38-08:43/5 18:27 16:50-17:41/51	08:07 14:59-16:02/63 16:35	08:43 15:07-15:47/40 16:24
23	05:41 06:20-06:53/33 21:42 20:25-21:10/45	06:30 07:06-07:40/34 20:45 19:53-20:17/24	07:21 07:47-08:42/55 19:33 18:33-19:07/34	08:13 08:40-08:43/3 18:25 16:49-17:42/53	08:09 14:58-16:00/62 16:33	08:44 15:08-15:48/40 16:24
24	05:42 06:19-06:54/35 21:40 20:26-21:09/43	06:31 07:04-07:40/36 20:43 19:53-20:15/22	07:23 07:48-08:41/53 19:31 18:33-19:04/31	08:15 16:49-17:42/53 18:23	08:11 14:58-15:59/61 16:32	08:44 15:08-15:49/41 16:25
25	05:43 06:18-06:54/36 21:39 20:25-21:08/43	06:33 07:04-07:41/37 20:41 19:54-20:13/19	07:25 07:50-08:41/51 19:29 18:33-19:01/28	07:17 15:48-16:43/55 17:21	08:12 14:58-15:58/60 16:31	08:44 15:08-15:49/41 16:25
26	05:45 06:19-06:55/36 21:38 20:26-21:07/41	06:35 07:04-07:41/37 20:38 19:56-20:11/15	07:26 07:52-08:40/48 19:26 18:34-18:59/25	07:19 08:11-08:18/7 17:19 15:34-16:43/69	08:14 14:58-15:57/59 16:30	08:45 15:10-15:51/41 16:26
27	05:46 06:18-06:55/37 21:36 20:25-21:05/40	06:36 07:03-07:45/42 20:36 19:56-20:09/13	07:28 07:53-08:39/46 19:24 18:34-18:56/22	07:20 08:07-08:21/14 17:17 15:31-16:43/72	08:15 14:58-15:56/58 16:29	08:45 15:10-15:51/41 16:27
28	05:48 06:18-06:55/37 21:35 20:25-21:03/38	06:38 07:05-07:50/45 20:34 19:58-20:07/9	07:30 07:55-08:38/43 19:22 18:35-18:54/19	07:22 08:05-08:23/18 17:15 15:28-16:43/75	08:17 14:58-15:55/57 16:29	08:45 15:10-15:52/42 16:28
29	05:49 06:19-06:56/37 21:33 20:25-21:03/38	06:40 07:06-07:52/46 20:32 19:59-20:04/5	07:31 07:57-08:38/41 19:19 18:36-18:52/16	07:24 08:04-08:24/20 17:13 15:26-16:43/77	08:18 14:58-15:54/56 16:28	08:45 15:11-15:53/42 16:29
30	05:51 06:20-06:56/36 20:11-20:20/9 21:31 20:25-21:01/36	06:41 07:08-07:54/46 20:30	07:33 07:58-08:36/38 19:17 18:37-18:49/12	07:26 08:03-08:25/22 17:11 15:25-16:42/77	08:20 14:59-15:53/54 16:27	08:45 15:11-15:54/43 16:29
31	05:52 06:22-06:56/34 20:08-20:24/16 21:30 20:26-21:00/34	06:43 07:10-07:56/46 20:27		07:28 08:02-08:26/24 17:09 15:23-16:40/77		08:46 15:12-15:55/43 16:30
Potential sun hours	504	455	381	331	265	241
Sum of minutes with flicker	2298	1909	2675	1372	2338	1361

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

Licensed user:
Jennings O'Donovan
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+353719161416
padraig / podowd@jodireland.com
Calculated:
11/06/2025 09:22/4.0.552

SHADOW - Calendar per WTG

Calculation: 6839 Garrane WF Real Case - V150 **WTG:** 2 - T02

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January	February	March	April	May	June
1	08:46 15:54-15:57/3 16:32	08:18 16:10-16:20/10 17:20	07:23 16:48-17:46/58 18:13 07:52-08:24/32	07:12 18:45-19:25/40 20:08	06:06 06:31-07:14/43 21:00 19:50-20:30/40	05:20 20:42-21:14/32 21:47 05:49-07:13/84
2	08:45 15:53-15:57/4 16:33	08:16 16:51-16:52/1 17:22	07:21 16:49-17:48/59 18:15 07:52-08:23/31	07:09 18:44-19:24/40 20:10	06:04 06:29-07:14/45 21:02 19:51-20:30/39	05:19 20:42-21:15/33 21:48 05:48-07:13/85
3	08:45 15:54-15:58/4 16:34	08:15 16:50-16:54/4 17:24	07:19 07:53-08:23/30 18:17 16:51-17:51/60	07:07 18:46-19:22/36 20:11	06:02 06:27-07:13/46 21:03 19:52-20:29/37	05:18 20:42-21:15/33 21:49 05:48-07:13/85
4	08:45 15:54-16:00/6 16:35	08:13 16:49-16:56/7 17:26	07:17 07:41-07:42/1 16:51-17:52/61 18:18 07:54-08:22/28	07:05 18:47-19:21/34 20:13	06:00 06:25-07:13/48 21:05 19:53-20:28/35	05:17 20:43-21:17/34 21:50 05:47-07:13/86
5	08:45 15:54-16:01/7 16:36	08:11 16:48-16:58/10 17:28	07:15 07:38-07:42/4 16:53-17:54/61 18:20 07:55-08:20/25	07:03 18:48-19:19/31 20:15	05:58 06:24-07:13/49 21:07 19:54-20:29/35	05:17 20:43-21:17/34 21:51 05:46-07:13/87
6	08:44 15:54-16:03/9 16:38	08:10 16:47-16:59/12 17:30	07:12 07:36-07:43/7 16:56-17:56/60 18:22 07:56-08:18/22	07:00 18:49-19:17/28 20:17	05:56 06:22-07:12/50 21:08 19:54-20:28/34	05:16 20:44-21:19/35 21:52 05:46-07:13/87
7	08:44 15:54-16:04/10 16:39	08:08 16:48-17:02/14 17:32	07:10 07:34-07:43/9 16:58-17:57/59 18:24 07:58-08:16/18	06:58 18:52-19:15/23 20:18	05:55 06:20-07:11/51 21:10 19:54-20:27/33	05:15 20:44-21:19/35 21:53 05:45-07:13/88
8	08:44 15:54-16:05/11 16:40	08:06 16:47-17:04/17 17:34 08:32-08:34/2	07:08 07:31-07:42/11 17:02-17:59/57 18:26 08:01-08:12/11	06:56 18:55-19:12/17 20:20	05:53 06:18-07:11/53 21:12 19:55-20:25/30	05:15 20:45-21:20/35 21:54 05:45-07:13/88
9	08:43 15:54-16:07/13 16:42	08:04 16:46-17:06/20 17:35 08:30-08:35/5	07:05 07:29-07:42/13 18:27 17:03-18:02/59	06:53 19:00-19:05/5 20:22	05:51 06:17-07:10/53 21:13 19:56-20:25/29	05:14 20:45-21:20/35 21:55 05:45-07:13/88
10	08:43 15:54-16:08/14 16:43	08:02 16:45-17:08/23 17:37 08:28-08:36/8	07:03 07:27-07:42/15 18:29 17:03-18:03/60	06:51 20:24	05:49 06:15-07:10/55 21:15 19:57-20:24/27	05:14 20:45-21:22/37 21:55 05:45-07:13/88
11	08:42 15:54-16:10/16 16:44	08:01 16:45-17:10/25 17:39 08:26-08:37/11	07:01 07:24-07:41/17 18:31 17:04-18:05/61	06:49 20:25	05:48 06:14-07:11/57 21:17 19:59-20:23/24	05:14 20:46-21:23/37 21:56 05:45-07:13/88
12	08:41 15:54-16:11/17 16:46	07:59 16:44-17:13/29 17:41 08:24-08:38/14	06:59 07:22-07:40/18 18:33 17:05-18:07/62	06:47 19:58-20:01/3 20:27	05:46 06:12-07:11/59 20:00-20:21/21 21:18 20:45-20:48/3	05:13 20:47-21:23/36 21:57 05:46-07:14/88
13	08:41 15:54-16:13/19 16:47	07:57 16:43-17:15/32 17:43 08:22-08:38/16	06:56 07:23-07:39/16 18:35 17:05-18:08/63	06:44 19:55-20:01/6 20:29	05:44 06:11-07:12/61 20:02-20:20/18 21:20 20:45-20:50/5	05:13 20:46-21:23/37 21:58 05:45-07:13/88
14	08:40 15:54-16:14/20 16:49	07:55 16:43-17:17/34 17:45 08:20-08:38/18	06:54 07:24-07:36/12 18:36 17:06-18:11/65	06:42 19:53-20:03/10 20:31	05:43 06:09-07:12/63 20:04-20:17/13 21:21 20:43-20:51/8	05:13 20:47-21:24/37 21:58 05:45-07:13/88
15	08:39 15:55-16:16/21 16:50	07:53 16:43-17:19/36 17:47 08:18-08:39/21	06:52 07:27-07:32/5 18:38 17:08-18:13/65	06:40 19:52-20:05/13 20:32	05:41 06:08-07:12/64 20:08-20:13/5 21:23 20:43-20:53/10	05:12 20:47-21:25/38 21:59 05:46-07:13/87
16	08:38 15:55-16:18/23 16:52	07:51 16:42-17:21/39 17:49 08:16-08:39/23	06:49 17:09-18:14/65 18:40	06:38 07:01-07:05/4 20:34 19:51-20:07/16	05:39 06:06-07:12/66 21:25 20:42-20:54/12	05:12 20:48-21:25/37 21:59 05:46-07:14/88
17	08:37 15:55-16:20/25 16:54	07:49 16:42-17:23/41 17:51 08:14-08:39/25	06:47 17:11-18:16/65 18:42	06:35 06:59-07:07/8 20:36 19:50-20:09/19	05:38 06:05-07:13/68 21:26 20:42-20:55/13	05:12 20:48-21:26/38 22:00 05:46-07:14/88
18	08:36 15:56-16:22/26 16:55	07:47 16:41-17:24/43 17:52 08:12-08:38/26	06:45 17:14-18:18/64 18:43	06:33 06:57-07:09/12 20:38 19:49-20:10/21	05:36 06:04-07:13/69 21:28 20:41-20:56/15	05:12 20:48-21:26/38 22:00 05:47-07:14/87
19	08:35 15:56-16:24/28 16:57	07:45 16:42-17:26/44 17:54 08:09-08:37/28	06:42 17:17-18:19/62 18:45	06:31 06:55-07:10/15 20:39 19:49-20:12/23	05:35 06:02-07:12/70 21:29 20:41-20:58/17	05:12 20:48-21:26/38 22:01 05:47-07:14/87
20	08:34 15:57-16:26/29 16:59	07:43 16:42-17:28/46 17:56 08:07-08:36/29	06:40 17:20-18:21/61 18:47	06:29 06:53-07:12/19 20:41 19:47-20:13/26	05:34 06:01-07:13/72 21:31 20:41-20:59/18	05:12 20:49-21:26/37 22:01 05:47-07:14/87
21	08:33 15:57-16:27/30 17:00	07:41 16:42-17:31/49 17:58 08:05-08:36/31	06:38 17:21-18:23/62 18:49	06:27 06:50-07:12/22 20:43 19:47-20:15/28	05:32 06:00-07:13/73 21:32 20:41-21:01/20	05:12 20:49-21:26/37 22:01 05:48-07:15/87
22	08:32 15:58-16:28/30 17:02	07:39 16:43-17:33/50 18:00 08:03-08:35/32	06:35 17:21-18:25/64 18:51	06:24 06:48-07:12/24 20:44 19:47-20:16/29	05:31 05:59-07:13/74 21:34 20:40-21:01/21	05:13 20:50-21:27/37 22:01 05:48-07:15/87
23	08:31 15:59-16:28/29 17:04	07:36 16:43-17:35/52 18:02 08:01-08:33/32	06:33 17:22-18:27/65 18:52	06:22 06:46-07:13/27 20:46 19:46-20:18/32	05:30 05:57-07:12/75 21:35 20:40-21:03/23	05:13 20:50-21:27/37 22:01 05:48-07:15/87
24	08:29 15:59-16:28/29 17:06	07:34 16:43-17:36/53 18:04 07:59-08:31/32	06:31 17:22-18:28/66 18:54	06:20 06:44-07:13/29 20:48 19:46-20:20/34	05:28 05:56-07:13/77 21:36 20:40-21:04/24	05:13 20:49-21:27/38 22:02 05:48-07:15/87
25	08:28 16:00-16:28/28 17:07	07:32 16:44-17:38/54 18:06 07:56-08:27/31	06:28 17:24-18:30/66 18:56	06:18 06:42-07:14/32 20:50 19:46-20:21/35	05:27 05:55-07:13/78 21:38 20:40-21:06/26	05:14 20:50-21:28/38 22:02 05:48-07:16/88
26	08:27 16:00-16:27/27 17:09	07:30 16:45-17:41/56 18:07 07:54-08:25/31	06:26 17:26-18:30/64 18:58	06:16 06:40-07:14/34 20:51 19:47-20:23/36	05:26 05:54-07:13/79 21:39 20:40-21:07/27	05:14 20:50-21:27/37 22:02 05:48-07:16/88
27	08:25 16:02-16:27/25 17:11	07:28 16:46-17:43/57 18:09 07:52-08:25/33	06:24 17:27-18:29/62 18:59	06:14 06:38-07:14/36 20:53 19:47-20:24/37	05:25 05:53-07:13/80 21:41 20:41-21:08/27	05:14 20:50-21:28/38 22:02 05:49-07:16/87
28	08:24 16:02-16:26/24 17:13	07:26 16:48-17:45/57 18:11 07:52-08:25/33	06:21 17:30-18:29/59 19:01	06:12 06:36-07:14/38 20:55 19:47-20:26/39	05:24 05:52-07:13/81 21:42 20:41-21:09/28	05:15 20:50-21:27/37 22:01 05:49-07:16/87
29	08:22 16:04-16:26/22 17:15		07:19 18:34-19:28/54 20:03	06:10 06:35-07:15/40 20:57 19:48-20:27/39	05:23 05:51-07:13/82 21:43 20:41-21:10/29	05:15 20:50-21:28/38 22:01 05:49-07:17/88
30	08:21 16:05-16:24/19 17:17		07:16 18:43-19:27/44 20:04	06:08 06:33-07:15/42 20:58 19:49-20:30/41	05:22 05:51-07:13/82 21:44 20:41-21:11/30	05:16 20:50-21:27/37 22:01 05:49-07:17/88
31	08:19 16:07-16:23/16 17:18		07:14 18:44-19:26/42 20:06		05:21 20:42-21:13/31 21:46 05:50-07:13/83	
Potential sun hours	257	277	367	417	487	501
Sum of minutes with flicker	584	1396	2200	1123	2813	3706

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

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Calculated:
11/06/2025 09:22/4.0.552

SHADOW - Calendar per WTG

Calculation: 6839 Garrane WF Real Case - V150 **WTG:** 2 - T02

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	July	August	September	October	November	December
1	05:17 20:50-21:27/37	05:54 06:23-07:22/59 20:10-20:32/22	06:45	07:35 08:01-08:18/17	07:30 16:15-16:38/23	08:21 15:36-15:52/16
	22:01 05:49-07:17/88	21:28 20:56-20:58/2	20:25	19:15 17:44-18:47/63	17:07 07:58-08:06/8	16:26
2	05:17 20:51-21:27/36	05:56 06:25-07:22/57	06:46	07:36 08:02-08:19/17	07:31 16:16-16:36/20	08:23 15:37-15:51/14
	22:00 05:50-07:18/88	21:26 20:08-20:33/25	20:23	19:12 17:43-18:45/62	17:05 08:00-08:05/5	16:25
3	05:18 20:50-21:26/36	05:57 06:26-07:21/55	06:48 18:58-19:02/4	07:38 08:04-08:20/16	07:33 16:17-16:34/17	08:24 15:37-15:50/13
	22:00 05:49-07:18/89	21:25 20:07-20:34/27	20:20	19:10 17:42-18:43/61	17:04 08:02-08:03/1	16:25
4	05:19 20:50-21:26/36	05:59 06:28-07:21/53	06:50 18:52-19:09/17	07:40 08:05-08:19/14	07:35 16:17-16:32/15	08:26 15:39-15:50/11
	22:00 05:50-07:18/88	21:23 20:05-20:35/30	20:18	19:08 17:40-18:40/60	17:02	16:24
5	05:20 20:50-21:26/36	06:00 06:29-07:21/52	06:51 18:48-19:11/23	07:42 08:07-08:19/12 17:40-18:37/57	07:37 16:18-16:30/12	08:27 15:39-15:49/10
	21:59 05:51-07:19/88	21:21 20:05-20:36/31	20:16	19:05 08:40-08:46/6	17:00	16:24
6	05:21 20:50-21:25/35	06:02 06:31-07:22/51	06:53 18:46-19:13/27	07:43 08:09-08:19/10 17:38-18:35/57	07:39 16:19-16:28/9	08:28 15:40-15:49/9
	21:59 05:52-07:19/87	21:19 20:04-20:36/32	20:13	19:03 08:36-08:51/15	16:58	16:23
7	05:21 20:50-21:24/34	06:03 06:32-07:22/50	06:55 18:44-19:15/31	07:45 08:11-08:19/8 17:33-18:33/60	07:41 16:20-16:26/6	08:30 15:41-15:48/7
	21:58 05:53-07:20/87	21:18 20:03-20:37/34	20:11	19:01 08:33-08:53/20	16:57	16:23
8	05:22 20:50-21:23/33	06:05 06:34-07:23/49	06:56 18:41-19:15/34	07:47 08:12-08:17/5 17:30-18:30/60	07:42 16:21-16:24/3	08:31 15:41-15:47/6
	21:57 05:53-07:19/86	21:16 20:02-20:37/35	20:09	18:58 08:30-08:54/24	16:55	16:22
9	05:23 20:50-21:23/33	06:07 06:35-07:22/47	06:58 18:40-19:17/37	07:48 08:14-08:16/2 17:27-18:28/61	07:44 16:22-16:23/1	08:32 15:42-15:47/5
	21:57 05:54-07:20/86	21:14 20:02-20:38/36	20:06	18:56 08:29-08:55/26	16:53	16:22
10	05:24 20:50-21:22/32	06:08 06:37-07:23/46	07:00 18:38-19:17/39	07:50 08:28-08:56/28	07:46 15:41-15:52/11	08:33 15:43-15:47/4
	21:56 05:55-07:20/85	21:12 20:01-20:39/38	20:04	18:54 17:25-18:26/61	16:51	16:22
11	05:25 20:50-21:22/32	06:10 06:38-07:22/44	07:01 18:37-19:18/41	07:52 08:27-08:57/30	07:48 15:39-15:55/16	08:34 15:44-15:47/3
	21:55 05:56-07:20/84	21:10 19:59-20:38/39	20:02	18:51 17:24-18:24/60	16:50	16:22
12	05:27 20:49-21:21/32	06:12 06:40-07:23/43	07:03 18:36-19:18/42	07:54 17:22-18:20/58	07:50 15:37-15:56/19	08:35 15:44-15:46/2
	21:54 05:57-07:21/84	21:08 19:58-20:39/41	19:59	18:49 08:26-08:58/32	16:48	16:22
13	05:28 20:49-21:20/31	06:13 06:41-07:22/41	07:05 18:34-19:18/44	07:55 17:21-18:18/57	07:51 15:35-15:57/22	08:36 15:45-15:46/1
	21:53 05:58-07:21/83	21:06 19:56-20:37/41	19:57	18:47 08:25-08:57/32	16:47	16:22
14	05:29 06:00-07:22/82	06:15 06:43-07:22/39	07:06 18:25-19:19/54	07:57 17:19-18:16/57	07:53 15:34-15:58/24	08:37
	21:52 20:49-21:19/30	21:04 19:56-20:36/40	19:55	18:45 08:24-08:57/33	16:45	16:22
15	05:30 06:01-07:22/81	06:17 06:44-07:21/37	07:08 18:20-19:18/58	07:59 17:18-18:14/56	07:55 15:34-15:59/25	08:38
	21:51 20:50-21:19/29	21:02 19:55-20:33/38	19:52	18:43 08:25-08:57/32	16:44	16:22
16	05:31 06:02-07:22/80	06:18 06:46-07:21/35	07:10 18:17-19:18/61	08:01 17:17-18:12/55	07:57 15:33-16:00/27	08:39
	21:50 20:50-21:18/28	21:00 19:54-20:32/38	19:50	18:40 08:27-08:57/30	16:42	16:22
17	05:32 06:03-07:22/79	06:20 06:47-07:20/33	07:11 18:15-19:18/63	08:02 17:16-18:10/54	07:59 15:33-16:01/28	08:40
	21:49 20:50-21:17/27	20:58 19:53-20:29/36	19:48	18:38 08:29-09:01/32	16:41	16:22
18	05:34 06:04-07:22/78	06:22 06:49-07:20/31	07:13 18:12-19:17/65	08:04 17:15-18:08/53	08:00 15:33-16:02/29	08:41
	21:48 20:50-21:16/26	20:56 19:53-20:27/34	19:45	18:36 08:31-09:03/32	16:40	16:22
19	05:35 06:05-07:22/77	06:23 06:51-07:20/29	07:15 18:10-19:16/66	08:06 17:13-18:05/52	08:02 15:33-16:02/29	08:41
	21:47 20:50-21:14/24	20:54 19:52-20:26/34	19:43	18:34 08:33-09:05/32	16:38	16:22
20	05:36 06:07-07:23/76	06:25 06:52-07:18/26	07:16 18:09-19:14/65	08:08 17:13-18:02/49	08:04 15:33-16:03/30	08:42
	21:46 20:51-21:14/23	20:52 19:52-20:23/31	19:40	18:32 08:34-09:05/31	16:37	16:23
21	05:38 06:08-07:23/75	06:26 06:54-07:18/24	07:18 18:06-19:11/65	08:10 17:12-18:00/48	08:05 15:33-16:03/30	08:43
	21:44 20:50-21:13/23	20:49 19:52-20:22/30	19:38	18:30 08:36-09:06/30	16:36	16:23
22	05:39 06:09-07:23/74	06:28 06:55-07:16/21	07:20 18:05-19:09/64	08:11 17:12-17:58/46	08:07 15:33-16:02/29	08:43
	21:43 20:50-21:11/21	20:47 19:52-20:19/27	19:36	18:27 08:38-09:07/29	16:35	16:24
23	05:41 06:11-07:23/72	06:30 06:57-07:15/18	07:21 18:05-19:07/62	08:13 17:12-17:56/44	08:09 15:32-16:00/28	08:44
	21:42 20:50-21:10/20	20:45 19:52-20:17/25	19:33	18:25 08:40-09:08/28	16:33	16:24
24	05:42 06:12-07:23/71	06:31 06:58-07:13/15	07:23 18:03-19:04/61	08:15 17:12-17:54/42	08:11 15:33-15:59/26	08:44
	21:40 20:51-21:09/18	20:43 19:51-20:15/24	19:31	18:23 08:42-09:08/26	16:32	16:25
25	05:43 06:13-07:23/70	06:33 07:00-07:12/12	07:25 17:58-19:01/63	07:17 16:12-16:52/40	08:12 15:33-15:58/25	08:45
	21:39 20:51-21:08/17	20:41 19:52-20:13/21	19:29	17:21 07:44-08:08/24	16:31	16:25
26	05:45 06:15-07:23/68	06:35 07:02-07:10/8	07:26 17:55-18:59/64	07:19 16:12-16:50/38	08:14 15:34-15:57/23	08:45
	21:38 20:52-21:07/15	20:38 19:53-20:11/18	19:26	17:19 07:46-08:08/22	16:30	16:26
27	05:46 06:16-07:23/67	06:36 07:03-07:06/3	07:28 17:51-18:56/65	07:20 16:12-16:48/36	08:15 15:35-15:56/21	08:45
	21:36 20:52-21:05/13	20:36 19:53-20:09/16	19:24	17:17 07:48-08:08/20	16:29	16:27
28	05:48 06:17-07:22/65	06:38 19:54-20:07/13	07:30 17:49-18:54/65	07:22 16:13-16:46/33	08:17 15:34-15:55/21	08:45
	21:35 20:53-21:03/10	20:34	19:22	17:15 07:50-08:08/18	16:29	16:28
29	05:49 06:19-07:23/64 20:17-20:26/9	06:40 19:54-20:04/10	07:31 08:05-08:15/10	07:24 16:13-16:44/31	08:18 15:35-15:54/19	08:45
	21:33 20:54-21:03/9	20:32	19:19 17:48-18:52/64	17:13 07:52-08:08/16	16:28	16:29
30	05:51 06:20-07:22/62 20:13-20:28/15	06:41 19:56-20:02/6	07:33 08:02-08:17/15	07:26 16:14-16:42/28	08:20 15:36-15:53/17	08:46 15:53-15:54/1
	21:31 20:54-21:01/7	20:30	19:17 17:45-18:49/64	17:11 07:54-08:07/13	16:27	16:29
31	05:52 06:22-07:22/60 20:12-20:31/19	06:43 19:57-19:59/2		07:28 16:14-16:40/26		08:46 15:53-15:55/2
	21:30 20:56-21:00/4	20:27		17:09 07:56-08:06/10		16:30
Potential sun hours	504	455	381	331	264	241
Sum of minutes with flicker	3254	1854	1433	2337	619	104

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

Licensed user:
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padraig / podowd@jodireland.com
Calculated:
11/06/2025 09:22/4.0.552

SHADOW - Calendar per WTG

Calculation: 6839 Garrane WF Real Case - V150 **WTG:** 3 - T03

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January	February	March	April	May	June
1	08:46 09:30-09:47/17 16:32	08:18 17:20	07:24 17:37-17:46/9 18:13 07:47-08:23/36	07:12 07:53-08:02/9 19:01-19:42/41 20:08 08:13-08:45/32	06:06 20:19-20:31/12 21:00	05:20 05:49-05:59/10 21:47 21:00-21:14/14
2	08:45 09:30-09:46/16 16:33	08:16 17:22	07:21 17:37-17:48/11 18:15 07:45-08:24/39	07:10 08:14-08:42/28 20:10 19:03-19:43/40	06:04 20:19-20:33/14 21:02	05:19 05:48-05:59/11 21:48 21:00-21:15/15
3	08:45 09:31-09:46/15 16:34	08:15 17:24	07:19 17:37-17:50/13 18:17 07:44-08:24/40	07:07 08:16-08:39/23 20:11 19:10-19:45/35	06:02 20:18-20:34/16 21:03	05:18 05:48-06:00/12 21:49 20:59-21:15/16
4	08:45 09:33-09:47/14 16:35	08:13 17:26	07:17 17:36-17:52/16 18:18 07:44-08:24/40	07:05 08:20-08:36/16 20:13 19:11-19:47/36	06:00 20:18-20:35/17 21:05	05:17 05:47-06:00/13 21:50 21:00-21:17/17
5	08:45 09:33-09:46/13 16:36	08:11 17:28	07:15 17:37-17:54/17 18:20 07:38-08:22/44	07:03 19:10-19:48/38 20:15	05:58 20:19-20:38/19 21:07	05:17 05:46-06:00/14 21:51 21:00-21:17/17
6	08:44 09:35-09:46/11 16:38	08:10 17:30	07:12 17:37-17:56/19 18:22 07:36-08:22/46	07:00 19:11-19:50/39 20:17	05:56 20:18-20:39/21 21:08	05:16 05:46-06:01/15 21:52 21:01-21:19/18
7	08:44 09:36-09:44/8 16:39	08:08 17:32	07:10 17:37-17:57/20 18:24 07:34-08:22/48	06:58 19:11-19:52/41 20:18	05:55 20:18-20:40/22 21:10	05:15 05:45-06:00/15 21:53 21:01-21:19/18
8	08:44 09:40-09:43/3 16:40	08:06 17:34	07:08 17:39-17:59/20 18:26 07:31-08:20/49	06:56 19:12-19:54/42 20:20	05:53 20:18-20:42/24 21:12	05:15 05:45-06:01/16 21:54 21:01-21:20/19
9	08:43 16:42	08:04 17:35	07:06 17:41-18:02/21 18:27 07:29-08:19/50	06:53 19:12-19:55/43 20:22	05:51 20:19-20:44/25 21:13	05:14 05:45-06:02/17 21:55 21:01-21:20/19
10	08:43 16:43	08:02 17:37	07:03 17:41-18:03/22 18:29 07:27-08:18/51	06:51 19:14-19:57/43 20:24	05:49 20:20-20:45/25 21:15	05:14 05:44-06:01/17 21:55 21:02-21:22/20
11	08:42 16:44	08:01 17:09-17:10/1 17:39	07:01 17:42-18:05/23 18:31 07:24-08:16/52	06:49 19:16-19:59/43 20:25	05:48 20:21-20:47/26 21:17	05:14 05:44-06:02/18 21:56 21:03-21:23/20
12	08:41 16:46	07:59 17:08-17:12/4 17:41	06:59 17:42-18:07/25 18:33 07:22-08:14/52	06:47 19:18-20:01/43 20:27	05:46 20:21-20:48/27 21:18	05:13 05:44-06:02/18 21:57 21:03-21:23/20
13	08:41 16:47	07:57 17:07-17:15/8 17:43	06:56 17:42-18:08/26 18:35 07:20-08:12/52	06:44 19:21-20:01/40 20:29	05:44 20:23-20:50/27 21:20	05:13 05:43-06:01/18 21:58 21:03-21:23/20
14	08:40 16:49	07:55 17:06-17:17/11 17:45	06:54 17:43-18:11/28 18:36 07:17-08:09/52	06:42 19:24-20:03/39 20:31	05:43 20:24-20:51/27 21:22	05:13 05:43-06:02/19 21:58 21:03-21:24/21
15	08:39 16:50	07:53 17:06-17:19/13 17:47	06:52 17:45-18:13/28 18:38 07:15-08:03/48	06:40 19:24-20:05/41 20:32	05:41 20:26-20:52/26 21:23	05:12 05:43-06:02/19 21:59 21:04-21:25/21
16	08:38 16:52	07:51 17:06-17:21/15 17:49	06:49 17:46-18:14/28 18:40 07:12-07:57/45	06:38 19:25-20:07/42 20:34	05:39 20:26-20:51/25 21:25	05:12 05:43-06:02/19 21:59 21:04-21:25/21
17	08:37 16:54	07:49 17:05-17:23/18 17:51	06:47 17:49-18:16/27 18:42 07:10-07:58/48	06:35 19:26-20:09/43 20:36	05:38 20:27-20:51/24 21:26	05:12 05:43-06:02/19 22:00 21:04-21:26/22
18	08:36 16:55	07:47 08:12-08:14/2 17:52 17:04-17:24/20	06:45 07:08-07:58/50 18:44 17:52-18:18/26	06:33 19:28-20:10/42 20:38	05:36 20:27-20:50/23 21:28	05:12 05:43-06:03/20 22:00 21:04-21:26/22
19	08:35 16:57	07:45 08:09-08:15/6 17:54 17:04-17:26/22	06:42 07:05-07:57/52 18:45 17:51-18:19/28	06:31 19:29-20:12/43 20:39	05:35 20:28-20:49/21 21:29	05:12 05:43-06:03/20 22:01 21:05-21:26/21
20	08:34 16:59	07:43 08:07-08:17/10 17:56 17:05-17:28/23	06:40 07:03-07:58/55 18:47 17:51-18:21/30	06:29 19:30-20:10/40 20:41	05:34 20:29-20:49/20 21:31	05:12 05:43-06:03/20 22:01 21:05-21:26/21
21	08:33 17:00	07:41 08:05-08:19/14 17:58 17:05-17:31/26	06:38 07:01-07:58/57 18:49 17:51-18:23/32	06:27 19:34-20:09/35 20:43	05:32 20:31-20:48/17 21:32	05:12 05:44-06:04/20 22:01 21:05-21:26/21
22	08:32 17:02	07:39 08:03-08:20/17 18:00 17:06-17:31/25	06:35 06:58-07:56/58 18:51 17:51-18:25/34	06:24 19:39-20:08/29 20:44	05:31 21:00-21:01/1 21:34 20:31-20:46/15	05:13 05:44-06:04/20 22:01 21:06-21:27/21
23	08:31 17:04	07:37 08:01-08:22/21 18:02 17:07-17:30/23	06:33 06:56-07:56/60 18:52 17:51-18:27/36	06:22 19:40-20:07/27 20:46	05:30 21:00-21:03/3 21:35 20:33-20:45/12	05:13 05:44-06:04/20 22:02 21:06-21:27/21
24	08:29 17:06	07:34 07:59-08:23/24 18:04 17:07-17:28/21	06:31 06:54-07:56/62 18:54 17:51-18:28/37	06:20 19:41-20:06/25 20:48	05:28 20:59-21:04/5 21:36 20:35-20:43/8	05:13 05:44-06:04/20 22:02 21:05-21:27/22
25	08:28 17:07	07:32 07:56-08:22/26 18:06 17:08-17:27/19	06:28 06:51-07:54/63 18:56 17:52-18:30/38	06:18 19:42-20:05/23 20:50	05:27 05:55-05:56/1 21:38 20:59-21:06/7	05:14 05:45-06:04/19 22:02 21:06-21:28/22
26	08:27 17:09	07:30 07:54-08:23/29 18:07 17:10-17:25/15	06:26 06:49-07:54/65 18:58 17:53-18:32/39	06:16 19:44-20:03/19 20:51	05:26 05:54-05:56/2 21:39 20:59-21:07/8	05:14 05:45-06:04/19 22:02 21:06-21:27/21
27	08:25 17:11	07:28 17:39-17:43/4 17:14-17:22/8 18:09 07:52-08:24/32	06:24 06:47-07:52/65 18:59 17:53-18:33/40	06:14 20:22-20:24/2 20:53 19:46-20:00/14	05:25 05:53-05:57/4 21:41 20:59-21:08/9	05:14 05:46-06:05/19 22:02 21:07-21:28/21
28	08:24 17:13	07:26 17:39-17:45/6 18:11 07:50-08:24/34	06:21 06:47-07:51/64 19:01 17:55-18:35/40	06:12 20:21-20:26/5 20:55 19:49-19:56/7	05:24 05:52-05:57/5 21:42 20:59-21:09/10	05:15 05:46-06:05/19 22:01 21:06-21:27/21
29	08:22 17:15		07:19 07:48-08:50/62 20:03 18:57-19:37/40	06:10 20:20-20:27/7 20:57	05:23 05:51-05:58/7 21:43 20:59-21:10/11	05:15 05:47-06:05/18 22:01 21:07-21:28/21
30	08:21 17:17		07:17 07:48-08:07/19 18:57-19:38/41 20:05 08:10-08:48/38	06:08 20:20-20:30/10 20:58	05:22 05:51-05:59/8 21:44 20:59-21:11/12	05:16 05:47-06:05/18 22:01 21:06-21:27/21
31	08:19 17:18		07:14 07:50-08:05/15 18:59-19:40/41 20:06 08:11-08:47/36		05:21 05:50-05:59/9 21:46 21:00-21:13/13	
Potential sun hours	257	277	367	417	487	501
Sum of minutes with flicker	97	497	2468	1125	608	1116

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

Licensed user:
Jennings O'Donovan
Finisklin Business Park
F91 RHH9 Sligo
+353719161416
padraig / podowd@jodireland.com
Calculated:
11/06/2025 09:22/4.0.552

SHADOW - Calendar per WTG

Calculation: 6839 Garrane WF Real Case - V150 **WTG:** 3 - T03

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	July	August	September	October	November	December
1	05:17 05:48-06:06/18 22:01 21:07-21:27/20	05:54 20:31-20:58/27 21:28	06:45 19:15-19:58/43 20:25	07:35 18:21-18:47/26 19:15 08:00-08:52/52	07:30 17:07	08:22 16:26
2	05:17 05:49-06:06/17 22:00 21:07-21:27/20	05:56 20:30-20:56/26 21:26	06:46 19:13-19:56/43 20:23	07:36 18:21-18:45/24 19:12 08:02-08:54/52	07:31 17:05	08:23 16:25
3	05:18 05:49-06:06/17 22:00 21:07-21:26/19	05:57 20:30-20:55/25 21:25	06:48 19:10-19:53/43 20:20	07:38 18:19-18:42/23 19:10 08:04-08:56/52	07:33 17:04	08:24 16:25
4	05:19 05:50-06:06/16 22:00 21:07-21:26/19	05:59 20:29-20:53/24 21:23	06:50 19:09-19:51/42 20:18	07:40 18:19-18:40/21 19:08 08:05-08:56/51	07:35 17:02	08:26 09:24-09:27/3 16:24
5	05:20 05:51-06:07/16 21:59 21:07-21:26/19	06:00 20:29-20:51/22 21:21	06:51 19:07-19:48/41 20:16	07:42 18:17-18:37/20 19:05 08:07-08:57/50	07:37 17:00	08:27 09:21-09:29/8 16:24
6	05:21 05:52-06:07/15 21:59 21:07-21:25/18	06:02 20:28-20:49/21 21:19	06:53 19:07-19:46/39 20:13	07:43 18:15-18:35/20 19:03 08:09-08:57/48	07:39 16:58	08:28 09:21-09:32/11 16:23
7	05:21 05:53-06:07/14 21:58 21:07-21:24/17	06:03 20:28-20:48/20 21:18	06:55 19:06-19:44/38 20:11	07:45 18:13-18:33/20 19:01 08:11-08:58/47	07:41 16:57	08:30 09:20-09:33/13 16:23
8	05:22 05:54-06:07/13 21:57 21:07-21:23/16	06:05 20:27-20:46/19 21:16	06:56 08:14-08:30/16 20:09 19:05-19:41/36	07:47 18:12-18:30/18 18:58 08:12-08:57/45	07:42 16:55	08:31 09:20-09:34/14 16:22
9	05:23 05:54-06:07/13 21:57 21:07-21:23/16	06:07 20:27-20:44/17 21:14	06:58 08:11-08:33/22 20:06 19:05-19:40/35	07:48 18:12-18:28/16 18:56 08:18-08:58/40	07:44 16:53	08:32 09:20-09:35/15 16:22
10	05:24 05:55-06:07/12 21:56 21:07-21:22/15	06:08 20:28-20:43/15 21:12	07:00 08:07-08:35/28 20:04 18:56-19:37/41	07:50 18:11-18:26/15 18:54 08:18-08:58/40	07:46 16:51	08:33 09:20-09:36/16 16:22
11	05:25 05:56-06:07/11 21:55 21:07-21:22/15	06:10 20:27-20:41/14 21:10	07:01 07:46-07:54/8 18:54-19:35/41 20:02 08:05-08:37/32	07:52 18:11-18:24/13 18:51 08:18-08:58/40	07:48 16:50	08:34 09:20-09:37/17 16:22
12	05:27 05:57-06:07/10 21:54 21:07-21:21/14	06:12 20:28-20:39/11 21:08	07:03 07:43-07:57/14 18:52-19:33/41 19:59 08:04-08:39/35	07:54 18:10-18:20/10 18:49 08:20-08:58/38	07:50 16:48	08:35 09:20-09:38/18 16:22
13	05:28 05:59-06:08/9 21:53 21:07-21:20/13	06:13 20:28-20:37/9 21:06	07:05 07:40-07:58/18 18:49-19:30/41 19:57 08:02-08:39/37	07:55 18:11-18:18/7 18:47 08:21-08:57/36	07:51 16:47	08:36 09:20-09:38/18 16:22
14	05:29 06:00-06:07/7 21:52 21:07-21:19/12	06:15 20:29-20:36/7 21:04	07:06 07:38-08:40/62 19:55 18:48-19:28/40	07:57 18:11-18:16/5 18:45 08:23-08:56/33	07:53 16:45	08:37 09:20-09:39/19 16:22
15	05:30 06:01-06:07/6 21:51 21:08-21:19/11	06:17 20:29-20:33/4 21:02 19:56-20:05/9	07:08 07:37-08:41/64 19:52 18:45-19:25/40	07:59 18:12-18:14/2 17:44-17:56/12 18:43 08:25-08:56/31	07:55 16:44	08:38 09:21-09:40/19 16:22
16	05:31 06:02-06:07/5 21:50 21:08-21:18/10	06:18 20:30-20:32/2 21:00 19:53-20:08/15	07:10 07:36-08:41/65 19:50 18:43-19:23/40	08:01 08:27-08:55/28 18:40 17:42-17:58/16	07:57 16:42	08:39 09:21-09:41/20 16:22
17	05:32 06:03-06:06/3 21:49 21:09-21:17/8	06:20 19:50-20:10/20 20:58	07:11 07:37-08:42/65 19:48 18:42-19:21/39	08:02 08:29-08:54/25 18:38 17:40-18:00/20	07:59 16:41	08:40 09:21-09:41/20 16:22
18	05:34 06:04-06:06/2 21:48 21:09-21:16/7	06:22 19:48-20:11/23 20:56	07:13 07:38-08:42/64 19:45 18:39-19:18/39	08:04 08:31-08:54/23 18:36 17:39-18:01/22	08:00 16:40	08:41 09:21-09:41/20 16:22 15:18-15:21/3
19	05:35 21:09-21:14/5 21:47 20:47-20:51/4	06:23 19:47-20:13/26 20:54	07:15 07:40-08:42/62 19:43 18:38-19:16/38	08:06 08:33-08:53/20 18:34 17:37-18:01/24	08:02 16:38	08:41 09:22-09:42/20 16:22 15:18-15:23/5
20	05:36 21:10-21:14/4 21:46 20:44-20:54/10	06:25 19:46-20:13/27 20:52	07:16 07:42-08:43/61 19:41 18:38-19:14/36	08:08 08:34-08:50/16 18:32 17:36-18:02/26	08:04 16:37	08:42 09:23-09:43/20 16:23 15:18-15:23/5
21	05:38 21:10-21:13/3 21:44 20:43-20:56/13	06:26 19:45-20:14/29 20:49	07:18 07:43-08:42/59 19:38 18:36-19:11/35	08:10 08:36-08:49/13 18:30 17:35-18:00/25	08:06 16:36	08:43 09:23-09:43/20 16:23 15:18-15:24/6
22	05:39 20:41-20:57/16 21:43	06:28 19:38-20:14/36 20:47	07:20 07:45-08:42/57 19:36 18:36-19:09/33	08:11 08:38-08:47/9 18:27 17:35-17:58/23	08:07 16:35	08:43 09:24-09:44/20 16:24 15:18-15:24/6
23	05:41 20:40-20:58/18 21:42	06:30 19:35-20:15/40 20:45	07:21 07:47-08:42/55 19:33 18:36-19:07/31	08:13 08:40-08:45/5 18:25 17:35-17:56/21	08:09 16:33	08:44 09:24-09:44/20 16:24 15:20-15:25/5
24	05:42 20:39-20:59/20 21:40	06:31 19:32-20:14/42 20:43	07:23 07:48-08:41/53 19:31 18:34-19:04/30	08:15 17:35-17:54/19 18:23	08:11 16:32	08:44 09:24-09:44/20 16:25 15:20-15:25/5
25	05:43 20:38-21:00/22 21:39	06:33 19:30-20:13/43 20:41	07:25 07:50-08:41/51 19:29 18:34-19:01/27	07:17 16:35-16:52/17 17:21	08:12 16:31	08:45 09:25-09:45/20 16:25 15:22-15:25/3
26	05:45 20:38-21:01/23 21:38	06:35 19:29-20:11/42 20:39	07:26 18:34-18:59/25 19:26 07:52-08:41/49	07:19 16:35-16:50/15 17:19	08:14 16:30	08:45 09:25-09:45/20 16:26
27	05:46 20:37-21:02/25 21:36	06:36 19:27-20:09/42 20:36	07:28 18:28-18:56/28 19:24 07:53-08:39/46	07:20 16:36-16:48/12 17:17	08:15 16:29	08:45 09:26-09:45/19 16:27
28	05:48 20:36-21:02/26 21:35	06:38 19:26-20:07/41 20:34	07:30 18:26-18:54/28 19:22 07:55-08:39/44	07:22 16:36-16:46/10 17:15	08:17 16:29	08:45 09:26-09:46/20 16:28
29	05:49 20:35-21:03/28 21:33	06:40 19:24-20:04/40 20:32	07:31 18:25-18:52/27 19:19 07:57-08:48/51	07:24 16:37-16:44/7 17:13	08:19 16:28	08:45 09:27-09:46/19 16:29
30	05:51 20:33-21:01/28 21:31	06:41 19:21-20:02/41 20:30	07:33 18:22-18:49/27 19:17 07:58-08:50/52	07:26 16:38-16:42/4 17:11	08:20 16:27	08:46 09:28-09:46/18 16:29
31	05:52 20:33-21:00/27 21:30	06:43 19:17-19:59/42 20:27		07:28 16:39-16:40/1 17:09		08:46 09:29-09:47/18 16:30
Potential sun hours	504	455	381	331	264	241
Sum of minutes with flicker	745	821	2257	1308	0	523

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

Licensed user:
Jennings O'Donovan
Finisklin Business Park
F91 RHH9 Sligo
+353719161416
padraig / podowd@jodireland.com
Calculated:
11/06/2025 09:22/4.0.552

SHADOW - Calendar per WTG

Calculation: 6839 Garrane WF Real Case - V150 **WTG:** 4 - T04

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January	February	March	April	May	June
1	08:46 16:32	08:18 08:49-09:06/17 17:20	07:23 17:08-17:46/38 18:13	07:12 18:59-19:28/29 07:55-08:09/14 20:08 07:35-07:48/13 19:31-19:42/11	06:06 19:25-20:31/66 21:00	05:20 05:49-05:54/5 21:47 20:01-21:14/73
2	08:45 16:33	08:16 08:50-09:05/15 17:22	07:21 17:09-17:46/37 18:15	07:09 19:00-19:24/24 07:58-08:04/6 20:10 07:32-07:49/17 19:28-19:43/15	06:04 19:26-20:33/67 21:02	05:19 05:48-05:54/6 21:48 20:02-21:15/73
3	08:45 16:34	08:15 08:52-09:03/11 17:24	07:19 17:09-17:46/37 18:17	07:07 19:02-19:23/21 19:26-19:45/19 20:11 07:30-07:50/20	06:02 19:27-20:34/67 21:03	05:18 05:48-05:55/7 21:49 20:02-21:15/73
4	08:45 16:35	08:13 08:55-08:59/4 17:26	07:17 17:09-17:45/36 18:18	07:05 19:04-19:20/16 19:24-19:47/23 20:13 07:28-07:50/22	06:00 19:27-20:36/69 21:05	05:17 05:47-05:55/8 21:50 20:04-21:17/73
5	08:45 16:36	08:11 17:28	07:15 17:10-17:44/34 18:20	07:03 19:08-19:15/7 19:22-19:48/26 20:15 07:26-07:51/25	05:58 19:29-20:38/69 21:07	05:17 05:46-05:55/9 21:51 20:04-21:17/73
6	08:44 16:37	08:10 17:30	07:12 17:10-17:43/33 18:22	07:00 07:23-07:50/27 20:17 19:21-19:50/29	05:56 19:30-20:39/69 21:08	05:16 05:46-05:55/9 21:52 20:06-21:19/73
7	08:44 16:39	08:08 17:32	07:10 17:55-17:57/2 18:24 17:11-17:41/30	06:58 07:21-07:51/30 20:18 19:20-19:52/32	05:55 19:31-20:40/69 21:10	05:15 05:45-05:55/10 21:53 20:07-21:19/72
8	08:44 16:40	08:06 17:34	07:08 17:53-17:59/6 18:26 17:12-17:40/28	06:56 07:19-07:51/32 20:20 19:19-19:54/35	05:53 19:33-20:42/69 21:12	05:15 05:45-05:55/10 21:54 20:08-21:20/72
9	08:43 16:41	08:04 17:35	07:05 17:52-18:02/10 18:27 17:14-17:39/25	06:53 07:16-07:50/34 20:22 19:17-19:55/38	05:51 19:35-20:44/69 21:13	05:14 05:45-05:56/11 21:55 20:09-21:20/71
10	08:43 16:43	08:02 17:37	07:03 17:50-18:03/13 18:29 17:15-17:36/21	06:51 07:15-07:49/34 20:24 19:17-19:57/40	05:49 19:38-20:45/67 21:15	05:14 05:44-05:55/11 21:55 20:11-21:22/71
11	08:42 16:44	08:01 17:39	07:01 17:50-18:05/15 18:31 17:18-17:33/15	06:49 07:15-07:49/34 20:25 19:16-19:59/43	05:48 19:43-20:47/64 21:17	05:13 05:44-05:56/12 21:56 20:12-21:23/71
12	08:41 16:46	07:59 17:41	06:59 17:49-18:07/18 18:33 17:23-17:28/5	06:46 07:15-07:49/34 20:27 19:16-20:01/45	05:46 19:49-20:48/59 21:18	05:13 05:44-05:56/12 21:57 20:14-21:23/69
13	08:41 16:47	07:57 17:43	06:56 17:48-18:08/20 18:35	06:44 07:16-07:48/32 20:29 19:15-20:01/46	05:44 19:49-20:50/61 21:20	05:13 05:43-05:55/12 21:58 20:15-21:23/68
14	08:40 16:49	07:55 17:45	06:54 17:48-18:10/22 18:36	06:42 07:15-07:46/31 20:31 19:15-20:03/48	05:43 19:49-20:51/62 21:22	05:13 05:43-05:56/13 21:58 20:17-21:24/67
15	08:39 16:50	07:53 17:47	06:52 17:48-18:13/25 18:38	06:40 07:16-07:45/29 20:32 19:15-20:05/50	05:41 19:50-20:53/63 21:23	05:12 05:43-05:56/13 21:59 20:17-21:25/68
16	08:38 16:52	07:51 17:49	06:49 17:48-18:14/26 18:40 07:12-07:16/4	06:38 07:17-07:44/27 20:34 19:14-20:07/53	05:39 19:50-20:54/64 21:25	05:12 05:43-05:56/13 21:59 20:17-21:25/68
17	08:37 16:54	07:49 17:19-17:23/4 17:51	06:47 17:48-18:16/28 18:42 07:10-07:18/8	06:35 07:18-07:43/25 20:36 19:15-20:09/54	05:38 19:50-20:55/65 21:26	05:12 05:43-05:56/13 22:00 20:18-21:26/68
18	08:36 16:55	07:47 17:17-17:24/7 17:52	06:45 17:49-18:18/29 18:43 07:08-07:19/11	06:33 07:20-07:41/21 20:38 19:15-20:10/55	05:36 19:50-20:56/66 21:28	05:12 05:43-05:56/13 22:00 20:18-21:26/68
19	08:35 16:57	07:45 17:15-17:26/11 17:54	06:42 17:49-18:19/30 18:45 07:05-07:19/14	06:31 07:22-07:38/16 20:39 19:15-20:12/57	05:35 19:51-20:58/67 21:29	05:12 05:43-05:56/13 22:01 20:18-21:26/68
20	08:34 09:03-09:05/2 16:59	07:43 17:14-17:28/14 17:56	06:40 17:50-18:21/31 18:47 07:03-07:20/17	06:29 07:25-07:35/10 20:41 19:14-20:13/59	05:34 19:52-20:59/67 21:31	05:12 05:43-05:56/13 22:01 20:18-21:26/68
21	08:33 09:01-09:05/4 17:00	07:41 17:13-17:31/18 17:58	06:38 17:52-18:23/31 18:49 07:01-07:21/20	06:27 19:15-20:15/60 20:43	05:32 19:52-21:01/69 21:32	05:12 05:44-05:58/14 22:01 20:18-21:26/68
22	08:32 09:00-09:06/6 17:02	07:39 17:12-17:33/21 18:00	06:35 17:53-18:25/32 18:51 06:58-07:20/22	06:24 19:15-20:16/61 20:44	05:31 19:52-21:01/69 21:34	05:13 05:44-05:58/14 22:01 20:19-21:27/68
23	08:31 08:59-09:07/8 17:04	07:36 17:11-17:35/24 18:02	06:33 17:56-18:27/31 18:52 06:56-07:20/24	06:22 19:16-20:18/62 20:46	05:30 19:53-21:03/70 21:35	05:13 05:44-05:57/13 22:02 20:19-21:27/68
24	08:29 08:57-09:07/10 17:06	07:34 17:10-17:36/26 18:04	06:31 17:56-18:28/32 18:54 06:54-07:20/26	06:20 19:16-20:20/64 20:48	05:28 19:54-21:04/70 21:36	05:13 05:44-05:57/13 22:02 20:19-21:27/68
25	08:28 08:56-09:07/11 17:07	07:32 17:10-17:38/28 18:06	06:28 17:57-18:30/33 18:56 06:51-07:19/28	06:18 19:17-20:21/64 20:50	05:27 19:55-21:06/71 21:38	05:14 05:45-05:58/13 22:02 20:20-21:28/68
26	08:27 08:54-09:07/13 17:09	07:30 17:09-17:41/32 18:07	06:26 17:57-18:32/35 18:58 06:49-07:19/30	06:16 19:18-20:23/65 20:51	05:26 19:55-21:07/72 21:39	05:14 05:45-05:58/13 22:02 20:20-21:27/67
27	08:25 08:53-09:08/15 17:11	07:28 17:09-17:43/34 18:09	06:24 17:56-18:33/37 18:59 06:49-07:17/28	06:14 19:19-20:24/65 20:53	05:25 19:56-21:08/72 21:41	05:14 05:46-05:59/13 22:02 20:20-21:28/68
28	08:24 08:51-09:07/16 17:13	07:26 17:09-17:45/36 18:11	06:21 17:57-18:35/38 19:01 06:49-07:16/27	06:12 19:20-20:26/66 20:55	05:24 05:52-05:53/1 21:42 19:57-21:09/72	05:15 05:46-05:59/13 22:01 20:20-21:27/67
29	08:22 08:50-09:08/18 17:15		07:19 18:57-19:34/37 07:42-07:43/1 20:03 07:50-08:15/25	06:10 19:22-20:27/65 20:57	05:23 05:51-05:53/2 21:43 19:58-21:10/72	05:15 05:47-06:00/13 22:01 20:20-21:28/68
30	08:21 08:48-09:07/19 17:17		07:16 18:57-19:32/35 07:39-07:45/6 20:04 07:51-08:13/22	06:08 19:25-20:30/65 20:58	05:22 05:51-05:54/3 21:44 19:58-21:11/73	05:16 05:47-05:59/12 22:01 20:18-21:27/69
31	08:19 08:47-09:06/19 17:18		07:14 18:58-19:31/33 07:52-08:11/19 20:06 07:37-07:47/10 19:34-19:40/6		05:21 05:50-05:54/4 21:46 20:00-21:13/73	
Potential sun hours	257	277	367	417	487	501
Sum of minutes with flicker	141	302	1336	2045	2112	2430

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

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padraig / podowd@jodireland.com
Calculated:
11/06/2025 09:22/4.0.552

SHADOW - Calendar per WTG

Calculation: 6839 Garrane WF Real Case - V150 **WTG:** 4 - T04

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	July		August		September		October		November		December	
1	05:17	05:48-06:00/12	05:54	19:59-20:58/59	06:45	07:14-07:48/34	07:35	18:28-18:47/19	07:30		08:21	
	22:01	20:17-21:27/70	21:28		20:25	19:15-19:58/43	19:15		17:07		16:26	
2	05:17	05:49-06:01/12	05:55	19:50-20:56/66	06:46	07:14-07:48/34	07:36	18:28-18:45/17	07:31		08:23	
	22:00	20:16-21:27/71	21:26		20:23	19:16-19:56/40	19:12	17:58-18:11/13	17:05		16:25	
3	05:18	05:49-06:00/11	05:57	19:47-20:55/68	06:48	07:14-07:48/34	07:38	18:28-18:42/14	07:33		08:24	
	22:00	20:15-21:26/71	21:25		20:20	19:15-19:53/38	19:10	17:54-18:13/19	17:04		16:25	
4	05:19	05:50-06:01/11	05:59	19:44-20:53/69	06:50	07:16-07:48/32	07:40	18:29-18:40/11	07:35		08:26	
	22:00	20:14-21:26/72	21:23		20:18	19:16-19:51/35	19:08	17:52-18:15/23	17:02		16:24	
5	05:20	05:51-06:01/10	06:00	19:43-20:51/68	06:51	07:17-07:47/30	07:42	18:30-18:37/7	07:37		08:27	
	21:59	20:13-21:26/73	21:21		20:16	19:16-19:48/32	19:05	17:50-18:17/27	17:00		16:24	
6	05:21	05:52-06:02/10	06:02	19:40-20:49/69	06:53	07:19-07:46/27	07:43	18:31-18:35/4	07:39		08:28	
	21:59	20:13-21:25/72	21:19		20:13	19:17-19:46/29	19:03	17:48-18:18/30	16:58		16:23	
7	05:21	05:53-06:02/9	06:03	19:39-20:48/69	06:55	19:04-19:10/6 19:18-19:44/26	07:45	18:31-18:32/1	07:41	08:25-08:31/6	08:30	
	21:58	20:11-21:24/73	21:18		20:11	07:21-07:46/25	19:01	17:47-18:19/32	16:56		16:23	
8	05:22	05:54-06:02/8	06:05	19:37-20:46/69	06:56	18:59-19:14/15 19:18-19:41/23	07:47	17:45-18:19/34	07:42	08:23-08:34/11	08:31	
	21:57	20:11-21:24/73	21:16		20:09	07:22-07:45/23	18:58		16:55		16:22	
9	05:23	05:54-06:01/7	06:07	19:37-20:44/67	06:58	18:56-19:17/21 19:20-19:40/20	07:48	17:44-18:19/35	07:44	08:21-08:36/15	08:32	
	21:57	20:10-21:23/73	21:14		20:06	07:24-07:44/20	18:56		16:53		16:22	
10	05:24	05:55-06:02/7	06:08	19:36-20:43/67	07:00	18:53-19:17/24 07:52-07:56/4	07:50	17:44-18:20/36	07:46	08:20-08:37/17	08:33	
	21:56	20:09-21:22/73	21:12		20:04	07:25-07:42/17 19:21-19:37/16	18:54		16:51		16:22	
11	05:25	05:56-06:02/6	06:10	19:34-20:41/67	07:01	18:52-19:20/28 07:47-08:01/14	07:52	17:43-18:20/37	07:48	08:19-08:38/19	08:34	
	21:55	20:09-21:22/73	21:10		20:02	07:27-07:41/14 19:23-19:35/12	18:51		16:50		16:22	
12	05:27	05:57-06:02/5	06:12	19:34-20:39/65	07:03	18:50-19:23/33 07:45-08:03/18	07:54	17:42-18:19/37	07:50	08:20-08:39/19	08:35	
	21:54	20:08-21:21/73	21:08		19:59	07:29-07:39/10 19:26-19:33/7	18:49		16:48		16:22	
13	05:28	05:59-06:03/4	06:13	19:32-20:37/65	07:05	18:48-19:23/35 07:30-07:36/6	07:55	17:42-18:18/36	07:51	08:22-08:40/18	08:36	
	21:53	20:07-21:20/73	21:06		19:57	07:42-08:04/22 19:29-19:30/1	18:47		16:47		16:22	
14	05:29	06:00-06:03/3	06:15	19:30-20:36/66	07:06	18:48-19:25/37 07:32-07:34/2	07:57	17:41-18:16/35	07:53	08:24-08:40/16	08:37	
	21:52	20:07-21:19/72	21:04		19:55	07:41-08:06/25	18:45		16:45		16:22	
15	05:30	06:01-06:02/1	06:17	19:28-20:33/65	07:08	18:46-19:25/39	07:59	17:41-18:14/33	07:55	08:26-08:41/15	08:38	
	21:51	20:07-21:19/72	21:02		19:52	07:40-08:07/27	18:43		16:44		16:22	
16	05:31	20:06-21:18/72	06:18	19:26-20:32/66	07:10	18:46-19:23/37	08:01	17:42-18:12/30	07:57	08:27-08:40/13	08:39	
	21:50		21:00		19:50	07:38-08:06/28	18:40		16:42		16:22	
17	05:32	20:05-21:17/72	06:20	19:24-20:29/65	07:11	18:45-19:21/36	08:02	17:42-18:10/28	07:59	08:29-08:40/11	08:40	09:39-09:42/3
	21:49		20:58		19:48	07:38-08:07/29	18:38		16:41		16:22	
18	05:34	20:05-21:16/71	06:21	19:24-20:28/64	07:13	18:44-19:18/34	08:04	17:42-18:08/26	08:00	08:31-08:41/10	08:41	09:38-09:42/4
	21:48		20:56		19:45	07:38-08:06/28	18:36		16:40		16:22	
19	05:35	20:04-21:14/70	06:23	19:23-20:26/63	07:15	18:44-19:16/32	08:06	17:42-18:05/23	08:02	08:33-08:41/8	08:41	09:38-09:44/6
	21:47		20:54		19:43	07:40-08:07/27	18:34		16:38		16:22	
20	05:36	20:04-21:14/70	06:25	19:21-20:23/62	07:16	18:44-19:14/30	08:08	17:43-18:02/19	08:04	08:35-08:41/6	08:42	09:38-09:45/7
	21:46		20:52		19:40	07:42-08:07/25	18:32		16:37		16:23	
21	05:38	20:03-21:13/70	06:26	19:21-20:22/61	07:18	18:39-19:11/32	08:10	17:43-18:00/17	08:06	08:37-08:41/4	08:43	09:38-09:45/7
	21:44		20:49		19:38	07:43-08:06/23	18:29		16:36		16:23	
22	05:39	20:02-21:11/69	06:28	19:19-20:19/60	07:20	18:37-19:09/32	08:11	17:45-17:58/13	08:07	08:39-08:41/2	08:43	09:39-09:46/7
	21:43		20:47		19:36	07:45-08:05/20	18:27		16:35		16:24	
23	05:41	20:02-21:10/68	06:30	07:28-07:39/11	07:21	18:35-19:07/32	08:13	17:46-17:56/10	08:09		08:44	09:39-09:46/7
	21:42		20:45	19:19-20:17/58	19:33	07:47-08:05/18	18:25		16:33		16:24	
24	05:42	20:02-21:09/67	06:31	07:24-07:42/18	07:23	18:33-19:03/30	08:15	17:47-17:54/7	08:11		08:44	09:40-09:46/6
	21:40		20:43	19:18-20:15/57	19:31	07:48-08:03/15	18:23		16:32		16:25	
25	05:43	20:01-21:08/67	06:33	07:22-07:44/22	07:25	18:32-19:01/29	07:17	16:50-16:52/2	08:12		08:45	09:41-09:46/5
	21:39		20:41	19:17-20:13/56	19:29	07:50-08:02/12	17:21		16:31		16:25	
26	05:45	20:01-21:07/66	06:35	07:21-07:46/25	07:26	18:31-18:59/28	07:19		08:14		08:45	09:42-09:46/4
	21:38		20:39	19:17-20:11/54	19:26	07:52-08:01/9	17:19		16:30		16:26	
27	05:46	20:01-21:05/64	06:36	07:19-07:46/27	07:28	18:29-18:56/27	07:20		08:15		08:45	
	21:36		20:36	19:16-20:09/53	19:24	07:53-07:59/6	17:17		16:29		16:27	
28	05:48	20:00-21:03/63	06:38	07:18-07:47/29	07:30	18:29-18:54/25	07:22		08:17		08:45	
	21:35		20:34	19:16-20:07/51	19:22	07:55-07:57/2	17:15		16:28		16:28	
29	05:49	20:00-21:03/63	06:40	07:16-07:47/31	07:31	18:29-18:52/23	07:24		08:18		08:45	
	21:33		20:32	19:15-20:04/49	19:19		17:13		16:28		16:28	
30	05:51	19:59-21:01/62	06:41	07:16-07:48/32	07:33	18:28-18:49/21	07:26		08:20		08:46	
	21:31		20:30	19:16-20:02/46	19:17		17:11		16:27		16:29	
31	05:52	20:00-21:00/60	06:43	07:15-07:49/34			07:28				08:46	
	21:30		20:27	19:15-19:59/44			17:09				16:30	
Potential sun hours	504		455		381		331		264		241	
Sum of minutes with flicker	2274		2137		1668		675		190		56	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

Licensed user:
Jennings O'Donovan
Finisklin Business Park
F91 RHH9 Sligo
+353719161416
padraig / podowd@jodireland.com
Calculated:
11/06/2025 09:22/4.0.552

SHADOW - Calendar per WTG

Calculation: 6839 Garrane WF Real Case - V150 **WTG:** 5 - T05

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January	February	March	April	May	June
1	08:46 09:58-10:05/7	08:18 08:45-09:09/24	07:24	07:12 19:24-19:42/18	06:06 06:35-07:24/49 20:01-20:31/30	05:20 06:05-06:49/44
	16:32 15:18-15:44/26	17:20 16:12-16:29/17	18:13	20:08 19:09-19:21/12	21:00 06:31-06:32/1	21:47 20:32-21:14/42
2	08:45 10:01-10:02/1	08:16 08:43-09:09/26	07:21	07:09 19:24-19:43/19	06:04 06:29-06:55/26 20:01-20:33/32	05:19 06:05-06:49/44
	16:33 15:18-15:43/25	17:22 16:14-16:27/13	18:15	20:10	21:02 06:57-07:22/25	21:48 20:33-21:15/42
3	08:45 15:19-15:44/25	08:15 08:41-09:09/28	07:19	07:07 19:24-19:45/21	06:02 06:27-06:54/27 20:01-20:34/33	05:18 06:06-06:49/43
	16:34	17:24 16:18-16:23/5	18:17	20:11	21:03 06:59-07:20/21	21:49 20:33-21:15/42
4	08:45 15:20-15:44/24	08:13 08:41-09:08/27	07:17	07:05 19:25-19:47/22	06:00 06:25-06:52/27 20:01-20:36/35	05:17 06:06-06:49/43
	16:35	17:26	18:18	20:13	21:05 07:01-07:17/16	21:50 20:34-21:17/43
5	08:45 15:20-15:44/24	08:11 08:42-09:09/27	07:15	07:03 19:26-19:48/22	05:58 06:24-06:50/26 20:02-20:38/36	05:17 06:06-06:49/43
	16:36	17:28	18:20	20:15	21:07 07:05-07:14/9	21:51 20:34-21:17/43
6	08:44 16:02-16:03/1	08:10 08:43-09:08/25	07:12	07:00 19:27-19:50/23	05:56 06:22-06:43/21	05:16 06:07-06:49/42
	16:38 15:22-15:44/22	17:30	18:22	20:17	21:08 20:02-20:39/37	21:52 20:35-21:19/44
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	16:42 15:25-15:43/18	17:35	18:27	20:22 07:16-07:27/11	21:13 20:04-20:44/40	21:55 20:36-21:21/45
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	17:18 16:10-16:30/20		20:06		21:46 20:32-21:13/41	
Potential sun hours	257	277	367	417	487	501
Sum of minutes with flicker	855	279	371	1413	2486	2520

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

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Calculated:
11/06/2025 09:22/4.0.552

SHADOW - Calendar per WTG

Calculation: 6839 Garrane WF Real Case - V150 **WTG:** 5 - T05

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	July	August	September	October	November	December
1	05:17 06:13-06:53/40	05:54 06:23-06:57/34	06:45 19:36-19:58/22	07:35	07:30 08:17-08:33/16	08:22 15:43-15:52/9
	22:01 20:43-21:27/44	21:28 20:16-20:58/42	20:25 07:11-07:29/18	19:15	17:07	16:26 15:09-15:24/15
2	05:17 06:13-06:54/41	05:56 06:25-06:57/32	06:46 19:36-19:56/20	07:36	07:31 08:15-08:34/19	08:23 15:44-15:51/7
	22:00 20:43-21:27/44	21:26 20:14-20:56/42	20:23 07:13-07:28/15	19:12	17:05	16:25 15:09-15:26/17
3	05:18 06:13-06:53/40	05:57 06:26-06:56/30	06:48 19:36-19:53/17	07:38	07:33 08:14-08:36/22	08:24 15:45-15:50/5
	22:00 20:42-21:26/44	21:25 20:14-20:55/41	20:20 07:14-07:25/11	19:10	17:04	16:25 15:08-15:26/18
4	05:19 06:13-06:54/41	05:59 06:28-06:55/27	06:50 19:36-19:51/15	07:40	07:35 08:13-08:37/24	08:26 15:46-15:50/4
	22:00 20:42-21:26/44	21:23 20:13-20:53/40	20:18 07:16-07:23/7	19:08	17:02	16:24 15:08-15:28/20
5	05:20 06:13-06:55/42	06:00 06:29-06:54/25	06:51 19:36-19:48/12 07:17-07:20/3	07:42	07:37 08:12-08:38/26	08:27 15:46-15:49/3
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6	05:21 06:13-06:55/42	06:02 06:31-06:53/22	06:53 19:24-19:46/22	07:43	07:39 08:12-08:38/26	08:28 15:48-15:49/1
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	21:30 20:18-21:00/42	20:27 07:10-07:31/21		17:09		16:30 15:17-15:43/26
Potential sun hours	504	455	381	331	264	241
Sum of minutes with flicker	2638	1988	669	11	859	1095

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

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padraig / podowd@jodireland.com
Calculated:
11/06/2025 09:22/4.0.552

SHADOW - Calendar per WTG

Calculation: 6839 Garrane WF Real Case - V150 **WTG:** 6 - T06

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January	February	March	April	May	June
1	08:46 09:37-09:52/15 15:13-15:54/41	08:18	07:23	07:12 19:08-19:42/34	06:06 19:56-20:31/35	05:20 20:49-21:14/25
	16:32 09:18-09:23/5	17:20	18:13	20:08	21:00 06:31-06:46/15	21:47
2	08:45 09:37-09:51/14 15:12-15:53/41	08:16	07:21	07:09 19:07-19:43/36	06:04 19:55-20:33/38	05:19 20:49-21:15/26
	16:33 09:17-09:23/6	17:22	18:15	20:10	21:02 06:29-06:43/14	21:48
3	08:45 09:39-09:51/12 15:13-15:54/41	08:15	07:19	07:07 19:07-19:45/38	06:02 19:55-20:34/39	05:18 20:48-21:15/27
	16:34 09:17-09:23/6	17:24	18:17	20:11	21:03 06:27-06:43/16	21:49
4	08:45 09:40-09:51/11 15:14-15:55/41	08:13	07:17	07:05 19:06-19:47/41	06:00 19:55-20:33/38	05:17 20:49-21:17/28
	16:35 09:17-09:25/8	17:26	18:18	20:13	21:05 06:25-06:43/18	21:50
5	08:45 09:42-09:49/7 15:14-15:55/41	08:11	07:15	07:03 19:05-19:48/43	05:58 19:55-20:32/37	05:17 20:48-21:17/29
	16:36 09:16-09:25/9	17:28	18:20	20:15	21:07 06:24-06:45/21	21:51
6	08:44 09:45-09:48/3 15:15-15:56/41	08:10	07:12	07:00 19:05-19:50/45	05:56 19:56-20:33/37	05:16 20:48-21:19/31
	16:37 09:16-09:26/10	17:30	18:22	20:17	21:08 06:22-06:44/22	21:52
7	08:44 09:15-09:26/11	08:08	07:10	06:58 19:05-19:52/47	05:55 19:56-20:32/36	05:15 20:48-21:19/31
	16:39 15:15-15:56/41	17:32	18:24	20:18	21:10 06:20-06:44/24	21:53
8	08:44 09:15-09:27/12	08:06	07:08	06:56 19:06-19:54/48	05:53 19:56-20:31/35	05:15 20:48-21:20/32
	16:40 15:15-15:56/41	17:34	18:26	20:20	21:12 06:18-06:44/26	21:54
9	08:43 09:14-09:27/13	08:04	07:05	06:53 19:05-19:55/50	05:51 19:57-20:31/34	05:14 20:48-21:21/33
	16:41 15:16-15:57/41	17:35	18:27	20:22	21:13 06:17-06:45/28	21:55
10	08:43 09:13-09:28/15	08:02	07:03	06:51 19:05-19:57/52	05:49 19:58-20:30/32	05:14 20:48-21:22/34
	16:43 15:17-15:57/40	17:37	18:29	20:24	21:15 06:15-06:44/29	21:55
11	08:42 09:12-09:28/16	08:01	07:01	06:49 19:06-19:59/53	05:48 19:59-20:30/31	05:13 20:48-21:23/35
	16:44 15:17-15:57/40	17:39	18:31	20:25 07:12-07:13/1	21:17 06:14-06:44/30	21:56
12	08:41 09:11-09:28/17	07:59 08:24-08:25/1	06:59	06:46 19:07-20:01/54	05:46 19:59-20:28/29	05:13 20:49-21:24/35
	16:46 15:17-15:57/40	17:41	18:33	20:27 07:10-07:15/5	21:18 06:13-06:44/31	21:57
13	08:41 09:11-09:30/19	07:57 08:22-08:26/4	06:56	06:44 19:06-20:01/55	05:44 20:00-20:27/27	05:13 20:48-21:23/35
	16:47 15:18-15:57/39	17:43	18:35	20:29 07:08-07:16/8	21:20 06:14-06:44/30	21:58
14	08:40 09:10-09:30/20	07:55 08:20-08:27/7	06:54	06:42 19:07-20:03/56	05:43 20:02-20:26/24	05:13 20:48-21:24/36
	16:49 15:19-15:57/38	17:45	18:36	20:31 07:05-07:16/11	21:22 06:14-06:43/29	21:58
15	08:39 09:09-09:30/21	07:53 08:18-08:27/9	06:52	06:40 19:09-20:05/56	05:41 20:03-20:25/22	05:12 20:48-21:25/37
	16:50 15:19-15:57/38	17:47	18:38	20:32 07:03-07:16/13	21:23 06:15-06:43/28	21:59
16	08:38 09:08-09:31/23	07:51 08:16-08:27/11	06:49	06:38 19:10-20:07/57	05:39 20:04-20:23/19	05:12 20:49-21:25/36
	16:52 15:20-15:57/37	17:49	18:40	20:34 07:01-07:17/16	21:25 06:14-06:42/28	21:59
17	08:37 09:06-09:30/24	07:49 08:14-08:28/14	06:47	06:35 19:12-20:09/57	05:38 20:07-20:22/15	05:12 20:49-21:26/37
	16:54 15:21-15:57/36	17:51	18:42	20:36 06:59-07:17/18	21:26 06:15-06:42/27	22:00
18	08:36 09:05-09:30/25	07:47 08:12-08:28/16	06:45	06:33 19:14-20:10/56	05:36 20:09-20:18/9	05:12 20:49-21:26/37
	16:55 15:22-15:57/35	17:52	18:43	20:38 06:57-07:17/20	21:28 06:16-06:41/25	22:00
19	08:35 09:04-09:30/26	07:45 08:09-08:27/18	06:42	06:31 19:37-20:12/35 19:16-19:33/17	05:35 06:17-06:40/23	05:12 20:49-21:26/37
	16:57 15:23-15:57/34	17:54	18:45	20:39 06:55-07:17/22	21:29	22:01
20	08:34 09:03-09:31/28	07:43 08:07-08:26/19	06:40	06:29 19:37-20:13/36 19:20-19:27/7	05:34 06:18-06:39/21	05:12 20:49-21:26/37
	16:59 15:24-15:57/33	17:56	18:47	20:41 06:53-07:17/24	21:31	22:01
21	08:33 09:01-09:30/29	07:41 08:05-08:26/21	06:38	06:27 19:39-20:15/36	05:32 06:19-06:39/20	05:12 20:49-21:26/37
	17:00 15:25-15:56/31	17:58	18:49	20:43 06:50-07:15/25	21:32 20:59-21:01/2	22:01
22	08:32 09:00-09:30/30	07:39 08:06-08:25/19	06:35	06:24 19:41-20:16/35	05:31 06:20-06:38/18	05:13 20:50-21:27/37
	17:02 15:26-15:55/29	18:00	18:51	20:44 06:48-07:15/27	21:34 20:56-21:01/5	22:01
23	08:31 09:00-09:30/30	07:36 08:07-08:23/16	06:33 18:25-18:27/2	06:22 19:53-20:18/25 19:47-19:48/1	05:30 06:21-06:36/15	05:13 20:50-21:27/37
	17:04 15:28-15:55/27	18:02	18:52	20:46 06:46-07:14/28	21:35 20:55-21:03/8	22:02
24	08:29 09:00-09:28/28	07:34 08:09-08:22/13	06:31 18:20-18:28/8	06:20 19:54-20:20/26	05:28 06:23-06:34/11	05:13 20:50-21:27/37
	17:06 15:29-15:54/25	18:04	18:54	20:48 06:44-07:13/29	21:36 20:54-21:04/10	22:02
25	08:28 09:01-09:28/27	07:32 08:11-08:17/6	06:28 18:18-18:30/12	06:18 19:55-20:21/26	05:27 06:26-06:32/6	05:13 20:51-21:28/37
	17:07 15:31-15:53/22	18:06	18:56	20:50 06:42-07:12/30	21:38 20:53-21:06/13	22:02
26	08:27 09:02-09:26/24	07:30	06:26 18:16-18:32/16	06:16 19:56-20:23/27	05:26 20:52-21:07/15	05:14 20:51-21:27/36
	17:09 15:33-15:51/18	18:07	18:58	20:51 06:40-07:11/31	21:39	22:02
27	08:25 09:03-09:25/22	07:28	06:24 18:14-18:33/19	06:14 19:56-20:24/28	05:25 20:51-21:08/17	05:14 20:51-21:28/37
	17:11 15:36-15:49/13	18:09	18:59	20:53 06:38-07:09/31	21:41	22:02
28	08:24 09:04-09:22/18	07:26	06:21 18:12-18:35/23	06:12 19:56-20:26/30	05:24 20:50-21:09/19	05:15 20:51-21:27/36
	17:13	18:11	19:01	20:55 06:36-07:07/31	21:42	22:01
29	08:22 09:06-09:22/16		07:19 19:11-19:37/26	06:10 19:55-20:27/32 06:56-07:05/9	05:23 20:50-21:10/20	05:15 20:52-21:28/36
	17:15		20:03	20:57 06:35-06:51/16	21:43	22:01
30	08:21 09:08-09:19/11		07:16 19:09-19:38/29	06:08 19:56-20:30/34	05:22 20:49-21:11/22	05:16 20:52-21:27/35
	17:17		20:04	20:58 06:33-06:49/16	21:44	22:01
31	08:19 09:12-09:15/3		07:14 19:09-19:40/31		05:21 20:50-21:13/23	
	17:18		20:06		21:46	
Potential sun hours	257	277	367	417	487	501
Sum of minutes with flicker	1558	174	166	1684	1246	1023

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

Licensed user:
Jennings O'Donovan
Finisklin Business Park
F91 RHH9 Sligo
+353719161416
padraig / podowd@jodireland.com
Calculated:
11/06/2025 09:22/4.0.552

SHADOW - Calendar per WTG

Calculation: 6839 Garrane WF Real Case - V150 **WTG:** 6 - T06

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	July	August	September	October	November	December
1	05:17 20:52-21:27/35 22:01	05:54 20:10-20:39/29 21:28 06:23-06:54/31	06:45 19:05-19:58/53 20:25 07:11-07:12/1	07:35 19:15	07:30 17:07	08:22 08:54-09:10/16 16:26 14:59-15:39/40
2	05:17 20:52-21:27/35 22:00	05:55 20:08-20:39/31 21:26 06:25-06:55/30	06:46 19:04-19:56/52 20:23	07:36 19:12	07:31 17:05	08:23 08:56-09:11/15 16:25 15:00-15:40/40
3	05:18 20:53-21:26/33 22:00	05:57 20:08-20:41/33 21:25 06:26-06:55/29	06:48 19:03-19:53/50 20:20	07:38 19:10	07:33 17:04	08:24 08:57-09:10/13 16:25 14:59-15:40/41
4	05:19 20:53-21:26/33 22:00	05:59 20:07-20:41/34 21:23 06:28-06:55/27	06:50 19:03-19:51/48 20:18	07:40 19:08	07:35 17:02	08:26 08:59-09:11/12 16:24 15:00-15:41/41
5	05:20 20:54-21:26/32 21:59	06:00 20:06-20:42/36 21:21 06:29-06:54/25	06:51 19:01-19:48/47 20:16	07:42 19:05	07:37 17:00	08:27 09:00-09:11/11 16:24 15:00-15:41/41
6	05:20 20:55-21:25/30 21:59	06:02 20:05-20:42/37 21:19 06:31-06:55/24	06:53 19:01-19:46/45 20:13	07:43 19:03	07:39 16:58	08:28 09:32-09:33/1 15:01-15:42/41 16:23 09:02-09:12/10
7	05:21 20:54-21:24/30 21:58	06:03 20:05-20:42/37 21:18 06:32-06:54/22	06:55 19:01-19:44/43 20:11	07:45 19:01	07:41 16:56	08:30 09:29-09:36/7 15:01-15:42/41 16:23 09:03-09:12/9
8	05:22 20:55-21:24/29 21:57	06:05 20:04-20:42/38 21:16 06:34-06:54/20	06:56 19:00-19:41/41 20:09	07:47 18:58	07:42 16:55	08:31 09:28-09:38/10 15:01-15:42/41 16:22 09:04-09:12/8
9	05:23 20:55-21:23/28 21:57	06:07 20:04-20:43/39 21:14 06:35-06:53/18	06:58 19:01-19:40/39 20:06	07:48 18:56	07:44 16:53	08:32 09:28-09:40/12 15:01-15:42/41 16:22 09:06-09:13/7
10	05:24 20:56-21:22/26 21:56	06:08 20:05-20:43/38 21:12 06:37-06:53/16	07:00 19:00-19:37/37 20:04	07:50 18:54	07:46 16:51	08:33 09:27-09:41/14 15:03-15:43/40 16:22 09:07-09:13/6
11	05:25 20:56-21:22/26 21:55	06:10 20:04-20:41/37 21:10 06:38-06:51/13	07:01 19:00-19:35/35 20:02	07:52 18:51	07:48 08:43-08:48/5 16:50	08:34 09:27-09:42/15 15:03-15:44/41 16:22 09:08-09:13/5
12	05:26 20:57-21:21/24 21:54	06:12 20:04-20:39/35 21:08 06:40-06:56/16	07:03 19:01-19:33/32 19:59	07:54 18:49	07:50 08:40-08:51/11 16:48	08:35 09:27-09:43/16 15:03-15:44/41 16:22 09:09-09:13/4
13	05:28 20:57-21:20/23 21:53	06:13 20:03-20:37/34 21:06 06:41-06:57/16	07:05 19:01-19:30/29 19:57	07:55 18:47	07:51 08:38-08:53/15 16:47	08:36 09:27-09:44/17 15:04-15:44/40 16:22 09:10-09:13/3
14	05:29 20:58-21:19/21 21:52	06:15 20:04-20:36/32 07:02-07:14/12 21:04 06:43-06:59/16	07:06 19:01-19:28/27 19:55	07:57 18:45	07:53 08:37-08:55/18 16:45	08:37 09:27-09:44/17 15:04-15:45/41 16:22 09:11-09:13/2
15	05:30 21:00-21:19/19 21:51	06:17 20:03-20:33/30 21:02 06:44-07:15/31	07:08 19:02-19:25/23 19:52	07:59 18:42	07:55 08:36-08:58/22 16:44 15:08-15:21/13	08:38 09:27-09:45/18 15:05-15:45/40 16:22 09:12-09:14/2
16	05:31 21:00-21:18/18 21:50	06:18 20:04-20:32/28 21:00 06:46-07:17/31	07:10 19:03-19:23/20 19:50	08:01 18:40	07:57 08:34-08:59/25 16:42 15:06-15:24/18	08:39 09:28-09:46/18 15:05-15:46/41 16:22 09:13-09:14/1
17	05:32 21:01-21:17/16 21:49	06:20 20:02-20:29/27 20:58 06:48-07:18/30	07:11 19:04-19:21/17 19:48	08:02 08:42-08:51/9 18:38	07:59 08:34-09:01/27 16:41 15:04-15:26/22	08:40 09:28-09:47/19 15:05-15:46/41 16:22 09:14-09:15/1
18	05:34 21:02-21:16/14 21:48	06:21 20:01-20:28/27 20:56 06:49-07:19/30	07:13 19:05-19:18/13 19:45	08:04 08:39-08:54/15 18:36	08:00 08:34-09:02/28 16:40 15:03-15:28/25	08:41 09:28-09:47/19 16:22 15:06-15:46/40
19	05:35 06:34-06:42/8 21:47 21:03-21:15/12	06:23 19:59-20:25/26 20:54 06:51-07:20/29	07:15 19:07-19:16/9 19:43	08:06 08:38-08:55/17 18:34	08:02 08:34-09:04/30 16:38 15:02-15:29/27	08:41 09:28-09:48/20 16:22 15:06-15:47/41
20	05:36 06:32-06:45/13 21:46 21:05-21:14/9	06:25 19:59-20:23/24 19:50-19:56/6 20:52 06:52-07:20/28	07:16 19:10-19:14/4 19:40	08:08 08:36-08:55/19 18:32	08:04 08:35-09:05/30 16:37 15:01-15:31/30	08:42 09:29-09:49/20 16:23 15:06-15:46/40
21	05:38 06:31-06:47/16 21:44 21:06-21:13/7	06:26 19:46-20:22/36 20:49 06:54-07:21/27	07:18 19:38	08:10 08:36-08:56/20 18:29	08:06 08:37-09:06/29 16:36 15:01-15:32/31	08:43 09:29-09:49/20 16:23 15:07-15:47/40
22	05:39 06:29-06:48/19 21:43 21:07-21:11/4	06:28 19:43-20:19/36 20:47 06:55-07:20/25	07:20 19:36	08:11 08:38-08:57/19 18:27	08:07 08:39-09:07/28 16:35 15:00-15:33/33	08:43 09:30-09:50/20 16:24 15:07-15:47/40
23	05:40 06:29-06:50/21 21:42 21:09-21:10/1	06:30 19:42-20:17/35 19:24-19:33/9 20:45 06:57-07:20/23	07:21 19:33	08:13 08:40-08:57/17 18:25	08:09 08:41-09:07/26 16:33 15:00-15:34/34	08:44 09:30-09:50/20 16:24 15:08-15:48/40
24	05:42 06:28-06:50/22 21:40	06:31 19:39-20:15/36 19:19-19:36/17 20:43 06:58-07:20/22	07:23 19:31	08:15 08:42-08:57/15 18:23	08:11 08:42-09:07/25 16:32 14:59-15:34/35	08:44 09:30-09:50/20 16:25 15:08-15:49/41
25	05:43 20:23-20:26/3 21:39 06:27-06:51/24	06:33 19:16-20:13/57 20:41 07:00-07:20/20	07:25 19:29	07:17 07:44-07:57/13 17:21	08:12 08:44-09:08/24 16:31 14:59-15:35/36	08:45 09:32-09:51/19 16:25 15:10-15:50/40
26	05:45 20:18-20:30/12 21:38 06:27-06:52/25	06:35 19:14-20:10/56 20:39 07:02-07:20/18	07:26 19:26	07:19 07:46-07:57/11 17:19	08:14 08:46-09:09/23 16:30 14:59-15:36/37	08:45 09:32-09:51/19 15:10-15:50/40 16:26 09:18-09:19/1
27	05:46 20:16-20:33/17 21:36 06:26-06:52/26	06:36 19:12-20:09/57 20:36 07:03-07:18/15	07:28 19:24	07:20 07:48-07:57/9 17:17	08:15 08:48-09:09/21 16:29 14:59-15:37/38	08:45 09:32-09:51/19 15:10-15:51/41 16:27 09:18-09:19/1
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29	05:49 20:13-20:36/23 21:33 06:25-06:54/29	06:40 19:08-20:04/56 20:32 07:06-07:16/10	07:31 19:19	07:24 07:52-07:55/3 17:13	08:19 08:51-09:10/19 16:28 14:59-15:38/39	08:45 09:34-09:51/17 15:11-15:52/41 16:28 09:18-09:20/2
30	05:51 20:12-20:37/25 21:31 06:24-06:54/30	06:41 19:07-20:02/55 20:30 07:08-07:16/8	07:33 19:17	07:26 17:11	08:20 08:53-09:10/17 16:27 15:00-15:39/39	08:46 09:35-09:51/16 15:11-15:52/41 16:29 09:18-09:21/3
31	05:52 20:11-20:39/28 21:30 06:24-06:55/31	06:43 19:06-19:59/53 20:27 07:10-07:14/4		07:28 17:09		08:46 09:35-09:52/17 15:12-15:53/41 16:30 09:18-09:22/4
Potential sun hours	504	455	381	331	264	241
Sum of minutes with flicker	925	1897	665	173	938	1823

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

Licensed user:
Jennings O'Donovan
Finisklin Business Park
F91 RHH9 Sligo
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padraig / podowd@jodireland.com
Calculated:
11/06/2025 09:22/4.0.552

SHADOW - Calendar per WTG

Calculation: 6839 Garrane WF Real Case - V150 **WTG:** 7 - T07

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January	February	March	April	May	June
1	08:46 09:18-09:36/18 16:32 14:59-15:56/57	08:18 08:45-09:01/16 17:20 15:44-16:29/45	07:24 16:46-17:25/39 18:13	07:12 20:08	06:06 20:21-20:31/10 21:00	05:20 20:55-21:14/19 20:26-20:44/18 21:47 05:49-06:16/27
2	08:45 09:17-09:35/18 16:33 14:59-15:57/58	08:16 08:43-09:01/18 17:22 15:44-16:29/45	07:21 16:47-17:24/37 18:15	07:09 20:10	06:04 20:19-20:33/14 21:02	05:19 20:55-21:15/20 20:27-20:42/15 21:48 05:48-06:16/28
3	08:45 09:17-09:35/18 16:34 15:00-15:58/58	08:15 08:41-09:02/21 17:24 15:45-16:28/43	07:19 16:48-17:23/35 18:17	07:07 20:11	06:02 20:18-20:34/16 21:03	05:18 20:55-21:15/20 20:28-20:41/13 21:49 05:49-06:17/28
4	08:45 09:17-09:35/18 16:35 15:01-16:00/59	08:13 08:39-09:02/23 17:26 15:45-16:27/42	07:17 07:41-07:43/2 18:18 16:49-17:20/31	07:05 20:13	06:00 20:17-20:36/19 21:05	05:17 20:55-21:17/22 20:30-20:40/10 21:50 05:49-06:16/27
5	08:45 09:16-09:35/19 16:36 15:01-16:01/60	08:11 08:37-09:02/25 17:28 15:46-16:26/40	07:15 07:38-07:43/5 18:20 16:51-17:19/28	07:03 20:15	05:58 20:16-20:37/21 21:07	05:17 20:55-21:17/22 20:32-20:38/6 21:51 05:49-06:16/27
6	08:44 09:16-09:36/20 16:37 15:02-16:03/61	08:10 08:36-09:03/27 15:48-16:26/38 17:30 16:59-17:00/1	07:12 07:36-07:44/8 18:22 16:53-17:17/24	07:00 20:17	05:56 20:16-20:39/23 21:08	05:16 20:56-21:19/23 21:52 05:50-06:16/26
7	08:44 09:15-09:36/21 16:39 15:02-16:04/62	08:08 08:34-09:03/29 15:49-16:25/36 17:32 16:56-17:02/6	07:10 07:34-07:45/11 18:24 16:56-17:13/17	06:58 20:18	05:55 20:15-20:40/25 21:10	05:15 20:55-21:19/24 21:53 05:50-06:16/26
8	08:44 09:15-09:37/22 16:40 15:02-16:05/63	08:06 08:32-09:03/31 15:50-16:24/34 17:34 16:54-17:04/10	07:08 07:31-07:45/14 18:26 17:01-17:08/7	06:56 20:20	05:53 20:15-20:42/27 21:12	05:15 20:56-21:20/24 21:54 05:50-06:16/26
9	08:43 09:14-09:37/23 16:41 15:04-16:07/63	08:04 08:30-09:03/33 15:52-16:23/31 17:35 16:52-17:06/14	07:05 07:29-07:45/16 18:27	06:53 20:22	05:51 20:15-20:44/29 21:13	05:14 20:55-21:21/26 21:55 05:50-06:16/26
10	08:43 09:13-09:38/25 16:43 15:04-16:08/64	08:02 08:28-09:03/35 15:54-16:21/27 17:37 16:51-17:08/17	07:03 07:27-07:46/19 18:29	06:51 20:24	05:49 20:14-20:45/31 21:15	05:14 20:56-21:22/26 21:56 05:51-06:16/25
11	08:42 09:12-09:38/26 16:44 15:05-16:10/65	08:01 08:26-09:02/36 15:56-16:19/23 17:39 16:50-17:10/20	07:01 07:24-07:45/21 18:31	06:49 20:25	05:48 20:15-20:47/32 21:17	05:13 20:57-21:23/26 21:56 05:52-06:16/24
12	08:41 09:11-09:38/27 16:46 15:05-16:11/66	07:59 08:24-09:02/38 15:59-16:16/17 17:41 16:49-17:12/23	06:59 07:22-07:44/22 18:33	06:46 20:27	05:46 20:14-20:48/34 21:18	05:13 20:56-21:23/27 21:57 05:52-06:16/24
13	08:41 09:11-09:40/29 16:47 15:06-16:13/67	07:57 08:22-09:01/39 16:04-16:11/7 17:43 16:48-17:15/27	06:56 07:20-07:44/24 18:35	06:44 20:29	05:44 20:14-20:49/35 21:20	05:13 20:56-21:23/27 21:58 05:52-06:16/24
14	08:40 09:10-09:40/30 16:49 15:08-16:15/67	07:55 08:23-09:00/37 17:45 16:47-17:17/30	06:54 07:18-07:43/25 18:36	06:42 20:31	05:43 06:09-06:10/1 21:22 20:14-20:51/37	05:13 20:57-21:24/27 21:58 05:52-06:16/24
15	08:39 09:09-09:40/31 16:50 15:08-16:16/68	07:53 08:23-08:59/36 17:47 16:46-17:19/33	06:52 07:19-07:42/23 18:38	06:40 20:32	05:41 06:08-06:12/4 21:23 20:15-20:53/38	05:12 20:57-21:25/28 21:59 05:53-06:16/23
16	08:38 09:08-09:41/33 16:52 15:09-16:18/69	07:51 08:24-08:58/34 17:49 16:46-17:21/35	06:49 07:19-07:40/21 18:40	06:38 20:34	05:39 06:06-06:12/6 21:25 20:14-20:54/40	05:12 20:57-21:25/28 21:59 05:53-06:16/23
17	08:37 09:06-09:40/34 16:54 15:11-16:20/69	07:49 08:25-08:56/31 17:51 16:45-17:23/38	06:47 07:21-07:38/17 18:42	06:35 20:36	05:38 06:05-06:13/8 21:26 20:15-20:55/40	05:12 20:58-21:26/28 22:00 05:54-06:16/22
18	08:36 09:07-09:40/33 16:55 15:12-16:22/70	07:47 08:26-08:54/28 17:52 16:45-17:25/40	06:45 07:23-07:36/13 18:43	06:33 20:38	05:36 06:04-06:14/10 21:28 20:15-20:56/41	05:12 20:58-21:26/28 22:00 05:54-06:16/22
19	08:35 09:08-09:41/33 16:57 15:14-16:24/70	07:45 08:26-08:50/24 17:54 16:44-17:26/42	06:42 18:45	06:31 20:39	05:35 06:02-06:14/12 21:29 20:15-20:57/42	05:12 20:58-21:26/28 22:01 05:54-06:16/22
20	08:34 09:08-09:41/33 15:16-15:38/22 16:59 15:39-16:26/47	07:43 08:27-08:48/21 17:56 16:44-17:28/44	06:40 18:47	06:29 20:41	05:34 06:01-06:15/14 21:31 20:16-20:57/41	05:12 20:58-21:26/28 22:01 05:54-06:16/22
21	08:33 09:08-09:40/32 15:17-15:36/19 17:00 15:38-16:27/49	07:41 08:30-08:46/16 17:58 16:44-17:29/45	06:38 18:49	06:27 20:43	05:32 21:00-21:01/1 20:17-20:56/39 21:32 06:00-06:15/15	05:12 20:58-21:26/28 22:01 05:55-06:17/22
22	08:32 09:09-09:41/32 15:20-15:35/15 17:02 15:39-16:28/49	07:39 08:33-08:43/10 18:00 16:44-17:29/45	06:35 18:51	06:24 20:44	05:31 20:58-21:02/4 20:17-20:55/38 21:34 05:59-06:16/17	05:13 20:59-21:27/28 22:01 05:55-06:17/22
23	08:31 09:10-09:41/31 15:24-15:32/8 17:04 15:40-16:28/48	07:37 16:44-17:29/45 18:02	06:33 18:52	06:22 20:46	05:30 20:57-21:03/6 20:17-20:54/37 21:35 05:57-06:15/18	05:13 20:59-21:27/28 22:02 05:55-06:17/22
24	08:29 09:11-09:40/29 17:06 15:39-16:28/49	07:34 16:43-17:28/45 18:04	06:31 18:54	06:20 20:48	05:28 20:57-21:04/7 20:18-20:53/35 21:37 05:56-06:15/19	05:13 20:59-21:27/28 22:02 05:55-06:17/22
25	08:28 09:12-09:40/28 17:07 15:40-16:29/49	07:32 16:44-17:28/44 18:06	06:28 18:56	06:18 20:50	05:27 20:56-21:06/10 20:19-20:51/32 21:38 05:55-06:16/21	05:13 21:00-21:28/28 22:02 05:56-06:18/22
26	08:27 09:13-09:39/26 17:09 15:40-16:29/49	07:30 16:44-17:27/43 18:07	06:26 18:58	06:16 20:51	05:26 20:56-21:07/11 20:20-20:47/27 21:39 05:54-06:16/22	05:14 20:59-21:27/28 22:02 05:55-06:18/23
27	08:25 09:14-09:38/24 15:41-16:29/48 17:11 08:53-08:55/2	07:28 16:45-17:27/42 18:09	06:24 18:59	06:14 20:53	05:25 20:56-21:08/12 20:20-20:47/27 21:41 05:53-06:16/23	05:14 21:00-21:28/28 22:02 05:56-06:19/23
28	08:24 09:15-09:37/22 15:41-16:29/48 17:13 08:51-08:56/5	07:26 16:46-17:26/40 18:11	06:21 19:01	06:12 20:55	05:24 20:55-21:09/14 20:21-20:46/25 21:42 05:52-06:16/24	05:15 21:00-21:27/27 22:02 05:56-06:19/23
29	08:22 09:18-09:36/18 15:42-16:29/47 17:15 08:50-08:58/8		07:19 20:03	06:10 20:23-20:27/4 20:57	05:23 20:55-21:10/15 20:22-20:45/23 21:43 05:51-06:16/25	05:15 21:01-21:28/27 22:01 05:56-06:20/24
30	08:21 09:20-09:34/14 15:42-16:29/47 17:17 08:48-08:59/11		07:16 20:04	06:08 20:22-20:30/8 20:58	05:22 20:55-21:11/16 20:23-20:45/22 21:44 05:51-06:17/26	05:16 21:00-21:27/27 22:01 05:56-06:20/24
31	08:19 09:23-09:30/7 15:42-16:29/47 17:18 08:46-08:59/13		07:14 20:06		05:21 20:56-21:13/17 20:25-20:45/20 21:46 05:50-06:17/27	
Potential sun hours	257	277	367	417	487	501
Sum of minutes with flicker	2670	1765	459	12	1325	1563

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

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Calculated:
11/06/2025 09:22/4.0.552

SHADOW - Calendar per WTG

Calculation: 6839 Garrane WF Real Case - V150 **WTG:** 7 - T07

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	July	August	September	October	November	December
1	05:17 21:01-21:27/26	05:54 20:25-20:58/33	06:45	07:35 08:00-08:23/23	07:30 07:58-08:32/34 15:23-15:51/28	08:22 08:54-09:20/26
	22:01 05:56-06:20/24	21:28	20:25	19:15	17:07 16:21-16:38/17	16:26 14:47-15:52/65
2	05:17 21:00-21:26/26	05:55 20:24-20:56/32	06:46	07:36 08:02-08:23/21	07:31 08:00-08:33/33 15:21-15:53/32	08:23 08:56-09:21/25
	22:01 05:56-06:21/25	21:26	20:23	19:12	17:05 16:22-16:36/14	16:25 14:47-15:51/64
3	05:18 21:01-21:26/25	05:57 20:25-20:55/30	06:48	07:38 08:04-08:23/19	07:33 08:02-08:33/31 15:20-15:54/34	08:24 08:57-09:20/23
	22:00 05:56-06:21/25	21:25	20:20	19:10	17:04 16:24-16:34/10	16:25 14:47-15:50/63
4	05:19 21:01-21:26/25	05:59 20:24-20:53/29	06:50	07:40 08:05-08:22/17	07:35 08:04-08:33/29 15:19-15:55/36	08:26 08:59-09:21/22
	22:00 05:56-06:21/25	21:23	20:18	19:08	17:02 16:26-16:32/6	16:24 14:47-15:50/63
5	05:20 21:02-21:26/24	06:00 20:25-20:51/26	06:51	07:42 08:07-08:22/15	07:37 08:06-08:33/27	08:27 09:00-09:21/21
	21:59 05:56-06:22/26	21:21	20:16	19:05	17:00 15:18-15:56/38	16:24 14:47-15:49/62
6	05:20 21:02-21:25/23	06:02 20:25-20:49/24	06:53	07:43 08:09-08:22/13	07:39 08:08-08:33/25	08:28 09:02-09:22/20
	21:59 05:56-06:23/27	21:19	20:13	19:03 17:35-17:48/13	16:58 15:17-15:57/40	16:23 14:48-15:49/61
7	05:21 21:01-21:24/23	06:03 20:26-20:48/22	06:55	07:45 08:11-08:21/10	07:41 08:10-08:33/23	08:30 09:03-09:22/19
	21:58 05:56-06:23/27	21:18	20:11	19:01 17:31-17:52/21	16:56 15:16-15:58/42	16:23 14:48-15:48/60
8	05:22 21:02-21:24/22 20:37-20:46/9	06:05 20:26-20:46/20	06:56	07:47 08:12-08:19/7	07:42 08:12-08:32/20	08:31 09:04-09:22/18
	21:57 05:55-06:23/28	21:16	20:09	18:58 17:27-17:53/26	16:55 15:15-15:59/44	16:22 14:48-15:47/59
9	05:23 21:02-21:23/21 20:36-20:48/12	06:07 20:27-20:45/18	06:58	07:48 08:14-08:18/4	07:44 08:14-08:32/18	08:32 09:06-09:24/18
	21:57 05:55-06:23/28	21:14	20:06	18:56 17:25-17:55/30	16:53 15:15-15:59/44	16:22 14:48-15:47/59
10	05:24 21:02-21:22/20 20:35-20:49/14	06:08 20:28-20:43/15	07:00	07:50 17:23-17:56/33	07:46 08:16-08:32/16	08:33 09:07-09:25/18
	21:56 05:55-06:23/28	21:12	20:04	18:54	16:51 15:15-16:00/45	16:22 14:49-15:47/58
11	05:25 21:03-21:22/19 20:34-20:50/16	06:10 20:28-20:41/13	07:01	07:52 17:22-17:57/35	07:48 08:54-09:03/9 15:14-16:00/46	08:34 09:08-09:26/18
	21:55 05:56-06:24/28	21:10	20:02	18:51	16:50 08:18-08:31/13	16:22 14:49-15:47/58
12	05:26 21:03-21:21/18 20:33-20:52/19	06:12 20:30-20:39/9	07:03	07:54 17:21-17:58/37	07:50 08:51-09:06/15 15:14-16:01/47	08:35 09:09-09:27/18
	21:54 05:57-06:24/27	21:08	19:59	18:49	16:48 08:20-08:30/10	16:22 14:49-15:46/57
13	05:28 21:03-21:20/17 20:32-20:53/21	06:13 20:30-20:37/7	07:05	07:55 17:19-17:58/39	07:51 08:50-09:08/18 15:14-16:01/47	08:36 09:10-09:28/18
	21:53 05:58-06:24/26	21:06	19:57	18:47	16:47 08:22-08:30/8	16:22 14:50-15:46/56
14	05:29 21:03-21:19/16 20:31-20:54/23	06:15 20:32-20:36/4	07:06	07:57 17:18-17:59/41	07:53 08:48-09:10/22 15:13-16:01/48	08:37 09:11-09:29/18
	21:52 06:00-06:25/25	21:04	19:55	18:45	16:45 08:24-08:29/5	16:21 14:50-15:46/56
15	05:30 21:05-21:19/14 20:31-20:55/24	06:17	07:08	07:59 17:17-17:59/42	07:55 08:47-09:11/24 15:13-16:01/48	08:38 09:12-09:31/19
	21:51 06:01-06:25/24	21:02	19:52	18:43	16:44 08:26-08:28/2	16:22 14:50-15:46/56
16	05:31 21:05-21:18/13 20:30-20:56/26	06:18	07:10	08:01 17:16-18:00/44	07:57 08:46-09:12/26	08:39 09:13-09:32/19
	21:50 06:02-06:25/23	21:00	19:50	18:40	16:42 15:13-16:01/48	16:22 14:51-15:46/55
17	05:32 21:05-21:17/12 20:29-20:57/28	06:20	07:11	08:02 17:16-18:00/44	07:59 08:45-09:13/28	08:40 09:14-09:33/19
	21:49 06:03-06:25/22	20:58	19:48	18:38	16:41 15:13-16:02/49	16:22 14:51-15:46/55
18	05:34 21:06-21:16/10 20:29-20:58/29	06:21	07:13	08:04 17:16-18:00/44	08:00 08:45-09:14/29	08:41 09:14-09:33/19
	21:48 06:04-06:25/21	20:56	19:45	18:36	16:40 15:13-16:02/49	16:22 14:51-15:46/55
19	05:35 21:06-21:15/9 20:28-21:01/33	06:23	07:15	08:06 17:14-18:00/46	08:02 08:44-09:15/31 14:58-15:06/8	08:41 09:15-09:34/19
	21:47 06:05-06:25/20	20:54	19:43	18:34	16:38 15:14-16:02/48	16:22 14:52-15:47/55
20	05:36 21:08-21:14/6 20:28-21:04/36	06:25	07:16	08:08 09:02-09:14/12	08:04 08:44-09:16/32 14:55-15:10/15	08:42 09:16-09:35/19
	21:46 06:07-06:26/19	20:52	19:40	18:32 17:14-18:00/46	16:37 15:14-16:03/49	16:23 14:52-15:46/54
21	05:38 21:08-21:13/5 20:27-21:05/38	06:26	07:18	08:10 08:59-09:17/18	08:06 08:44-09:16/32 14:53-15:12/19	08:43 09:16-09:35/19
	21:45 06:08-06:25/17	20:49	19:38	18:29 17:14-17:59/45	16:36 15:14-16:03/49	16:23 14:53-15:47/54
22	05:39 21:09-21:11/2 20:27-21:06/39	06:28	07:20	08:11 08:57-09:19/22	08:07 08:44-09:17/33 14:52-15:14/22	08:43 09:17-09:36/19
	21:43 06:09-06:25/16	20:47	19:36	18:27 17:14-17:58/44	16:35 15:15-16:02/47	16:24 14:53-15:47/54
23	05:40 21:09-21:10/1 20:26-21:06/40	06:30	07:21	08:13 08:56-09:21/25	08:09 08:45-09:18/33	08:44 09:17-09:36/19
	21:42 06:11-06:26/15	20:45	19:33	18:25 17:14-17:56/42	16:33 14:51-16:01/70	16:24 14:54-15:48/54
24	05:42 06:12-06:25/13	06:31	07:23	08:15 08:55-09:24/29	08:11 08:44-09:17/33	08:44 09:17-09:36/19
	21:40 20:26-21:07/41	20:43	19:31	18:23 17:15-17:54/39	16:32 14:49-15:59/70	16:25 14:54-15:49/55
25	05:43 06:13-06:24/11	06:33	07:25 08:07-08:17/10	07:17 07:54-08:26/32	08:12 08:44-09:18/34	08:45 09:18-09:37/19
	21:39 20:26-21:08/42	20:41	19:29	17:21 16:15-16:52/37	16:31 14:49-15:58/69	16:25 14:55-15:50/55
26	05:45 06:15-06:24/9	06:35	07:26 08:04-08:20/16	07:19 07:53-08:28/35	08:14 08:46-09:19/33	08:45 09:18-09:37/19
	21:38 20:25-21:06/41	20:39	19:26	17:19 16:15-16:50/35	16:30 14:48-15:57/69	16:26 14:55-15:50/55
27	05:46 06:16-06:23/7	06:36	07:28 08:01-08:21/20	07:20 07:52-08:29/37	08:15 08:48-09:19/31	08:45 09:18-09:37/19
	21:36 20:25-21:05/40	20:36	19:24	17:17 16:16-16:48/32	16:29 14:48-15:56/68	16:27 14:56-15:51/55
28	05:48 06:17-06:22/5	06:38	07:30 08:00-08:22/22	07:22 07:52-08:30/38	08:17 08:49-09:19/30	08:45 09:18-09:37/19
	21:35 20:25-21:03/38	20:34	19:22	17:15 16:17-16:46/29	16:28 14:47-15:54/67	16:28 14:56-15:52/56
29	05:49 06:19-06:22/3	06:40	07:31 07:59-08:23/24	07:24 07:52-08:31/39 15:32-15:43/11	08:19 08:51-09:20/29	08:45 09:18-09:36/18
	21:33 20:25-21:03/38	20:32	19:19	17:13 16:18-16:44/26	16:28 14:47-15:54/67	16:28 14:57-15:53/56
30	05:51 20:25-21:01/36	06:41	07:33 07:58-08:23/25	07:26 07:54-08:32/38 15:28-15:47/19	08:20 08:53-09:20/27	08:46 09:18-09:36/18
	21:31	20:30	19:17	17:11 16:18-16:42/24	16:27 14:47-15:53/66	16:29 14:57-15:54/57
31	05:52 20:25-21:00/35	06:43		07:28 07:56-08:32/36 15:25-15:49/24		08:46 09:18-09:36/18
	21:30	20:27		17:09 16:20-16:40/20		16:30 14:58-15:55/57
Potential sun hours	504	455	381	331	264	241
Sum of minutes with flicker	1689	282	117	1458	2458	2381

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

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F91 RHH9 Sligo
+353719161416
padraig / podowd@jodireland.com

Calculated:
11/06/2025 09:22/4.0.552

SHADOW - Calendar per WTG

Calculation: 6839 Garrane WF Real Case - V150 **WTG:** 8 - T08

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January	February	March	April	May	June
1	08:46 15:33-15:56/23 16:32 09:45-10:49/64	08:18 16:29-16:50/21 17:20	07:24 07:54-08:39/45 18:13 17:28-17:46/18	07:12 20:08	06:06 20:22-20:31/9 21:00	05:20 20:51-21:14/23 21:47
2	08:46 15:33-15:57/24 16:33 09:45-10:49/64	08:16 16:29-16:52/23 17:22	07:21 07:54-08:38/44 18:15 17:28-17:48/20	07:10 20:10	06:04 20:21-20:33/12 21:02	05:19 20:52-21:15/23 21:48
3	08:45 15:34-15:58/24 16:34 09:46-10:49/63	08:15 16:29-16:54/25 17:24	07:19 07:55-08:38/43 18:17 17:28-17:50/22	07:07 20:11	06:02 20:21-20:34/13 21:03	05:18 20:52-21:15/23 21:49
4	08:45 15:36-16:00/24 16:35 09:47-10:50/63	08:13 16:29-16:55/26 17:26	07:17 07:55-08:37/42 18:18 17:28-17:52/24	07:05 20:13	06:00 20:21-20:36/15 21:05	05:17 20:53-21:17/24 21:50
5	08:45 15:36-16:01/25 16:36 09:47-10:49/62	08:11 16:30-16:55/25 17:28	07:15 07:55-08:36/41 18:20 17:28-17:53/25	07:03 20:15	05:58 20:21-20:37/16 21:07	05:17 20:53-21:17/24 21:51
6	08:45 15:38-16:03/25 16:38 09:48-10:50/62	08:10 16:58-17:00/2 17:30 16:31-16:55/24	07:12 07:56-08:35/39 18:22 17:29-17:52/23	07:00 20:17	05:56 20:22-20:39/17 21:08	05:16 20:54-21:19/25 21:52
7	08:44 15:39-16:04/25 16:39 09:48-10:50/62	08:08 16:57-17:02/5 17:32 16:32-16:54/22	07:10 07:57-08:34/37 18:24 17:29-17:50/21	06:58 20:18	05:55 20:23-20:40/17 21:10	05:15 20:54-21:19/25 21:53
8	08:44 15:39-16:05/26 16:40 09:49-10:50/61	08:06 16:56-17:04/8 17:34 16:33-16:53/20	07:08 07:57-08:32/35 18:26 17:31-17:49/18	06:56 20:20	05:53 20:23-20:40/17 21:12	05:15 20:55-21:20/25 21:54
9	08:43 15:41-16:07/26 16:42 09:49-10:50/61	08:04 16:55-17:06/11 17:35 16:35-16:52/17	07:06 07:59-08:30/31 18:27 17:33-17:47/14	06:53 20:22	05:51 20:25-20:39/14 21:13	05:14 20:56-21:21/25 21:55
10	08:43 15:42-16:08/26 16:43 09:50-10:50/60	08:02 16:54-17:08/14 17:37 16:37-16:50/13	07:03 08:01-08:29/28 18:29 17:35-17:43/8	06:51 20:24	05:49 20:26-20:37/11 21:15	05:14 20:57-21:22/25 21:56
11	08:42 15:44-16:10/26 16:44 09:50-10:49/59	08:01 16:54-17:10/16 17:39 16:41-16:46/5	07:01 08:02-08:25/23 18:31	06:49 20:25	05:48 20:29-20:35/6 21:17	05:13 20:57-21:23/26 21:56
12	08:41 15:45-16:11/26 16:46 09:51-10:49/58	07:59 08:24-08:26/2 17:41 16:54-17:12/18	06:59 08:05-08:22/17 18:33	06:47 20:27	05:46 21:18	05:13 20:58-21:23/25 21:57
13	08:41 15:46-16:13/27 16:47 09:52-10:50/58	07:57 08:22-08:29/7 17:43 16:54-17:15/21	06:56 08:11-08:17/6 18:35	06:44 19:59-20:01/2 20:29	05:44 21:20	05:13 20:58-21:23/25 21:58
14	08:40 15:49-16:15/26 16:49 09:53-10:49/56	07:55 08:20-08:31/11 17:45 16:54-17:17/23	06:54 18:36	06:42 19:58-20:03/5 20:31	05:43 21:22	05:13 20:59-21:24/25 21:58
15	08:39 15:51-16:17/26 16:50 09:54-10:49/55	07:53 08:18-08:33/15 17:47 16:54-17:19/25	06:52 18:38	06:40 19:57-20:05/8 20:32	05:41 20:52-20:53/1 21:23	05:12 21:00-21:25/25 21:59
16	08:38 15:51-16:18/27 16:52 09:55-10:48/53	07:51 08:16-08:35/19 17:49 16:54-17:21/27	06:49 18:40	06:38 19:57-20:07/10 20:34	05:39 20:51-20:54/3 21:25	05:12 21:00-21:25/25 21:59
17	08:37 15:53-16:20/27 16:54 09:55-10:47/52	07:49 08:14-08:36/22 17:51 16:55-17:23/28	06:47 18:42	06:35 19:56-20:09/13 20:36	05:38 20:50-20:55/5 21:26	05:12 21:01-21:26/25 22:00
18	08:36 15:54-16:22/28 16:55 09:56-10:46/50	07:47 08:12-08:37/25 17:52 16:56-17:24/28	06:45 18:44	06:33 19:56-20:10/14 20:38	05:36 20:49-20:56/7 21:28	05:12 21:01-21:26/25 22:00
19	08:35 15:56-16:24/28 16:57 09:57-10:45/48	07:45 08:09-08:37/28 17:54 16:56-17:22/26	06:42 18:45	06:31 19:56-20:12/16 20:39	05:35 20:49-20:58/9 21:29	05:12 21:02-21:26/24 22:01
20	08:34 15:58-16:26/28 16:59 09:58-10:44/46	07:43 08:07-08:38/31 17:56 16:57-17:22/25	06:40 18:47	06:29 19:55-20:13/18 20:41	05:34 20:49-20:59/10 21:31	05:12 21:02-21:26/24 22:01
21	08:33 16:00-16:27/27 17:00 09:59-10:42/43	07:41 08:05-08:39/34 17:58 16:58-17:21/23	06:38 18:49	06:27 19:55-20:15/20 20:43	05:32 20:49-21:01/12 21:32	05:12 21:02-21:26/24 22:01
22	08:32 16:04-16:27/23 17:02 10:00-10:40/40	07:39 08:03-08:39/36 18:00 17:00-17:20/20	06:35 18:51	06:24 19:56-20:16/20 20:44	05:31 20:48-21:01/13 21:34	05:13 21:03-21:27/24 22:01
23	08:31 16:06-16:27/21 16:30-16:32/2 17:04 10:02-10:37/35	07:37 08:01-08:40/39 17:02-17:18/16 18:02 17:34-17:35/1	06:33 18:52	06:22 19:57-20:18/21 20:46	05:30 20:49-21:03/14 21:35	05:13 21:03-21:27/24 22:02
24	08:29 16:08-16:26/18 16:29-16:33/4 17:06 10:03-10:35/32	07:34 07:59-08:40/41 17:05-17:15/10 18:04 17:32-17:36/4	06:31 18:54	06:20 19:57-20:20/23 20:48	05:28 20:49-21:04/15 21:37	05:13 21:03-21:27/24 22:02
25	08:28 16:10-16:26/16 16:29-16:36/7 17:07 10:05-10:34/29	07:32 07:56-08:39/43 18:06 17:31-17:38/7	06:28 18:56	06:18 19:59-20:21/22 20:50	05:27 20:49-21:06/17 21:38	05:14 21:03-21:28/25 22:02
26	08:27 16:11-16:24/13 16:28-16:37/9 17:09 10:07-10:32/25	07:30 07:54-08:40/46 18:07 17:30-17:40/10	06:26 18:58	06:16 20:01-20:19/18 20:51	05:26 20:49-21:07/18 21:39	05:14 21:03-21:27/24 22:02
27	08:25 16:14-16:23/9 16:28-16:40/12 17:11 10:10-10:30/20	07:28 07:54-08:40/46 18:09 17:29-17:43/14	06:24 18:59	06:14 20:11-20:16/5 20:53	05:25 20:49-21:08/19 21:41	05:14 21:03-21:28/25 22:02
28	08:24 10:13-10:27/14 17:13 16:28-16:41/13	07:26 07:54-08:40/46 18:11 17:29-17:45/16	06:21 19:01	06:12 20:23-20:26/3 20:55	05:24 20:50-21:09/19 21:42	05:15 21:02-21:27/25 22:02
29	08:22 16:28-16:44/16 17:15		07:19 20:03	06:10 20:22-20:27/5 20:57	05:23 20:50-21:10/20 21:43	05:15 21:03-21:28/25 22:01
30	08:21 16:28-16:46/18 17:17		07:17 20:05	06:08 20:22-20:30/8 20:58	05:22 20:50-21:11/21 21:44	05:16 21:02-21:27/25 22:01
31	08:19 16:28-16:47/19 17:18		07:14 20:06		05:21 20:51-21:13/22 21:46	
Potential sun hours	257	277	367	417	487	501
Sum of minutes with flicker	2139	1110	624	231	372	736

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

Licensed user:
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padraig / podowd@jodireland.com
Calculated:
11/06/2025 09:22/4.0.552

SHADOW - Calendar per WTG

Calculation: 6839 Garrane WF Real Case - V150 **WTG:** 8 - T08

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	July	August	September	October	November	December
1	05:17 21:02-21:27/25 22:01	05:54 21:28	06:45 20:25	07:35 08:46-08:59/13 19:15	07:30 16:24-16:38/14 17:07 16:06-16:20/14	08:22 15:26-15:52/26 16:26 09:32-10:31/59
2	05:17 21:01-21:27/26 22:01	05:56 20:37-20:46/9 21:26	06:46 20:23	07:36 08:42-09:03/21 19:12	07:31 16:25-16:36/11 17:05 16:04-16:22/18	08:23 15:25-15:51/26 16:25 09:33-10:33/60
3	05:18 21:01-21:26/25 22:00	05:57 20:36-20:48/12 21:25	06:48 20:20	07:38 08:40-09:06/26 19:10	07:33 16:25-16:34/9 17:04 16:03-16:23/20	08:24 15:24-15:50/26 16:25 09:33-10:33/60
4	05:19 21:01-21:26/25 22:00	05:59 20:34-20:49/15 21:23	06:50 20:18	07:40 08:37-09:07/30 19:08 18:11-18:23/12	07:35 16:26-16:32/6 17:02 16:02-16:24/22	08:26 15:25-15:50/25 16:24 09:33-10:34/61
5	05:20 21:01-21:26/25 21:59	06:00 20:33-20:50/17 21:21	06:51 20:16	07:42 08:35-09:08/33 19:05 18:09-18:25/16	07:37 16:28-16:30/2 17:00 16:01-16:25/24	08:27 15:24-15:49/25 16:24 09:33-10:35/62
6	05:21 21:01-21:25/24 21:59	06:02 20:32-20:49/17 21:19	06:53 20:14	07:43 08:34-09:09/35 19:03 18:07-18:27/20	07:39 16:00-16:26/26 16:58	08:28 15:24-15:49/25 16:23 09:34-10:36/62
7	05:21 21:00-21:24/24 21:58	06:03 20:32-20:48/16 21:18	06:55 20:11	07:45 08:33-09:11/38 19:01 18:06-18:28/22	07:41 16:00-16:26/26 16:57	08:30 15:24-15:48/24 16:23 09:34-10:36/62
8	05:22 21:00-21:24/24 21:57	06:05 20:31-20:46/15 21:16	06:56 20:09	07:47 08:31-09:10/39 18:58 18:04-18:28/24	07:42 16:00-16:24/24 16:55	08:31 15:23-15:47/24 16:22 09:34-10:37/63
9	05:23 20:59-21:23/24 21:57	06:07 20:31-20:44/13 21:14	06:58 20:07	07:49 08:30-09:11/41 18:56 18:03-18:28/25	07:44 15:59-16:22/23 16:53	08:32 15:23-15:47/24 16:22 09:35-10:38/63
10	05:24 20:59-21:22/23 21:56	06:08 20:31-20:43/12 21:12	07:00 20:04	07:50 08:29-09:12/43 18:54 18:02-18:26/24	07:46 15:59-16:21/22 16:51	08:33 15:23-15:47/24 16:22 09:35-10:39/64
11	05:25 20:59-21:22/23 21:55	06:10 20:30-20:41/11 21:10	07:01 20:02	07:52 08:29-09:12/43 18:51 18:02-18:24/22	07:48 16:00-16:19/19 16:50	08:34 15:23-15:47/24 16:22 09:35-10:39/64
12	05:27 20:59-21:21/22 21:54	06:12 20:30-20:39/9 21:08	07:03 19:59	07:54 08:28-09:13/45 18:49 18:02-18:21/19	07:50 16:00-16:17/17 16:48	08:35 15:22-15:46/24 16:22 09:35-10:40/65
13	05:28 20:59-21:20/21 21:53	06:13 20:30-20:37/7 21:06	07:05 19:57	07:55 08:27-09:12/45 18:47 18:01-18:18/17	07:52 16:00-16:16/16 16:47	08:36 15:22-15:46/24 16:22 09:36-10:40/64
14	05:29 20:58-21:19/21 21:52	06:15 20:31-20:36/5 21:04	07:06 19:55	07:57 08:27-09:12/45 18:45 18:01-18:16/15	07:53 09:45-10:00/15 16:45 16:00-16:13/13	08:37 15:22-15:46/24 16:22 09:36-10:41/65
15	05:30 20:59-21:19/20 21:51	06:17 20:31-20:33/2 21:02	07:08 19:52	07:59 08:26-09:12/46 18:43 18:02-18:14/12	07:55 15:46-15:55/9 16:00-16:12/12 16:44 09:42-10:04/22	08:38 15:22-15:46/24 16:22 09:37-10:41/64
16	05:31 20:59-21:18/19 21:50	06:18 20:18-20:25/7 21:00 20:11-20:16/5	07:10 19:50	08:01 08:27-09:12/45 18:40 18:02-18:12/10	07:57 15:44-15:57/13 16:01-16:10/9 16:42 09:40-10:05/25	08:39 15:22-15:46/24 16:22 09:37-10:42/65
17	05:32 20:59-21:17/18 21:49	06:20 20:07-20:26/19 20:58	07:11 19:48	08:03 08:29-09:12/43 18:38 18:03-18:10/7	07:59 15:43-15:59/16 16:02-16:09/7 16:41 09:38-10:07/29	08:40 15:22-15:46/24 16:22 09:38-10:43/65
18	05:34 20:59-21:16/17 21:48	06:22 20:05-20:28/23 20:56	07:13 19:45	08:04 08:31-09:11/40 17:35-17:47/12 18:36 18:04-18:08/4	08:00 15:42-16:00/18 16:03-16:07/4 16:40 09:37-10:09/32	08:41 15:22-15:46/24 16:22 09:38-10:43/65
19	05:35 20:58-21:15/17 21:47	06:23 20:03-20:25/22 20:54	07:15 19:43	08:06 08:33-09:11/38 18:34 17:31-17:49/18	08:02 15:40-16:01/21 16:04-16:06/2 16:38 09:36-10:11/35	08:42 15:22-15:47/25 16:22 09:38-10:43/65
20	05:36 20:59-21:14/15 21:46	06:25 20:02-20:23/21 20:52	07:16 19:41	08:08 08:34-09:09/35 18:32 17:30-17:50/20	08:04 15:39-16:02/23 16:37 09:35-10:15/40	08:42 15:23-15:47/24 16:23 09:39-10:44/65
21	05:38 20:59-21:13/14 21:45	06:26 20:02-20:22/20 20:49	07:18 19:38	08:10 08:36-09:09/33 18:30 17:28-17:51/23	08:06 15:36-16:03/27 16:36 09:35-10:18/43	08:43 15:23-15:47/24 16:23 09:39-10:44/65
22	05:39 20:59-21:11/12 21:43	06:28 20:00-20:19/19 20:47	07:20 19:36	08:11 08:38-09:08/30 18:27 17:27-17:52/25	08:07 15:34-16:02/28 16:35 09:34-10:20/46	08:43 15:24-15:48/24 16:24 09:40-10:45/65
23	05:41 20:59-21:10/11 21:42	06:30 20:00-20:17/17 20:45	07:21 19:33	08:13 08:40-09:07/27 18:25 17:26-17:53/27	08:09 15:33-16:01/28 16:33 09:34-10:22/48	08:44 15:24-15:48/24 16:24 09:40-10:45/65
24	05:42 21:00-21:09/9 21:41	06:31 19:59-20:15/16 20:43	07:23 19:31	08:15 08:42-09:06/24 18:23 17:25-17:54/29	08:11 15:31-15:59/28 16:32 09:33-10:23/50	08:44 15:24-15:48/24 16:25 09:40-10:45/65
25	05:43 21:00-21:08/8 21:39	06:33 19:59-20:13/14 20:41	07:25 19:29	08:17 07:44-08:05/21 17:21 16:24-16:52/28	08:12 15:31-15:58/27 16:31 09:33-10:25/52	08:45 15:25-15:50/25 16:25 09:42-10:46/64
26	05:45 21:00-21:06/6 21:38	06:35 19:59-20:11/12 20:39	07:26 19:26	07:19 07:46-08:04/18 17:19 16:24-16:50/26	08:14 15:31-15:57/26 16:30 09:33-10:26/53	08:45 15:26-15:50/24 16:26 09:42-10:47/65
27	05:46 21:01-21:05/4 21:36	06:36 19:59-20:09/10 20:36	07:28 19:24	07:20 07:48-08:02/14 17:17 16:24-16:48/24	08:15 15:30-15:56/26 16:29 09:33-10:28/55	08:45 15:26-15:51/25 16:27 09:42-10:47/65
28	05:48 21:01-21:03/2 21:35	06:38 19:59-20:07/8 20:34	07:30 19:22	07:22 07:50-08:00/10 17:15 16:23-16:46/23	08:17 15:28-15:54/26 16:29 09:32-10:28/56	08:45 15:27-15:52/25 16:28 09:43-10:47/64
29	05:49 21:33	06:40 19:59-20:04/5 20:32	07:31 19:19	07:24 07:52-07:58/6 17:13 16:23-16:44/21	08:19 15:27-15:54/27 16:28 09:33-10:30/57	08:46 15:28-15:53/25 16:28 09:43-10:48/65
30	05:51 21:31	06:41 20:00-20:02/2 20:30	07:33 19:17	07:26 07:54-07:55/1 17:11 16:23-16:42/19	08:20 15:27-15:53/26 16:27 09:33-10:31/58	08:46 15:29-15:54/25 16:29 09:44-10:48/64
31	05:52 21:30	06:43 20:27		07:28 16:24-16:40/16 17:09 16:09-16:17/8		08:46 15:31-15:55/24 16:30 09:44-10:48/64
Potential sun hours	504	455	381	331	264	241
Sum of minutes with flicker	504	380	0	1496	1445	2733

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

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padraig / podowd@jodireland.com
Calculated:
11/06/2025 09:22/4.0.552

SHADOW - Calendar per WTG

Calculation: 6839 Garrane WF Real Case - V150 **WTG:** 9 - T09

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January	February	March	April	May	June
1	08:46 15:17-15:56/39	08:18 16:09-16:37/28 16:46-16:50/4	07:24 07:59-08:56/57	07:12 07:37-08:11/34	06:06	05:20 21:09-21:14/5
	16:32 09:18-09:50/32	17:20 09:16-10:01/45	18:13 17:11-17:46/35	20:08 18:59-19:15/16	21:00	21:47 20:44-21:05/21
2	08:46 15:17-15:57/40	08:16 16:11-16:36/25 16:44-16:52/8	07:21 08:00-08:55/55	07:09 07:36-08:10/34	06:04	05:19 21:09-21:15/6
	16:33 09:17-09:50/33	17:22 09:17-10:00/43	18:15 17:11-17:48/37	20:10 19:03-19:09/6	21:02	21:48 20:44-21:04/20
3	08:45 15:18-15:58/40	08:15 16:12-16:35/23 08:41-08:44/3	07:19 08:01-08:54/53	07:07 07:37-08:09/32	06:02	05:18 21:08-21:15/7
	16:34 09:17-09:51/34	17:24 09:17-09:59/42 16:43-16:54/11	18:17 17:11-17:50/39	20:11	21:03	21:49 20:45-21:04/19
4	08:45 15:20-16:00/40	08:13 16:14-16:34/20 08:39-08:47/8	07:17 08:01-08:52/51	07:05 07:37-08:09/32	06:00	05:17 21:09-21:17/8
	16:35 09:17-09:52/35	17:26 09:18-09:58/40 16:42-16:56/14	18:18 17:10-17:52/42	20:13	21:05	21:50 20:46-21:04/18
5	08:45 15:20-16:01/41	08:11 16:16-16:32/16 08:37-08:49/12	07:15 08:01-08:49/48	07:03 07:38-08:08/30	05:58	05:17 21:08-21:17/9
	16:36 09:16-09:52/36	17:28 09:19-09:57/38 16:41-16:57/16	18:20 17:11-17:53/42	20:15	21:07	21:51 20:47-21:03/16
6	08:45 15:22-16:03/41	08:10 16:19-16:30/11 08:36-08:52/16	07:12 08:02-08:47/45	07:00 07:38-08:05/27	05:56	05:16 21:09-21:19/10
	16:37 09:16-09:53/37	17:30 09:21-09:57/36 16:41-17:00/19	18:22 17:11-17:53/42	20:17	21:08	21:52 20:48-21:03/15
7	08:44 15:23-16:04/41	08:08 09:23-09:55/32 16:40-17:02/22	07:10 08:03-08:44/41	06:58 07:40-08:04/24	05:55	05:15 21:09-21:19/10
	16:39 09:15-09:54/39	17:32 08:34-08:54/20	18:24 17:11-17:52/41	20:18	21:10	21:53 20:48-21:02/14
8	08:44 15:25-16:05/40	08:06 09:24-09:53/29 16:39-17:04/25	07:08 08:04-08:40/36	06:56 07:41-08:02/21	05:53	05:15 21:09-21:20/11
	16:40 09:15-09:55/40	17:34 08:32-08:55/23	18:26 17:12-17:51/39	20:20	21:12	21:54 20:50-21:02/12
9	08:43 15:26-16:07/41	08:04 09:26-09:51/25 16:39-17:06/27	07:06 08:05-08:38/33	06:53 07:43-07:58/15	05:51	05:14 21:09-21:21/12
	16:41 09:14-09:55/41	17:35 08:30-08:56/26	18:27 17:13-17:51/38	20:22	21:13	21:55 20:50-21:01/11
10	08:43 15:28-16:08/40	08:02 09:29-09:48/19 16:39-17:08/29	07:03 08:07-08:36/29	06:51 07:47-07:54/7	05:49 20:42-20:45/3	05:14 21:09-21:22/13
	16:43 09:13-09:56/43	17:37 08:28-08:57/29	18:29 17:13-17:49/36	20:24	21:15	21:56 20:52-21:00/8
11	08:42 15:30-16:10/40	08:01 09:34-09:43/9 16:38-17:10/32	07:01 08:09-08:33/24	06:49	05:48 20:42-20:47/5	05:13 21:10-21:23/13
	16:44 09:12-09:56/44	17:39 08:26-08:58/32	18:31 17:15-17:48/33	20:25	21:17	21:56 20:53-21:00/7
12	08:41 15:31-16:11/40	07:59 08:24-08:59/35	06:59 08:12-08:29/17 17:16-17:47/31	06:46	05:46 20:41-20:48/7	05:13 21:09-21:23/14
	16:46 09:11-09:57/46	17:41 16:38-17:12/34	18:33 18:04-18:07/3	20:27	21:18	21:57 20:54-20:57/3
13	08:41 15:33-16:13/40	07:57 08:22-08:59/37	06:56 08:20-08:22/2 17:17-17:45/28	06:44	05:44 20:40-20:49/9	05:13 21:09-21:23/14
	16:47 09:11-09:58/47	17:43 16:38-17:15/37	18:35 18:01-18:08/7	20:29	21:20	21:58
14	08:40 15:35-16:15/40	07:55 08:20-09:00/40	06:54 17:59-18:10/11	06:42	05:43 20:40-20:51/11	05:13 21:10-21:24/14
	16:49 09:10-09:59/49	17:45 16:38-17:16/38	18:36 17:19-17:43/24	20:31	21:22	21:58
15	08:39 15:36-16:17/41	07:53 08:18-09:01/43	06:52 17:58-18:13/15	06:40	05:41 20:40-20:53/13	05:12 21:10-21:25/15
	16:50 09:09-09:59/50	17:47 16:39-17:16/37	18:38 17:21-17:41/20	20:32	21:23	21:59
16	08:38 15:36-16:18/42	07:51 08:16-09:01/45	06:49 17:56-18:14/18	06:38	05:39 20:39-20:54/15	05:12 21:10-21:25/15
	16:52 09:09-10:00/51	17:49 16:39-17:16/37	18:40 17:23-17:37/14	20:34	21:25	21:59
17	08:37 15:38-16:20/42	07:49 08:14-09:02/48	06:47 17:55-18:16/21	06:35	05:38 20:40-20:55/15	05:12 21:11-21:26/15
	16:54 09:09-09:59/50	17:51 16:39-17:16/37	18:42	20:36	21:26	22:00
18	08:36 15:39-16:22/43	07:47 08:12-09:02/50 16:40-17:15/35	06:45 17:55-18:18/23	06:33	05:36 20:39-20:56/17	05:12 21:11-21:26/15
	16:55 09:09-10:00/51	17:52 17:24-17:25/1	18:44	20:38	21:28	22:00
19	08:35 15:41-16:24/43	07:45 08:09-09:01/52 16:40-17:14/34	06:42 17:53-18:19/26	06:31	05:35 20:39-20:58/19	05:12 21:11-21:26/15
	16:57 09:09-10:01/52	17:54 17:21-17:26/5	18:45	20:39	21:29	22:01
20	08:34 15:43-16:26/43	07:43 08:07-09:01/54 16:41-17:13/32	06:40 07:03-07:07/4	06:29	05:34 20:39-20:59/20	05:12 21:11-21:26/15
	16:59 09:10-10:01/51	17:56 17:19-17:28/9	18:47 17:53-18:21/28	20:41	21:31	22:01
21	08:33 15:44-16:27/43	07:41 08:05-09:01/56 16:42-17:12/30	06:38 07:01-07:09/8	06:27	05:32 20:40-21:01/21	05:12 21:11-21:26/15
	17:00 09:10-10:01/51	17:58 17:17-17:31/14	18:49 17:53-18:23/30	20:43	21:32	22:01
22	08:32 15:46-16:29/43	07:39 08:03-09:01/58 16:43-17:11/28	06:35 06:58-07:10/12	06:24	05:31 20:39-21:02/23	05:13 21:12-21:27/15
	17:02 09:10-10:01/51	18:00 17:16-17:33/17	18:51 17:52-18:25/33	20:44	21:34	22:01
23	08:31 15:48-16:32/44	07:37 08:01-09:01/60 16:45-17:10/25	06:33 06:56-07:11/15	06:22	05:30 20:39-21:03/24	05:13 21:12-21:27/15
	17:04 09:11-10:02/51	18:02 17:15-17:35/20	18:52 17:52-18:27/35	20:46	21:35	22:02
24	08:29 15:50-16:33/43	07:34 08:00-09:01/61 16:47-17:08/21	06:31 06:54-07:12/18	06:20	05:28 20:40-21:04/24	05:13 21:12-21:27/15
	17:06 09:11-10:02/51	18:04 17:14-17:37/23	18:54 17:51-18:26/35	20:48	21:37	22:02
25	08:28 15:52-16:36/44	07:32 07:59-08:59/60 16:48-17:04/16	06:28 06:51-07:12/21	06:18	05:27 20:40-21:06/26	05:13 21:13-21:28/15
	17:07 09:12-10:02/50	18:06 17:13-17:38/25	18:56 17:52-18:26/34	20:50	21:38	22:02
26	08:27 15:52-16:37/45	07:30 08:00-08:59/59 16:53-17:00/7	06:26 06:49-07:13/24	06:16	05:26 20:41-21:06/25	05:14 21:12-21:27/15
	17:09 09:12-10:02/50	18:07 17:12-17:40/28	18:58 17:52-18:25/33	20:51	21:39	22:02
27	08:25 15:54-16:39/45	07:28 08:00-08:58/58	06:24 06:47-07:13/26	06:14	05:25 20:41-21:06/25	05:14 21:13-21:28/15
	17:11 09:13-10:02/49	18:09 17:12-17:43/31	18:59 17:52-18:23/31	20:53	21:41	22:02
28	08:24 15:56-16:38/42	07:26 08:00-08:58/58	06:21 06:44-07:13/29	06:12	05:24 20:41-21:06/25	05:15 21:13-21:27/14
	17:13 09:13-10:02/49	18:11 17:12-17:45/33	19:01 17:53-18:22/29	20:55	21:42	22:02
29	08:22 15:58-16:38/40		07:19 07:42-08:13/31	06:10	05:23 21:09-21:10/1	05:15 21:14-21:28/14
	17:15 09:14-10:02/48		20:03 18:54-19:21/27	20:57	21:43 20:42-21:05/23	22:01
30	08:21 16:01-16:38/37		07:16 07:39-08:12/33	06:08	05:22 21:09-21:11/2	05:16 21:13-21:27/14
	17:17 09:14-10:01/47		20:05 18:55-19:19/24	20:58	21:44 20:42-21:05/23	22:01
31	08:19 16:06-16:37/31		07:14 07:37-08:12/35		05:21 21:09-21:13/4	
	17:18 09:15-10:01/46		20:06 18:57-19:17/20		21:46 20:44-21:06/22	
Potential sun hours	257	277	367	417	487	501
Sum of minutes with flicker	2678	2385	1771	278	402	547

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

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+353719161416
padraig / podowd@jodireland.com
Calculated:
11/06/2025 09:22/4.0.552

SHADOW - Calendar per WTG

Calculation: 6839 Garrane WF Real Case - V150 **WTG:** 9 - T09

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	July	August	September	October	November	December
1	05:17 21:14-21:27/13	05:54 20:52-20:58/6	06:45	07:35 08:53-09:06/13 17:56-18:26/30	07:30 08:58-09:18/20 16:08-16:38/30	08:22 15:12-15:52/40
	22:01 20:58-21:03/5	21:28	20:25	19:15 18:42-18:47/5	17:07 07:58-08:26/28	16:26 08:54-09:38/44
2	05:17 21:13-21:26/13	05:55 20:52-20:56/4	06:46 07:46-07:53/7	07:36 08:49-09:10/21	07:31 08:56-09:21/25 16:09-16:36/27	08:23 15:11-15:51/40
	22:01 20:56-21:04/8	21:26	20:23	19:12 17:54-18:27/33	17:05 08:00-08:25/25	16:25 08:56-09:39/43
3	05:18 21:14-21:26/12	05:57 20:53-20:55/2	06:48 07:41-07:56/15	07:38 08:46-09:13/27	07:33 08:54-09:23/29 16:09-16:34/25	08:24 15:09-15:50/41
	22:00 20:56-21:05/9	21:25	20:20	19:10 17:53-18:28/35	17:04 08:02-08:24/22	16:25 08:57-09:38/41
4	05:19 21:14-21:26/12	05:59	06:50 07:38-07:59/21	07:40 08:43-09:14/31	07:35 08:52-09:25/33 16:10-16:32/22	08:26 15:09-15:50/41
	22:00 20:55-21:07/12	21:23	20:18	19:08 17:51-18:27/36	17:02 08:04-08:23/19	16:24 08:59-09:39/40
5	05:20 21:15-21:26/11	06:00	06:51 07:36-08:00/24	07:42 08:42-09:16/34	07:37 15:48-16:00/12 08:06-08:22/16	08:27 15:08-15:49/41
	21:59 20:55-21:08/13	21:21	20:16	19:05 17:49-18:28/39	17:00 08:51-09:26/35 16:11-16:30/19	16:24 09:00-09:39/39
6	05:20 21:15-21:25/10	06:02	06:53 07:34-08:01/27	07:43 08:40-09:19/39	07:39 15:46-16:03/17 08:08-08:20/12	08:28 15:08-15:49/41
	21:59 20:55-21:09/14	21:19	20:14	19:03 17:48-18:28/40	16:58 08:50-09:28/38 16:12-16:28/16	16:23 09:02-09:40/38
7	05:21 21:15-21:24/9	06:03	06:55 07:33-08:03/30	07:45 08:39-09:22/43	07:41 15:44-16:05/21 08:10-08:18/8	08:30 15:07-15:48/41
	21:58 20:53-21:09/16	21:18	20:11	19:01 17:48-18:29/41	16:56 08:49-09:29/40 16:13-16:26/13	16:23 09:03-09:39/36
8	05:22 21:15-21:24/9	06:05	06:56 07:31-08:03/32	07:47 08:37-09:23/46	07:42 15:43-16:06/23 08:12-08:15/3	08:31 15:07-15:47/40
	21:57 20:53-21:10/17	21:16	20:09	18:58 17:46-18:28/42	16:55 08:48-09:30/42 16:14-16:24/10	16:22 09:04-09:39/35
9	05:23 21:16-21:23/7	06:07	06:58 07:31-08:03/32	07:48 08:36-09:25/49	07:44 15:41-16:07/26 16:15-16:22/7	08:32 15:08-15:47/39
	21:57 20:52-21:11/19	21:14	20:07	18:56 17:46-18:28/42	16:53 08:47-09:31/44	16:22 09:06-09:40/34
10	05:24 21:16-21:22/6	06:08	07:00 07:29-08:03/34	07:50 08:35-09:27/52	07:46 15:40-16:08/28 16:17-16:21/4	08:33 15:07-15:47/40
	21:56 20:52-21:11/19	21:12	20:04 18:58-19:00/2	18:54 17:45-18:26/41	16:51 08:47-09:32/45	16:22 09:07-09:40/33
11	05:25 21:16-21:22/6	06:10	07:01 07:29-08:04/35	07:52 08:34-09:28/54	07:48 15:38-16:09/31	08:34 15:07-15:47/40
	21:55 20:52-21:12/20	21:10	20:02 18:52-19:06/14	18:51 17:45-18:24/39	16:50 08:46-09:33/47	16:22 09:08-09:40/32
12	05:26 21:17-21:21/4	06:12	07:03 07:29-08:04/35	07:54 08:34-09:29/55	07:50 15:32-16:10/38	08:35 15:06-15:46/40
	21:54 20:51-21:13/22	21:08	19:59 18:49-19:09/20	18:49 17:45-18:21/36	16:48 08:46-09:33/47	16:22 09:09-09:42/33
13	05:28 21:17-21:20/3	06:13	07:05 07:30-08:03/33	07:55 08:32-09:29/57	07:52 15:30-16:10/40	08:36 15:06-15:46/40
	21:53 20:51-21:13/22	21:06	19:57 18:46-19:10/24	18:47 17:44-18:18/34	16:47 08:46-09:34/48	16:22 09:10-09:43/33
14	05:29 21:18-21:19/1	06:15	07:06 07:32-08:03/31	07:57 08:32-09:30/58	07:53 15:28-16:11/43	08:37 15:07-15:46/39
	21:52 20:50-21:14/24	21:04	19:55 18:45-19:11/26	18:45 17:44-18:16/32	16:45 08:46-09:34/48	16:22 09:11-09:44/33
15	05:30 20:51-21:15/24	06:17	07:08 07:34-08:03/29	07:59 08:32-09:31/59	07:55 15:26-16:10/44	08:38 15:07-15:46/39
	21:51	21:02	19:52 18:43-19:12/29	18:43 17:44-18:14/30	16:44 08:46-09:35/49	16:22 09:12-09:45/33
16	05:31 20:51-21:15/24	06:18	07:10 07:35-08:02/27	08:01 08:32-09:31/59 17:23-17:34/11	07:57 15:25-16:10/45	08:39 15:07-15:46/39
	21:50	21:00	19:50 18:42-19:13/31	18:40 17:45-18:12/27	16:42 08:45-09:35/50	16:22 09:13-09:46/33
17	05:32 20:50-21:16/26	06:20	07:11 07:37-08:01/24	08:03 08:32-09:32/60 17:20-17:38/18	07:59 15:25-16:09/44	08:40 15:08-15:46/38
	21:49	20:58	19:48 18:41-19:13/32	18:38 17:45-18:10/25	16:41 08:45-09:35/50	16:22 09:14-09:47/33
18	05:34 20:50-21:16/26	06:21	07:13 07:38-08:00/22	08:04 08:32-09:32/60 17:17-17:40/23	08:00 15:24-16:07/43	08:41 15:07-15:46/39
	21:48	20:56	19:45 18:39-19:13/34	18:36 17:46-18:08/22	16:40 08:45-09:35/50	16:22 09:14-09:47/33
19	05:35 20:49-21:15/26	06:23	07:15 07:40-07:59/19	08:06 08:33-09:32/59 17:14-17:41/27	08:02 15:22-16:06/44	08:42 15:08-15:47/39
	21:47	20:54	19:43 18:39-19:13/34	18:34 17:46-18:05/19	16:38 08:45-09:36/51	16:22 09:15-09:48/33
20	05:36 20:50-21:14/24	06:25	07:16 07:42-07:58/16	08:08 08:34-09:32/58 17:13-17:42/29	08:04 15:21-16:04/43	08:42 15:09-15:47/38
	21:46	20:52	19:41 18:39-19:14/35	18:32 17:47-18:02/15	16:37 08:45-09:36/51	16:23 09:16-09:49/33
21	05:38 20:50-21:13/23	06:26	07:18 07:43-07:56/13	08:10 08:36-09:32/56 17:12-17:43/31	08:06 15:20-16:03/43	08:43 15:08-15:47/39
	21:45	20:49	19:38 18:37-19:11/34	18:29 17:48-18:00/12	16:36 08:46-09:37/51	16:23 09:16-09:49/33
22	05:39 20:49-21:11/22	06:28	07:20 07:45-07:54/9	08:11 08:38-09:32/54 17:11-17:44/33	08:07 15:19-16:02/43	08:43 15:09-15:48/39
	21:43	20:47	19:36 18:37-19:09/32	18:27 17:50-17:58/8	16:35 08:46-09:37/51	16:24 09:17-09:50/33
23	05:40 20:49-21:10/21	06:30	07:21 07:47-07:52/5	08:13 08:40-09:31/51 17:10-17:44/34	08:09 15:18-16:01/43	08:44 15:10-15:48/38
	21:42	20:45	19:33 18:37-19:07/30	18:25 17:52-17:56/4	16:33 08:46-09:38/52	16:24 09:17-09:50/33
24	05:42 20:50-21:09/19	06:31	07:23 07:48-07:49/1	08:15 08:42-09:31/49	08:11 15:16-15:59/43	08:44 15:10-15:48/38
	21:41	20:43	19:31 18:37-19:03/26	18:23 17:09-17:45/36	16:32 08:46-09:37/51	16:25 09:17-09:50/33
25	05:43 20:49-21:08/19	06:33	07:25 18:37-19:01/24	07:17 07:44-08:31/47	08:12 15:16-15:58/42	08:45 15:11-15:50/39
	21:39	20:41	19:29	17:21 16:09-16:45/36	16:31 08:47-09:37/50	16:25 09:18-09:51/33
26	05:45 20:49-21:06/17	06:35	07:26 18:38-18:59/21	07:19 07:46-08:31/45	08:14 15:15-15:57/42	08:45 15:11-15:50/39
	21:38	20:39	19:26	17:19 16:08-16:46/38	16:30 08:47-09:38/51	16:26 09:18-09:51/33
27	05:46 20:50-21:05/15	06:36	07:28 18:37-18:56/19	07:20 07:48-08:30/42	08:15 15:15-15:56/41	08:45 15:12-15:51/39
	21:36	20:36	19:24 18:07-18:17/10	17:17 16:08-16:46/38	16:29 08:48-09:38/50	16:27 09:18-09:51/33
28	05:48 20:50-21:03/13	06:38	07:30 18:38-18:54/16	07:22 07:50-08:29/39	08:17 15:14-15:54/40	08:45 15:12-15:52/40
	21:35	20:34	19:22 18:03-18:21/18	17:15 16:08-16:46/38	16:28 08:49-09:38/49	16:28 09:18-09:51/33
29	05:49 20:51-21:03/12	06:40	07:31 18:40-18:52/12	07:24 07:52-08:29/37	08:19 15:13-15:54/41	08:46 15:13-15:53/40
	21:33	20:32	19:19 18:00-18:23/23	17:13 16:08-16:44/36	16:28 08:51-09:38/47	16:28 09:18-09:51/33
30	05:51 20:51-21:01/10	06:41	07:33 18:40-18:49/9	07:26 07:54-08:28/34	08:20 15:13-15:53/40	08:46 15:14-15:54/40
	21:31	20:30	19:17 17:57-18:24/27	17:11 16:08-16:42/34	16:27 08:53-09:39/46	16:29 09:18-09:51/33
31	05:52 20:52-21:00/8	06:43		07:28 09:02-09:14/12 16:08-16:40/32		08:46 15:15-15:55/40
	21:30	20:27		17:09 07:56-08:27/31		16:30 09:18-09:51/33
Potential sun hours	504	455	381	331	264	241
Sum of minutes with flicker	665	12	1103	2612	2606	2301

Table layout: For each day in each month the following matrix apply

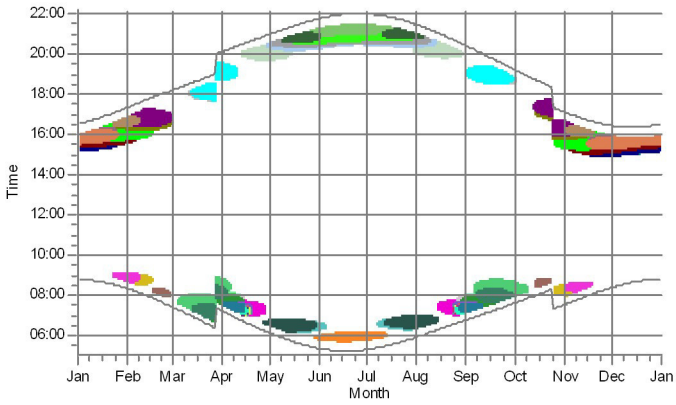
Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

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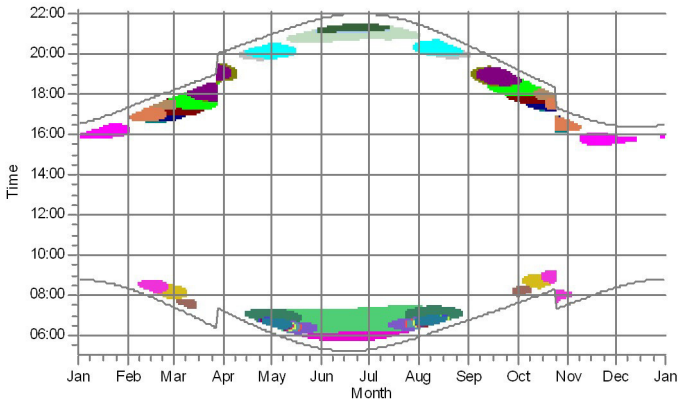
SHADOW - Calendar per WTG, graphical

Calculation: 6839 Garrane WF Real Case - V150

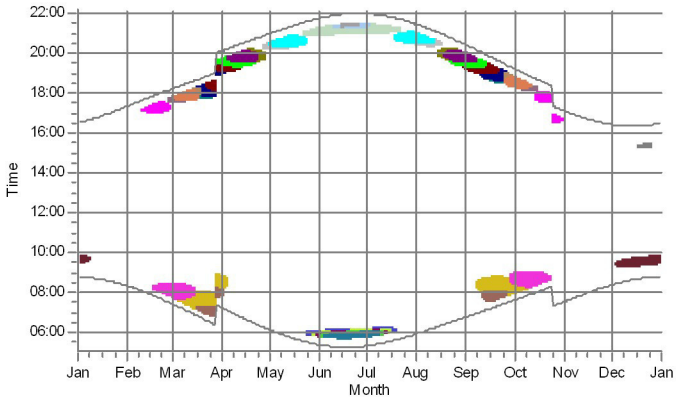
1: T01



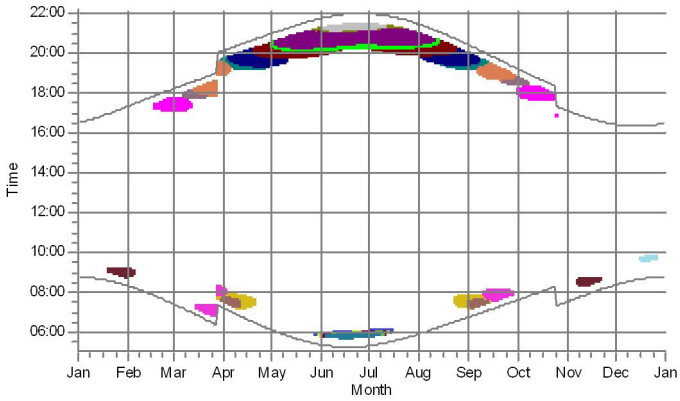
2: T02



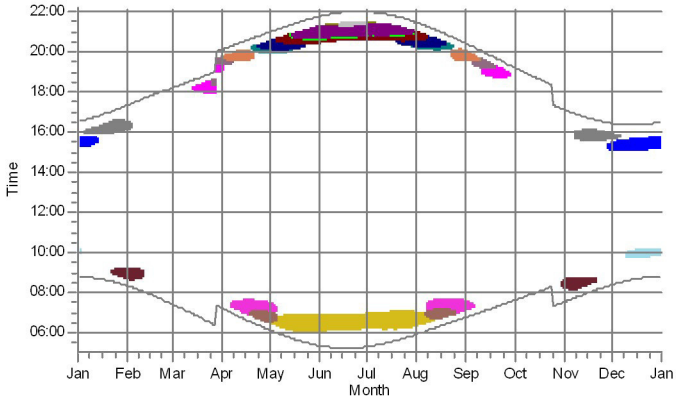
3: T03



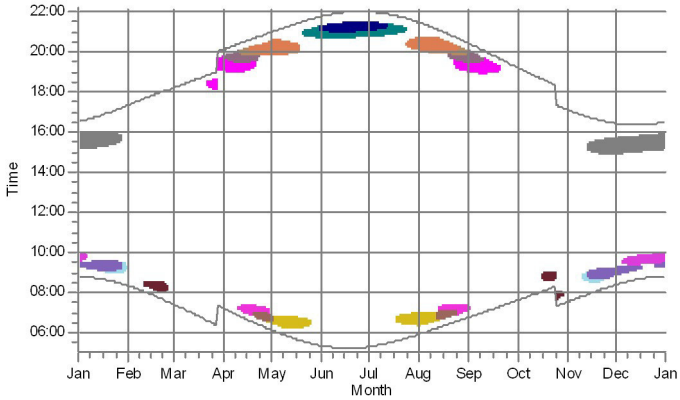
4: T04



5: T05



6: T06



Shadow receptors

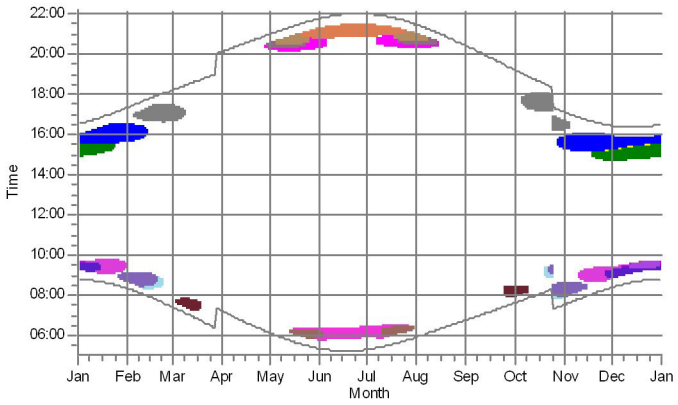
B: 2	H: 8	N: 14	W: 23	AC: 29	AI: 35	CR: 142	CX: 148	DD: 173	
C: 3	I: 9	O: 15	X: 24	AD: 30	BR: 83	CS: 143	CY: 149	DE: 174	
D: 4	J: 10	P: 16	Y: 25	AE: 31	BS: 84	CT: 144	CZ: 150	DF: 177	
E: 5	K: 11	Q: 17	Z: 26	AF: 32	BT: 85	CU: 145	DA: 170	DH: 179	
F: 6	L: 12	R: 18	AA: 27	AG: 33	BU: 86	CV: 146	DB: 171		
G: 7	M: 13	V: 22	AB: 28	AH: 34	CQ: 141	CW: 147	DC: 172		

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11/06/2025 09:22/4.0.552

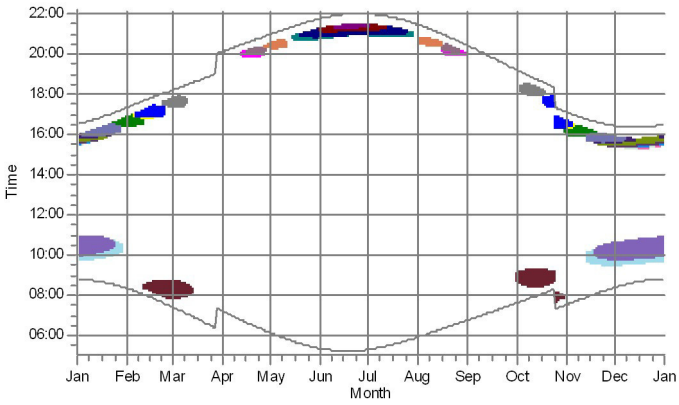
SHADOW - Calendar per WTG, graphical

Calculation: 6839 Garrane WF Real Case - V150

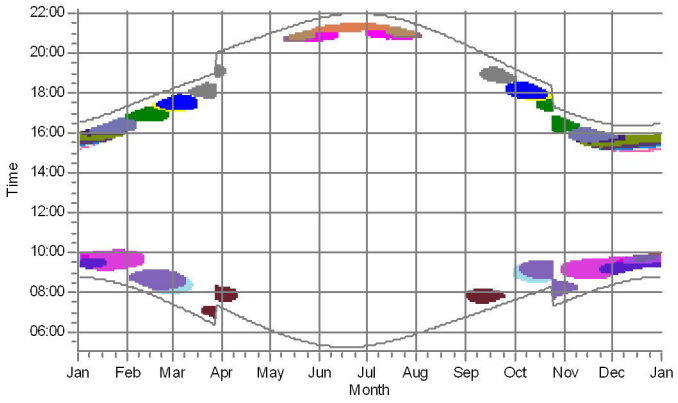
7: T07



8: T08



9: T09



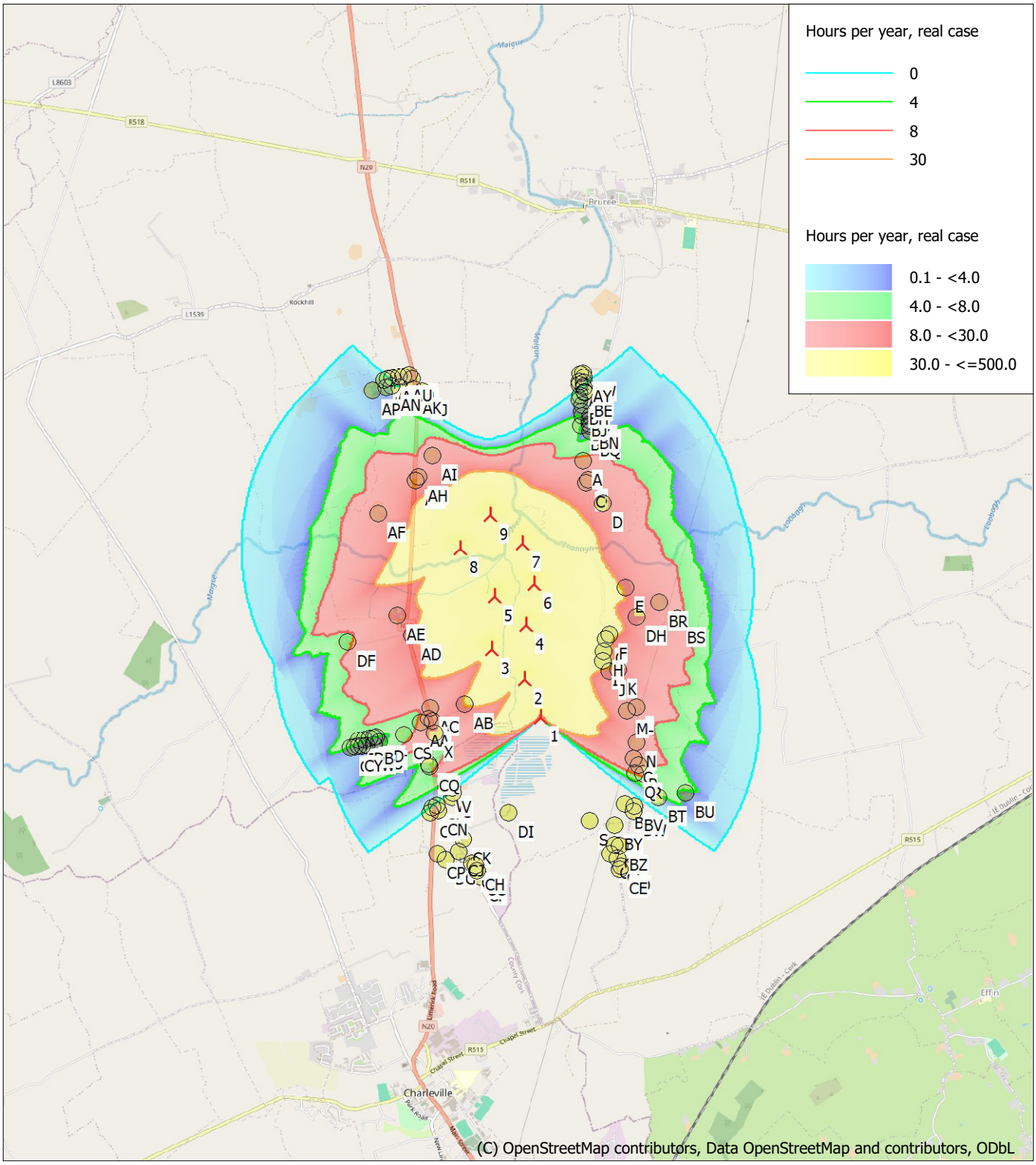
Shadow receptors

A: 1	E: 5	I: 9	AG: 33	AO: 41	BC: 68	BG: 72	BK: 76	BO: 80	BS: 84		
B: 2	F: 6	K: 11	AH: 34	AP: 42	BD: 69	BH: 73	BL: 77	BP: 81	DF: 177		
C: 3	G: 7	AE: 31	AI: 35	AQ: 46	BE: 70	BI: 74	BM: 78	BQ: 82	DH: 179		
D: 4	H: 8	AF: 32	AN: 40	AR: 47	BF: 71	BJ: 75	BN: 79	BR: 83			

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11/06/2025 09:22/4.0.552

SHADOW - Map

Calculation: 6839 Garrane WF Real Case - V150



0 500 1000 1500 2000 m

Map: EMD OpenStreetMap , Print scale 1:50,000, Map center Irish ITM-IRENET95 (IE), geocentric, GRS80 East: 554,270 North: 627,200

New WTG Shadow receptor

Flicker map level: Height Contours: CONTOURLINE_6839_Garrane_WF_1.wpo (1)

Time step: 2 minutes, Day step: 3 days, Map resolution: 10 m, Visibility resolution: 5 m, Eye height: 1.5 m

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Calculated:
09/06/2025 13:54/4.0.552

SHADOW - Main Result

Calculation: 6839 Garrane WF Worst Case - V150

Assumptions for shadow calculations

Maximum distance for influence
Calculate only when more than 20 % of sun is covered by the blade
Please look in WTG table

Minimum sun height over horizon for influence	3 °
Day step for calculation	1 days
Time step for calculation	1 minutes

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

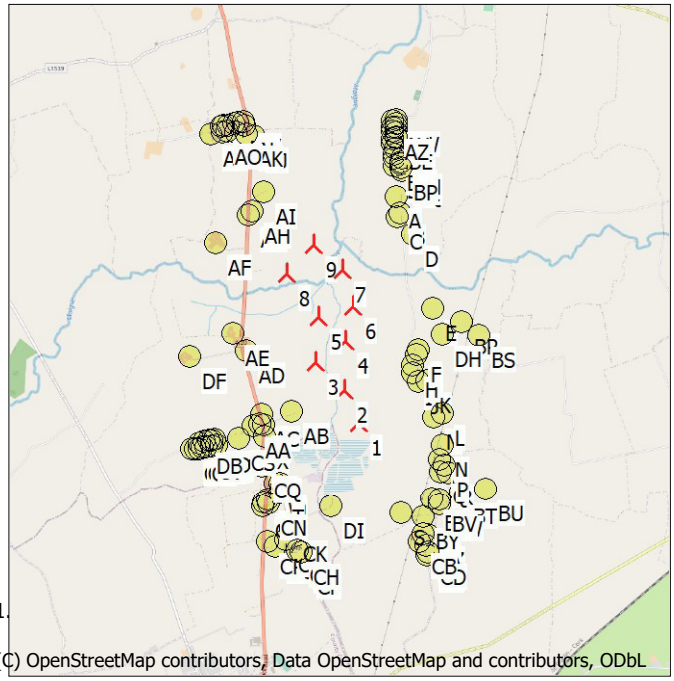
Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW
211	277	155	351	176	225	510	804	979	1,075	826	665

W	WNW	NW	NNW	Sum
564	773	750	419	8,760

Monthly aggregation of real case reduction
A ZVI (Zones of Visual Influence) calculation is performed before flicker calculation so non visible WTG do not contribute to calculated flicker values. A WTG will be visible if it is visible from any part of the receiver window. The ZVI calculation is based on the following assumptions:
Height contours used: Height Contours: CONTOURLINE_6839_Garrane_WF_1.
Receptor grid resolution: 1.0 m

All coordinates are in
Irish ITM-IRENET95 (IE), geocentric, GRS80



(C) OpenStreetMap contributors, Data OpenStreetMap and contributors, ODbL

Scale 1:75,000

New WTG Shadow receptor

WTGs

	Easting	Northing	Z	Row data/Description	WTG type Valid	Manufact.	Type-generator	Power, rated	Rotor diameter	Hub height	Shadow data Calculation distance	RPM
			[m]					[kW]	[m]	[m]	[m]	[RPM]
1	554,494	626,040	61.3	T01	Yes	VESTAS	V150-6.0-6,000	6,000	150.0	95.0	1,902	-
2	554,358	626,367	58.0	T02	Yes	VESTAS	V150-6.0-6,000	6,000	150.0	95.0	1,902	-
3	554,070	626,632	58.9	T03	Yes	VESTAS	V150-6.0-6,000	6,000	150.0	95.0	1,902	-
4	554,378	626,844	57.7	T04	Yes	VESTAS	V150-6.0-6,000	6,000	150.0	95.0	1,902	-
5	554,107	627,092	58.6	T05	Yes	VESTAS	V150-6.0-6,000	6,000	150.0	95.0	1,902	-
6	554,452	627,196	57.3	T06	Yes	VESTAS	V150-6.0-6,000	6,000	150.0	95.0	1,902	-
7	554,352	627,558	57.6	T07	Yes	VESTAS	V150-6.0-6,000	6,000	150.0	95.0	1,902	-
8	553,804	627,520	58.7	T08	Yes	VESTAS	V150-6.0-6,000	6,000	150.0	95.0	1,902	-
9	554,073	627,806	59.1	T09	Yes	VESTAS	V150-6.0-6,000	6,000	150.0	95.0	1,902	-

Shadow receptor-Input

No.	Name	Easting	Northing	Z	Width	Height	Elevation a.g.l.	Slope of window	Direction mode	Eye height (ZVI) a.g.l.
				[m]	[m]	[m]	[m]	[°]		[m]
A	1	554,890	628,270	62.5	2.0	2.0	0.5	90.0	"Green house mode"	2.5
B	2	554,927	628,102	62.3	2.0	2.0	0.5	90.0	"Green house mode"	2.5
C	3	554,909	628,076	61.6	2.0	2.0	0.5	90.0	"Green house mode"	2.5
D	4	555,053	627,900	60.7	2.0	2.0	0.5	90.0	"Green house mode"	2.5
E	5	555,248	627,163	62.1	2.0	2.0	0.5	90.0	"Green house mode"	2.5
F	6	555,099	626,752	62.2	2.0	2.0	0.5	90.0	"Green house mode"	2.5
G	7	555,074	626,712	62.4	2.0	2.0	0.5	90.0	"Green house mode"	2.5
H	8	555,045	626,607	63.2	2.0	2.0	0.5	90.0	"Green house mode"	2.5
I	9	555,044	626,526	63.9	2.0	2.0	0.5	90.0	"Green house mode"	2.5
J	10	555,100	626,434	64.9	2.0	2.0	0.5	90.0	"Green house mode"	2.5
K	11	555,177	626,448	65.9	2.0	2.0	0.5	90.0	"Green house mode"	2.5
L	12	555,329	626,120	65.2	2.0	2.0	0.5	90.0	"Green house mode"	2.5
M	13	555,250	626,093	65.0	2.0	2.0	0.5	90.0	"Green house mode"	2.5
N	14	555,329	625,807	69.0	2.0	2.0	0.5	90.0	"Green house mode"	2.5
O	15	555,304	625,667	69.1	2.0	2.0	0.5	90.0	"Green house mode"	2.5
P	16	555,349	625,612	69.0	2.0	2.0	0.5	90.0	"Green house mode"	2.5
Q	17	555,310	625,539	68.6	2.0	2.0	0.5	90.0	"Green house mode"	2.5
R	18	555,384	625,532	68.2	2.0	2.0	0.5	90.0	"Green house mode"	2.5

To be continued on next page...

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Calculated:
09/06/2025 13:54/4.0.552

SHADOW - Main Result

Calculation: 6839 Garrane WF Worst Case - V150

...continued from previous page

No.	Name	Easting	Northing	Z	Width	Height	Elevation a.g.l.	Slope of window	Direction mode	Eye height (ZVI) a.g.l.
				[m]	[m]	[m]	[m]	[°]		[m]
S	19	554,912	625,134	68.7	2.0	2.0	0.5	90.0	"Green house mode"	2.5
T	20	553,714	625,349	65.6	2.0	2.0	0.5	90.0	"Green house mode"	2.5
U	21	553,722	625,387	65.4	2.0	2.0	0.5	90.0	"Green house mode"	2.5
V	22	553,714	625,434	65.3	2.0	2.0	0.5	90.0	"Green house mode"	2.5
W	23	553,661	625,440	64.6	2.0	2.0	0.5	90.0	"Green house mode"	2.5
X	24	553,566	625,907	64.9	2.0	2.0	0.5	90.0	"Green house mode"	2.5
Y	25	553,552	626,017	64.3	2.0	2.0	0.5	90.0	"Green house mode"	2.5
Z	26	553,518	626,038	63.9	2.0	2.0	0.5	90.0	"Green house mode"	2.5
AA	27	553,445	626,008	65.4	2.0	2.0	0.5	90.0	"Green house mode"	2.5
AB	28	553,834	626,159	66.0	2.0	2.0	0.5	90.0	"Green house mode"	2.5
AC	29	553,532	626,131	61.8	2.0	2.0	0.5	90.0	"Green house mode"	2.5
AD	30	553,379	626,762	58.2	2.0	2.0	0.5	90.0	"Green house mode"	2.5
AE	31	553,252	626,931	63.3	2.0	2.0	0.5	90.0	"Green house mode"	2.5
AF	32	553,094	627,829	64.0	2.0	2.0	0.5	90.0	"Green house mode"	2.5
AG	33	553,426	628,112	63.2	2.0	2.0	0.5	90.0	"Green house mode"	2.5
AH	34	553,451	628,146	63.1	2.0	2.0	0.5	90.0	"Green house mode"	2.5
AI	35	553,575	628,329	65.1	2.0	2.0	0.5	90.0	"Green house mode"	2.5
AJ	36	553,486	628,892	68.0	2.0	2.0	0.5	90.0	"Green house mode"	2.5
AK	37	553,408	628,905	69.2	2.0	2.0	0.5	90.0	"Green house mode"	2.5
AL	38	553,398	628,993	72.8	2.0	2.0	0.5	90.0	"Green house mode"	2.5
AM	39	553,295	628,921	72.3	2.0	2.0	0.5	90.0	"Green house mode"	2.5
AN	40	553,221	628,934	73.0	2.0	2.0	0.5	90.0	"Green house mode"	2.5
AO	41	553,175	628,924	72.8	2.0	2.0	0.5	90.0	"Green house mode"	2.5
AP	42	553,052	628,901	68.7	2.0	2.0	0.5	90.0	"Green house mode"	2.5
AQ	46	553,161	628,986	70.7	2.0	2.0	0.5	90.0	"Green house mode"	2.5
AR	47	553,189	628,997	70.3	2.0	2.0	0.5	90.0	"Green house mode"	2.5
AS	48	553,229	629,001	70.7	2.0	2.0	0.5	90.0	"Green house mode"	2.5
AT	49	553,285	629,011	70.4	2.0	2.0	0.5	90.0	"Green house mode"	2.5
AU	50	553,325	629,016	70.9	2.0	2.0	0.5	90.0	"Green house mode"	2.5
AV	51	553,376	629,036	70.9	2.0	2.0	0.5	90.0	"Green house mode"	2.5
AW	62	554,895	629,036	73.0	2.0	2.0	0.5	90.0	"Green house mode"	2.5
AX	63	554,864	629,031	73.3	2.0	2.0	0.5	90.0	"Green house mode"	2.5
AY	64	554,899	628,995	71.5	2.0	2.0	0.5	90.0	"Green house mode"	2.5
AZ	65	554,860	628,961	69.6	2.0	2.0	0.5	90.0	"Green house mode"	2.5
BA	66	554,900	628,954	69.3	2.0	2.0	0.5	90.0	"Green house mode"	2.5
BB	67	554,861	628,927	68.7	2.0	2.0	0.5	90.0	"Green house mode"	2.5
BC	68	554,901	628,917	68.7	2.0	2.0	0.5	90.0	"Green house mode"	2.5
BD	69	554,902	628,908	68.7	2.0	2.0	0.5	90.0	"Green house mode"	2.5
BE	70	554,904	628,867	69.0	2.0	2.0	0.5	90.0	"Green house mode"	2.5
BF	71	554,904	628,858	68.9	2.0	2.0	0.5	90.0	"Green house mode"	2.5
BG	72	554,862	628,836	68.6	2.0	2.0	0.5	90.0	"Green house mode"	2.5
BH	73	554,860	628,794	67.9	2.0	2.0	0.5	90.0	"Green house mode"	2.5
BI	74	554,885	628,752	67.6	2.0	2.0	0.5	90.0	"Green house mode"	2.5
BJ	75	554,876	628,695	66.2	2.0	2.0	0.5	90.0	"Green house mode"	2.5
BK	76	554,879	628,657	65.5	2.0	2.0	0.5	90.0	"Green house mode"	2.5
BL	77	554,953	628,657	64.7	2.0	2.0	0.5	90.0	"Green house mode"	2.5
BM	78	554,941	628,622	64.9	2.0	2.0	0.5	90.0	"Green house mode"	2.5
BN	79	554,942	628,591	64.5	2.0	2.0	0.5	90.0	"Green house mode"	2.5
BO	80	554,870	628,575	65.0	2.0	2.0	0.5	90.0	"Green house mode"	2.5
BP	81	554,948	628,565	64.3	2.0	2.0	0.5	90.0	"Green house mode"	2.5
BQ	82	554,951	628,528	63.8	2.0	2.0	0.5	90.0	"Green house mode"	2.5
BR	83	555,536	627,030	64.1	2.0	2.0	0.5	90.0	"Green house mode"	2.5
BS	84	555,700	626,885	66.3	2.0	2.0	0.5	90.0	"Green house mode"	2.5
BT	85	555,514	625,336	73.4	2.0	2.0	0.5	90.0	"Green house mode"	2.5
BU	86	555,754	625,366	74.0	2.0	2.0	0.5	90.0	"Green house mode"	2.5
BV	87	555,303	625,256	68.9	2.0	2.0	0.5	90.0	"Green house mode"	2.5
BW	88	555,298	625,212	68.8	2.0	2.0	0.5	90.0	"Green house mode"	2.5
BX	89	555,222	625,276	68.8	2.0	2.0	0.5	90.0	"Green house mode"	2.5
BY	90	555,135	625,094	68.9	2.0	2.0	0.5	90.0	"Green house mode"	2.5
BZ	91	555,175	624,909	72.0	2.0	2.0	0.5	90.0	"Green house mode"	2.5
CA	92	555,131	624,919	70.2	2.0	2.0	0.5	90.0	"Green house mode"	2.5
CB	93	555,091	624,842	71.3	2.0	2.0	0.5	90.0	"Green house mode"	2.5
CC	94	555,157	624,807	73.2	2.0	2.0	0.5	90.0	"Green house mode"	2.5
CD	95	555,181	624,733	77.0	2.0	2.0	0.5	90.0	"Green house mode"	2.5

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SHADOW - Main Result

Calculation: 6839 Garrane WF Worst Case - V150

...continued from previous page

No.	Name	Easting	Northing	Z	Width	Height	Elevation a.g.l.	Slope of window	Direction mode	Eye height (ZVI) a.g.l.
				[m]	[m]	[m]	[m]	[°]		[m]
CE	96	555,168	624,715	76.9	2.0	2.0	0.5	90.0	"Green house mode"	2.5
CF	122	553,948	624,658	75.9	2.0	2.0	0.5	90.0	"Green house mode"	2.5
CG	123	553,926	624,708	74.4	2.0	2.0	0.5	90.0	"Green house mode"	2.5
CH	124	553,915	624,753	71.5	2.0	2.0	0.5	90.0	"Green house mode"	2.5
CI	125	553,882	624,769	70.0	2.0	2.0	0.5	90.0	"Green house mode"	2.5
CJ	126	553,767	624,877	68.2	2.0	2.0	0.5	90.0	"Green house mode"	2.5
CK	127	553,809	624,982	67.3	2.0	2.0	0.5	90.0	"Green house mode"	2.5
CL	128	553,578	625,279	64.0	2.0	2.0	0.5	90.0	"Green house mode"	2.5
CM	129	553,546	625,258	63.3	2.0	2.0	0.5	90.0	"Green house mode"	2.5
CN	130	553,597	625,237	63.6	2.0	2.0	0.5	90.0	"Green house mode"	2.5
CO	131	553,527	625,219	63.6	2.0	2.0	0.5	90.0	"Green house mode"	2.5
CP	132	553,580	624,855	70.0	2.0	2.0	0.5	90.0	"Green house mode"	2.5
CQ	141	553,519	625,617	62.6	2.0	2.0	0.5	90.0	"Green house mode"	2.5
CR	142	553,516	625,637	62.6	2.0	2.0	0.5	90.0	"Green house mode"	2.5
CS	143	553,302	625,898	70.4	2.0	2.0	0.5	90.0	"Green house mode"	2.5
CT	144	553,081	625,833	70.5	2.0	2.0	0.5	90.0	"Green house mode"	2.5
CU	145	553,035	625,813	69.7	2.0	2.0	0.5	90.0	"Green house mode"	2.5
CV	146	552,972	625,807	70.7	2.0	2.0	0.5	90.0	"Green house mode"	2.5
CW	147	552,937	625,803	70.8	2.0	2.0	0.5	90.0	"Green house mode"	2.5
CX	148	552,905	625,800	70.5	2.0	2.0	0.5	90.0	"Green house mode"	2.5
CY	149	552,872	625,797	70.0	2.0	2.0	0.5	90.0	"Green house mode"	2.5
CZ	150	552,836	625,790	69.7	2.0	2.0	0.5	90.0	"Green house mode"	2.5
DA	170	552,903	625,855	71.9	2.0	2.0	0.5	90.0	"Green house mode"	2.5
DB	171	552,953	625,860	72.3	2.0	2.0	0.5	90.0	"Green house mode"	2.5
DC	172	553,003	625,872	71.7	2.0	2.0	0.5	90.0	"Green house mode"	2.5
DD	173	553,034	625,878	71.3	2.0	2.0	0.5	90.0	"Green house mode"	2.5
DE	174	553,057	625,881	71.3	2.0	2.0	0.5	90.0	"Green house mode"	2.5
DF	177	552,817	626,710	67.0	2.0	2.0	0.5	90.0	"Green house mode"	2.5
DG	178	553,652	624,809	69.1	2.0	2.0	0.5	90.0	"Green house mode"	2.5
DH	179	555,336	626,905	62.7	2.0	2.0	0.5	90.0	"Green house mode"	2.5
DI	180	554,207	625,213	65.9	2.0	2.0	0.5	90.0	"Green house mode"	2.5

Calculation Results

Shadow receptor

		Shadow, worst case			**Shadow, expected values**
No.	Name	Shadow hours per year [h/year]	Shadow days per year [days/year]	Max shadow hours per day [h/day]	Shadow hours per year [h/year]
A	1	67:40	134	0:42	9:47
B	2	97:57	166	0:47	14:39
C	3	104:48	171	0:49	15:46
D	4	118:33	197	0:57	18:19
E	5	130:20	305	0:47	25:49
F	6	175:09	340	0:57	33:03
G	7	181:12	336	1:04	34:00
H	8	213:06	331	1:10	40:57
I	9	194:12	327	1:05	37:38
J	10	143:49	257	0:53	28:11
K	11	135:20	255	0:52	27:13
L	12	59:27	160	0:42	12:35
M	13	69:18	137	0:48	14:54
N	14	66:34	138	0:41	14:57
O	15	57:06	106	0:41	12:54
P	16	49:53	98	0:38	11:14
Q	17	37:00	77	0:40	8:14
R	18	38:55	84	0:36	8:42
S	19	0:00	0	0:00	0:00
T	20	0:00	0	0:00	0:00
U	21	0:00	0	0:00	0:00
V	22	2:46	27	0:09	0:34
W	23	10:09	45	0:19	2:06
X	24	62:00	130	0:41	13:09
Y	25	70:15	154	0:42	15:06

To be continued on next page...

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SHADOW - Main Result

Calculation: 6839 Garrane WF Worst Case - V150

...continued from previous page

		Shadow, worst case			Shadow, expected values
No.	Name	Shadow hours per year [h/year]	Shadow days per year [days/year]	Max shadow hours per day [h/day]	Shadow hours per year [h/year]
Z	26	54:07	125	0:41	11:43
AA	27	42:36	111	0:37	9:18
AB	28	147:21	185	1:06	30:38
AC	29	50:32	113	0:42	10:40
AD	30	147:27	275	0:50	29:23
AE	31	105:09	274	0:44	20:24
AF	32	78:55	198	0:49	13:40
AG	33	116:31	164	1:03	18:26
AH	34	106:10	155	1:00	16:47
AI	35	70:24	104	0:53	10:55
AJ	36	0:00	0	0:00	0:00
AK	37	0:00	0	0:00	0:00
AL	38	0:00	0	0:00	0:00
AM	39	0:00	0	0:00	0:00
AN	40	6:44	24	0:24	0:58
AO	41	12:46	34	0:28	1:51
AP	42	16:18	56	0:24	2:24
AQ	46	6:48	24	0:23	0:59
AR	47	1:30	13	0:09	0:13
AS	48	0:00	0	0:00	0:00
AT	49	0:00	0	0:00	0:00
AU	50	0:00	0	0:00	0:00
AV	51	0:00	0	0:00	0:00
AW	62	0:00	0	0:00	0:00
AX	63	0:00	0	0:00	0:00
AY	64	0:00	0	0:00	0:00
AZ	65	0:00	0	0:00	0:00
BA	66	0:00	0	0:00	0:00
BB	67	0:00	0	0:00	0:00
BC	68	2:15	16	0:11	0:18
BD	69	3:26	20	0:13	0:27
BE	70	8:28	32	0:21	1:08
BF	71	9:32	34	0:21	1:17
BG	72	8:41	32	0:21	1:10
BH	73	14:09	40	0:26	1:54
BI	74	21:28	52	0:30	2:55
BJ	75	26:45	62	0:31	3:41
BK	76	28:28	68	0:32	3:58
BL	77	23:43	76	0:30	3:21
BM	78	23:24	80	0:31	3:20
BN	79	22:08	84	0:31	3:11
BO	80	29:02	80	0:34	4:07
BP	81	20:47	72	0:31	3:01
BQ	82	20:28	66	0:32	3:00
BR	83	80:05	279	0:31	15:19
BS	84	49:41	213	0:25	9:47
BT	85	15:00	57	0:23	3:18
BU	86	17:12	88	0:22	3:54
BV	87	0:00	0	0:00	0:00
BW	88	0:00	0	0:00	0:00
BX	89	0:00	0	0:00	0:00
BY	90	0:00	0	0:00	0:00
BZ	91	0:00	0	0:00	0:00
CA	92	0:00	0	0:00	0:00
CB	93	0:00	0	0:00	0:00
CC	94	0:00	0	0:00	0:00
CD	95	0:00	0	0:00	0:00
CE	96	0:00	0	0:00	0:00
CF	122	0:00	0	0:00	0:00
CG	123	0:00	0	0:00	0:00
CH	124	0:00	0	0:00	0:00
CI	125	0:00	0	0:00	0:00
CJ	126	0:00	0	0:00	0:00

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SHADOW - Main Result

Calculation: 6839 Garrane WF Worst Case - V150

...continued from previous page

		Shadow, worst case			Shadow, expected values
No.	Name	Shadow hours per year [h/year]	Shadow days per year [days/year]	Max shadow hours per day [h/day]	Shadow hours per year [h/year]
CK	127	0:00	0	0:00	0:00
CL	128	0:00	0	0:00	0:00
CM	129	0:00	0	0:00	0:00
CN	130	0:00	0	0:00	0:00
CO	131	0:00	0	0:00	0:00
CP	132	0:00	0	0:00	0:00
CQ	141	27:15	72	0:34	6:00
CR	142	25:21	66	0:35	5:37
CS	143	29:01	94	0:30	6:22
CT	144	15:55	69	0:23	3:30
CU	145	14:46	77	0:22	3:15
CV	146	14:42	89	0:20	3:13
CW	147	15:23	93	0:19	3:21
CX	148	16:30	96	0:19	3:34
CY	149	17:39	100	0:18	3:47
CZ	150	18:23	102	0:17	3:55
DA	170	22:37	108	0:20	4:48
DB	171	20:50	105	0:20	4:27
DC	172	19:56	102	0:21	4:18
DD	173	19:31	100	0:22	4:14
DE	174	18:54	99	0:22	4:07
DF	177	36:01	169	0:26	7:15
DG	178	0:00	0	0:00	0:00
DH	179	126:42	334	0:44	24:12
DI	180	0:00	0	0:00	0:00

Total amount of flickering on the shadow receptors caused by each WTG

No.	Name	Worst case [h/year]	Expected [h/year]
1	T01	405:17	76:50
2	T02	357:03	70:49
3	T03	192:45	37:38
4	T04	256:06	54:39
5	T05	253:04	51:41
6	T06	204:32	39:30
7	T07	269:39	46:30
8	T08	196:10	32:52
9	T09	289:20	48:23

Total times in Receptor wise and WTG wise tables can differ, as a WTG can lead to flicker at 2 or more receptors simultaneously and/or receptors may receive flicker from 2 or more WTGs simultaneously.

The calculation of the total expected values for a given receptor assumes a weighted average directional reduction for all WTGs contributing to shadow flicker within the same day. In the case where shadow flicker from different WTGs is not concurrent within the day, the total expected time at a given receptor may deviate marginally from the individual flicker time caused by each turbine separately.

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SHADOW - Calendar

Calculation: 6839 Garrane WF Worst Case - V150 **Shadow receptor:** A - 1

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January		February		March	April	May	June	July	August	September	October		November		December		
1	08:46		14:59 (7)	08:18		16:29 (8)	07:23	07:12	06:06	05:20	05:17	05:54	06:45	07:35		07:30		16:06 (8)	08:22		14:47 (7)
	16:32	41	15:40 (7)	17:20	21	16:50 (9)	18:13	20:08	21:00	21:47	22:01	21:28	20:25	19:14		17:07	32	16:38 (9)	16:26	37	15:24 (7)
2	08:45		14:59 (7)	08:16		16:29 (8)	07:21	07:09	06:04	05:19	05:17	05:55	06:46	07:36		07:31		16:04 (8)	08:23		14:47 (7)
	16:33	41	15:40 (7)	17:22	23	16:52 (9)	18:15	20:10	21:02	21:48	22:01	21:26	20:23	19:12		17:05	32	16:36 (9)	16:25	38	15:25 (7)
3	08:45		15:00 (7)	08:15		16:29 (8)	07:19	07:07	06:02	05:18	05:18	05:57	06:48	07:38		07:33		16:03 (8)	08:24		14:47 (7)
	16:34	40	15:40 (7)	17:24	25	16:54 (9)	18:17	20:11	21:03	21:49	22:00	21:25	20:20	19:10		17:04	31	16:34 (9)	16:25	38	15:25 (7)
4	08:45		15:01 (7)	08:13		16:29 (8)	07:17	07:05	06:00	05:17	05:19	05:59	06:50	07:40		07:35		16:02 (8)	08:26		14:47 (7)
	16:35	40	15:41 (7)	17:26	27	16:56 (9)	18:18	20:13	21:05	21:50	22:00	21:23	20:18	19:07		17:02	30	16:32 (9)	16:24	39	15:26 (7)
5	08:45		15:01 (7)	08:11		16:30 (8)	07:15	07:02	05:58	05:17	05:20	06:00	06:51	07:42		07:37		16:01 (8)	08:27		14:47 (7)
	16:36	40	15:41 (7)	17:28	27	16:57 (9)	18:20	20:15	21:07	21:51	21:59	21:21	20:16	19:05		17:00	29	16:30 (9)	16:24	39	15:26 (7)
6	08:44		15:02 (7)	08:10		16:31 (8)	07:12	07:00	05:56	05:16	05:20	06:02	06:53	07:43		07:39		16:00 (8)	08:28		14:48 (7)
	16:37	40	15:42 (7)	17:30	29	17:00 (9)	18:22	20:17	21:08	21:52	21:59	21:19	20:13	19:03		16:58	28	16:28 (9)	16:23	40	15:28 (7)
7	08:44		15:02 (7)	08:08		16:32 (8)	07:10	06:58	05:55	05:15	05:21	06:03	06:55	07:45		07:41		16:00 (8)	08:30		14:48 (7)
	16:39	39	15:41 (7)	17:32	30	17:02 (9)	18:24	20:18	21:10	21:53	21:58	21:18	20:11	19:01		16:56	26	16:26 (9)	16:23	40	15:28 (7)
8	08:44		15:02 (7)	08:06		16:33 (8)	07:08	06:56	05:53	05:15	05:22	06:05	06:56	07:47		07:42		16:00 (8)	08:31		14:48 (7)
	16:40	39	15:41 (7)	17:33	31	17:04 (9)	18:26	20:20	21:12	21:54	21:57	21:16	20:09	18:58		16:55	24	16:24 (9)	16:22	40	15:28 (7)
9	08:43		15:04 (7)	08:04		16:35 (8)	07:05	06:53	05:51	05:14	05:23	06:07	06:58	07:48		07:44		15:59 (8)	08:32		14:48 (7)
	16:41	38	15:42 (7)	17:35	31	17:06 (9)	18:27	20:22	21:13	21:55	21:57	21:14	20:06	18:56		16:53	23	16:22 (9)	16:22	40	15:28 (7)
10	08:43		15:04 (7)	08:02		16:37 (8)	07:03	06:51	05:49	05:14	05:24	06:08	07:00	07:50		07:46		15:59 (8)	08:33		14:49 (7)
	16:43	38	15:42 (7)	17:37	31	17:08 (9)	18:29	20:24	21:15	21:56	21:56	21:12	20:04	18:54		16:51	22	16:21 (9)	16:22	41	15:30 (7)
11	08:42		15:05 (7)	08:01		16:38 (9)	07:01	06:49	05:48	05:13	05:25	06:10	07:01	07:52		07:48		16:00 (8)	08:34		14:49 (7)
	16:44	37	15:42 (7)	17:39	32	17:10 (9)	18:31	20:25	21:17	21:56	21:55	21:10	20:02	18:51		16:50	19	16:19 (8)	16:22	41	15:30 (7)
12	08:41		15:05 (7)	07:59		16:38 (9)	06:59	06:46	05:46	05:13	05:26	06:12	07:03	07:54		07:50		16:00 (8)	08:35		14:49 (7)
	16:46	36	15:41 (7)	17:41	34	17:12 (9)	18:33	20:27	21:18	21:57	21:54	21:08	19:59	18:49		16:48	17	16:17 (8)	16:22	42	15:31 (7)
13	08:41		15:06 (7)	07:57		16:38 (9)	06:56	06:44	05:44	05:13	05:28	06:13	07:05	07:55		07:51		16:00 (8)	08:36		14:50 (7)
	16:47	35	15:41 (7)	17:43	37	17:15 (9)	18:35	20:29	21:20	21:58	21:53	21:06	19:57	18:47		16:47	16	16:16 (8)	16:21	41	15:31 (7)
14	08:40		15:08 (7)	07:55		16:38 (9)	06:54	06:42	05:43	05:13	05:29	06:15	07:06	07:57		07:53		16:00 (8)	08:37		14:50 (7)
	16:49	34	15:42 (7)	17:45	38	17:16 (9)	18:36	20:31	21:22	21:58	21:52	21:04	19:55	18:45		16:45	13	16:13 (8)	16:21	42	15:32 (7)
15	08:39		15:08 (7)	07:53		16:39 (9)	06:52	06:40	05:41	05:12	05:30	06:16	07:08	07:59		07:55		16:00 (8)	08:38		14:50 (7)
	16:50	33	15:41 (7)	17:47	37	17:16 (9)	18:38	20:32	21:23	21:59	21:51	21:02	19:52	18:42		16:44	12	16:12 (8)	16:21	42	15:32 (7)
16	08:38		15:09 (7)	07:51		16:39 (9)	06:49	06:37	05:39	05:12	05:31	06:18	07:10	08:01	17:23 (9)	07:57		16:01 (8)	08:39		14:51 (7)
	16:52	32	15:41 (7)	17:49	37	17:16 (9)	18:40	20:34	21:25	21:59	21:50	21:00	19:50	18:40	11 17:34 (9)	16:42	9	16:10 (8)	16:22	42	15:33 (7)
17	08:37		15:11 (7)	07:49		16:39 (9)	06:47	06:35	05:38	05:12	05:32	06:20	07:11	08:02	17:20 (9)	07:59		16:02 (8)	08:40		14:51 (7)
	16:54	29	15:40 (7)	17:51	37	17:16 (9)	18:42	20:36	21:26	22:00	21:49	20:58	19:48	18:38	18 17:38 (9)	16:41	7	16:09 (8)	16:22	42	15:33 (7)
18	08:36		15:12 (7)	07:47		16:40 (9)	06:45	06:33	05:36	05:12	05:34	06:21	07:13	08:04	17:17 (9)	08:00		16:03 (8)	08:41		14:51 (7)
	16:55	28	15:40 (7)	17:52	35	17:15 (9)	18:43	20:38	21:28	22:00	21:48	20:56	19:45	18:36	23 17:40 (9)	16:40	4	16:07 (8)	16:22	42	15:33 (7)
19	08:35		15:14 (7)	07:45		16:40 (9)	06:42	06:31	05:35	05:12	05:35	06:23	07:15	08:06	17:14 (9)	08:02		14:58 (7)	08:41		14:52 (7)
	16:57	25	15:39 (7)	17:54	34	17:14 (9)	18:45	20:39	21:29	22:01	21:47	20:54	19:43	18:34	27 17:41 (9)	16:38	10	16:06 (8)	16:22	42	15:34 (7)
20	08:34		15:16 (7)	07:43		16:41 (9)	06:40	06:29	05:33	05:12	05:36	06:25	07:16	08:08	17:13 (9)	08:04		14:55 (7)	08:42		14:52 (7)
	16:59	22	15:38 (7)	17:56	32	17:13 (9)	18:47	20:41	21:31	22:01	21:46	20:52	19:40	18:32	29 17:42 (9)	16:37	15	15:10 (7)	16:23	42	15:34 (7)
21	08:33		15:17 (7)	07:41		16:42 (9)	06:38	06:27	05:32	05:12	05:38	06:26	07:18	08:10	17:12 (9)	08:06		14:53 (7)	08:43		14:53 (7)
	17:00	19	15:36 (7)	17:58	30	17:12 (9)	18:49	20:43	21:32	22:01	21:45	20:49	19:38	18:29	31 17:43 (9)	16:36	19	15:12 (7)	16:23	42	15:35 (7)
22	08:32		15:20 (7)	07:39		16:43 (9)	06:35	06:24	05:31	05:13	05:39	06:28	07:20	08:11	17:11 (9)	08:07		14:52 (7)	08:43		14:53 (7)
	17:02	15	15:35 (7)	18:00	28	17:11 (9)	18:50	20:44	21:34	22:01	21:43	20:47	19:36	18:27	33 17:44 (9)	16:35	22	15:14 (7)	16:24	42	15:35 (7)
23	08:31		15:24 (7)	07:36		16:45 (9)	06:33	06:22	05:29	05:13	05:40	06:30	07:21	08:13	17:10 (9)	08:09		14:51 (7)	08:44		14:54 (7)
	17:04	10	16:32 (8)	18:02	25	17:10 (9)	18:52	20:46	21:35	22:02	21:42	20:45	19:33	18:25	34 17:44 (9)	16:33	25	15:16 (7)	16:24	42	15:36 (7)
24	08:29		16:29 (8)	07:34		16:47 (9)	06:31	06:20	05:28	05:13	05:42	06:31	07:23	08:15	17:09 (9)	08:11		14:49 (7)	08:44		14:54 (7)
	17:06	4	16:33 (8)	18:04	21	17:08 (9)	18:54	20:48	21:37	22:02	21:40	20:43	19:31	18:23	36 17:45 (9)	16:32	28	15:17 (7)	16:25	42	15:36 (7)
25	08:28		16:29 (8)	07:32		16:48 (9)	06:28	06:18	05:27	05:13	05:43	06:33	07:25	07:17		16:09 (9)	08:12		14:49 (7)	08:45		14:55 (7)
	17:07	7	16:36 (8)	18:05	16	17:04 (9)	18:56	20:50	21:38	22:02	21:39	20:41	19:29	17:21	36 16:45 (9)	16:31	29	15:18 (7)	16:25	42	15:37 (7)
26	08:27		16:28 (8)	07:30		16:53 (9)	06:26	06:16	05:26	05:14	05:45	06:35	07:26	07:19		16:08 (9)	08:14		14:48 (7)	08:45		14:55 (7)
	17:09	9	16:37 (8)	18:07	7	17:00 (9)	18:57	20:51	21:39	22:02	21:38	20:39	19:26	17:19	38 16:46 (9)	16:30	32	15:20 (7)	16:26	42	15:37 (7)
27	08:25		16:28 (8)	07:28			06:23	06:14	05:25	05:14	05:46	06:36	07:28	07:20		16:08 (9)	08:15		14:48 (7)	08:45		14:56 (7)
	17:11	12	16:40 (8)	18:09			18:59	20:53	21:41	22:02	21:36	20:36	19:24	17:17	38 16:46 (9)	16:29	33	15:21 (7)	16:27	42	15:38 (7)
28	08:24		16:28 (8)	07:26			06:21	06:12	05:24	05:15	05:48	06:38	07:30	07:22		16:08 (9)	08:17		14:47 (7)	08:45		14:56 (7)
	17:13	13	16:41 (8)	18:11			19:01	20:55	21:42	22:02	21:35	20:34	19:22	17:15	38 16:46 (9)	16:28	34	15:21 (7)	16:28	42	15:38 (7)
29	08:22		16:28 (8)				07:19	06:10	05:23	05:15	05:49	06:40	07:31	07:24		16:08 (9)	08:19		14:47 (7)	08:45		14:57 (7)
	17:15	16	16:44 (8)				20:03	20:57	21:43	22:01	21:33	20:32	19:19	17:13	36 16:44 (9)	16:28	35	15:22 (7)	16:28	41	15:38 (7)
30	08:21		16:28 (8)				07:16	06:08	05:22	05:16	05:51	06:41	07:33	07:26		16:08 (9)	08:20		14:47 (7)	08:46		14:57 (7)
	17:17	18	16:46 (8)				20:04	20:58	21:44	22:01	21:31	20:30	19:17	17:11	34 16:42 (9)	16:27	36	15:23 (7)	16:29	42	15:39 (7)
31	08:19		16:28 (8)				07:14		05:21		05:52	06:43		07:28		16:08 (9)			08:46		14:58 (7)
	17:18	19	16:47 (8)				20:06		21:46		21:30	20:27		17:09	32 16:40 (9)				16:30	41	15:39 (7)
Potential sun hours	257		277		367	417	487	502	504	455	381	331		264		241					
Total, worst case	849		755									494		692		1270					
Sun reduction	0.22		0.24									0.28		0.26		0.22					
Oper. time red.	1.00		1.00									1.00		1.00		1.00					
Wind dir. red.	0.61		0.60									0.60		0.61		0.62					
Total reduction	0.13		0.15									0.17		0.16		0.13					
Total, real	113		110									83		110		171					

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
Jennings O'Donovan
Finisklin Business Park
F91 RHH9 Sligo
+353719161416
Kathlyn Feeney / kfeeney@jodireland.com
Calculated:
09/06/2025 13:54/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Worst Case - V150 **Shadow receptor:** B - 2

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January		February		March		April	May	June
1	08:46		15:19 (5)	08:18		15:44 (7)	07:23	17:11 (9)	07:12	06:06	05:20
	16:32	37	15:56 (7)	17:20	42	16:26 (7)	18:13	35	17:46 (9)	20:08	21:00	21:47
2	08:45		15:19 (5)	08:16		15:45 (7)	07:21	17:11 (9)	07:09	06:04	05:19
	16:33	38	15:57 (7)	17:22	40	16:25 (7)	18:15	37	17:48 (9)	20:10	21:02	21:48
3	08:45		15:20 (5)	08:15		15:46 (7)	07:19	17:11 (9)	07:07	06:02	05:18
	16:34	38	15:58 (7)	17:24	38	16:24 (7)	18:17	39	17:50 (9)	20:11	21:03	21:49
4	08:45		15:21 (5)	08:13		15:46 (7)	07:17	17:10 (9)	07:05	06:00	05:17
	16:35	39	16:00 (7)	17:26	38	16:24 (7)	18:18	39	17:49 (9)	20:13	21:05	21:50
5	08:45		15:21 (5)	08:11		15:47 (7)	07:15	17:11 (9)	07:02	05:58	05:17
	16:36	40	16:01 (7)	17:28	36	16:23 (7)	18:20	37	17:48 (9)	20:15	21:07	21:51
6	08:44		15:23 (5)	08:10		15:50 (7)	07:12	17:11 (9)	07:00	05:56	05:16
	16:37	40	16:03 (7)	17:30	34	17:00 (8)	18:22	37	17:48 (9)	20:17	21:08	21:52
7	08:44		15:23 (5)	08:08		15:51 (7)	07:10	17:11 (9)	06:58	05:55	05:15
	16:39	41	16:04 (7)	17:32	35	17:02 (8)	18:24	35	17:46 (9)	20:18	21:10	21:53
8	08:44		15:24 (5)	08:06		15:53 (7)	07:08	17:12 (9)	06:56	05:53	05:15
	16:40	41	16:05 (7)	17:33	34	17:04 (8)	18:26	34	17:46 (9)	20:20	21:12	21:54
9	08:43		15:26 (5)	08:04		15:55 (7)	07:05	17:13 (9)	06:53	05:51	05:14
	16:41	41	16:07 (7)	17:35	33	17:06 (8)	18:27	32	17:45 (9)	20:22	21:13	21:55
10	08:43		15:27 (5)	08:02		15:58 (7)	07:03	17:13 (9)	06:51	05:49	05:14
	16:43	41	16:08 (7)	17:37	30	17:08 (8)	18:29	30	17:43 (9)	20:24	21:15	21:56
11	08:42		15:29 (5)	08:01		16:04 (7)	07:01	17:15 (9)	06:49	05:48	05:13
	16:44	41	16:10 (7)	17:39	21	17:10 (8)	18:31	26	17:41 (9)	20:25	21:17	21:56
12	08:41		15:32 (5)	07:59		16:54 (8)	06:59	17:17 (9)	06:46	05:46	05:13
	16:46	39	16:11 (7)	17:41	18	17:12 (8)	18:33	23	17:40 (9)	20:27	21:18	21:57
13	08:41		15:37 (7)	07:57		16:54 (8)	06:56	17:19 (9)	06:44	05:44	05:13
	16:47	36	16:13 (7)	17:43	21	17:15 (8)	18:35	17	17:36 (9)	20:29	21:20	21:58
14	08:40		15:38 (7)	07:55		16:54 (8)	06:54	17:24 (9)	06:42	05:43	05:13
	16:49	37	16:15 (7)	17:45	23	17:17 (8)	18:36	8	17:32 (9)	20:31	21:22	21:58
15	08:39		15:37 (7)	07:53		16:54 (8)	06:52			06:40	05:41	05:12
	16:50	39	16:16 (7)	17:47	25	17:19 (8)	18:38			20:32	21:23	21:59
16	08:38		15:38 (7)	07:51		16:54 (8)	06:49			06:37	05:39	05:12
	16:52	40	16:18 (7)	17:49	27	17:21 (8)	18:40			20:34	21:25	21:59
17	08:37		15:38 (7)	07:49		16:55 (8)	06:47			06:35	05:38	05:12
	16:54	42	16:20 (7)	17:51	26	17:21 (8)	18:42			20:36	21:26	22:00
18	08:36		15:38 (7)	07:47		16:56 (8)	06:45			06:33	05:36	05:12
	16:55	44	16:22 (7)	17:52	26	17:25 (9)	18:43			20:38	21:28	22:00
19	08:35		15:38 (7)	07:45		16:56 (8)	06:42			06:31	05:35	05:12
	16:57	46	16:24 (7)	17:54	28	17:26 (9)	18:45			20:39	21:29	22:01
20	08:34		15:39 (7)	07:43		16:57 (8)	06:40			06:29	05:33	05:12
	16:59	46	16:25 (7)	17:56	30	17:28 (9)	18:47			20:41	21:31	22:01
21	08:33		15:38 (7)	07:41		16:59 (8)	06:38			06:27	05:32	05:12
	17:00	47	16:25 (7)	17:58	31	17:31 (9)	18:49			20:43	21:32	22:01
22	08:32		15:39 (7)	07:39		17:01 (8)	06:35			06:24	05:31	05:13
	17:02	47	16:26 (7)	18:00	30	17:33 (9)	18:50			20:44	21:34	22:01
23	08:31		15:40 (7)	07:36		17:06 (8)	06:33			06:22	05:29	05:13
	17:04	46	16:26 (7)	18:02	24	17:35 (9)	18:52			20:46	21:35	22:02
24	08:29		15:39 (7)	07:34		17:14 (9)	06:31			06:20	05:28	05:13
	17:06	47	16:26 (7)	18:04	23	17:37 (9)	18:54			20:48	21:37	22:02
25	08:28		15:40 (7)	07:32		17:13 (9)	06:28			06:18	05:27	05:13
	17:07	47	16:27 (7)	18:05	25	17:38 (9)	18:56			20:50	21:38	22:02
26	08:27		15:40 (7)	07:30		17:12 (9)	06:26			06:16	05:26	05:14
	17:09	46	16:26 (7)	18:07	28	17:40 (9)	18:57			20:51	21:39	22:02
27	08:25		15:41 (7)	07:28		17:12 (9)	06:23			06:14	05:25	05:14
	17:11	46	16:27 (7)	18:09	31	17:43 (9)	18:59			20:53	21:41	22:02
28	08:24		15:41 (7)	07:26		17:12 (9)	06:21			06:12	05:24	05:15
	17:13	45	16:26 (7)	18:11	33	17:45 (9)	19:01			20:55	21:42	22:02
29	08:22		15:42 (7)				07:19			06:10	05:23	05:15
	17:15	45	16:27 (7)				20:03			20:57	21:43	22:01
30	08:21		15:43 (7)				07:16			06:08	05:22	05:16
	17:17	43	16:26 (7)				20:04			20:58	21:44	22:01
31	08:19		15:43 (7)				07:14				05:21	
	17:18	43	16:26 (7)				20:06				21:46	
Potential sun hours	257			277			367			417	487	502
Total, worst case		1308			830			429				
Sun reduction		0.22			0.24			0.28				
Oper. time red.		1.00			1.00			1.00				
Wind dir. red.		0.62			0.61			0.60				
Total reduction		0.13			0.15			0.17				
Total, real		175			123			72				

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
Jennings O'Donovan
Finisklin Business Park
F91 RHH9 Sligo
+353719161416
Kathlyn Feeney / kfeeney@jodireland.com
Calculated:
09/06/2025 13:54/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Worst Case - V150 **Shadow receptor:** B - 2

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	July	August	September		October		November		December	
1	05:17	05:54	06:45		07:35		07:30		08:22	
	22:01	21:28	20:25		19:14	20	17:07	32	16:26	41
2	05:17	05:55	06:46		07:36		07:31		08:23	
	22:01	21:26	20:23		19:12	24	17:05	34	16:25	40
3	05:18	05:57	06:48		07:38		07:33		08:24	
	22:00	21:25	20:20		19:10	28	17:04	36	16:25	41
4	05:19	05:59	06:50		07:40		07:35		08:26	
	22:00	21:23	20:18		19:07	30	17:02	36	16:24	41
5	05:20	06:00	06:51		07:42		07:37		08:27	
	21:59	21:21	20:16		19:05	33	17:00	35	16:24	41
6	05:20	06:02	06:53		07:43		07:39		08:28	
	21:59	21:19	20:13		19:03	35	16:58	35	16:23	40
7	05:21	06:03	06:55		07:45		07:41		08:30	
	21:58	21:18	20:11		19:01	36	16:56	37	16:23	40
8	05:22	06:05	06:56		07:47		07:42		08:31	
	21:57	21:16	20:09		18:58	37	16:55	39	16:22	39
9	05:23	06:07	06:58		07:48		07:44		08:32	
	21:57	21:14	20:06		18:56	37	16:53	40	16:22	39
10	05:24	06:08	07:00		07:50		07:46		08:33	
	21:56	21:12	20:04		18:54	39	16:51	42	16:22	38
11	05:25	06:10	07:01		07:52		07:48		08:34	
	21:55	21:10	20:02		18:51	39	16:50	43	16:22	38
12	05:26	06:12	07:03		07:54		07:50		08:35	
	21:54	21:08	19:59		18:49	36	16:48	44	16:22	37
13	05:28	06:13	07:05		07:55		07:51		08:36	
	21:53	21:06	19:57		18:47	34	16:47	45	16:21	37
14	05:29	06:15	07:06		07:57		07:53		08:37	
	21:52	21:04	19:55		18:45	32	16:45	45	16:21	37
15	05:30	06:16	07:08		07:59		07:55		08:38	
	21:51	21:02	19:52		18:42	30	16:44	46	16:21	36
16	05:31	06:18	07:10		08:01		07:57		08:39	
	21:50	21:00	19:50		18:40	27	16:42	46	16:22	36
17	05:32	06:20	07:11		08:02		07:59		08:40	
	21:49	20:58	19:48		18:38	25	16:41	47	16:22	36
18	05:34	06:21	07:13		08:04		08:00		08:41	
	21:48	20:56	19:45		18:36	22	16:40	47	16:22	36
19	05:35	06:23	07:15		08:06		08:02		08:41	
	21:47	20:54	19:43		18:34	27	16:38	46	16:22	36
20	05:36	06:25	07:16		08:08		08:04		08:42	
	21:46	20:52	19:40		18:32	29	16:37	47	16:23	35
21	05:38	06:26	07:18		08:10		08:06		08:43	
	21:45	20:49	19:38		18:29	30	16:36	47	16:23	35
22	05:39	06:28	07:20		08:11		08:07		08:43	
	21:43	20:47	19:36		18:27	30	16:35	46	16:24	35
23	05:40	06:30	07:21		08:13		08:09		08:44	
	21:42	20:45	19:33		18:25	28	16:33	45	16:24	35
24	05:42	06:31	07:23		08:15		08:11		08:44	
	21:40	20:43	19:31		18:23	25	16:32	44	16:25	36
25	05:43	06:33	07:25		07:17		08:12		08:45	
	21:39	20:41	19:29		17:21	27	16:31	42	16:25	36
26	05:45	06:35	07:26		07:19		08:14		08:45	
	21:38	20:38	19:26		17:19	26	16:30	40	16:26	35
27	05:46	06:36	07:28		07:20		08:15		08:45	
	21:36	20:36	19:24		17:17	24	16:29	39	16:27	36
28	05:48	06:38	07:30		07:22		08:17		08:45	
	21:35	20:34	19:22		17:15	23	16:28	37	16:28	37
29	05:49	06:40	07:31		07:24		08:19		08:45	
	21:33	20:32	19:19		17:13	21	16:28	36	16:28	37
30	05:51	06:41	07:33	18:00 (9)	07:26		08:20		08:46	
	21:31	20:30	19:17	15 18:15 (9)	17:11	19	16:27	39	16:29	37
31	05:52	06:43			07:28				08:46	
	21:30	20:27			17:09	24			16:30	38
Potential sun hours	504	455	381		331		264		241	
Total, worst case				15		897		1237		1161
Sun reduction				0.34		0.28		0.26		0.22
Oper. time red.				1.00		1.00		1.00		1.00
Wind dir. red.				0.60		0.60		0.62		0.62
Total reduction				0.20		0.17		0.16		0.13
Total, real				3		152		199		157

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
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Kathlyn Feeney / kfeeney@jodireland.com
Calculated:
09/06/2025 13:54/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Worst Case - V150 **Shadow receptor:** C - 3

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January		February		March		April	May	June
1	08:46		15:18 (5)	08:18		15:44 (7)	07:23	17:14 (9)	07:12	06:06	05:20
	16:32	38	15:56 (7)	17:20	45	16:29 (7)	18:13	32	17:46 (9)	20:08	21:00	21:47
2	08:45		15:18 (5)	08:16		15:44 (7)	07:21	17:14 (9)	07:09	06:04	05:19
	16:33	39	15:57 (7)	17:22	45	16:29 (7)	18:15	34	17:48 (9)	20:10	21:02	21:48
3	08:45		15:19 (5)	08:15		15:45 (7)	07:19	17:14 (9)	07:07	06:02	05:18
	16:34	39	15:58 (7)	17:24	43	16:28 (7)	18:17	36	17:50 (9)	20:11	21:03	21:49
4	08:45		15:20 (5)	08:13		15:45 (7)	07:17	17:13 (9)	07:05	06:00	05:17
	16:35	40	16:00 (7)	17:26	42	16:27 (7)	18:18	39	17:52 (9)	20:13	21:05	21:50
5	08:45		15:20 (5)	08:11		15:46 (7)	07:15	17:13 (9)	07:02	05:58	05:17
	16:36	41	16:01 (7)	17:28	40	16:26 (7)	18:20	40	17:53 (9)	20:15	21:07	21:51
6	08:44		15:22 (5)	08:10		15:48 (7)	07:12	17:13 (9)	07:00	05:56	05:16
	16:37	41	16:03 (7)	17:30	38	16:26 (7)	18:22	40	17:53 (9)	20:17	21:08	21:52
7	08:44		15:22 (5)	08:08		15:49 (7)	07:10	17:13 (9)	06:58	05:55	05:15
	16:39	42	16:04 (7)	17:32	38	17:02 (8)	18:24	39	17:52 (9)	20:18	21:10	21:53
8	08:44		15:23 (5)	08:06		15:50 (7)	07:08	17:13 (9)	06:56	05:53	05:15
	16:40	42	16:05 (7)	17:33	39	17:04 (8)	18:26	38	17:51 (9)	20:20	21:12	21:54
9	08:43		15:25 (5)	08:04		15:52 (7)	07:05	17:14 (9)	06:53	05:51	05:14
	16:41	42	16:07 (7)	17:35	39	17:06 (8)	18:27	37	17:51 (9)	20:22	21:13	21:55
10	08:43		15:26 (5)	08:02		15:54 (7)	07:03	17:14 (9)	06:51	05:49	05:14
	16:43	42	16:08 (7)	17:37	38	17:08 (8)	18:29	35	17:49 (9)	20:24	21:15	21:56
11	08:42		15:27 (5)	08:01		15:56 (7)	07:01	17:15 (9)	06:49	05:48	05:13
	16:44	43	16:10 (7)	17:39	37	17:10 (8)	18:31	33	17:48 (9)	20:25	21:17	21:56
12	08:41		15:29 (5)	07:59		15:59 (7)	06:59	17:16 (9)	06:46	05:46	05:13
	16:46	42	16:11 (7)	17:41	33	17:12 (8)	18:33	31	17:47 (9)	20:27	21:18	21:57
13	08:41		15:31 (5)	07:57		16:04 (7)	06:56	17:17 (9)	06:44	05:44	05:13
	16:47	42	16:13 (7)	17:43	26	17:15 (8)	18:35	28	17:45 (9)	20:29	21:20	21:58
14	08:40		15:39 (7)	07:55		16:56 (8)	06:54	17:19 (9)	06:42	05:43	05:13
	16:49	36	16:15 (7)	17:45	21	17:17 (8)	18:36	24	17:43 (9)	20:31	21:22	21:58
15	08:39		15:38 (7)	07:53		16:56 (8)	06:52	17:21 (9)	06:40	05:41	05:12
	16:50	38	16:16 (7)	17:47	23	17:19 (8)	18:38	20	17:41 (9)	20:32	21:23	21:59
16	08:38		15:39 (7)	07:51		16:56 (8)	06:49	17:23 (9)	06:37	05:39	05:12
	16:52	39	16:18 (7)	17:49	25	17:21 (8)	18:40	14	17:37 (9)	20:34	21:25	21:59
17	08:37		15:39 (7)	07:49		16:56 (8)	06:47		06:35	05:38	05:12
	16:54	41	16:20 (7)	17:51	27	17:23 (8)	18:42		20:36	21:26	22:00
18	08:36		15:39 (7)	07:47		16:57 (8)	06:45		06:33	05:36	05:12
	16:55	43	16:22 (7)	17:52	27	17:24 (8)	18:43		20:38	21:28	22:00
19	08:35		15:39 (7)	07:45		16:56 (8)	06:42		06:31	05:35	05:12
	16:57	45	16:24 (7)	17:54	26	17:22 (8)	18:45		20:39	21:29	22:01
20	08:34		15:40 (7)	07:43		16:57 (8)	06:40		06:29	05:33	05:12
	16:59	46	16:26 (7)	17:56	26	17:28 (9)	18:47		20:41	21:31	22:01
21	08:33		15:39 (7)	07:41		16:58 (8)	06:38		06:27	05:32	05:12
	17:00	48	16:27 (7)	17:58	30	17:31 (9)	18:49		20:43	21:32	22:01
22	08:32		15:40 (7)	07:39		17:00 (8)	06:35		06:24	05:31	05:13
	17:02	48	16:28 (7)	18:00	31	17:33 (9)	18:50		20:44	21:34	22:01
23	08:31		15:40 (7)	07:36		17:02 (8)	06:33		06:22	05:29	05:13
	17:04	48	16:28 (7)	18:02	30	17:35 (9)	18:52		20:46	21:35	22:02
24	08:29		15:40 (7)	07:34		17:05 (8)	06:31		06:20	05:28	05:13
	17:06	48	16:28 (7)	18:04	27	17:37 (9)	18:54		20:48	21:37	22:02
25	08:28		15:40 (7)	07:32		17:18 (9)	06:28		06:18	05:27	05:13
	17:07	49	16:29 (7)	18:05	20	17:38 (9)	18:56		20:50	21:38	22:02
26	08:27		15:40 (7)	07:30		17:17 (9)	06:26		06:16	05:26	05:14
	17:09	49	16:29 (7)	18:07	23	17:40 (9)	18:57		20:51	21:39	22:02
27	08:25		15:41 (7)	07:28		17:16 (9)	06:23		06:14	05:25	05:14
	17:11	48	16:29 (7)	18:09	27	17:43 (9)	18:59		20:53	21:41	22:02
28	08:24		15:41 (7)	07:26		17:16 (9)	06:21		06:12	05:24	05:15
	17:13	48	16:29 (7)	18:11	29	17:45 (9)	19:01		20:55	21:42	22:02
29	08:22		15:42 (7)				07:19		06:10	05:23	05:15
	17:15	47	16:29 (7)				20:03		20:57	21:43	22:01
30	08:21		15:42 (7)				07:16		06:08	05:22	05:16
	17:17	47	16:29 (7)				20:04		20:58	21:44	22:01
31	08:19		15:42 (7)				07:14			05:21	
	17:18	47	16:29 (7)				20:06			21:46	
Potential sun hours	257			277			367		417	487	502
Total, worst case		1348			895			520			
Sun reduction		0.22			0.24			0.28			
Oper. time red.		1.00			1.00			1.00			
Wind dir. red.		0.62			0.61			0.60			
Total reduction		0.13			0.15			0.17			
Total, real		180			132			87			

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

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Kathlyn Feeney / kfeeney@jodireland.com
Calculated:
09/06/2025 13:54/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Worst Case - V150 **Shadow receptor:** C - 3

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	July		August		September		October		November		December	
1	05:17		05:54		06:45		07:35		07:30		08:22	
	22:01		21:28		20:25		19:14	30	17:07	39	16:26	43
2	05:17		05:55		06:46		07:36		07:31		08:23	
	22:01		21:26		20:23		19:12	33	17:05	40	16:25	42
3	05:18		05:57		06:48		07:38		07:33		08:24	
	22:00		21:25		20:20		19:10	35	17:04	39	16:25	42
4	05:19		05:59		06:50		07:40		07:35		08:26	
	22:00		21:23		20:18		19:07	36	17:02	38	16:24	42
5	05:20		06:00		06:51		07:42		07:37		08:27	
	21:59		21:21		20:16		19:05	37	17:00	38	16:24	42
6	05:20		06:02		06:53		07:43		07:39		08:28	
	21:59		21:19		20:13		19:03	38	16:58	40	16:23	41
7	05:21		06:03		06:55		07:45		07:41		08:30	
	21:58		21:18		20:11		19:01	39	16:56	42	16:23	41
8	05:22		06:05		06:56		07:47		07:42		08:31	
	21:57		21:16		20:09		18:58	40	16:55	44	16:22	40
9	05:23		06:07		06:58		07:48		07:44		08:32	
	21:57		21:14		20:06		18:56	40	16:53	44	16:22	40
10	05:24		06:08		07:00		07:50		07:46		08:33	
	21:56		21:12		20:04		18:54	38	16:51	45	16:22	39
11	05:25		06:10		07:01		07:52		07:48		08:34	
	21:55		21:10		20:02		18:51	36	16:50	46	16:22	39
12	05:26		06:12		07:03		07:54		07:50		08:35	
	21:54		21:08		19:59		18:49	33	16:48	47	16:22	38
13	05:28		06:13		07:05		07:55		07:51		08:36	
	21:53		21:06		19:57		18:47	30	16:47	47	16:21	38
14	05:29		06:15		07:06		07:57		07:53		08:37	
	21:52		21:04		19:55		18:45	28	16:45	48	16:21	37
15	05:30		06:16		07:08		07:59		07:55		08:38	
	21:51		21:02		19:52		18:42	25	16:44	48	16:21	37
16	05:31		06:18		07:10		08:01		07:57		08:39	
	21:50		21:00		19:50		18:40	23	16:42	48	16:22	36
17	05:32		06:20		07:11		08:02		07:59		08:40	
	21:49		20:58		19:48		18:38	20	16:41	49	16:22	37
18	05:34		06:21		07:13		08:04		08:00		08:41	
	21:48		20:56		19:45		18:36	29	16:40	48	16:22	36
19	05:35		06:23		07:15		08:06		08:02		08:41	
	21:47		20:54		19:43		18:34	31	16:38	48	16:22	36
20	05:36		06:25		07:16		08:08		08:04		08:42	
	21:46		20:52		19:40		18:32	29	16:37	48	16:23	36
21	05:38		06:26		07:18		08:10		08:06		08:43	
	21:45		20:49		19:38		18:29	28	16:36	48	16:23	36
22	05:39		06:28		07:20		08:11		08:07		08:43	
	21:43		20:47		19:36		18:27	25	16:35	46	16:24	36
23	05:40		06:30		07:21		08:13		08:09		08:44	
	21:42		20:45		19:33		18:25	26	16:33	45	16:24	36
24	05:42		06:31		07:23		08:15		08:11		08:44	
	21:40		20:43		19:31		18:23	28	16:32	43	16:25	37
25	05:43		06:33		07:25		08:17		08:12		08:45	
	21:39		20:41		19:29		17:21	26	16:31	41	16:25	36
26	05:45		06:35		07:26		07:19		08:14		08:45	
	21:38		20:38		19:26		17:19	25	16:30	39	16:26	36
27	05:46		06:36		07:28	18:07 (9)	07:20		08:15		08:45	
	21:36		20:36		19:24	10 18:17 (9)	07:17	23	16:29	37	16:27	37
28	05:48		06:38		07:30	18:03 (9)	07:22		08:17		08:45	
	21:35		20:34		19:22	18 18:21 (9)	17:15	21	16:28	36	16:28	37
29	05:49		06:40		07:31	18:00 (9)	07:24		08:19		08:45	
	21:33		20:32		19:19	23 18:23 (9)	17:13	30	16:28	42	16:28	38
30	05:51		06:41		07:33	17:57 (9)	07:26		08:20		08:46	
	21:31		20:30		19:17	27 18:24 (9)	17:11	35	16:27	42	16:29	38
31	05:52		06:43				07:28				08:46	
	21:30		20:27				17:09	38			16:30	38
Potential sun hours	504		455		381		331		264		241	
Total, worst case						78		955		1305		1187
Sun reduction						0.34		0.28		0.26		0.22
Oper. time red.						1.00		1.00		1.00		1.00
Wind dir. red.						0.60		0.60		0.61		0.62
Total reduction						0.20		0.17		0.16		0.13
Total, real						16		162		209		160

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

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SHADOW - Calendar

Calculation: 6839 Garrane WF Worst Case - V150 **Shadow receptor:** D - 4

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January		February		March		April		May	June
1	08:46		15:13 (6)	08:18		16:12 (5)	07:23		16:46 (7)	07:12		18:59 (9)	06:06	05:20
	16:32	41	15:54 (6)	17:20	17	16:29 (5)	18:13	57	17:46 (8)	20:08	16	19:15 (9)	21:00	21:47
2	08:45		15:12 (6)	08:16		16:14 (5)	07:21		16:47 (7)	07:09		19:03 (9)	06:04	05:19
	16:33	41	15:53 (6)	17:22	13	16:27 (5)	18:15	57	17:48 (8)	20:10	6	19:09 (9)	21:02	21:48
3	08:45		15:13 (6)	08:15		16:18 (5)	07:19		16:48 (7)	07:07			06:02	05:18
	16:34	41	15:54 (6)	17:24	5	16:23 (5)	18:17	57	17:50 (8)	20:11			21:03	21:49
4	08:45		15:14 (6)	08:13			07:17		16:49 (7)	07:05			06:00	05:17
	16:35	41	15:55 (6)	17:26			18:18	55	17:52 (8)	20:13			21:05	21:50
5	08:45		15:14 (6)	08:11			07:15		16:51 (7)	07:02			05:58	05:17
	16:36	41	15:55 (6)	17:28			18:20	53	17:53 (8)	20:15			21:07	21:51
6	08:44		15:15 (6)	08:10		16:59 (7)	07:12		16:53 (7)	07:00			05:56	05:16
	16:37	42	16:03 (5)	17:30	1	17:00 (7)	18:22	47	17:52 (8)	20:17			21:08	21:52
7	08:44		15:15 (6)	08:08		16:56 (7)	07:10		16:56 (7)	06:58			05:55	05:15
	16:39	44	16:04 (5)	17:32	6	17:02 (7)	18:24	38	17:50 (8)	20:18			21:10	21:53
8	08:44		15:15 (6)	08:06		16:54 (7)	07:08		17:01 (7)	06:56			05:53	05:15
	16:40	45	16:05 (5)	17:33	10	17:04 (7)	18:26	25	17:49 (8)	20:20			21:12	21:54
9	08:43		15:16 (6)	08:04		16:52 (7)	07:05		17:33 (8)	06:53			05:51	05:14
	16:41	46	16:07 (5)	17:35	14	17:06 (7)	18:27	14	17:47 (8)	20:22			21:13	21:55
10	08:43		15:17 (6)	08:02		16:51 (7)	07:03		17:35 (8)	06:51			05:49	05:14
	16:43	47	16:08 (5)	17:37	17	17:08 (7)	18:29	8	17:43 (8)	20:24			21:15	21:55
11	08:42		15:17 (6)	08:01		16:50 (7)	07:01			06:49			05:48	05:13
	16:44	49	16:10 (5)	17:39	20	17:10 (7)	18:31			20:25			21:17	21:56
12	08:41		15:17 (6)	07:59		16:49 (7)	06:59		18:04 (9)	06:46			05:46	05:13
	16:46	50	16:11 (5)	17:41	23	17:12 (7)	18:33	3	18:07 (9)	20:27			21:18	21:57
13	08:41		15:18 (6)	07:57		16:48 (7)	06:56		18:01 (9)	06:44			05:44	05:13
	16:47	51	16:13 (5)	17:43	27	17:15 (7)	18:35	7	18:08 (9)	20:29			21:20	21:58
14	08:40		15:19 (6)	07:55		16:47 (7)	06:54		17:59 (9)	06:42			05:43	05:13
	16:49	51	16:14 (5)	17:45	30	17:17 (7)	18:36	11	18:10 (9)	20:31			21:22	21:58
15	08:39		15:19 (6)	07:53		16:46 (7)	06:52		17:58 (9)	06:40			05:41	05:12
	16:50	53	16:16 (5)	17:47	33	17:19 (7)	18:38	15	18:13 (9)	20:32			21:23	21:59
16	08:38		15:20 (6)	07:51		16:46 (7)	06:49		17:56 (9)	06:37			05:39	05:12
	16:52	54	16:18 (5)	17:49	35	17:21 (7)	18:40	18	18:14 (9)	20:34			21:25	21:59
17	08:37		15:21 (6)	07:49		16:45 (7)	06:47		17:55 (9)	06:35			05:38	05:12
	16:54	55	16:20 (5)	17:51	38	17:23 (7)	18:42	21	18:16 (9)	20:36			21:26	22:00
18	08:36		15:22 (6)	07:47		16:45 (7)	06:45		17:55 (9)	06:33			05:36	05:12
	16:55	55	16:22 (5)	17:52	40	17:25 (7)	18:43	23	18:18 (9)	20:37			21:28	22:00
19	08:35		15:23 (6)	07:45		16:44 (7)	06:42		17:53 (9)	06:31			05:35	05:12
	16:57	56	16:24 (5)	17:54	42	17:26 (7)	18:45	26	18:19 (9)	20:39			21:29	22:01
20	08:34		15:24 (6)	07:43		16:44 (7)	06:40		17:53 (9)	06:29			05:33	05:12
	16:59	56	16:26 (5)	17:56	44	17:28 (7)	18:47	28	18:21 (9)	20:41			21:31	22:01
21	08:33		15:25 (6)	07:41		16:44 (7)	06:38		17:53 (9)	06:27			05:32	05:12
	17:00	56	16:27 (5)	17:58	45	17:29 (7)	18:49	30	18:23 (9)	20:43			21:32	22:01
22	08:32		15:26 (6)	07:39		16:44 (7)	06:35		17:52 (9)	06:24			05:31	05:13
	17:02	55	16:29 (5)	18:00	45	17:29 (7)	18:50	33	18:25 (9)	20:44			21:34	22:01
23	08:31		15:28 (6)	07:36		16:44 (7)	06:33		17:52 (9)	06:22			05:29	05:13
	17:04	55	16:32 (5)	18:02	46	17:35 (8)	18:52	35	18:27 (9)	20:46			21:35	22:02
24	08:29		15:29 (6)	07:34		16:43 (7)	06:31		17:51 (9)	06:20			05:28	05:13
	17:06	54	16:33 (5)	18:04	49	17:36 (8)	18:54	35	18:26 (9)	20:48			21:36	22:02
25	08:28		15:31 (6)	07:32		16:44 (7)	06:28		17:52 (9)	06:18			05:27	05:13
	17:07	50	16:33 (5)	18:05	51	17:38 (8)	18:56	34	18:26 (9)	20:50			21:38	22:02
26	08:27		15:33 (6)	07:30		16:44 (7)	06:26		17:52 (9)	06:16			05:26	05:14
	17:09	45	16:32 (5)	18:07	53	17:40 (8)	18:57	33	18:25 (9)	20:51			21:39	22:02
27	08:25		15:36 (6)	07:28		16:45 (7)	06:23		17:52 (9)	06:14			05:25	05:14
	17:11	40	16:33 (5)	18:09	56	17:43 (8)	18:59	31	18:23 (9)	20:53			21:41	22:02
28	08:24		16:06 (5)	07:26		16:46 (7)	06:21		17:53 (9)	06:12			05:24	05:15
	17:13	26	16:32 (5)	18:11	56	17:45 (8)	19:01	29	18:22 (9)	20:55			21:42	22:01
29	08:22		16:08 (5)				07:19		18:54 (9)	06:10			05:23	05:15
	17:15	24	16:32 (5)				20:03	27	19:21 (9)	20:57			21:43	22:01
30	08:21		16:09 (5)				07:16		18:55 (9)	06:08			05:22	05:16
	17:17	22	16:31 (5)				20:04	24	19:19 (9)	20:58			21:44	22:01
31	08:19		16:10 (5)				07:14		18:57 (9)				05:21	
	17:18	20	16:30 (5)				20:06	20	19:17 (9)				21:46	
Potential sun hours	257			277			367			417			487	501
Total, worst case		1406			816			894			22			
Sun reduction		0.22			0.24			0.28			0.38			
Oper. time red.		1.00			1.00			1.00			1.00			
Wind dir. red.		0.62			0.60			0.60			0.60			
Total reduction		0.13			0.15			0.17			0.23			
Total, real		188			120			150			5			

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

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Kathlyn Feeney / kfeeney@jodireland.com

Calculated:
09/06/2025 13:54/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Worst Case - V150 **Shadow receptor:** D - 4

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	July	August	September		October		November		December		
1	05:17	05:54	06:45		07:35		18:42 (9)	07:30		16:21 (7)	08:21		14:59 (6)
	22:01	21:28	20:25		19:14	5	18:47 (9)	17:07	17	16:38 (7)	16:26	49	15:52 (5)
2	05:17	05:55	06:46		07:36			07:31		16:22 (7)	08:23		15:00 (6)
	22:00	21:26	20:23		19:12			17:05	14	16:36 (7)	16:25	47	15:51 (5)
3	05:18	05:57	06:48		07:38			07:33		16:24 (7)	08:24		14:59 (6)
	22:00	21:25	20:20		19:10			17:04	10	16:34 (7)	16:25	46	15:50 (5)
4	05:19	05:59	06:50		07:40		18:11 (8)	07:35		16:26 (7)	08:26		15:00 (6)
	22:00	21:23	20:18		19:07	12	18:23 (8)	17:02	6	16:32 (7)	16:24	45	15:50 (5)
5	05:20	06:00	06:51		07:42		18:09 (8)	07:37			08:27		15:00 (6)
	21:59	21:21	20:16		19:05	16	18:25 (8)	17:00			16:24	44	15:49 (5)
6	05:20	06:02	06:53		07:43		17:35 (7)	07:39			08:28		15:01 (6)
	21:59	21:19	20:13		19:03	33	18:27 (8)	16:58			16:23	42	15:49 (5)
7	05:21	06:03	06:55		07:45		17:31 (7)	07:41			08:30		15:01 (6)
	21:58	21:18	20:11		19:01	43	18:28 (8)	16:56			16:23	41	15:42 (6)
8	05:22	06:05	06:56		07:47		17:27 (7)	07:42		15:48 (5)	08:31		15:01 (6)
	21:57	21:16	20:09		18:58	50	18:28 (8)	16:55	6	15:54 (5)	16:22	41	15:42 (6)
9	05:23	06:07	06:58		07:48		17:25 (7)	07:44		15:45 (5)	08:32		15:01 (6)
	21:57	21:14	20:06		18:56	55	18:28 (8)	16:53	13	15:58 (5)	16:22	41	15:42 (6)
10	05:24	06:08	07:00		18:58 (9)		07:50		17:23 (7)	07:46		15:43 (5)	08:33		15:03 (6)
	21:56	21:12	20:04	2	19:00 (9)		18:54	57	18:26 (8)	16:51	17	16:00 (5)	16:22	40	15:43 (6)
11	05:25	06:10	07:01		18:52 (9)		07:52		17:22 (7)	07:48		15:42 (5)	08:34		15:03 (6)
	21:55	21:10	20:02	14	19:06 (9)		18:51	57	18:24 (8)	16:50	20	16:02 (5)	16:22	41	15:44 (6)
12	05:26	06:12	07:03		18:49 (9)		07:54		17:21 (7)	07:50		15:40 (5)	08:35		15:03 (6)
	21:54	21:08	19:59	20	19:09 (9)		18:49	56	18:21 (8)	16:48	23	16:03 (5)	16:22	41	15:44 (6)
13	05:28	06:13	07:05		18:46 (9)		07:55		17:19 (7)	07:51		15:40 (5)	08:36		15:04 (6)
	21:53	21:06	19:57	24	19:10 (9)		18:47	56	18:18 (8)	16:47	24	16:04 (5)	16:21	40	15:44 (6)
14	05:29	06:15	07:06		18:45 (9)		07:57		17:18 (7)	07:53		15:38 (5)	08:37		15:04 (6)
	21:52	21:04	19:55	26	19:11 (9)		18:45	56	18:16 (8)	16:45	26	16:04 (5)	16:21	41	15:45 (6)
15	05:30	06:16	07:08		18:43 (9)		07:59		17:17 (7)	07:55		15:08 (6)	08:38		15:05 (6)
	21:51	21:02	19:52	29	19:12 (9)		18:42	54	18:14 (8)	16:44	40	16:05 (5)	16:21	40	15:45 (6)
16	05:31	06:18	07:10		18:42 (9)		08:01		17:16 (7)	07:57		15:06 (6)	08:39		15:05 (6)
	21:50	21:00	19:50	31	19:13 (9)		18:40	54	18:12 (8)	16:42	45	16:05 (5)	16:22	41	15:46 (6)
17	05:32	06:20	07:11		18:41 (9)		08:02		17:16 (7)	07:59		15:04 (6)	08:40		15:05 (6)
	21:49	20:58	19:48	32	19:13 (9)		18:38	51	18:10 (8)	16:41	51	16:06 (5)	16:22	41	15:46 (6)
18	05:34	06:21	07:13		18:39 (9)		08:04		17:16 (7)	08:00		15:03 (6)	08:41		15:06 (6)
	21:48	20:56	19:45	34	19:13 (9)		18:36	48	18:08 (8)	16:40	55	16:07 (5)	16:22	40	15:46 (6)
19	05:35	06:23	07:15		18:39 (9)		08:06		17:14 (7)	08:02		15:02 (6)	08:41		15:06 (6)
	21:47	20:54	19:43	34	19:13 (9)		18:34	46	18:00 (7)	16:38	55	16:06 (5)	16:22	41	15:47 (6)
20	05:36	06:25	07:16		18:39 (9)		08:08		17:14 (7)	08:04		15:01 (6)	08:42		15:06 (6)
	21:46	20:52	19:40	35	19:14 (9)		18:32	46	18:00 (7)	16:37	57	16:05 (5)	16:23	40	15:46 (6)
21	05:38	06:26	07:18		18:37 (9)		08:10		17:14 (7)	08:06		15:01 (6)	08:43		15:07 (6)
	21:44	20:49	19:38	34	19:11 (9)		18:29	45	17:59 (7)	16:36	56	16:03 (5)	16:23	40	15:47 (6)
22	05:39	06:28	07:20		18:37 (9)		08:11		17:14 (7)	08:07		15:00 (6)	08:43		15:07 (6)
	21:43	20:47	19:36	32	19:09 (9)		18:27	44	17:58 (7)	16:35	56	16:02 (5)	16:24	40	15:47 (6)
23	05:40	06:30	07:21		18:37 (9)		08:13		17:14 (7)	08:09		15:00 (6)	08:44		15:08 (6)
	21:42	20:45	19:33	30	19:07 (9)		18:25	42	17:56 (7)	16:33	56	16:01 (5)	16:24	40	15:48 (6)
24	05:42	06:31	07:23		18:37 (9)		08:15		17:15 (7)	08:11		14:59 (6)	08:44		15:08 (6)
	21:40	20:43	19:31	26	19:03 (9)		18:23	39	17:54 (7)	16:32	55	15:59 (5)	16:25	41	15:49 (6)
25	05:43	06:33	07:25		18:37 (9)		07:17		16:15 (7)	08:12		14:59 (6)	08:45		15:10 (6)
	21:39	20:41	19:29	24	19:01 (9)		17:21	37	16:52 (7)	16:31	55	15:58 (5)	16:25	40	15:50 (6)
26	05:45	06:35	07:26		18:38 (9)		07:19		16:15 (7)	08:14		14:59 (6)	08:45		15:10 (6)
	21:38	20:38	19:26	21	18:59 (9)		17:19	35	16:50 (7)	16:30	54	15:57 (5)	16:26	40	15:50 (6)
27	05:46	06:36	07:28		18:37 (9)		07:20		16:16 (7)	08:15		14:59 (6)	08:45		15:10 (6)
	21:36	20:36	19:24	19	18:56 (9)		17:17	32	16:48 (7)	16:29	53	15:56 (5)	16:27	41	15:51 (6)
28	05:48	06:38	07:30		18:38 (9)		07:22		16:17 (7)	08:17		14:59 (6)	08:45		15:11 (6)
	21:35	20:34	19:22	16	18:54 (9)		17:15	29	16:46 (7)	16:28	52	15:55 (5)	16:28	40	15:51 (6)
29	05:49	06:40	07:31		18:40 (9)		07:24		16:18 (7)	08:19		14:59 (6)	08:45		15:11 (6)
	21:33	20:32	19:19	12	18:52 (9)		17:13	26	16:44 (7)	16:28	51	15:54 (5)	16:28	41	15:52 (6)
30	05:51	06:41	07:33		18:40 (9)		07:26		16:18 (7)	08:20		15:00 (6)	08:46		15:11 (6)
	21:31	20:30	19:17	9	18:49 (9)		17:11	24	16:42 (7)	16:27	49	15:53 (5)	16:29	41	15:52 (6)
31	05:52	06:43					07:28		16:20 (7)				08:46		15:12 (6)
	21:30	20:27					17:09	20	16:40 (7)				16:30	41	15:53 (6)
Potential sun hours	504	455	381				331			264			241		
Total, worst case				504		1168			1016			1287			
Sun reduction				0.34		0.28			0.26			0.22			
Oper. time red.				1.00		1.00			1.00			1.00			
Wind dir. red.				0.60		0.60			0.61			0.62			
Total reduction				0.20		0.17			0.16			0.14			
Total, real				102		198			163			174			

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

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Kathlyn Feeney / kfeeney@jodireland.com

Calculated:
09/06/2025 13:54/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Worst Case - V150 **Shadow receptor:** E - 5

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January		February		March		April		May		June		
1	08:46		15:54 (2)	08:18		16:10 (2)	07:23		17:08 (4)	07:12		19:08 (6)	06:06		20:21 (7)	05:20		20:26 (7)
	16:32	3	15:57 (2)	17:20	10	16:20 (2)	18:13	38	17:46 (4)	20:08	34	19:42 (6)	21:00	10	20:31 (7)	21:47	39	21:05 (9)
2	08:45		15:53 (2)	08:16			07:21		17:09 (4)	07:09		19:07 (6)	06:04		20:19 (7)	05:19		20:27 (7)
	16:33	4	15:57 (2)	17:22			18:15	37	17:46 (4)	20:10	36	19:43 (6)	21:02	14	20:33 (7)	21:48	35	21:04 (9)
3	08:45		15:54 (2)	08:15			07:19		17:09 (4)	07:07		19:07 (6)	06:02		20:18 (7)	05:18		20:28 (7)
	16:34	4	15:58 (2)	17:24			18:17	37	17:46 (4)	20:11	38	19:45 (6)	21:03	16	20:34 (7)	21:49	32	21:04 (9)
4	08:45		15:54 (2)	08:13			07:17		17:09 (4)	07:05		19:06 (6)	06:00		20:17 (7)	05:17		20:30 (7)
	16:35	6	16:00 (2)	17:26			18:18	36	17:45 (4)	20:13	41	19:47 (6)	21:05	19	20:36 (7)	21:50	28	21:04 (9)
5	08:45		15:54 (2)	08:11			07:15		17:10 (4)	07:02		19:05 (6)	05:58		20:16 (7)	05:17		20:32 (7)
	16:36	7	16:01 (2)	17:28			18:20	34	17:44 (4)	20:15	43	19:48 (6)	21:07	21	20:37 (7)	21:51	22	21:03 (9)
6	08:44		15:54 (2)	08:10			07:12		17:10 (4)	07:00		19:05 (6)	05:56		20:16 (7)	05:16		20:48 (9)
	16:37	9	16:03 (2)	17:30			18:22	33	17:43 (4)	20:17	44	19:49 (6)	21:08	23	20:39 (7)	21:52	15	21:03 (9)
7	08:44		15:54 (2)	08:08			07:10		17:11 (4)	06:58		19:05 (6)	05:55		20:15 (7)	05:15		20:48 (9)
	16:39	10	16:04 (2)	17:32			18:24	30	17:41 (4)	20:18	44	19:49 (6)	21:10	25	20:40 (7)	21:53	14	21:02 (9)
8	08:44		15:54 (2)	08:06			07:08		17:12 (4)	06:56		19:06 (6)	05:53		20:15 (7)	05:15		20:50 (9)
	16:40	11	16:05 (2)	17:33			18:26	28	17:40 (4)	20:20	43	19:49 (6)	21:12	27	20:42 (7)	21:54	12	21:02 (9)
9	08:43		15:54 (2)	08:04			07:05		17:14 (4)	06:53		19:05 (6)	05:51		20:15 (7)	05:14		20:50 (9)
	16:41	13	16:07 (2)	17:35			18:27	25	17:39 (4)	20:22	42	19:47 (6)	21:13	29	20:44 (7)	21:55	11	21:01 (9)
10	08:42		15:54 (2)	08:02			07:03		17:15 (4)	06:51		19:05 (6)	05:49		20:14 (7)	05:14		20:52 (9)
	16:43	14	16:08 (2)	17:37			18:29	21	17:36 (4)	20:24	42	19:47 (6)	21:15	31	20:45 (7)	21:55	8	21:00 (9)
11	08:42		15:54 (2)	08:01		17:09 (3)	07:01		17:18 (4)	06:49		19:06 (6)	05:48		20:15 (7)	05:13		20:53 (9)
	16:44	16	16:10 (2)	17:39	1	17:10 (3)	18:31	15	17:33 (4)	20:25	40	19:46 (6)	21:17	32	20:47 (7)	21:56	7	21:00 (9)
12	08:41		15:54 (2)	07:59		17:08 (3)	06:59		17:23 (4)	06:46		19:07 (6)	05:46		20:14 (7)	05:13		20:54 (9)
	16:46	17	16:11 (2)	17:41	4	17:12 (3)	18:33	5	17:28 (4)	20:27	38	19:45 (6)	21:18	34	20:48 (7)	21:57	3	20:57 (9)
13	08:40		15:54 (2)	07:57		17:07 (3)	06:56			06:44		19:06 (6)	05:44		20:14 (7)	05:13		
	16:47	19	16:13 (2)	17:43	8	17:15 (3)	18:35			20:29	39	20:01 (8)	21:20	35	20:49 (7)	21:58		
14	08:40		15:54 (2)	07:55		17:06 (3)	06:54			06:42		19:07 (6)	05:43		20:14 (7)	05:13		
	16:49	20	16:14 (2)	17:45	11	17:17 (3)	18:36			20:31	40	20:03 (8)	21:21	37	20:51 (7)	21:58		
15	08:39		15:55 (2)	07:53		17:06 (3)	06:52		18:12 (5)	06:40		19:09 (6)	05:41		20:15 (7)	05:12		
	16:50	21	16:16 (2)	17:47	13	17:19 (3)	18:38	1	18:13 (5)	20:32	40	20:05 (8)	21:23	38	20:53 (9)	21:59		
16	08:38		15:55 (2)	07:51		17:06 (3)	06:49		18:09 (5)	06:37		19:10 (6)	05:39		20:14 (7)	05:12		
	16:52	23	16:18 (2)	17:49	15	17:21 (3)	18:40	5	18:14 (5)	20:34	40	20:07 (8)	21:25	40	20:54 (9)	21:59		
17	08:37		15:55 (2)	07:49		17:05 (3)	06:47		18:08 (5)	06:35		19:12 (6)	05:38		20:15 (7)	05:12		
	16:54	25	16:20 (2)	17:51	18	17:23 (3)	18:42	8	18:16 (5)	20:36	39	20:09 (8)	21:26	40	20:55 (9)	22:00		
18	08:36		15:56 (2)	07:47		17:04 (3)	06:45		18:07 (5)	06:33		19:14 (6)	05:36		20:15 (7)	05:12		
	16:55	26	16:22 (2)	17:52	20	17:24 (3)	18:43	11	18:18 (5)	20:37	36	20:10 (8)	21:28	41	20:56 (9)	22:00		
19	08:35		15:56 (2)	07:45		17:04 (3)	06:42		18:05 (5)	06:31		19:16 (6)	05:35		20:15 (7)	05:12		
	16:57	28	16:24 (2)	17:54	22	17:26 (3)	18:45	14	18:19 (5)	20:39	33	20:12 (8)	21:29	43	20:58 (9)	22:01		
20	08:34		15:57 (2)	07:43		17:05 (3)	06:40		18:04 (5)	06:29		19:20 (6)	05:34		20:16 (7)	05:12		
	16:59	29	16:26 (2)	17:56	23	17:28 (3)	18:47	17	18:21 (5)	20:41	25	20:13 (8)	21:31	43	20:59 (9)	22:01		
21	08:33		15:57 (2)	07:41		17:05 (3)	06:38		18:04 (5)	06:27		19:55 (8)	05:32		20:17 (7)	05:12		
	17:00	30	16:27 (2)	17:58	26	17:31 (3)	18:49	19	18:23 (5)	20:43	20	20:15 (8)	21:32	44	21:01 (9)	22:01		
22	08:32		15:58 (2)	07:39		17:06 (3)	06:35		18:02 (5)	06:24		19:56 (8)	05:31		20:17 (7)	05:13		
	17:02	30	16:28 (2)	18:00	27	17:33 (4)	18:50	23	18:25 (5)	20:44	20	20:16 (8)	21:34	45	21:02 (9)	22:01		
23	08:31		15:59 (2)	07:36		17:07 (3)	06:33		18:02 (5)	06:22		19:57 (8)	05:29		20:17 (7)	05:13		
	17:04	29	16:28 (2)	18:02	28	17:35 (4)	18:52	25	18:27 (5)	20:46	19	20:16 (8)	21:35	46	21:03 (9)	22:01		
24	08:29		15:59 (2)	07:34		17:07 (3)	06:31		18:02 (5)	06:20		19:57 (8)	05:28		20:18 (7)	05:13		
	17:06	29	16:28 (2)	18:04	29	17:36 (4)	18:54	26	18:28 (5)	20:48	18	20:15 (8)	21:36	46	21:04 (9)	22:02		
25	08:28		16:00 (2)	07:32		17:08 (3)	06:28		18:02 (5)	06:18		19:59 (8)	05:27		20:19 (7)	05:13		
	17:07	28	16:28 (2)	18:05	30	17:38 (4)	18:56	28	18:30 (5)	20:50	14	20:13 (8)	21:38	47	21:06 (9)	22:02		
26	08:27		16:00 (2)	07:30		17:09 (4)	06:26		18:02 (5)	06:16		20:01 (8)	05:26		20:20 (7)	05:14		
	17:09	27	16:27 (2)	18:07	32	17:41 (4)	18:57	30	18:32 (6)	20:51	10	20:11 (8)	21:39	46	21:06 (9)	22:02		
27	08:25		16:02 (2)	07:28		17:09 (4)	06:23		18:02 (5)	06:14			05:25		20:20 (7)	05:14		
	17:11	25	16:27 (2)	18:09	34	17:43 (4)	18:59	31	18:33 (6)	20:53			21:40	46	21:06 (9)	22:02		
28	08:24		16:02 (2)	07:26		17:09 (4)	06:21		18:03 (5)	06:12			05:24		20:21 (7)	05:15		
	17:13	24	16:26 (2)	18:11	36	17:45 (4)	19:01	32	18:35 (6)	20:55			21:42	45	21:06 (9)	22:01		
29	08:22		16:04 (2)				07:19		19:04 (5)	06:10		20:23 (7)	05:23		20:22 (7)	05:15		
	17:15	22	16:26 (2)				20:03	33	19:37 (6)	20:56	4	20:27 (7)	21:43	43	21:05 (9)	22:01		
30	08:21		16:05 (2)				07:16		19:04 (5)	06:08		20:22 (7)	05:22		20:23 (7)	05:16		
	17:17	19	16:24 (2)				20:04	34	19:38 (6)	20:58	8	20:30 (7)	21:44	42	21:05 (9)	22:01		
31	08:19		16:07 (2)				07:14		19:06 (5)				05:21		20:25 (7)			
	17:18	16	16:23 (2)				20:06	34	19:40 (6)				21:45	41	21:06 (9)			
Potential sun hours	257			277			367			417			487			501		
Total, worst case		584			387			710			890			1089			226	
Sun reduction		0.22			0.24			0.28			0.38			0.39			0.35	
Oper. time red.		1.00			1.00			1.00			1.00			1.00			1.00	
Wind dir. red.		0.61			0.60			0.60			0.61			0.63			0.64	
Total reduction		0.13			0.15			0.17			0.23			0.25			0.22	
Total, real		78			57			119			206			272			50	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
Jennings O'Donovan
Finisklin Business Park
F91 RHH9 Sligo
+353719161416
Kathlyn Feeney / kfeeney@jodireland.com

SHADOW - Calendar

Calculation: 6839 Garrane WF Worst Case - V150 **Shadow receptor:** E - 5

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	July		August		September		October		November		December		
1	05:17		20:58 (9)	05:54		20:25 (7)	06:45		19:05 (6)	07:35		07:30		08:21		15:36 (2)
	22:01	5	21:03 (9)	21:28	33	20:58 (7)	20:25	40	19:45 (6)	19:14		17:07		16:26	16	15:52 (2)
2	05:17		20:56 (9)	05:55		20:24 (7)	06:46		19:04 (6)	07:36		17:58 (4)	07:31	08:23		15:37 (2)
	22:00	8	21:04 (9)	21:26	32	20:56 (7)	20:23	42	19:46 (6)	19:12	13	18:11 (4)	17:05	16:25	14	15:51 (2)
3	05:18		20:56 (9)	05:57		20:25 (7)	06:48		19:03 (6)	07:38		17:54 (4)	07:33	08:24		15:37 (2)
	22:00	9	21:05 (9)	21:25	30	20:55 (7)	20:20	42	19:45 (6)	19:10	19	18:13 (4)	17:04	16:25	13	15:50 (2)
4	05:19		20:55 (9)	05:59		20:24 (7)	06:50		19:03 (6)	07:40		17:52 (4)	07:35	08:26		15:39 (2)
	22:00	12	21:07 (9)	21:23	29	20:53 (7)	20:18	43	19:46 (6)	19:07	23	18:15 (4)	17:02	16:24	11	15:50 (2)
5	05:20		20:55 (9)	06:00		20:25 (7)	06:51		19:01 (6)	07:42		17:50 (4)	07:37	08:27		15:39 (2)
	21:59	13	21:08 (9)	21:21	26	20:51 (7)	20:16	44	19:45 (6)	19:05	27	18:17 (4)	17:00	16:24	10	15:49 (2)
6	05:20		20:55 (9)	06:02		20:25 (7)	06:53		19:01 (6)	07:43		17:48 (4)	07:39	08:28		15:40 (2)
	21:59	14	21:09 (9)	21:19	24	20:49 (7)	20:13	44	19:45 (6)	19:03	30	18:18 (4)	16:58	16:23	9	15:49 (2)
7	05:21		20:53 (9)	06:03		20:26 (7)	06:55		19:01 (6)	07:45		17:47 (4)	07:41	08:30		15:41 (2)
	21:58	16	21:09 (9)	21:17	22	20:48 (7)	20:11	43	19:44 (6)	19:01	32	18:19 (4)	16:56	16:23	7	15:48 (2)
8	05:22		20:37 (7)	06:05		20:26 (7)	06:56		19:00 (6)	07:47		17:45 (4)	07:42	08:31		15:41 (2)
	21:57	26	21:10 (9)	21:16	20	20:46 (7)	20:09	41	19:41 (6)	18:58	34	18:19 (4)	16:55	16:22	6	15:47 (2)
9	05:23		20:36 (7)	06:07		20:27 (7)	06:58		19:01 (6)	07:48		17:44 (4)	07:44	08:32		15:42 (2)
	21:57	31	21:11 (9)	21:14	18	20:45 (7)	20:06	39	19:40 (6)	18:56	35	18:19 (4)	16:53	16:22	5	15:47 (2)
10	05:24		20:35 (7)	06:08		20:28 (7)	07:00		19:00 (6)	07:50		17:44 (4)	07:46	15:41 (2)	08:33		15:43 (2)
	21:56	33	21:11 (9)	21:12	15	20:43 (7)	20:04	37	19:37 (6)	18:54	36	18:20 (4)	16:51	11	15:52 (2)	16:22	4	15:47 (2)
11	05:25		20:34 (7)	06:10		20:28 (7)	07:01		19:00 (6)	07:52		17:43 (4)	07:48	15:39 (2)	08:34		15:44 (2)
	21:55	36	21:12 (9)	21:10	13	20:41 (7)	20:02	35	19:35 (6)	18:51	37	18:20 (4)	16:50	16	15:55 (2)	16:22	3	15:47 (2)
12	05:26		20:33 (7)	06:12		20:30 (7)	07:03		18:59 (5)	07:54		17:42 (4)	07:50	15:37 (2)	08:35		15:44 (2)
	21:54	40	21:13 (9)	21:08	9	20:39 (7)	19:59	34	19:33 (6)	18:49	37	18:19 (4)	16:48	19	15:56 (2)	16:22	2	15:46 (2)
13	05:28		20:32 (7)	06:13		20:30 (7)	07:05		18:56 (5)	07:55		17:42 (4)	07:51	15:35 (2)	08:36		15:45 (2)
	21:53	41	21:13 (9)	21:06	7	20:37 (7)	19:57	34	19:30 (6)	18:47	36	18:18 (4)	16:47	22	15:57 (2)	16:21	1	15:46 (2)
14	05:29		20:31 (7)	06:15		20:32 (7)	07:06		18:54 (5)	07:57		17:41 (4)	07:53	15:34 (2)	08:37		
	21:52	43	21:14 (9)	21:04	4	20:36 (7)	19:55	34	19:28 (6)	18:45	35	18:16 (4)	16:45	24	15:58 (2)	16:21		
15	05:30		20:31 (7)	06:16			07:08		18:52 (5)	07:59		17:41 (4)	07:55	15:34 (2)	08:38		
	21:51	44	21:15 (9)	21:02			19:52	33	19:25 (6)	18:42	33	18:14 (4)	16:44	25	15:59 (2)	16:22		
16	05:31		20:30 (7)	06:18		20:11 (8)	07:10		18:51 (5)	08:01		17:42 (3)	07:57	15:33 (2)	08:39		
	21:50	45	21:15 (9)	21:00	5	20:16 (8)	19:50	32	19:23 (6)	18:40	30	18:12 (4)	16:42	27	16:00 (2)	16:22		
17	05:32		20:29 (7)	06:20		20:07 (8)	07:11		18:51 (5)	08:02		17:40 (3)	07:59	15:33 (2)	08:40		
	21:49	47	21:16 (9)	20:58	11	20:18 (8)	19:48	30	19:21 (6)	18:38	30	18:10 (4)	16:41	28	16:01 (2)	16:22		
18	05:34		20:29 (7)	06:21		20:05 (8)	07:13		18:49 (5)	08:04		17:39 (3)	08:00	15:33 (2)	08:41		
	21:48	47	21:16 (9)	20:56	15	20:20 (8)	19:45	29	19:18 (5)	18:36	29	18:08 (4)	16:40	29	16:02 (2)	16:22		
19	05:35		20:28 (7)	06:23		20:03 (8)	07:15		18:49 (5)	08:06		17:37 (3)	08:02	15:33 (2)	08:41		
	21:47	47	21:15 (9)	20:54	18	20:21 (8)	19:43	27	19:16 (5)	18:34	28	18:05 (4)	16:38	29	16:02 (2)	16:22		
20	05:36		20:28 (7)	06:25		20:02 (8)	07:16		18:49 (5)	08:08		17:36 (3)	08:04	15:33 (2)	08:42		
	21:46	46	21:14 (9)	20:51	20	20:22 (8)	19:40	25	19:14 (5)	18:32	26	18:02 (3)	16:37	30	16:03 (2)	16:23		
21	05:38		20:27 (7)	06:26		20:02 (8)	07:18		18:48 (5)	08:10		17:35 (3)	08:05	15:33 (2)	08:43		
	21:44	46	21:13 (9)	20:49	20	20:22 (8)	19:38	23	19:11 (5)	18:29	25	18:00 (3)	16:36	30	16:03 (2)	16:23		
22	05:39		20:27 (7)	06:28		20:00 (8)	07:20		18:48 (5)	08:11		17:35 (3)	08:07	15:33 (2)	08:43		
	21:43	44	21:11 (9)	20:47	19	20:19 (8)	19:36	21	19:09 (5)	18:27	23	17:58 (3)	16:35	29	16:02 (2)	16:24		
23	05:40		20:26 (7)	06:30		19:24 (6)	07:21		18:49 (5)	08:13		17:35 (3)	08:09	15:32 (2)	08:44		
	21:42	44	21:10 (9)	20:45	26	20:17 (8)	19:33	18	19:07 (5)	18:25	21	17:56 (3)	16:33	28	16:00 (2)	16:24		
24	05:42		20:26 (7)	06:31		19:19 (6)	07:23		18:48 (5)	08:15		17:35 (3)	08:11	15:33 (2)	08:44		
	21:40	43	21:09 (9)	20:43	33	20:15 (8)	19:31	15	19:03 (5)	18:23	19	17:54 (3)	16:32	26	15:59 (2)	16:25		
25	05:43		20:26 (7)	06:33		19:16 (6)	07:25		18:49 (5)	07:17		16:35 (3)	08:12	15:33 (2)	08:45		
	21:39	42	21:08 (9)	20:41	37	20:13 (8)	19:29	12	19:01 (5)	17:21	17	16:52 (3)	16:31	25	15:58 (2)	16:25		
26	05:45		20:25 (7)	06:35		19:14 (6)	07:26		18:50 (5)	07:19		16:35 (3)	08:14	15:34 (2)	08:45		
	21:38	41	21:06 (9)	20:38	39	20:11 (8)	19:26	9	18:59 (5)	17:19	15	16:50 (3)	16:30	23	15:57 (2)	16:26		
27	05:46		20:25 (7)	06:36		19:12 (6)	07:28		18:50 (5)	07:20		16:36 (3)	08:15	15:35 (2)	08:45		
	21:36	40	21:05 (9)	20:36	40	20:09 (8)	19:24	6	18:56 (5)	17:17	12	16:48 (3)	16:29	21	15:56 (2)	16:27		
28	05:48		20:25 (7)	06:38		19:10 (6)	07:30		18:52 (5)	07:22		16:36 (3)	08:17	15:34 (2)	08:45		
	21:35	38	21:03 (9)	20:34	41	20:07 (8)	19:22	2	18:54 (5)	17:15	10	16:46 (3)	16:28	21	15:55 (2)	16:28		
29	05:49		20:25 (7)	06:40		19:08 (6)	07:31			07:24		16:37 (3)	08:18	15:35 (2)	08:45		
	21:33	38	21:03 (9)	20:32	40	20:04 (8)	19:19			17:13	7	16:44 (3)	16:28	19	15:54 (2)	16:28		
30	05:51		20:25 (7)	06:41		19:07 (6)	07:33			07:26		16:38 (3)	08:20		15:36 (2)	08:46		15:53 (2)
	21:31	36	21:01 (7)	20:29	39	20:02 (8)	19:17			17:11	4	16:42 (3)	16:27	17	15:53 (2)	16:29	1	15:54 (2)
31	05:52		20:25 (7)	06:43		19:06 (6)				07:28		16:39 (3)				08:46		15:53 (2)
	21:30	35	21:00 (7)	20:27	38	19:44 (6)				17:09	1	16:40 (3)				16:30	2	15:55 (2)
Potential sun hours	504			455			381			331			264			241		
Total, worst case		1050			723			834			724			499			104	
Sun reduction		0.33			0.35			0.34			0.28			0.26			0.22	
Oper. time red.		1.00			1.00			1.00			1.00			1.00			1.00	
Wind dir. red.		0.63			0.62			0.61			0.60			0.61			0.61	
Total reduction		0.21			0.22			0.21			0.17			0.16			0.13	
Total, real		221			158			171			123			80			14	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
Jennings O'Donovan
Finisklin Business Park
F91 RHH9 Sligo
+353719161416
Kathlyn Feeney / kfeeney@jodireland.com
Calculated:
09/06/2025 13:54/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Worst Case - V150 **Shadow receptor:** F - 6

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January		February		March		April		May		June		
1	08:46		15:11 (1)	08:18		07:23		16:49 (2)	07:12		19:31 (4)	06:06		19:27 (4)	05:20		20:49 (6)
	16:32	41	15:52 (1)	17:20		18:13	26	17:15 (2)	20:08	11	19:42 (4)	21:00	49	20:31 (5)	21:47	25	21:14 (6)
2	08:45		15:12 (1)	08:16		07:21		16:51 (2)	07:09		19:28 (4)	06:04		19:30 (4)	05:19		20:49 (6)
	16:33	41	15:53 (1)	17:22		18:15	22	17:13 (2)	20:10	15	19:43 (4)	21:02	44	20:33 (5)	21:48	26	21:15 (6)
3	08:45		15:13 (1)	08:15		07:19		16:54 (2)	07:07		19:26 (4)	06:02		20:01 (5)	05:18		20:48 (6)
	16:34	40	15:53 (1)	17:24		18:17	17	17:11 (2)	20:11	19	19:45 (4)	21:03	33	20:34 (5)	21:49	27	21:15 (6)
4	08:45		15:14 (1)	08:13	16:53 (2)	07:17		16:58 (2)	07:05		19:24 (4)	06:00		20:01 (5)	05:17		20:49 (6)
	16:35	40	15:54 (1)	17:26	3 16:56 (2)	18:18	7	17:05 (2)	20:13	23	19:47 (4)	21:05	33	20:34 (5)	21:50	28	21:17 (6)
5	08:45		15:14 (1)	08:11	16:51 (2)	07:15			07:02		19:22 (4)	05:58		20:02 (5)	05:17		20:48 (6)
	16:36	40	15:54 (1)	17:28	7 16:58 (2)	18:20			20:15	26	19:48 (4)	21:07	33	20:35 (5)	21:51	29	21:17 (6)
6	08:44		15:15 (1)	08:10	16:49 (2)	07:12			07:00		19:21 (4)	05:56		20:02 (5)	05:16		20:48 (6)
	16:37	40	15:55 (1)	17:30	10 16:59 (2)	18:22			20:17	29	19:50 (4)	21:08	32	20:34 (5)	21:52	31	21:19 (6)
7	08:44		15:15 (1)	08:08	16:49 (2)	07:10			06:58		19:20 (4)	05:55		20:02 (5)	05:15		20:48 (6)
	16:39	40	15:55 (1)	17:32	13 17:02 (2)	18:24			20:18	32	19:52 (4)	21:10	31	20:33 (5)	21:53	31	21:19 (6)
8	08:44		15:15 (1)	08:06	16:47 (2)	07:08			06:56		19:19 (4)	05:53		20:02 (5)	05:15		20:48 (6)
	16:40	40	15:55 (1)	17:33	17 17:04 (2)	18:26			20:20	35	19:54 (4)	21:12	30	20:32 (5)	21:54	32	21:20 (6)
9	08:43		15:16 (1)	08:04	16:46 (2)	07:05			06:53		19:17 (4)	05:51		20:04 (5)	05:14		20:48 (6)
	16:41	40	15:56 (1)	17:35	20 17:06 (2)	18:27			20:22	38	19:55 (4)	21:13	28	20:32 (5)	21:55	33	21:21 (6)
10	08:42		15:16 (1)	08:02	16:45 (2)	07:03		18:02 (3)	06:51		19:17 (4)	05:49		20:04 (5)	05:14		20:48 (6)
	16:43	40	15:56 (1)	17:37	23 17:08 (2)	18:29	1	18:03 (3)	20:24	40	19:57 (4)	21:15	27	20:31 (5)	21:55	34	21:22 (6)
11	08:42		15:17 (1)	08:01	16:45 (2)	07:01		18:00 (3)	06:49		19:16 (4)	05:48		20:05 (5)	05:13		20:48 (6)
	16:44	39	15:56 (1)	17:39	25 17:10 (2)	18:31	5	18:05 (3)	20:25	43	19:59 (4)	21:17	25	20:30 (5)	21:56	35	21:23 (6)
12	08:41		15:17 (1)	07:59	16:44 (2)	06:59		17:58 (3)	06:46		19:16 (4)	05:46		20:06 (5)	05:13		20:49 (6)
	16:46	39	15:56 (1)	17:41	29 17:13 (2)	18:33	9	18:07 (3)	20:27	45	20:01 (4)	21:18	23	20:29 (5)	21:57	35	21:24 (6)
13	08:40		15:18 (1)	07:57	16:43 (2)	06:56		17:56 (3)	06:44		19:15 (4)	05:44		20:07 (5)	05:13		20:48 (6)
	16:47	38	15:56 (1)	17:43	32 17:15 (2)	18:35	12	18:08 (3)	20:29	46	20:01 (4)	21:20	20	20:27 (5)	21:58	35	21:23 (6)
14	08:40		15:18 (1)	07:55	16:43 (2)	06:54		17:55 (3)	06:42		19:15 (4)	05:43		20:09 (5)	05:13		20:48 (6)
	16:49	38	15:56 (1)	17:45	34 17:17 (2)	18:36	15	18:10 (3)	20:31	48	20:03 (4)	21:21	17	20:26 (5)	21:58	36	21:24 (6)
15	08:39		15:19 (1)	07:53	16:43 (2)	06:52		17:54 (3)	06:40		19:15 (4)	05:41		20:11 (5)	05:12		20:48 (6)
	16:50	37	15:56 (1)	17:47	36 17:19 (2)	18:38	19	18:13 (3)	20:32	48	20:03 (4)	21:23	15	20:53 (8)	21:59	37	21:25 (6)
16	08:38		15:20 (1)	07:51	16:42 (2)	06:49		17:52 (3)	06:37		19:14 (4)	05:39		20:14 (5)	05:12		20:49 (6)
	16:52	36	15:56 (1)	17:49	39 17:21 (2)	18:40	22	18:14 (3)	20:34	49	20:03 (4)	21:25	10	20:54 (8)	21:59	36	21:25 (6)
17	08:37		15:21 (1)	07:49	16:42 (2)	06:47		17:52 (3)	06:35		19:15 (4)	05:38		20:50 (8)	05:12		20:49 (6)
	16:54	35	15:56 (1)	17:51	41 17:23 (2)	18:42	24	18:16 (3)	20:36	47	20:02 (4)	21:26	5	20:55 (8)	22:00	37	21:26 (6)
18	08:36		15:22 (1)	07:47	16:41 (2)	06:45		17:52 (3)	06:33		19:15 (4)	05:36		20:49 (8)	05:12		20:49 (6)
	16:55	34	15:56 (1)	17:52	43 17:24 (2)	18:43	26	18:18 (3)	20:37	47	20:02 (4)	21:28	7	20:56 (8)	22:00	37	21:26 (6)
19	08:35		15:23 (1)	07:45	16:42 (2)	06:42		17:51 (3)	06:31		19:15 (4)	05:35		20:49 (8)	05:12		20:49 (6)
	16:57	33	15:56 (1)	17:54	42 17:24 (2)	18:45	28	18:19 (3)	20:39	47	20:02 (4)	21:29	9	20:58 (8)	22:01	37	21:26 (6)
20	08:34		15:24 (1)	07:43	16:42 (2)	06:40		17:51 (3)	06:29		19:14 (4)	05:34		20:49 (8)	05:12		20:49 (6)
	16:59	32	15:56 (1)	17:56	42 17:24 (2)	18:47	30	18:21 (3)	20:41	48	20:13 (5)	21:31	10	20:59 (8)	22:01	37	21:26 (6)
21	08:33		15:24 (1)	07:41	16:42 (2)	06:38		17:51 (3)	06:27		19:15 (4)	05:32		20:49 (8)	05:12		20:49 (6)
	17:00	31	15:55 (1)	17:58	42 17:24 (2)	18:49	32	18:23 (3)	20:43	51	20:15 (5)	21:32	12	21:01 (8)	22:01	37	21:26 (6)
22	08:32		15:26 (1)	07:39	16:43 (2)	06:35		17:51 (3)	06:24		19:15 (4)	05:31		20:48 (8)	05:13		20:50 (6)
	17:02	29	15:55 (1)	18:00	40 17:23 (2)	18:50	32	18:23 (3)	20:44	53	20:16 (5)	21:34	13	21:01 (8)	22:01	37	21:27 (6)
23	08:31		15:28 (1)	07:36	16:43 (2)	06:33		17:51 (3)	06:22		19:16 (4)	05:30		20:49 (8)	05:13		20:50 (6)
	17:04	27	15:55 (1)	18:02	40 17:23 (2)	18:52	32	18:23 (3)	20:46	54	20:18 (5)	21:35	14	21:03 (8)	22:01	37	21:27 (6)
24	08:29		15:28 (1)	07:34	16:43 (2)	06:31		17:51 (3)	06:20		19:16 (4)	05:28		20:49 (8)	05:13		20:50 (6)
	17:06	25	15:53 (1)	18:04	39 17:22 (2)	18:54	30	18:21 (3)	20:48	56	20:20 (5)	21:36	15	21:04 (8)	22:02	37	21:27 (6)
25	08:28		15:31 (1)	07:32	16:44 (2)	06:28		17:52 (3)	06:18		19:17 (4)	05:27		20:49 (8)	05:13		20:51 (6)
	17:07	21	15:52 (1)	18:06	37 17:21 (2)	18:56	28	18:20 (3)	20:50	56	20:21 (5)	21:38	17	21:06 (8)	22:02	37	21:28 (6)
26	08:27		15:32 (1)	07:30	16:45 (2)	06:26		17:53 (3)	06:16		19:18 (4)	05:26		20:49 (8)	05:14		20:51 (6)
	17:09	18	15:50 (1)	18:07	35 17:20 (2)	18:57	26	18:19 (3)	20:51	57	20:23 (5)	21:39	18	21:07 (8)	22:02	36	21:27 (6)
27	08:25		15:36 (1)	07:28	16:46 (2)	06:23		17:53 (3)	06:14		19:19 (4)	05:25		20:49 (8)	05:14		20:51 (6)
	17:11	13	15:49 (1)	18:09	33 17:19 (2)	18:59	24	18:17 (3)	20:53	56	20:24 (5)	21:40	19	21:08 (8)	22:02	37	21:28 (6)
28	08:24			07:26	16:48 (2)	06:21		17:55 (3)	06:12		19:20 (4)	05:24		20:50 (8)	05:15		20:51 (6)
	17:13			18:11	30 17:18 (2)	19:01	20	18:15 (3)	20:55	56	20:26 (5)	21:42	19	21:09 (8)	22:01	36	21:27 (6)
29	08:22					07:19		18:58 (3)	06:10		19:22 (4)	05:23		20:50 (8)	05:15		20:52 (6)
	17:15					20:03	14	19:12 (3)	20:56	54	20:27 (5)	21:43	20	21:10 (8)	22:01	36	21:28 (6)
30	08:21					07:16		19:02 (3)	06:08		19:25 (4)	05:22		20:49 (6)	05:16		20:52 (6)
	17:17					20:04	4	19:06 (3)	20:58	52	20:30 (5)	21:44	22	21:11 (8)	22:01	35	21:27 (6)
31	08:19					07:14		19:34 (4)				05:21		20:50 (6)			
	17:18					20:06	6	19:40 (4)				21:45	23	21:13 (8)			
Potential sun hours	257			277		367			417			487			501		
Total, worst case		927			752		511			1281			673			1023	
Sun reduction		0.22			0.24		0.28			0.38			0.39			0.35	
Oper. time red.		1.00			1.00		1.00			1.00			1.00			1.00	
Wind dir. red.		0.62			0.60		0.60			0.61			0.63			0.64	
Total reduction		0.13			0.15		0.17			0.23			0.25			0.22	
Total, real		125			110		85			297			166			226	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
Jennings O'Donovan
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F91 RHH9 Sligo
+353719161416
Kathlyn Feeney / kfeeney@jodireland.com

SHADOW - Calendar

Calculation: 6839 Garrane WF Worst Case - V150 **Shadow receptor:** F - 6

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	July		August		September		October		November		December		
1	05:17		20:52 (6)	05:54		20:16 (5)	06:45		19:15 (4)	07:35		18:36 (3)	07:30		16:15 (2)	08:21		14:59 (1)
	22:01	35	21:27 (6)	21:28	24	20:40 (5)	20:25	43	19:58 (4)	19:14	11	18:47 (3)	17:07	23	16:38 (2)	16:26	39	15:38 (1)
2	05:17		20:52 (6)	05:55		20:14 (5)	06:46		19:16 (4)	07:36		18:38 (3)	07:31		16:16 (2)	08:23		14:59 (1)
	22:00	34	21:26 (6)	21:26	26	20:40 (5)	20:23	40	19:56 (4)	19:12	7	18:45 (3)	17:05	20	16:36 (2)	16:25	40	15:39 (1)
3	05:18		20:53 (6)	05:57		20:14 (5)	06:48		19:15 (4)	07:38		18:39 (3)	07:33		16:17 (2)	08:24		14:59 (1)
	22:00	33	21:26 (6)	21:25	28	20:42 (5)	20:20	38	19:53 (4)	19:10	3	18:42 (3)	17:04	17	16:34 (2)	16:25	40	15:39 (1)
4	05:19		20:53 (6)	05:59		20:13 (5)	06:50		19:16 (4)	07:40			07:35		16:18 (2)	08:26		15:00 (1)
	22:00	33	21:26 (6)	21:23	29	20:42 (5)	20:18	35	19:51 (4)	19:07			17:02	14	16:32 (2)	16:24	40	15:40 (1)
5	05:20		20:54 (6)	06:00		20:12 (5)	06:51		19:16 (4)	07:42			07:37		16:20 (2)	08:27		15:00 (1)
	21:59	32	21:26 (6)	21:21	31	20:43 (5)	20:16	32	19:48 (4)	19:05			17:00	10	16:30 (2)	16:24	40	15:40 (1)
6	05:20		20:55 (6)	06:02		20:11 (5)	06:53		19:17 (4)	07:43			07:39		16:22 (2)	08:28		15:00 (1)
	21:59	30	21:25 (6)	21:19	32	20:43 (5)	20:13	29	19:46 (4)	19:03			16:58	6	16:28 (2)	16:23	40	15:40 (1)
7	05:21		20:54 (6)	06:03		20:11 (5)	06:55		19:18 (4)	07:45			07:41		16:24 (2)	08:30		15:01 (1)
	21:58	30	21:24 (6)	21:17	33	20:44 (5)	20:11	26	19:44 (4)	19:01			16:56	2	16:26 (2)	16:23	40	15:41 (1)
8	05:22		20:55 (6)	06:05		20:10 (5)	06:56		19:18 (4)	07:47			07:42			08:31		15:01 (1)
	21:57	29	21:24 (6)	21:16	33	20:43 (5)	20:09	23	19:41 (4)	18:58			16:55			16:22	40	15:41 (1)
9	05:23		20:55 (6)	06:07		20:10 (5)	06:58		19:20 (4)	07:48			07:44			08:32		15:01 (1)
	21:57	28	21:23 (6)	21:14	34	20:44 (5)	20:06	20	19:40 (4)	18:56			16:53			16:22	40	15:41 (1)
10	05:24		20:56 (6)	06:08		20:10 (5)	07:00		19:21 (4)	07:50		17:30 (2)	07:46			08:33		15:02 (1)
	21:56	26	21:22 (6)	21:12	33	20:43 (5)	20:04	16	19:37 (4)	18:54	13	17:43 (2)	16:51			16:22	41	15:43 (1)
11	05:25		20:56 (6)	06:10		19:37 (4)	07:01		19:23 (4)	07:52		17:26 (2)	07:48			08:34		15:03 (1)
	21:55	26	21:22 (6)	21:10	46	20:41 (5)	20:02	12	19:35 (4)	18:51	20	17:46 (2)	16:50			16:22	40	15:43 (1)
12	05:26		20:57 (6)	06:12		19:35 (4)	07:03		19:26 (4)	07:54		17:23 (2)	07:50			08:35		15:03 (1)
	21:54	24	21:21 (8)	21:08	49	20:39 (5)	19:59	7	19:33 (4)	18:49	24	17:47 (2)	16:48			16:22	40	15:43 (1)
13	05:28		20:57 (6)	06:13		19:32 (4)	07:05		19:29 (4)	07:55		17:21 (2)	07:51			08:36		15:03 (1)
	21:53	23	21:20 (8)	21:06	53	20:37 (5)	19:57	1	19:30 (4)	18:47	28	17:49 (2)	16:47			16:21	41	15:44 (1)
14	05:29		20:58 (8)	06:15		19:30 (4)	07:06		18:49 (3)	07:57		17:19 (2)	07:53			08:37		15:04 (1)
	21:52	21	21:19 (8)	21:04	55	20:36 (5)	19:55	13	19:02 (3)	18:45	32	17:51 (2)	16:45			16:21	40	15:44 (1)
15	05:30		20:59 (8)	06:16		19:28 (4)	07:08		18:45 (3)	07:59		17:18 (2)	07:55		15:08 (1)	08:38		15:04 (1)
	21:51	20	21:19 (8)	21:02	56	20:33 (5)	19:52	19	19:04 (3)	18:42	34	17:52 (2)	16:44	13	15:21 (1)	16:22	41	15:45 (1)
16	05:31		20:59 (8)	06:18		19:26 (4)	07:10		18:43 (3)	08:01		17:17 (2)	07:57		15:05 (1)	08:39		15:05 (1)
	21:50	19	21:18 (8)	21:00	57	20:32 (5)	19:50	23	19:06 (3)	18:40	36	17:53 (2)	16:42	18	15:23 (1)	16:22	40	15:45 (1)
17	05:32		20:59 (8)	06:20		19:24 (4)	07:11		18:42 (3)	08:02		17:16 (2)	07:59		15:04 (1)	08:40		15:05 (1)
	21:49	18	21:17 (8)	20:58	56	20:29 (5)	19:48	25	19:07 (3)	18:38	37	17:53 (2)	16:41	21	15:25 (1)	16:22	40	15:45 (1)
18	05:34		20:59 (8)	06:21		19:24 (4)	07:13		18:39 (3)	08:04		17:15 (2)	08:00		15:02 (1)	08:41		15:05 (1)
	21:48	17	21:16 (8)	20:56	57	20:28 (5)	19:45	28	19:07 (3)	18:36	39	17:54 (2)	16:40	25	15:27 (1)	16:22	41	15:46 (1)
19	05:35		20:58 (8)	06:23		19:23 (4)	07:15		18:38 (3)	08:06		17:13 (2)	08:02		15:02 (1)	08:41		15:06 (1)
	21:47	17	21:15 (8)	20:54	55	20:26 (5)	19:43	30	19:08 (3)	18:34	41	17:54 (2)	16:38	27	15:29 (1)	16:22	40	15:46 (1)
20	05:36		20:59 (8)	06:25		19:21 (4)	07:16		18:38 (3)	08:08		17:13 (2)	08:04		15:01 (1)	08:42		15:06 (1)
	21:46	15	21:14 (8)	20:51	54	20:23 (5)	19:40	31	19:09 (3)	18:32	41	17:54 (2)	16:37	29	15:30 (1)	16:23	40	15:46 (1)
21	05:38		20:59 (8)	06:26		19:21 (4)	07:18		18:36 (3)	08:10		17:12 (2)	08:05		15:00 (1)	08:43		15:07 (1)
	21:44	14	21:13 (8)	20:49	53	20:22 (5)	19:38	33	19:09 (3)	18:29	42	17:54 (2)	16:36	31	15:31 (1)	16:23	40	15:47 (1)
22	05:39		20:59 (8)	06:28		19:19 (4)	07:20		18:36 (3)	08:11		17:12 (2)	08:07		15:00 (1)	08:43		15:07 (1)
	21:43	12	21:11 (8)	20:47	50	20:19 (5)	19:36	33	19:09 (3)	18:27	42	17:54 (2)	16:35	32	15:32 (1)	16:24	40	15:47 (1)
23	05:40		20:59 (8)	06:30		19:19 (4)	07:21		18:36 (3)	08:13		17:12 (2)	08:09		14:59 (1)	08:44		15:08 (1)
	21:42	11	21:10 (8)	20:45	47	20:17 (5)	19:33	31	19:07 (3)	18:25	42	17:54 (2)	16:33	33	15:32 (1)	16:24	40	15:48 (1)
24	05:42		21:00 (8)	06:31		19:18 (4)	07:23		18:34 (3)	08:15		17:12 (2)	08:10		14:59 (1)	08:44		15:08 (1)
	21:40	9	21:09 (8)	20:43	47	20:05 (4)	19:31	30	19:04 (3)	18:23	42	17:54 (2)	16:32	34	15:33 (1)	16:25	40	15:48 (1)
25	05:43		21:00 (8)	06:33		19:17 (4)	07:25		18:34 (3)	07:17		16:12 (2)	08:12		14:59 (1)	08:44		15:08 (1)
	21:39	8	21:08 (8)	20:41	48	20:05 (4)	19:29	27	19:01 (3)	17:21	40	16:52 (2)	16:31	35	15:34 (1)	16:25	41	15:49 (1)
26	05:45		21:00 (8)	06:35		19:17 (4)	07:26		18:35 (3)	07:19		16:12 (2)	08:14		14:59 (1)	08:45		15:10 (1)
	21:38	6	21:06 (8)	20:38	48	20:05 (4)	19:26	24	18:59 (3)	17:19	38	16:50 (2)	16:30	36	15:35 (1)	16:26	40	15:50 (1)
27	05:46		21:01 (8)	06:36		19:16 (4)	07:28		18:34 (3)	07:20		16:12 (2)	08:15		14:59 (1)	08:45		15:10 (1)
	21:36	4	21:05 (8)	20:36	49	20:05 (4)	19:24	22	18:56 (3)	17:17	36	16:48 (2)	16:29	37	15:36 (1)	16:27	40	15:50 (1)
28	05:48		20:23 (5)	06:38		19:16 (4)	07:30		18:35 (3)	07:22		16:13 (2)	08:17		14:58 (1)	08:45		15:10 (1)
	21:35	12	21:03 (8)	20:34	49	20:05 (4)	19:22	19	18:54 (3)	17:15	33	16:46 (2)	16:28	38	15:36 (1)	16:28	41	15:51 (1)
29	05:49		20:21 (5)	06:40		19:15 (4)	07:31		18:35 (3)	07:24		16:13 (2)	08:18		14:59 (1)	08:45		15:11 (1)
	21:33	15	20:36 (5)	20:32	49	20:04 (4)	19:19	17	18:52 (3)	17:13	31	16:44 (2)	16:28	38	15:37 (1)	16:28	40	15:51 (1)
30	05:51		20:19 (5)	06:41		19:16 (4)	07:33		18:35 (3)	07:26		16:14 (2)	08:20		14:59 (1)	08:45		15:11 (1)
	21:31	18	20:37 (5)	20:30	46	20:02 (4)	19:17	14	18:49 (3)	17:11	28	16:42 (2)	16:27	39	15:38 (1)	16:29	41	15:52 (1)
31	05:52		20:18 (5)	06:43		19:15 (4)				07:28		16:14 (2)				08:46		15:12 (1)
	21:30	21	20:39 (5)	20:27	44	19:59 (4)				17:09	26	16:40 (2)				16:30	40	15:52 (1)
Potential sun hours	504			455			381			331			264			241		
Total, worst case		640			1371			741			766			578			1246	
Sun reduction		0.33			0.35			0.34			0.28			0.26			0.22	
Oper. time red.		1.00			1.00			1.00			1.00			1.00			1.00	
Wind dir. red.		0.64			0.61			0.60			0.60			0.62			0.62	
Total reduction		0.21			0.22			0.20			0.17			0.16			0.14	
Total, real		135			297			151			130			93			168	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
Jennings O'Donovan
Finisklin Business Park
F91 RHH9 Sligo
+353719161416
Kathlyn Feeney / kfeeney@jodireland.com
Calculated:
09/06/2025 13:54/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Worst Case - V150 **Shadow receptor:** G - 7

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January		February		March		April		May		June	
1	08:46		15:12 (1)	08:18		07:23		16:48 (2)	07:12		19:01 (3)	06:06		19:25 (4)	05:20		20:56 (8)
	16:32	42	15:54 (1)	17:20		18:13	38	17:26 (2)	20:08	19	19:20 (3)	21:00	63	20:31 (5)	21:47	18	21:14 (8)
2	08:45		15:12 (1)	08:16		07:21		16:49 (2)	07:09		19:03 (3)	06:04		19:26 (4)	05:19		20:56 (8)
	16:33	43	15:55 (1)	17:22		18:15	36	17:25 (2)	20:10	13	19:16 (3)	21:02	64	20:33 (5)	21:48	19	21:15 (8)
3	08:45		15:13 (1)	08:15		07:19		16:51 (2)	07:07			06:02		19:27 (4)	05:18		20:56 (8)
	16:34	42	15:55 (1)	17:24		18:17	33	17:24 (2)	20:11			21:03	63	20:34 (5)	21:49	19	21:15 (8)
4	08:45		15:14 (1)	08:13		07:17		16:51 (2)	07:05			06:00		19:27 (4)	05:17		20:57 (8)
	16:35	42	15:56 (1)	17:26		18:18	30	17:21 (2)	20:13			21:05	64	20:36 (5)	21:50	20	21:17 (8)
5	08:45		15:14 (1)	08:11		07:15		16:53 (2)	07:02		19:44 (4)	05:58		19:29 (4)	05:17		20:57 (8)
	16:36	42	15:56 (1)	17:28		18:20	27	17:20 (2)	20:15	4	19:48 (4)	21:07	64	20:38 (5)	21:51	20	21:17 (8)
6	08:44		15:15 (1)	08:10		07:12		16:56 (2)	07:00		19:40 (4)	05:56		19:30 (4)	05:16		20:58 (8)
	16:37	42	15:57 (1)	17:30		18:22	21	17:17 (2)	20:17	10	19:50 (4)	21:08	62	20:39 (5)	21:52	21	21:19 (8)
7	08:44		15:15 (1)	08:08	16:59 (2)	07:10		16:58 (2)	06:58		19:38 (4)	05:55		19:31 (4)	05:15		20:58 (8)
	16:39	42	15:57 (1)	17:32	3 17:02 (2)	18:24	15	17:13 (2)	20:18	14	19:52 (4)	21:10	61	20:40 (5)	21:53	21	21:19 (8)
8	08:44		15:15 (1)	08:06	16:56 (2)	07:08			06:56		19:36 (4)	05:53		19:33 (4)	05:15		20:59 (8)
	16:40	42	15:57 (1)	17:34	8 17:04 (2)	18:26			20:20	18	19:54 (4)	21:12	59	20:42 (5)	21:54	21	21:20 (8)
9	08:43		15:16 (1)	08:04	16:55 (2)	07:05			06:53		19:33 (4)	05:51		19:35 (4)	05:14		20:58 (8)
	16:41	42	15:58 (1)	17:35	11 17:06 (2)	18:27			20:22	22	19:55 (4)	21:13	56	20:43 (5)	21:55	23	21:21 (8)
10	08:42		15:16 (1)	08:02	16:53 (2)	07:03			06:51		19:32 (4)	05:49		19:38 (4)	05:14		20:59 (8)
	16:43	42	15:58 (1)	17:37	15 17:08 (2)	18:29			20:24	25	19:57 (4)	21:15	50	20:43 (5)	21:55	23	21:22 (6)
11	08:42		15:16 (1)	08:01	16:52 (2)	07:01			06:49		19:30 (4)	05:48		19:43 (4)	05:13		21:00 (8)
	16:44	42	15:58 (1)	17:39	18 17:10 (2)	18:31			20:25	29	19:59 (4)	21:17	41	20:43 (5)	21:56	23	21:23 (6)
12	08:41		15:17 (1)	07:59	16:51 (2)	06:59			06:46		19:29 (4)	05:46		20:09 (5)	05:13		21:00 (8)
	16:46	42	15:59 (1)	17:41	22 17:13 (2)	18:33			20:27	32	20:01 (4)	21:18	33	20:42 (5)	21:57	24	21:24 (6)
13	08:40		15:17 (1)	07:57	16:50 (2)	06:56			06:44		19:27 (4)	05:44		20:10 (5)	05:13		21:00 (8)
	16:47	42	15:59 (1)	17:43	25 17:15 (2)	18:35			20:29	34	20:01 (4)	21:20	32	20:42 (5)	21:58	23	21:23 (6)
14	08:40		15:18 (1)	07:55	16:49 (2)	06:54		18:05 (3)	06:42		19:26 (4)	05:43		20:10 (5)	05:13		21:00 (8)
	16:49	41	15:59 (1)	17:45	28 17:17 (2)	18:36	6	18:11 (3)	20:31	37	20:03 (4)	21:21	31	20:41 (5)	21:58	24	21:24 (6)
15	08:39		15:18 (1)	07:53	16:48 (2)	06:52		18:04 (3)	06:40		19:26 (4)	05:41		20:11 (5)	05:12		21:01 (8)
	16:50	41	15:59 (1)	17:47	31 17:19 (2)	18:38	9	18:13 (3)	20:32	39	20:05 (4)	21:23	30	20:41 (5)	21:59	24	21:25 (6)
16	08:38		15:19 (1)	07:51	16:48 (2)	06:49		18:01 (3)	06:37		19:25 (4)	05:39		20:12 (5)	05:12		21:01 (8)
	16:52	40	15:59 (1)	17:49	33 17:21 (2)	18:40	13	18:14 (3)	20:34	42	20:07 (4)	21:25	27	20:39 (5)	21:59	24	21:25 (6)
17	08:37		15:20 (1)	07:49	16:47 (2)	06:47		18:00 (3)	06:35		19:25 (4)	05:38		20:13 (5)	05:12		21:02 (8)
	16:54	39	15:59 (1)	17:51	36 17:23 (2)	18:42	16	18:16 (3)	20:36	44	20:09 (4)	21:26	26	20:39 (5)	22:00	24	21:26 (6)
18	08:36		15:21 (1)	07:47	16:46 (2)	06:45		17:59 (3)	06:33		19:24 (4)	05:36		20:13 (5)	05:12		21:02 (8)
	16:55	38	15:59 (1)	17:52	38 17:24 (2)	18:43	19	18:18 (3)	20:37	46	20:10 (4)	21:28	25	20:38 (5)	22:00	24	21:26 (6)
19	08:35		15:22 (1)	07:45	16:46 (2)	06:42		17:58 (3)	06:31		19:24 (4)	05:35		20:14 (5)	05:12		21:02 (8)
	16:57	38	16:00 (1)	17:54	40 17:26 (2)	18:45	21	18:19 (3)	20:39	48	20:12 (4)	21:29	23	20:37 (5)	22:01	24	21:26 (6)
20	08:34		15:23 (1)	07:43	16:46 (2)	06:40		17:57 (3)	06:29		19:23 (4)	05:34		20:16 (5)	05:12		21:02 (8)
	16:59	37	16:00 (1)	17:56	42 17:28 (2)	18:47	24	18:21 (3)	20:41	50	20:13 (4)	21:31	21	20:59 (8)	22:01	24	21:26 (6)
21	08:33		15:23 (1)	07:41	16:46 (2)	06:38		17:57 (3)	06:27		19:23 (4)	05:32		20:18 (5)	05:12		21:02 (8)
	17:00	36	15:59 (1)	17:58	44 17:30 (2)	18:49	26	18:23 (3)	20:43	50	20:13 (4)	21:32	21	21:01 (8)	22:01	24	21:26 (6)
22	08:32		15:24 (1)	07:39	16:46 (2)	06:35		17:56 (3)	06:24		19:22 (4)	05:31		20:18 (5)	05:13		21:03 (8)
	17:02	35	15:59 (1)	18:00	44 17:30 (2)	18:50	29	18:25 (3)	20:44	50	20:12 (4)	21:34	20	21:01 (8)	22:01	24	21:27 (6)
23	08:31		15:26 (1)	07:36	16:46 (2)	06:33		17:56 (3)	06:22		19:22 (4)	05:30		20:21 (5)	05:13		21:03 (8)
	17:04	33	15:59 (1)	18:02	44 17:30 (2)	18:52	31	18:27 (3)	20:46	50	20:12 (4)	21:35	17	21:03 (8)	22:01	24	21:27 (6)
24	08:29		15:26 (1)	07:34	16:45 (2)	06:31		17:55 (3)	06:20		19:22 (4)	05:28		20:56 (8)	05:13		21:03 (8)
	17:06	32	15:58 (1)	18:04	44 17:29 (2)	18:54	33	18:28 (3)	20:48	51	20:20 (5)	21:36	8	21:04 (8)	22:02	24	21:27 (6)
25	08:28		15:28 (1)	07:32	16:46 (2)	06:28		17:55 (3)	06:18		19:22 (4)	05:27		20:56 (8)	05:13		21:04 (8)
	17:07	29	15:57 (1)	18:06	43 17:29 (2)	18:56	34	18:29 (3)	20:50	53	20:21 (5)	21:38	10	21:06 (8)	22:02	24	21:28 (6)
26	08:27		15:29 (1)	07:30	16:46 (2)	06:26		17:56 (3)	06:16		19:23 (4)	05:26		20:56 (8)	05:14		21:03 (8)
	17:09	27	15:56 (1)	18:07	43 17:29 (2)	18:57	33	18:29 (3)	20:51	56	20:23 (5)	21:39	11	21:07 (8)	22:02	24	21:27 (6)
27	08:25		15:31 (1)	07:28	16:47 (2)	06:23		17:55 (3)	06:14		19:23 (4)	05:25		20:56 (8)	05:14		21:04 (8)
	17:11	24	15:55 (1)	18:09	41 17:28 (2)	18:59	32	18:27 (3)	20:53	57	20:24 (5)	21:40	12	21:08 (8)	22:02	24	21:28 (6)
28	08:24		15:33 (1)	07:26	16:48 (2)	06:21		17:56 (3)	06:12		19:23 (4)	05:24		20:55 (8)	05:15		21:04 (8)
	17:13	20	15:53 (1)	18:11	39 17:27 (2)	19:01	31	18:27 (3)	20:55	59	20:26 (5)	21:42	14	21:09 (8)	22:01	23	21:27 (6)
29	08:22		15:35 (1)			07:19		18:57 (3)	06:10		19:23 (4)	05:23		20:55 (8)	05:15		21:04 (8)
	17:15	16	15:51 (1)			20:03	29	19:26 (3)	20:56	62	20:27 (5)	21:43	15	21:10 (8)	22:01	24	21:28 (6)
30	08:21		15:40 (1)			07:16		18:57 (3)	06:08		19:25 (4)	05:22		20:55 (8)	05:16		21:04 (8)
	17:17	8	15:48 (1)			20:04	26	19:23 (3)	20:58	63	20:30 (5)	21:44	16	21:11 (8)	22:01	23	21:27 (6)
31	08:19					07:14		18:59 (3)				05:21		20:56 (8)			
	17:18					20:06	23	19:22 (3)				21:45	17	21:13 (8)			
Potential sun hours	257			277		367			417			487			501		
Total, worst case		1081			692		635			1077			1056			681	
Sun reduction		0.22			0.24		0.28			0.38			0.39			0.35	
Oper. time red.		1.00			1.00		1.00			1.00			1.00			1.00	
Wind dir. red.		0.62			0.60		0.60			0.60			0.62			0.64	
Total reduction		0.13			0.15		0.17			0.23			0.24			0.22	
Total, real		145			101		107			248			259			152	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

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Calculated:
09/06/2025 13:54/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Worst Case - V150 **Shadow receptor:** G - 7

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	July		August		September		October		November		December		
1	05:17		21:04 (8)	05:54		20:20 (5)	06:45		19:29 (4)	07:35		07:30		16:23 (2)	08:21		14:59 (1)
	22:01	23	21:27 (6)	21:28	33	20:53 (5)	20:25	29	19:58 (4)	19:14		07:07	15	16:38 (2)	16:26	41	15:40 (1)
2	05:17		21:04 (8)	05:55		19:50 (4)	06:46		19:31 (4)	07:36		07:31		16:24 (2)	08:23		14:59 (1)
	22:00	23	21:27 (6)	21:26	45	20:52 (5)	20:23	25	19:56 (4)	19:12		17:05	12	16:36 (2)	16:25	42	15:41 (1)
3	05:18		21:04 (8)	05:57		19:47 (4)	06:48		19:31 (4)	07:38		07:33		16:26 (2)	08:24		14:59 (1)
	22:00	22	21:26 (8)	21:25	52	20:53 (5)	20:20	22	19:53 (4)	19:10		17:04	8	16:34 (2)	16:25	42	15:41 (1)
4	05:19		21:04 (8)	05:59		19:44 (4)	06:50		19:33 (4)	07:40		07:35		16:29 (2)	08:26		15:00 (1)
	22:00	22	21:26 (8)	21:23	58	20:53 (5)	20:18	18	19:51 (4)	19:07		17:02	3	16:32 (2)	16:24	42	15:42 (1)
5	05:20		21:04 (8)	06:00		19:43 (4)	06:51		19:34 (4)	07:42		07:37			08:27		15:00 (1)
	21:59	22	21:26 (8)	21:21	59	20:51 (5)	20:16	14	19:48 (4)	19:05		17:00			16:24	42	15:42 (1)
6	05:20		21:04 (8)	06:02		19:40 (4)	06:53		19:36 (4)	07:43		17:38 (2)		07:39	08:28		15:00 (1)
	21:59	21	21:25 (8)	21:19	61	20:49 (5)	20:13	10	19:46 (4)	19:03	10	17:48 (2)		16:58	16:23	42	15:42 (1)
7	05:21		21:03 (8)	06:03		19:39 (4)	06:55		19:40 (4)	07:45		17:33 (2)		07:41	08:30		15:01 (1)
	21:58	21	21:24 (8)	21:17	63	20:48 (5)	20:11	4	19:44 (4)	19:01	19	17:52 (2)		16:56	16:23	42	15:43 (1)
8	05:22		21:04 (8)	06:05		19:37 (4)	06:56			07:47		17:30 (2)		07:42	08:31		15:01 (1)
	21:57	20	21:24 (8)	21:16	64	20:46 (5)	20:09			18:58	24	17:54 (2)		16:55	16:22	42	15:43 (1)
9	05:23		21:04 (8)	06:07		19:37 (4)	06:58			07:48		17:27 (2)		07:44	08:32		15:01 (1)
	21:57	19	21:23 (8)	21:14	63	20:44 (5)	20:06			18:56	29	17:56 (2)		16:53	16:22	43	15:44 (1)
10	05:24		21:04 (8)	06:08		19:36 (4)	07:00		18:56 (3)	07:50		17:25 (2)		07:46	08:33		15:02 (1)
	21:56	18	21:22 (8)	21:12	63	20:43 (5)	20:04	13	19:09 (3)	18:54	32	17:57 (2)		16:51	16:22	43	15:45 (1)
11	05:25		21:04 (8)	06:10		19:34 (4)	07:01		18:54 (3)	07:52		17:24 (2)		07:48	08:34		15:03 (1)
	21:55	18	21:22 (8)	21:10	64	20:41 (5)	20:02	18	19:12 (3)	18:51	34	17:58 (2)		16:50	16:22	42	15:45 (1)
12	05:26		21:04 (8)	06:12		19:34 (4)	07:03		18:52 (3)	07:54		17:22 (2)		07:50	15:10 (1)		15:03 (1)
	21:54	17	21:21 (8)	21:08	63	20:39 (5)	19:59	22	19:14 (3)	18:49	36	17:58 (2)		16:48	9	15:19 (1)	16:22	42	15:45 (1)
13	05:28		21:04 (8)	06:13		19:32 (4)	07:05		18:49 (3)	07:55		17:21 (2)		07:51	15:07 (1)		08:36		15:04 (1)
	21:53	16	21:20 (8)	21:06	63	20:37 (5)	19:57	26	19:15 (3)	18:47	38	17:59 (2)		16:47	16	15:23 (1)	16:21	42	15:46 (1)
14	05:29		21:04 (8)	06:15		19:32 (4)	07:06		18:48 (3)	07:57		17:20 (2)		07:53	15:05 (1)		08:37		15:04 (1)
	21:52	15	21:19 (8)	21:04	61	20:36 (5)	19:55	28	19:16 (3)	18:45	40	18:00 (2)		16:45	20	15:25 (1)	16:21	42	15:46 (1)
15	05:30		21:05 (8)	06:16		19:31 (4)	07:08		18:46 (3)	07:59		17:19 (2)		07:55	15:03 (1)		08:38		15:05 (1)
	21:51	14	21:19 (8)	21:02	59	20:33 (5)	19:52	30	19:16 (3)	18:42	42	18:01 (2)		16:44	24	15:27 (1)	16:22	41	15:46 (1)
16	05:31		21:05 (8)	06:18		19:30 (4)	07:10		18:45 (3)	08:01		17:18 (2)		07:57	15:02 (1)		08:39		15:05 (1)
	21:50	13	21:18 (8)	21:00	58	20:32 (5)	19:50	31	19:16 (3)	18:40	43	18:01 (2)		16:42	27	15:29 (1)	16:22	41	15:46 (1)
17	05:32		21:05 (8)	06:20		19:29 (4)	07:11		18:44 (3)	08:02		17:18 (2)		07:59	15:01 (1)		08:40		15:05 (1)
	21:49	12	21:17 (8)	20:58	55	20:29 (5)	19:48	33	19:17 (3)	18:38	43	18:01 (2)		16:41	29	15:30 (1)	16:22	41	15:46 (1)
18	05:34		21:05 (8)	06:21		19:29 (4)	07:13		18:43 (3)	08:04		17:18 (2)		08:00	15:00 (1)		08:41		15:06 (1)
	21:48	11	21:16 (8)	20:56	53	20:28 (5)	19:45	34	19:17 (3)	18:36	43	18:01 (2)		16:40	32	15:32 (1)	16:22	40	15:46 (1)
19	05:35		21:05 (8)	06:23		19:29 (4)	07:15		18:42 (3)	08:06		17:16 (2)		08:02	15:00 (1)		08:41		15:07 (1)
	21:47	10	21:15 (8)	20:54	49	20:18 (4)	19:43	34	19:16 (3)	18:34	45	18:01 (2)		16:38	33	15:33 (1)	16:22	40	15:47 (1)
20	05:36		20:33 (5)	06:25		19:28 (4)	07:16		18:42 (3)	08:08		17:16 (2)		08:04	14:59 (1)		08:42		15:06 (1)
	21:46	15	21:14 (8)	20:51	50	20:18 (4)	19:40	32	19:14 (3)	18:32	45	18:01 (2)		16:37	35	15:34 (1)	16:23	41	15:47 (1)
21	05:38		20:30 (5)	06:26		19:28 (4)	07:18		18:41 (3)	08:10		17:16 (2)		08:05	14:59 (1)		08:43		15:07 (1)
	21:44	19	21:13 (8)	20:49	50	20:18 (4)	19:38	30	19:11 (3)	18:29	44	18:00 (2)		16:36	36	15:35 (1)	16:23	40	15:47 (1)
22	05:39		20:28 (5)	06:28		19:27 (4)	07:20		18:41 (3)	08:11		17:16 (2)		08:07	14:59 (1)		08:43		15:07 (1)
	21:43	20	21:11 (8)	20:47	50	20:17 (4)	19:36	28	19:09 (3)	18:27	42	17:58 (2)		16:35	37	15:36 (1)	16:24	40	15:47 (1)
23	05:40		20:26 (5)	06:30		19:27 (4)	07:21		18:42 (3)	08:13		17:16 (2)		08:09	14:58 (1)		08:44		15:08 (1)
	21:42	22	21:10 (8)	20:45	50	20:17 (4)	19:33	25	19:07 (3)	18:25	40	17:56 (2)		16:33	38	15:36 (1)	16:24	40	15:48 (1)
24	05:42		20:26 (5)	06:31		19:27 (4)	07:23		18:41 (3)	08:15		17:17 (2)		08:10	14:58 (1)		08:44		15:09 (1)
	21:40	22	21:09 (8)	20:43	48	20:15 (4)	19:31	23	19:04 (3)	18:23	37	17:54 (2)		16:32	38	15:36 (1)	16:25	40	15:49 (1)
25	05:43		20:24 (5)	06:33		19:27 (4)	07:25		18:42 (3)	07:17		16:17 (2)		08:12	14:58 (1)		08:44		15:09 (1)
	21:39	24	20:48 (5)	20:41	46	20:13 (4)	19:29	19	19:01 (3)	17:21	35	16:52 (2)		16:31	39	15:37 (1)	16:25	40	15:49 (1)
26	05:45		20:24 (5)	06:35		19:28 (4)	07:26		18:42 (3)	07:19		16:17 (2)		08:14	14:58 (1)		08:45		15:10 (1)
	21:38	25	20:49 (5)	20:38	43	20:11 (4)	19:26	17	18:59 (3)	17:19	33	16:50 (2)		16:30	40	15:38 (1)	16:26	41	15:51 (1)
27	05:46		20:23 (5)	06:36		19:27 (4)	07:28		18:42 (3)	07:20		16:18 (2)		08:15	14:58 (1)		08:45		15:10 (1)
	21:36	27	20:50 (5)	20:36	42	20:09 (4)	19:24	14	18:56 (3)	17:17	30	16:48 (2)		16:29	41	15:39 (1)	16:27	41	15:51 (1)
28	05:48		20:22 (5)	06:38		19:28 (4)	07:30		18:44 (3)	07:22		16:19 (2)		08:17	14:58 (1)		08:45		15:11 (1)
	21:35	28	20:50 (5)	20:34	39	20:07 (4)	19:22	10	18:54 (3)	17:15	27	16:46 (2)		16:28	41	15:39 (1)	16:28	41	15:52 (1)
29	05:49		20:22 (5)	06:40		19:27 (4)	07:31		18:45 (3)	07:24		16:20 (2)		08:18	14:58 (1)		08:45		15:11 (1)
	21:33	29	20:51 (5)	20:32	37	20:04 (4)	19:19	7	18:52 (3)	17:13	24	16:44 (2)		16:28	42	15:40 (1)	16:28	42	15:53 (1)
30	05:51		20:21 (5)	06:41		19:28 (4)	07:33		18:46 (3)	07:26		16:20 (2)		08:20	14:59 (1)		08:45		15:11 (1)
	21:31	31	20:52 (5)	20:30	34	20:02 (4)	19:17	3	18:49 (3)	17:11	22	16:42 (2)		16:27	42	15:41 (1)	16:29	42	15:53 (1)
31	05:52		20:21 (5)	06:43		19:28 (4)				07:28		16:22 (2)					08:46		15:12 (1)
	21:30	32	20:53 (5)	20:27	31	19:59 (4)				17:09	18	16:40 (2)					16:30	42	15:54 (1)
Potential sun hours	504			455			381			331			264				241		
Total, worst case		631			1606			599			875			657			1282		
Sun reduction		0.33			0.35			0.34			0.28			0.26			0.22		
Oper. time red.		1.00			1.00			1.00			1.00			1.00			1.00		
Wind dir. red.		0.63			0.61			0.60			0.60			0.62			0.62		
Total reduction		0.21			0.22			0.20			0.17			0.16			0.14		
Total, real		133			346			122			148			106			173		

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

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SHADOW - Calendar

Calculation: 6839 Garrane WF Worst Case - V150 **Shadow receptor:** H - 8

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January		February		March		April		May		June		
1	08:46	15:24 (1)	08:18	15:36 (1)	07:23	17:03 (2)	07:12	19:11 (3)	06:06	19:51 (4)	05:20	20:01 (4)	
	16:32	32	15:56 (1)	17:20	38	16:14 (1)	18:13	43	17:46 (2)	20:08	31	19:42 (3)	21:00	40	20:31 (4)	21:47	62	21:14 (8)
2	08:45		15:24 (1)	08:16	15:38 (1)	07:21	17:03 (2)	07:09	19:10 (3)	06:04	19:50 (4)	05:19	20:02 (4)	
	16:33	33	15:57 (1)	17:22	36	16:14 (1)	18:15	45	17:48 (2)	20:10	33	19:43 (3)	21:02	43	20:33 (4)	21:48	59	21:15 (8)
3	08:45		15:25 (1)	08:15	15:40 (1)	07:19	17:03 (2)	07:07	19:10 (3)	06:02	19:50 (4)	05:18	20:02 (4)	
	16:34	34	15:59 (1)	17:24	32	16:12 (1)	18:17	47	17:50 (2)	20:11	35	19:45 (3)	21:03	44	20:34 (4)	21:49	59	21:15 (8)
4	08:45		15:26 (1)	08:13	15:41 (1)	07:17	17:02 (2)	07:05	19:11 (3)	06:00	19:49 (4)	05:17	20:04 (4)	
	16:35	34	16:00 (1)	17:26	30	16:11 (1)	18:18	48	17:50 (2)	20:13	35	19:46 (3)	21:05	47	20:36 (4)	21:50	57	21:17 (8)
5	08:45		15:25 (1)	08:11	15:43 (1)	07:15	17:02 (2)	07:02	19:10 (3)	05:58	19:50 (4)	05:17	20:04 (4)	
	16:36	36	16:01 (1)	17:28	26	16:09 (1)	18:20	48	17:50 (2)	20:15	34	19:44 (3)	21:07	48	20:38 (4)	21:51	56	21:17 (8)
6	08:44		15:26 (1)	08:10	15:45 (1)	07:12	17:03 (2)	07:00	19:11 (3)	05:56	19:49 (4)	05:16	20:06 (4)	
	16:37	37	16:03 (1)	17:30	22	16:07 (1)	18:22	47	17:50 (2)	20:17	33	19:44 (3)	21:08	50	20:39 (5)	21:52	55	21:19 (8)
7	08:44		15:26 (1)	08:08	15:48 (1)	07:10	17:02 (2)	06:58	19:11 (3)	05:55	19:49 (4)	05:15	20:07 (4)	
	16:39	38	16:04 (1)	17:32	18	16:06 (1)	18:24	47	17:49 (2)	20:18	32	19:43 (3)	21:10	51	20:40 (5)	21:53	53	21:19 (8)
8	08:44		15:26 (1)	08:06	15:53 (1)	07:08	17:02 (2)	06:56	19:12 (3)	05:53	19:48 (4)	05:15	20:08 (4)	
	16:40	39	16:05 (1)	17:34	8	16:01 (1)	18:26	47	17:49 (2)	20:20	30	19:42 (3)	21:12	54	20:42 (5)	21:54	51	21:20 (8)
9	08:43		15:27 (1)	08:04			07:05	17:03 (2)	06:53	19:12 (3)	05:51	19:49 (4)	05:14	20:09 (4)	
	16:41	40	16:07 (1)	17:35			18:27	46	17:49 (2)	20:22	28	19:40 (3)	21:13	55	20:44 (5)	21:55	49	21:21 (8)
10	08:42		15:26 (1)	08:02			07:03	17:03 (2)	06:51	19:14 (3)	05:49	19:48 (4)	05:14	20:11 (4)	
	16:43	42	16:08 (1)	17:37			18:29	44	17:47 (2)	20:24	24	19:38 (3)	21:15	57	20:45 (5)	21:55	48	21:22 (8)
11	08:42		15:26 (1)	08:01			07:01	17:04 (2)	06:49	19:16 (3)	05:48	19:49 (4)	05:13	20:12 (4)	
	16:44	44	16:10 (1)	17:39			18:31	42	17:46 (2)	20:25	21	19:37 (3)	21:17	58	20:47 (5)	21:56	45	21:23 (8)
12	08:41		15:27 (1)	07:59			06:59	17:05 (2)	06:46	19:18 (3)	05:46	19:49 (4)	05:13	20:14 (4)	
	16:46	44	16:11 (1)	17:41			18:33	41	17:46 (2)	20:27	16	19:34 (3)	21:18	59	20:48 (5)	21:57	41	21:23 (8)
13	08:40		15:27 (1)	07:57			06:56	17:05 (2)	06:44	19:21 (3)	05:44	19:49 (4)	05:13	20:15 (4)	
	16:47	46	16:13 (1)	17:43			18:35	39	17:44 (2)	20:29	8	19:29 (3)	21:20	61	20:50 (5)	21:58	37	21:23 (8)
14	08:40		15:27 (1)	07:55			06:54	17:06 (2)	06:42		05:43	19:49 (4)	05:13	20:39 (5)	
	16:49	46	16:13 (1)	17:45			18:36	37	17:43 (2)	20:31			21:21	62	20:51 (5)	21:58	32	21:24 (8)
15	08:39		15:27 (1)	07:53			06:52	17:08 (2)	06:40		05:41	19:50 (4)	05:12	20:40 (5)	
	16:50	47	16:14 (1)	17:47			18:38	33	17:41 (2)	20:32			21:23	63	20:53 (5)	21:59	32	21:25 (8)
16	08:38		15:27 (1)	07:51			06:49	17:09 (2)	06:38		05:39	19:50 (4)	05:12	20:41 (5)	
	16:52	47	16:14 (1)	17:49			18:40	30	17:39 (2)	20:34			21:25	64	20:54 (5)	21:59	31	21:25 (8)
17	08:37		15:28 (1)	07:49		17:22 (2)	06:47	17:11 (2)	06:35		05:38	19:50 (4)	05:12	20:41 (5)	
	16:54	47	16:15 (1)	17:51	1	17:23 (2)	18:42	26	17:37 (2)	20:36			21:26	65	20:55 (5)	22:00	31	21:26 (8)
18	08:36		15:28 (1)	07:47		17:17 (2)	06:45	17:14 (2)	06:33		05:36	19:50 (4)	05:12	20:41 (5)	
	16:55	47	16:15 (1)	17:52	7	17:24 (2)	18:43	20	17:34 (2)	20:37			21:28	66	20:56 (5)	22:00	31	21:26 (8)
19	08:35		15:29 (1)	07:45		17:15 (2)	06:42	17:17 (2)	06:31		05:35	19:51 (4)	05:12	20:42 (5)	
	16:57	47	16:16 (1)	17:54	11	17:26 (2)	18:45	12	17:29 (2)	20:39			21:29	67	20:58 (5)	22:01	30	21:26 (8)
20	08:34		15:29 (1)	07:43		17:13 (2)	06:40			06:29		20:07 (4)	05:34		19:52 (4)	05:12		20:42 (5)
	16:59	47	16:16 (1)	17:56	15	17:28 (2)	18:47			20:41	6	20:13 (4)	21:31	67	20:59 (5)	22:01	30	21:26 (8)
21	08:33		15:29 (1)	07:41		17:11 (2)	06:38			06:27		20:04 (4)	05:32		19:52 (4)	05:12		20:42 (5)
	17:00	47	16:16 (1)	17:58	20	17:31 (2)	18:49			20:43	11	20:15 (4)	21:32	69	21:01 (5)	22:01	30	21:26 (8)
22	08:32		15:30 (1)	07:39		17:10 (2)	06:35			06:24		20:01 (4)	05:31		19:52 (4)	05:13		20:43 (5)
	17:02	46	16:16 (1)	18:00	23	17:33 (2)	18:50			20:44	15	20:16 (4)	21:34	69	21:01 (5)	22:01	30	21:27 (8)
23	08:30		15:31 (1)	07:36		17:09 (2)	06:33	18:22 (3)	06:22		19:59 (4)	05:30		19:53 (4)	05:13		20:43 (5)
	17:04	46	16:17 (1)	18:02	26	17:35 (2)	18:52	5	18:27 (3)	20:46	19	20:18 (4)	21:35	70	21:03 (5)	22:01	30	21:27 (8)
24	08:29		15:31 (1)	07:34		17:07 (2)	06:31	18:19 (3)	06:20		19:58 (4)	05:28		19:54 (4)	05:13		20:42 (5)
	17:06	45	16:16 (1)	18:04	29	17:36 (2)	18:54	9	18:28 (3)	20:48	22	20:20 (4)	21:36	69	21:03 (5)	22:02	31	21:27 (8)
25	08:28		15:32 (1)	07:32		17:06 (2)	06:28	18:17 (3)	06:18		19:56 (4)	05:27		19:55 (4)	05:13		20:43 (5)
	17:07	45	16:17 (1)	18:06	32	17:38 (2)	18:56	13	18:30 (3)	20:50	25	20:21 (4)	21:38	68	21:03 (5)	22:02	31	21:28 (8)
26	08:27		15:32 (1)	07:30		17:06 (2)	06:26	18:16 (3)	06:16		19:55 (4)	05:26		19:55 (4)	05:14		20:43 (5)
	17:09	44	16:16 (1)	18:07	35	17:41 (2)	18:57	16	18:32 (3)	20:51	28	20:23 (4)	21:39	68	21:03 (5)	22:02	30	21:27 (8)
27	08:25		15:33 (1)	07:28		17:05 (2)	06:23	18:14 (3)	06:14		19:54 (4)	05:25		19:56 (4)	05:14		20:43 (5)
	17:11	44	16:17 (1)	18:09	38	17:43 (2)	18:59	19	18:33 (3)	20:53	30	20:24 (4)	21:40	67	21:03 (5)	22:02	32	21:28 (8)
28	08:24		15:33 (1)	07:26		17:05 (2)	06:21	18:14 (3)	06:12		19:53 (4)	05:24		19:57 (4)	05:15		20:43 (5)
	17:13	43	16:16 (1)	18:11	40	17:45 (2)	19:01	21	18:35 (3)	20:55	33	20:26 (4)	21:42	66	21:03 (5)	22:01	31	21:27 (8)
29	08:22		15:34 (1)				07:19	19:13 (3)	06:10		19:52 (4)	05:23		19:58 (4)	05:15		20:21 (4)
	17:15	41	16:15 (1)				20:03	24	19:37 (3)	20:56	35	20:27 (4)	21:43	65	21:03 (5)	22:01	35	21:28 (8)
30	08:21		15:35 (1)				07:16	19:12 (3)	06:08		19:52 (4)	05:22		19:58 (4)	05:16		20:18 (4)
	17:17	40	16:15 (1)				20:04	26	19:38 (3)	20:58	38	20:30 (4)	21:44	64	21:02 (5)	22:01	41	21:27 (8)
31	08:19		15:36 (1)				07:14	19:11 (3)					05:21		20:00 (4)			
	17:18	39	16:15 (1)				20:06	29	19:40 (3)				21:45	63	21:03 (5)			
Potential sun hours	257		277		367		417		487		501		
Total, worst case		1307		487		904		622		1859		1210	
Sun reduction		0.22		0.24		0.28		0.38		0.39		0.35	
Oper. time red.		1.00		1.00		1.00		1.00		1.00		1.00	
Wind dir. red.		0.62		0.61		0.60		0.61		0.63		0.64	
Total reduction		0.13		0.15		0.17		0.23		0.25		0.22	
Total, real		175		72		152		146		460		267	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

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SHADOW - Calendar

Calculation: 6839 Garrane WF Worst Case - V150 **Shadow receptor:** H - 8

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	July		August		September		October		November		December		
1	05:17		20:17 (4)	05:54		19:59 (4)	06:45		19:15 (3)	07:35		17:44 (2)	07:30			08:21		15:09 (1)
	22:01	43	21:27 (8)	21:28	59	20:58 (5)	20:25	21	19:36 (3)	19:14	40	18:24 (2)	17:07			16:26	43	15:52 (1)
2	05:17		20:16 (4)	05:55		19:58 (4)	06:46		19:13 (3)	07:36		17:43 (2)	07:31			08:23		15:10 (1)
	22:00	45	21:27 (8)	21:26	58	20:56 (5)	20:23	24	19:37 (3)	19:12	42	18:25 (2)	17:05			16:25	42	15:52 (1)
3	05:18		20:15 (4)	05:57		19:59 (4)	06:48		19:10 (3)	07:38		17:42 (2)	07:33		15:22 (1)	08:24		15:10 (1)
	22:00	47	21:26 (8)	21:25	56	20:55 (5)	20:20	28	19:38 (3)	19:10	44	18:26 (2)	17:04	10	15:32 (1)	16:25	40	15:50 (1)
4	05:19		20:14 (4)	05:59		19:58 (4)	06:50		19:09 (3)	07:40		17:40 (2)	07:35		15:18 (1)	08:26		15:11 (1)
	22:00	49	21:26 (8)	21:23	55	20:53 (5)	20:18	30	19:39 (3)	19:07	45	18:25 (2)	17:02	18	15:36 (1)	16:24	39	15:50 (1)
5	05:20		20:13 (4)	06:00		19:59 (4)	06:51		19:07 (3)	07:42		17:40 (2)	07:37		15:15 (1)	08:27		15:11 (1)
	21:59	53	21:26 (8)	21:21	52	20:51 (5)	20:16	32	19:39 (3)	19:05	46	18:26 (2)	17:00	23	15:38 (1)	16:24	38	15:49 (1)
6	05:20		20:13 (4)	06:02		19:58 (4)	06:53		19:07 (3)	07:43		17:39 (2)	07:39		15:13 (1)	08:28		15:11 (1)
	21:59	53	21:25 (8)	21:19	51	20:49 (5)	20:13	33	19:40 (3)	19:03	47	18:26 (2)	16:58	27	15:40 (1)	16:23	37	15:48 (1)
7	05:21		20:11 (4)	06:03		19:59 (4)	06:55		19:06 (3)	07:45		17:39 (2)	07:41		15:11 (1)	08:30		15:12 (1)
	21:58	55	21:24 (8)	21:17	49	20:48 (5)	20:11	34	19:40 (3)	19:01	47	18:26 (2)	16:56	31	15:42 (1)	16:23	36	15:48 (1)
8	05:22		20:11 (4)	06:05		19:58 (4)	06:56		19:05 (3)	07:47		17:38 (2)	07:42		15:10 (1)	08:31		15:13 (1)
	21:57	56	21:24 (8)	21:16	48	20:46 (4)	20:09	35	19:40 (3)	18:58	47	18:25 (2)	16:55	33	15:43 (1)	16:22	34	15:47 (1)
9	05:23		20:10 (4)	06:07		19:59 (4)	06:58		19:05 (3)	07:48		17:37 (2)	07:44		15:09 (1)	08:32		15:13 (1)
	21:57	59	21:23 (8)	21:14	45	20:44 (4)	20:06	35	19:40 (3)	18:56	48	18:25 (2)	16:53	36	15:45 (1)	16:22	34	15:47 (1)
10	05:24		20:09 (4)	06:08		19:59 (4)	07:00		19:03 (3)	07:50		17:37 (2)	07:46		15:08 (1)	08:33		15:15 (1)
	21:56	59	21:22 (8)	21:12	44	20:43 (4)	20:04	34	19:37 (3)	18:54	48	18:25 (2)	16:51	38	15:46 (1)	16:22	32	15:47 (1)
11	05:25		20:09 (4)	06:10		19:59 (4)	07:01		19:03 (3)	07:52		17:37 (2)	07:48		15:07 (1)	08:34		15:15 (1)
	21:55	61	21:22 (8)	21:10	42	20:41 (4)	20:02	32	19:35 (3)	18:51	47	18:24 (2)	16:50	39	15:46 (1)	16:22	32	15:47 (1)
12	05:26		20:08 (4)	06:12		20:00 (4)	07:03		19:04 (3)	07:54		17:37 (2)	07:50		15:06 (1)	08:35		15:16 (1)
	21:54	61	21:10 (5)	21:08	39	20:39 (4)	19:59	29	19:33 (3)	18:49	43	18:20 (2)	16:48	40	15:46 (1)	16:22	30	15:46 (1)
13	05:28		20:07 (4)	06:13		20:00 (4)	07:05		19:03 (3)	07:55		17:37 (2)	07:51		15:05 (1)	08:36		15:16 (1)
	21:53	64	21:11 (5)	21:06	37	20:37 (4)	19:57	27	19:30 (3)	18:47	41	18:18 (2)	16:47	42	15:47 (1)	16:22	30	15:46 (1)
14	05:29		20:07 (4)	06:15		20:01 (4)	07:06		19:03 (3)	07:57		17:37 (2)	07:53		15:05 (1)	08:37		15:17 (1)
	21:52	64	21:11 (5)	21:04	35	20:36 (4)	19:55	25	19:28 (3)	18:45	39	18:16 (2)	16:45	43	15:48 (1)	16:21	29	15:46 (1)
15	05:30		20:07 (4)	06:16		20:01 (4)	07:08		19:03 (3)	07:59		17:38 (2)	07:55		15:05 (1)	08:38		15:17 (1)
	21:51	65	21:12 (5)	21:02	32	20:33 (4)	19:52	22	19:25 (3)	18:42	36	18:14 (2)	16:44	44	15:49 (1)	16:22	29	15:46 (1)
16	05:31		20:06 (4)	06:18		20:02 (4)	07:10		19:04 (3)	08:01		17:38 (2)	07:57		15:05 (1)	08:39		15:18 (1)
	21:50	67	21:13 (5)	21:00	30	20:32 (4)	19:50	19	19:23 (3)	18:40	34	18:12 (2)	16:42	44	15:49 (1)	16:22	28	15:46 (1)
17	05:32		20:05 (4)	06:20		20:02 (4)	07:11		19:04 (3)	08:02		17:39 (2)	07:59		15:05 (1)	08:40		15:18 (1)
	21:49	68	21:13 (5)	20:58	27	20:29 (4)	19:48	17	19:21 (3)	18:38	31	18:10 (2)	16:41	45	15:50 (1)	16:22	28	15:46 (1)
18	05:34		20:05 (4)	06:21		20:03 (4)	07:13		19:05 (3)	08:04		17:40 (2)	08:00		15:05 (1)	08:41		15:19 (1)
	21:48	68	21:13 (5)	20:56	25	20:28 (4)	19:45	13	19:18 (3)	18:36	28	18:08 (2)	16:40	45	15:50 (1)	16:22	27	15:46 (1)
19	05:35		20:04 (4)	06:23		20:05 (4)	07:15		19:06 (3)	08:06		17:40 (2)	08:02		15:05 (1)	08:41		15:20 (1)
	21:47	69	21:13 (5)	20:54	21	20:26 (4)	19:43	10	19:16 (3)	18:34	25	18:05 (2)	16:38	46	15:51 (1)	16:22	27	15:47 (1)
20	05:36		20:04 (4)	06:25		20:05 (4)	07:16		19:08 (3)	08:08		17:41 (2)	08:04		15:05 (1)	08:42		15:20 (1)
	21:46	70	21:14 (5)	20:51	18	20:23 (4)	19:40	6	19:14 (3)	18:32	21	18:02 (2)	16:37	46	15:51 (1)	16:23	27	15:47 (1)
21	05:38		20:03 (4)	06:26		20:07 (4)	07:18		19:09 (3)	08:10		17:42 (2)	08:05		15:05 (1)	08:43		15:20 (1)
	21:44	70	21:13 (5)	20:49	15	20:22 (4)	19:38	2	19:11 (3)	18:29	18	18:00 (2)	16:36	47	15:52 (1)	16:23	27	15:47 (1)
22	05:39		20:02 (4)	06:28		20:09 (4)	07:20			08:11		17:44 (2)	08:07		15:05 (1)	08:43		15:20 (1)
	21:43	69	21:11 (5)	20:47	10	20:19 (4)	19:36			18:27	14	17:58 (2)	16:35	47	15:52 (1)	16:24	27	15:47 (1)
23	05:40		20:02 (4)	06:30		20:12 (4)	07:21			08:13		17:46 (2)	08:09		15:05 (1)	08:44		15:21 (1)
	21:42	68	21:10 (5)	20:45	5	20:17 (4)	19:33			18:25	10	17:56 (2)	16:33	47	15:52 (1)	16:24	27	15:48 (1)
24	05:42		20:02 (4)	06:31			07:23		18:04 (2)	08:15		17:48 (2)	08:10		15:05 (1)	08:44		15:22 (1)
	21:40	67	21:09 (5)	20:43			19:31	6	18:10 (2)	18:23	6	17:54 (2)	16:32	47	15:52 (1)	16:25	27	15:49 (1)
25	05:43		20:01 (4)	06:33			07:25		17:58 (2)	07:17			08:12		15:06 (1)	08:44		15:22 (1)
	21:39	67	21:08 (5)	20:41			19:29	18	18:16 (2)	17:21			16:31	47	15:53 (1)	16:25	27	15:49 (1)
26	05:45		20:01 (4)	06:35			07:26		17:55 (2)	07:19			08:14		15:07 (1)	08:45		15:23 (1)
	21:38	66	21:07 (5)	20:38			19:26	24	18:19 (2)	17:19			16:30	46	15:53 (1)	16:26	28	15:51 (1)
27	05:46		20:01 (4)	06:36			07:28		17:51 (2)	07:20			08:15		15:07 (1)	08:45		15:23 (1)
	21:36	64	21:05 (5)	20:36			19:24	29	18:20 (2)	17:17			16:29	47	15:54 (1)	16:27	28	15:51 (1)
28	05:48		20:00 (4)	06:38			07:30		17:49 (2)	07:22			08:17		15:07 (1)	08:45		15:23 (1)
	21:35	63	21:03 (5)	20:34			19:22	33	18:22 (2)	17:15			16:28	46	15:53 (1)	16:28	29	15:52 (1)
29	05:49		20:00 (4)	06:40			07:31		17:48 (2)	07:24			08:18		15:08 (1)	08:45		15:24 (1)
	21:33	63	21:03 (5)	20:32			19:19	35	18:23 (2)	17:13			16:28	46	15:54 (1)	16:28	29	15:53 (1)
30	05:51		19:59 (4)	06:41		19:21 (3)	07:33		17:45 (2)	07:26			08:20		15:09 (1)	08:45		15:24 (1)
	21:31	62	21:01 (5)	20:30	9	19:30 (3)	19:17	38	18:23 (2)	17:11			16:27	44	15:53 (1)	16:29	30	15:54 (1)
31	05:52		20:00 (4)	06:43		19:17 (3)				07:28						08:46		15:24 (1)
	21:30	60	21:00 (5)	20:27	16	19:33 (3)				17:09						16:30	31	15:55 (1)
Potential sun hours	504			455			381			331			264			241		
Total, worst case		1895			878			691			847			1114			972	
Sun reduction		0.33			0.35			0.34			0.28			0.26			0.22	
Oper. time red.		1.00			1.00			1.00			1.00			1.00			1.00	
Wind dir. red.		0.63			0.62			0.61			0.60			0.62			0.62	
Total reduction		0.21			0.22			0.21			0.17			0.16			0.13	
Total, real		396			194			142			144			179			131	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
Jennings O'Donovan
Finisklin Business Park
F91 RHH9 Sligo
+353719161416
Kathlyn Feeney / kfeeney@jodireland.com
Calculated:
09/06/2025 13:54/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Worst Case - V150 **Shadow receptor:** I - 9

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January		February		March		April		May		June	
1	08:46		15:47 (1)	08:18		15:46 (1)	07:23		17:32 (2)	07:12		19:31 (3)	06:06		20:26 (4)	05:20		20:12 (4)
	16:32	9	15:56 (1)	17:20	49	16:35 (1)	18:13	14	17:46 (2)	20:08	11	19:42 (3)	21:00	5	20:31 (4)	21:47	62	21:14 (5)
2	08:45		15:47 (1)	08:16		15:47 (1)	07:21		17:31 (2)	07:09		19:29 (3)	06:04		20:23 (4)	05:19		20:12 (4)
	16:33	10	15:57 (1)	17:22	48	16:35 (1)	18:15	17	17:48 (2)	20:10	14	19:43 (3)	21:02	10	20:33 (4)	21:48	63	21:15 (5)
3	08:45		15:47 (1)	08:15		15:47 (1)	07:19		17:29 (2)	07:07		19:28 (3)	06:02		20:21 (4)	05:18		20:12 (4)
	16:34	12	15:59 (1)	17:24	48	16:35 (1)	18:17	22	17:51 (2)	20:11	17	19:45 (3)	21:03	13	20:34 (4)	21:49	63	21:15 (5)
4	08:45		15:47 (1)	08:13		15:47 (1)	07:17		17:27 (2)	07:05		19:27 (3)	06:00		20:19 (4)	05:17		20:13 (4)
	16:35	13	16:00 (1)	17:26	48	16:35 (1)	18:18	25	17:52 (2)	20:13	20	19:47 (3)	21:05	17	20:36 (4)	21:50	64	21:17 (5)
5	08:45		15:47 (1)	08:11		15:48 (1)	07:15		17:26 (2)	07:02		19:25 (3)	05:58		20:19 (4)	05:17		20:13 (4)
	16:36	14	16:01 (1)	17:28	46	16:34 (1)	18:20	28	17:54 (2)	20:15	23	19:48 (3)	21:07	19	20:38 (4)	21:51	64	21:17 (5)
6	08:44		15:47 (1)	08:10		15:48 (1)	07:12		17:25 (2)	07:00		19:25 (3)	05:56		20:17 (4)	05:16		20:14 (4)
	16:37	16	16:03 (1)	17:30	46	16:34 (1)	18:22	31	17:56 (2)	20:17	25	19:50 (3)	21:08	22	20:39 (4)	21:52	65	21:19 (5)
7	08:44		15:46 (1)	08:08		15:50 (1)	07:10		17:23 (2)	06:58		19:25 (3)	05:55		20:16 (4)	05:15		20:14 (4)
	16:39	18	16:04 (1)	17:32	44	16:34 (1)	18:24	34	17:57 (2)	20:18	27	19:52 (3)	21:10	24	20:40 (4)	21:53	65	21:19 (5)
8	08:44		15:46 (1)	08:06		15:51 (1)	07:08		17:22 (2)	06:56		19:24 (3)	05:53		20:14 (4)	05:15		20:15 (4)
	16:40	19	16:05 (1)	17:34	42	16:33 (1)	18:26	37	17:59 (2)	20:20	30	19:54 (3)	21:12	28	20:42 (4)	21:54	64	21:19 (5)
9	08:43		15:46 (1)	08:04		15:52 (1)	07:05		17:22 (2)	06:53		19:23 (3)	05:51		20:14 (4)	05:14		20:15 (4)
	16:41	21	16:07 (1)	17:35	40	16:32 (1)	18:27	40	18:02 (2)	20:22	32	19:55 (3)	21:13	30	20:44 (4)	21:55	64	21:19 (5)
10	08:42		15:46 (1)	08:02		15:53 (1)	07:03		17:21 (2)	06:51		19:23 (3)	05:49		20:13 (4)	05:14		20:15 (4)
	16:43	22	16:08 (1)	17:37	38	16:31 (1)	18:29	42	18:03 (2)	20:24	34	19:57 (3)	21:15	32	20:45 (4)	21:55	64	21:19 (5)
11	08:42		15:45 (1)	08:01		15:54 (1)	07:01		17:20 (2)	06:49		19:23 (3)	05:48		20:13 (4)	05:13		20:16 (4)
	16:44	25	16:10 (1)	17:39	36	16:30 (1)	18:31	45	18:05 (2)	20:25	36	19:59 (3)	21:17	34	20:47 (4)	21:56	64	21:20 (5)
12	08:41		15:45 (1)	07:59		15:55 (1)	06:59		17:20 (2)	06:46		19:24 (3)	05:46		20:12 (4)	05:13		20:17 (4)
	16:46	26	16:11 (1)	17:41	34	16:29 (1)	18:33	47	18:07 (2)	20:27	34	19:58 (3)	21:18	36	20:48 (4)	21:57	63	21:20 (5)
13	08:40		15:45 (1)	07:57		15:57 (1)	06:56		17:19 (2)	06:44		19:23 (3)	05:44		20:12 (4)	05:13		20:16 (4)
	16:47	28	16:13 (1)	17:43	31	16:28 (1)	18:35	49	18:08 (2)	20:29	34	19:57 (3)	21:20	38	20:50 (4)	21:58	63	21:19 (5)
14	08:40		15:45 (1)	07:55		15:59 (1)	06:54		17:19 (2)	06:42		19:24 (3)	05:43		20:11 (4)	05:13		20:17 (4)
	16:49	29	16:14 (1)	17:45	27	16:26 (1)	18:36	49	18:08 (2)	20:31	32	19:56 (3)	21:21	40	20:51 (5)	21:58	63	21:20 (5)
15	08:39		15:45 (1)	07:53		16:02 (1)	06:52		17:19 (2)	06:40		19:24 (3)	05:41		20:11 (4)	05:12		20:17 (4)
	16:50	31	16:16 (1)	17:47	21	16:23 (1)	18:38	50	18:09 (2)	20:32	31	19:55 (3)	21:23	42	20:53 (5)	21:59	63	21:20 (5)
16	08:38		15:45 (1)	07:51		16:06 (1)	06:49		17:19 (2)	06:38		19:25 (3)	05:39		20:10 (4)	05:12		20:17 (4)
	16:52	33	16:18 (1)	17:49	14	16:20 (1)	18:40	48	18:07 (2)	20:34	29	19:54 (3)	21:25	44	20:54 (5)	21:59	63	21:20 (5)
17	08:37		15:45 (1)	07:49			06:47		17:19 (2)	06:35		19:26 (3)	05:38		20:11 (4)	05:12		20:18 (4)
	16:54	35	16:20 (1)	17:51			18:42	48	18:07 (2)	20:36	27	19:53 (3)	21:26	44	20:55 (5)	22:00	63	21:26 (8)
18	08:36		15:45 (1)	07:47			06:45		17:19 (2)	06:33		19:28 (3)	05:36		20:10 (4)	05:12		20:18 (4)
	16:55	37	16:22 (1)	17:52			18:43	48	18:07 (2)	20:37	24	19:52 (3)	21:28	46	20:56 (5)	22:00	63	21:26 (8)
19	08:35		15:45 (1)	07:45			06:42		17:19 (2)	06:31		19:29 (3)	05:35		20:10 (4)	05:12		20:18 (4)
	16:57	39	16:24 (1)	17:54			18:45	47	18:06 (2)	20:39	21	19:50 (3)	21:29	48	20:58 (5)	22:01	63	21:26 (8)
20	08:34		15:45 (1)	07:43			06:40		17:20 (2)	06:29		19:30 (3)	05:34		20:10 (4)	05:12		20:18 (4)
	16:59	41	16:26 (1)	17:56			18:47	45	18:05 (2)	20:41	17	19:47 (3)	21:31	49	20:59 (5)	22:01	63	21:26 (8)
21	08:33		15:44 (1)	07:41			06:38		17:21 (2)	06:27		19:34 (3)	05:32		20:10 (4)	05:12		20:18 (4)
	17:00	43	16:27 (1)	17:58			18:49	43	18:04 (2)	20:43	9	19:43 (3)	21:32	51	21:01 (5)	22:01	63	21:26 (8)
22	08:32		15:45 (1)	07:39			06:35		17:21 (2)	06:24			05:31		20:10 (4)	05:13		20:19 (4)
	17:02	45	16:30 (1)	18:00			18:50	41	18:02 (2)	20:44			21:34	51	21:01 (5)	22:01	63	21:27 (8)
23	08:30		15:45 (1)	07:36			06:33		17:22 (2)	06:22			05:30		20:10 (4)	05:13		20:19 (4)
	17:04	47	16:32 (1)	18:02			18:52	39	18:01 (2)	20:46			21:35	53	21:03 (5)	22:01	63	21:27 (8)
24	08:29		15:44 (1)	07:34			06:31		17:22 (2)	06:20			05:28		20:10 (4)	05:13		20:19 (4)
	17:06	49	16:33 (1)	18:04			18:54	37	17:59 (2)	20:48			21:36	54	21:04 (5)	22:02	63	21:27 (8)
25	08:28		15:45 (1)	07:32			06:28		17:24 (2)	06:18			05:27		20:10 (4)	05:13		20:20 (4)
	17:07	49	16:34 (1)	18:06			18:56	34	17:58 (2)	20:50			21:38	56	21:06 (5)	22:02	63	21:28 (8)
26	08:27		15:45 (1)	07:30			06:26		17:26 (2)	06:16			05:26		20:11 (4)	05:14		20:20 (4)
	17:09	49	16:34 (1)	18:07			18:57	30	17:56 (2)	20:51			21:39	56	21:07 (5)	22:02	62	21:22 (5)
27	08:25		15:45 (1)	07:28		17:39 (2)	06:23		17:27 (2)	06:14			05:25		20:11 (4)	05:14		20:20 (4)
	17:11	50	16:35 (1)	18:09	4	17:43 (2)	18:59	26	17:53 (2)	20:53			21:40	57	21:08 (5)	22:02	63	21:23 (5)
28	08:24		15:45 (1)	07:26		17:36 (2)	06:21		17:30 (2)	06:12			05:24		20:11 (4)	05:15		20:20 (4)
	17:13	50	16:35 (1)	18:11	9	17:45 (2)	19:01	21	17:51 (2)	20:55			21:42	58	21:09 (5)	22:01	63	21:23 (5)
29	08:22		15:45 (1)				07:19		18:34 (2)	06:10			05:23		20:11 (4)	05:15		20:20 (4)
	17:15	50	16:35 (1)				20:03	13	18:47 (2)	20:56			21:43	59	21:10 (5)	22:01	63	21:23 (5)
30	08:21		15:46 (1)				07:16		19:35 (3)	06:08			05:22		20:11 (4)	05:16		20:20 (4)
	17:17	49	16:35 (1)				20:04	3	19:38 (3)	20:58			21:44	60	21:11 (5)	22:01	63	21:23 (5)
31	08:19		15:46 (1)				07:14		19:33 (3)				05:21		20:12 (4)			
	17:18	49	16:35 (1)				20:06	7	19:40 (3)				21:45	61	21:13 (5)			
Potential sun hours	257			277			367			417			487			501		
Total, worst case		1008			625			1060			527			1237			1898	
Sun reduction		0.22			0.24			0.28			0.38			0.39			0.35	
Oper. time red.		1.00			1.00			1.00			1.00			1.00			1.00	
Wind dir. red.		0.61			0.61			0.60			0.61			0.63			0.64	
Total reduction		0.13			0.15			0.17			0.23			0.25			0.22	
Total, real		134			93			176			122			310			419	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
Jennings O'Donovan
Finisklin Business Park
F91 RHH9 Sligo
+353719161416
Kathlyn Feeney / kfeeney@jodireland.com
Calculated:
09/06/2025 13:54/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Worst Case - V150 **Shadow receptor:** I - 9

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	July		August		September		October		November		December		
1	05:17		20:20 (4)	05:54		20:23 (4)	06:45		19:22 (3)	07:35		17:59 (2)	07:30		15:22 (1)	08:21		15:28 (1)
	22:01	64	21:24 (5)	21:28	35	20:58 (4)	20:25	36	19:58 (3)	19:14	48	18:47 (2)	17:07	39	16:01 (1)	16:26	24	15:52 (1)
2	05:17		20:21 (4)	05:55		20:23 (4)	06:46		19:22 (3)	07:36		17:59 (2)	07:31		15:21 (1)	08:23		15:29 (1)
	22:00	63	21:24 (5)	21:26	33	20:56 (4)	20:23	34	19:56 (3)	19:12	46	18:45 (2)	17:05	41	16:02 (1)	16:25	23	15:52 (1)
3	05:18		20:20 (4)	05:57		20:24 (4)	06:48		19:21 (3)	07:38		17:59 (2)	07:33		15:20 (1)	08:24		15:29 (1)
	22:00	64	21:24 (5)	21:25	31	20:55 (4)	20:20	32	19:53 (3)	19:10	44	18:43 (2)	17:04	43	16:03 (1)	16:25	21	15:50 (1)
4	05:19		20:20 (4)	05:59		20:24 (4)	06:50		19:21 (3)	07:40		17:59 (2)	07:35		15:20 (1)	08:26		15:31 (1)
	22:00	64	21:24 (5)	21:23	29	20:53 (4)	20:18	30	19:51 (3)	19:07	41	18:40 (2)	17:02	44	16:04 (1)	16:24	19	15:50 (1)
5	05:20		20:20 (4)	06:00		20:25 (4)	06:51		19:21 (3)	07:42		17:59 (2)	07:37		15:19 (1)	08:27		15:31 (1)
	21:59	65	21:25 (5)	21:21	26	20:51 (4)	20:16	27	19:48 (3)	19:05	38	18:37 (2)	17:00	45	16:04 (1)	16:24	18	15:49 (1)
6	05:20		20:21 (4)	06:02		20:25 (4)	06:53		19:21 (3)	07:43		18:00 (2)	07:39		15:18 (1)	08:28		15:32 (1)
	21:59	64	21:25 (5)	21:19	24	20:49 (4)	20:13	25	19:46 (3)	19:03	35	18:35 (2)	16:58	47	16:05 (1)	16:23	16	15:48 (1)
7	05:21		20:20 (4)	06:03		20:27 (4)	06:55		19:22 (3)	07:45		18:00 (2)	07:41		15:18 (1)	08:30		15:34 (1)
	21:58	64	21:24 (5)	21:17	21	20:48 (4)	20:11	22	19:44 (3)	19:01	33	18:33 (2)	16:56	47	16:05 (1)	16:23	14	15:48 (1)
8	05:22		20:20 (4)	06:05		20:27 (4)	06:56		19:21 (3)	07:47		18:00 (2)	07:42		15:18 (1)	08:31		15:34 (1)
	21:57	64	21:24 (5)	21:16	19	20:46 (4)	20:09	20	19:41 (3)	18:58	30	18:30 (2)	16:55	48	16:06 (1)	16:22	13	15:47 (1)
9	05:23		20:20 (4)	06:07		20:29 (4)	06:58		19:22 (3)	07:48		18:01 (2)	07:44		15:18 (1)	08:32		15:35 (1)
	21:57	63	21:23 (5)	21:14	15	20:44 (4)	20:06	18	19:40 (3)	18:56	27	18:28 (2)	16:53	48	16:06 (1)	16:22	12	15:47 (1)
10	05:24		20:20 (4)	06:08		20:31 (4)	07:00		19:22 (3)	07:50		18:02 (2)	07:46		15:17 (1)	08:33		15:37 (1)
	21:56	62	21:22 (5)	21:12	12	20:43 (4)	20:04	15	19:37 (3)	18:54	24	18:26 (2)	16:51	50	16:07 (1)	16:22	10	15:47 (1)
11	05:25		20:20 (4)	06:10		20:32 (4)	07:01		19:23 (3)	07:52		18:04 (2)	07:48		15:17 (1)	08:34		15:38 (1)
	21:55	62	21:22 (5)	21:10	9	20:41 (4)	20:02	12	19:35 (3)	18:51	20	18:24 (2)	16:50	50	16:07 (1)	16:22	9	15:47 (1)
12	05:26		20:20 (4)	06:12		20:35 (4)	07:03		19:25 (3)	07:54		18:04 (2)	07:50		15:17 (1)	08:35		15:39 (1)
	21:54	61	21:21 (5)	21:08	4	20:39 (4)	19:59	8	19:33 (3)	18:49	16	18:20 (2)	16:48	49	16:06 (1)	16:22	7	15:46 (1)
13	05:28		20:20 (4)	06:13			07:05		19:26 (3)	07:55		18:06 (2)	07:51		15:17 (1)	08:36		15:40 (1)
	21:53	60	21:20 (5)	21:06			19:57	4	19:30 (3)	18:47	12	18:18 (2)	16:47	49	16:06 (1)	16:22	6	15:46 (1)
14	05:29		20:20 (4)	06:15			07:06		18:25 (2)	07:57		18:09 (2)	07:53		15:17 (1)	08:37		15:41 (1)
	21:52	59	21:19 (5)	21:04			19:55	11	18:36 (2)	18:45	7	18:16 (2)	16:45	50	16:07 (1)	16:22	5	15:46 (1)
15	05:30		20:20 (4)	06:17			07:08		18:20 (2)	07:59		18:13 (2)	07:55		15:17 (1)	08:38		15:42 (1)
	21:51	59	21:19 (5)	21:02			19:52	19	18:39 (2)	18:42	1	18:14 (2)	16:44	50	16:07 (1)	16:22	4	15:46 (1)
16	05:31		20:20 (4)	06:18			07:10		18:17 (2)	08:01			07:57		15:17 (1)	08:39		15:43 (1)
	21:50	58	21:18 (5)	21:00			19:50	25	18:42 (2)	18:40			16:42	50	16:07 (1)	16:22	3	15:46 (1)
17	05:32		20:20 (4)	06:20			07:11		18:15 (2)	08:02			07:59		15:18 (1)	08:40		15:43 (1)
	21:49	57	21:17 (5)	20:58			19:48	29	18:44 (2)	18:38			16:41	49	16:07 (1)	16:22	3	15:46 (1)
18	05:34		20:20 (4)	06:21			07:13		18:12 (2)	08:04			08:00		15:18 (1)	08:41		15:44 (1)
	21:48	56	21:16 (5)	20:56			19:45	33	18:45 (2)	18:36			16:40	49	16:07 (1)	16:22	2	15:46 (1)
19	05:35		20:20 (4)	06:23			07:15		18:10 (2)	08:06			08:02		15:19 (1)	08:41		15:45 (1)
	21:47	54	21:14 (5)	20:54			19:43	36	18:46 (2)	18:34			16:38	47	16:06 (1)	16:22	2	15:47 (1)
20	05:36		20:21 (4)	06:25			07:16		18:09 (2)	08:08			08:04		15:20 (1)	08:42		15:45 (1)
	21:46	53	21:14 (5)	20:51			19:40	39	18:48 (2)	18:32			16:37	45	16:05 (1)	16:23	2	15:47 (1)
21	05:38		20:20 (4)	06:26			07:18		18:06 (2)	08:10			08:05		15:20 (1)	08:43		15:46 (1)
	21:44	53	21:13 (5)	20:49			19:38	42	18:48 (2)	18:29			16:36	43	16:03 (1)	16:23	1	15:47 (1)
22	05:39		20:20 (4)	06:28		19:38 (3)	07:20		18:05 (2)	08:11			08:07		15:21 (1)	08:43		15:46 (1)
	21:43	51	21:11 (5)	20:47	10	19:48 (3)	19:36	44	18:49 (2)	18:27			16:35	41	16:02 (1)	16:24	1	15:47 (1)
23	05:40		20:20 (4)	06:30		19:35 (3)	07:21		18:05 (2)	08:13			08:09		15:21 (1)	08:44		15:47 (1)
	21:42	50	21:10 (5)	20:45	17	19:52 (3)	19:33	44	18:49 (2)	18:25			16:33	39	16:00 (1)	16:24	1	15:48 (1)
24	05:42		20:21 (4)	06:31		19:32 (3)	07:23		18:03 (2)	08:15			08:10		15:22 (1)	08:44		15:47 (1)
	21:40	48	21:09 (5)	20:43	21	19:53 (3)	19:31	46	18:49 (2)	18:23			16:32	37	15:59 (1)	16:25	2	15:49 (1)
25	05:43		20:20 (4)	06:33		19:30 (3)	07:25		18:02 (2)	07:17			08:12		15:23 (1)	08:44		15:47 (1)
	21:39	48	21:08 (5)	20:41	25	19:55 (3)	19:29	47	18:49 (2)	17:21			16:31	35	15:58 (1)	16:25	2	15:49 (1)
26	05:45		20:21 (4)	06:35		19:29 (3)	07:26		18:02 (2)	07:19		15:34 (1)	08:14		15:24 (1)	08:45		15:48 (1)
	21:38	46	21:07 (5)	20:38	27	19:56 (3)	19:26	48	18:50 (2)	17:19	16	15:50 (1)	16:30	33	15:57 (1)	16:26	3	15:51 (1)
27	05:46		20:21 (4)	06:36		19:27 (3)	07:28		18:00 (2)	07:20		15:31 (1)	08:15		15:25 (1)	08:45		15:48 (1)
	21:36	44	21:05 (5)	20:36	29	19:56 (3)	19:24	49	18:49 (2)	17:17	22	15:53 (1)	16:29	31	15:56 (1)	16:27	3	15:51 (1)
28	05:48		20:21 (4)	06:38		19:26 (3)	07:30		18:00 (2)	07:22		15:28 (1)	08:17		15:25 (1)	08:45		15:48 (1)
	21:35	42	21:03 (5)	20:34	31	19:57 (3)	19:22	49	18:49 (2)	17:15	28	15:56 (1)	16:28	30	15:55 (1)	16:28	4	15:52 (1)
29	05:49		20:22 (4)	06:40		19:24 (3)	07:31		18:00 (2)	07:24		15:26 (1)	08:18		15:26 (1)	08:45		15:48 (1)
	21:33	41	21:03 (5)	20:32	33	19:57 (3)	19:19	49	18:49 (2)	17:13	31	15:57 (1)	16:28	28	15:54 (1)	16:28	5	15:53 (1)
30	05:51		20:22 (4)	06:41		19:24 (3)	07:33		17:59 (2)	07:26		15:25 (1)	08:20		15:27 (1)	08:45		15:48 (1)
	21:31	39	21:01 (4)	20:30	34	19:58 (3)	19:17	49	18:48 (2)	17:11	34	15:59 (1)	16:27	26	15:53 (1)	16:29	6	15:54 (1)
31	05:52		20:23 (4)	06:43		19:23 (3)				07:28		15:23 (1)				08:46		15:48 (1)
	21:30	37	21:00 (4)	20:27	34	19:57 (3)				17:09	37	16:00 (1)				16:30	7	15:55 (1)
Potential sun hours	504			455			381			331			264			241		
Total, worst case		1715			519			942			590			1283			248	
Sun reduction		0.33			0.35			0.34			0.28			0.26			0.22	
Oper. time red.		1.00			1.00			1.00			1.00			1.00			1.00	
Wind dir. red.		0.64			0.62			0.60			0.60			0.61			0.61	
Total reduction		0.21			0.22			0.20			0.17			0.16			0.13	
Total, real		362			114			191			100			205			33	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
Jennings O'Donovan
Finisklin Business Park
F91 RHH9 Sligo
+353719161416
Kathlyn Feeney / kfeeney@jodireland.com
Calculated:
09/06/2025 13:54/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Worst Case - V150 **Shadow receptor:** J - 10

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January			February			March			April			May			June		
1	08:46			08:18		16:20 (1)	07:23			07:12		18:45 (2)	06:06			05:20		20:30 (4)
	16:32			17:20	29	16:49 (1)	18:13			20:08	40	19:25 (2)	21:00			21:47	44	21:14 (5)
2	08:45			08:16		16:20 (1)	07:21			07:09		18:44 (2)	06:04			05:19		20:30 (4)
	16:33			17:22	32	16:52 (1)	18:15			20:10	40	19:24 (2)	21:02			21:48	45	21:15 (5)
3	08:45			08:15		16:19 (1)	07:19			07:07		18:46 (2)	06:02			05:18		20:30 (4)
	16:34			17:24	35	16:54 (1)	18:17			20:11	36	19:22 (2)	21:03			21:49	45	21:15 (5)
4	08:45			08:13		16:19 (1)	07:17			07:05		18:47 (2)	06:00			05:17		20:30 (4)
	16:35			17:26	37	16:56 (1)	18:18			20:13	34	19:21 (2)	21:05			21:50	47	21:17 (5)
5	08:45			08:11		16:18 (1)	07:15			07:02		18:48 (2)	05:58			05:17		20:30 (4)
	16:36			17:28	40	16:58 (1)	18:20			20:15	31	19:19 (2)	21:07			21:51	47	21:17 (5)
6	08:44			08:10		16:17 (1)	07:12			07:00		18:49 (2)	05:56			05:16		20:31 (4)
	16:37			17:30	43	17:00 (1)	18:22			20:17	28	19:17 (2)	21:08			21:52	48	21:19 (5)
7	08:44			08:08		16:18 (1)	07:10			06:58		18:52 (2)	05:55			05:15		20:31 (4)
	16:39			17:32	44	17:02 (1)	18:24			20:18	27	19:52 (3)	21:10			21:53	48	21:19 (5)
8	08:44			08:06		16:18 (1)	07:08			06:56		18:55 (2)	05:53			05:15		20:31 (4)
	16:40			17:34	46	17:04 (1)	18:26			20:20	25	19:54 (3)	21:12			21:54	49	21:20 (5)
9	08:43			08:04		16:17 (1)	07:05			06:53		19:00 (2)	05:51		20:42 (4)	05:14		20:31 (4)
	16:41			17:35	49	17:06 (1)	18:27			20:22	16	19:55 (3)	21:13	2	20:44 (4)	21:55	50	21:21 (5)
10	08:42			08:02		16:17 (1)	07:03			06:51		19:43 (3)	05:49		20:40 (4)	05:14		20:32 (4)
	16:43			17:37	50	17:07 (1)	18:29			20:24	14	19:57 (3)	21:15	5	20:45 (4)	21:55	50	21:22 (5)
11	08:42			08:01		16:17 (1)	07:01		18:03 (2)	06:49		19:42 (3)	05:48		20:39 (4)	05:13		20:32 (4)
	16:44			17:39	50	17:07 (1)	18:31	2	18:05 (2)	20:25	17	19:59 (3)	21:17	8	20:47 (4)	21:56	51	21:23 (5)
12	08:41			07:59		16:17 (1)	06:59		18:00 (2)	06:46		19:41 (3)	05:46		20:37 (4)	05:13		20:33 (4)
	16:46			17:41	50	17:07 (1)	18:33	7	18:07 (2)	20:27	20	20:01 (3)	21:18	11	20:48 (4)	21:57	50	21:23 (5)
13	08:40			07:57		16:17 (1)	06:56		17:56 (2)	06:44		19:39 (3)	05:44		20:36 (4)	05:13		20:32 (4)
	16:47			17:43	50	17:07 (1)	18:35	12	18:08 (2)	20:29	22	20:01 (3)	21:20	14	20:50 (4)	21:58	51	21:23 (5)
14	08:40			07:55		16:18 (1)	06:54		17:54 (2)	06:42		19:39 (3)	05:43		20:35 (4)	05:13		20:33 (4)
	16:49			17:45	49	17:07 (1)	18:36	17	18:11 (2)	20:31	24	20:03 (3)	21:21	16	20:51 (4)	21:58	51	21:24 (5)
15	08:39			07:53		16:18 (1)	06:52		17:53 (2)	06:40		19:39 (3)	05:41		20:34 (4)	05:12		20:33 (4)
	16:50			17:47	48	17:06 (1)	18:38	20	18:13 (2)	20:32	26	20:05 (3)	21:23	19	20:53 (4)	21:59	52	21:25 (5)
16	08:38			07:51		16:18 (1)	06:49		17:51 (2)	06:38		19:39 (3)	05:39		20:33 (4)	05:12		20:33 (4)
	16:52			17:49	48	17:06 (1)	18:40	23	18:14 (2)	20:34	28	20:07 (3)	21:25	21	20:54 (4)	21:59	52	21:25 (5)
17	08:37			07:49		16:19 (1)	06:47		17:50 (2)	06:35		19:39 (3)	05:38		20:32 (4)	05:12		20:33 (4)
	16:54			17:51	47	17:06 (1)	18:42	26	18:16 (2)	20:36	30	20:09 (3)	21:26	23	20:55 (4)	22:00	53	21:26 (5)
18	08:36			07:47		16:18 (1)	06:45		17:49 (2)	06:33		19:39 (3)	05:36		20:31 (4)	05:12		20:34 (4)
	16:55			17:52	46	17:04 (1)	18:43	29	18:18 (2)	20:37	31	20:10 (3)	21:28	25	20:56 (4)	22:00	52	21:26 (5)
19	08:35			07:45		16:19 (1)	06:42		17:47 (2)	06:31		19:39 (3)	05:35		20:31 (4)	05:12		20:34 (4)
	16:57			17:54	45	17:04 (1)	18:45	32	18:19 (2)	20:39	33	20:12 (3)	21:29	27	20:58 (4)	22:01	52	21:26 (5)
20	08:34			07:43		16:20 (1)	06:40		17:46 (2)	06:29		19:38 (3)	05:34		20:31 (4)	05:12		20:34 (4)
	16:59			17:56	43	17:03 (1)	18:47	35	18:21 (2)	20:41	32	20:10 (3)	21:31	28	20:59 (4)	22:01	52	21:26 (5)
21	08:33			07:41		16:21 (1)	06:38		17:46 (2)	06:27		19:39 (3)	05:32		20:31 (4)	05:12		20:34 (4)
	17:00			17:58	41	17:02 (1)	18:49	37	18:23 (2)	20:43	30	20:09 (3)	21:32	30	21:01 (5)	22:01	52	21:26 (5)
22	08:32			07:39		16:22 (1)	06:35		17:45 (2)	06:24		19:39 (3)	05:31		20:30 (4)	05:13		20:35 (4)
	17:02			18:00	40	17:02 (1)	18:50	40	18:25 (2)	20:44	29	20:08 (3)	21:34	31	21:01 (5)	22:01	52	21:27 (5)
23	08:30			07:36		16:24 (1)	06:33		17:44 (2)	06:22		19:40 (3)	05:30		20:30 (4)	05:13		20:35 (4)
	17:04			18:02	36	17:00 (1)	18:52	43	18:27 (2)	20:46	27	20:07 (3)	21:35	33	21:03 (5)	22:01	52	21:27 (5)
24	08:29		16:29 (1)	07:34		16:24 (1)	06:31		17:43 (2)	06:20		19:41 (3)	05:28		20:30 (4)	05:13		20:35 (4)
	17:06	4	16:33 (1)	18:04	34	16:58 (1)	18:54	45	18:28 (2)	20:48	25	20:06 (3)	21:36	34	21:04 (5)	22:02	52	21:27 (5)
25	08:28		16:27 (1)	07:32		16:26 (1)	06:28		17:43 (2)	06:18		19:42 (3)	05:27		20:29 (4)	05:13		20:36 (4)
	17:07	9	16:36 (1)	18:06	31	16:57 (1)	18:56	47	18:30 (2)	20:50	23	20:05 (3)	21:38	37	21:06 (5)	22:02	52	21:28 (5)
26	08:27		16:26 (1)	07:30		16:28 (1)	06:26		17:43 (2)	06:16		19:44 (3)	05:26		20:29 (4)	05:14		20:35 (4)
	17:09	11	16:37 (1)	18:07	27	16:55 (1)	18:57	47	18:30 (2)	20:51	19	20:03 (3)	21:39	38	21:07 (5)	22:02	52	21:27 (5)
27	08:25		16:25 (1)	07:28		16:31 (1)	06:23		17:43 (2)	06:14		19:46 (3)	05:25		20:29 (4)	05:14		20:36 (4)
	17:11	15	16:40 (1)	18:09	21	16:52 (1)	18:59	46	18:29 (2)	20:53	14	20:00 (3)	21:40	39	21:08 (5)	22:02	52	21:28 (5)
28	08:24		16:23 (1)	07:26		16:36 (1)	06:21		17:43 (2)	06:12		19:49 (3)	05:24		20:29 (4)	05:15		20:36 (4)
	17:13	18	16:41 (1)	18:11	12	16:48 (1)	19:01	46	18:29 (2)	20:55	7	19:56 (3)	21:42	40	21:09 (5)	22:01	51	21:27 (5)
29	08:22		16:22 (1)				07:19		18:43 (2)	06:10			05:23		20:29 (4)	05:15		20:36 (4)
	17:15	21	16:43 (1)				20:03	45	19:28 (2)	20:56			21:43	41	21:10 (5)	22:01	52	21:28 (5)
30	08:21		16:22 (1)				07:16		18:43 (2)	06:08			05:22		20:29 (4)	05:16		20:36 (4)
	17:17	24	16:46 (1)				20:04	44	19:27 (2)	20:58			21:44	42	21:11 (5)	22:01	51	21:27 (5)
31	08:19		16:21 (1)				07:14		18:44 (2)				05:21		20:30 (4)			
	17:18	26	16:47 (1)				20:06	42	19:26 (2)				21:45	43	21:13 (5)			
Potential sun hours	257			277			367			417			487			501		
Total, worst case		128			1123			685			728			607			1507	
Sun reduction		0.22			0.24			0.28			0.38			0.39			0.35	
Oper. time red.		1.00			1.00			1.00			1.00			1.00			1.00	
Wind dir. red.		0.59			0.59			0.60			0.60			0.64			0.64	
Total reduction		0.13			0.14			0.17			0.23			0.25			0.22	
Total, real		17			162			115			167			153			333	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
Jennings O'Donovan
Finisklin Business Park
F91 RHH9 Sligo
+353719161416
Kathlyn Feeney / kfeeney@jodireland.com

Calculated:
09/06/2025 13:54/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Worst Case - V150 **Shadow receptor:** J - 10

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	July		August		September		October		November		December	
1	05:17		20:36 (4)	05:54		20:48 (4)	06:45		19:41 (3)	07:35		18:37 (2)	07:30		15:47 (1)	08:21
	22:01	51	21:27 (5)	21:28	10	20:58 (4)	20:25	17	19:58 (3)	19:14	10	18:47 (2)	17:07	49	16:36 (1)	16:26
2	05:17		20:37 (4)	05:55		20:49 (4)	06:46		19:42 (3)	07:36		18:40 (2)	07:31		15:47 (1)	08:23
	22:00	50	21:27 (5)	21:26	7	20:56 (4)	20:23	14	19:56 (3)	19:12	5	18:45 (2)	17:05	49	16:36 (1)	16:25
3	05:18		20:36 (4)	05:57		20:51 (4)	06:48		18:58 (2)	07:38			07:33		15:47 (1)	08:24
	22:00	50	21:26 (5)	21:25	4	20:55 (4)	20:20	15	19:53 (3)	19:10			17:04	47	16:34 (1)	16:25
4	05:19		20:37 (4)	05:59			06:50		18:52 (2)	07:40			07:35		15:48 (1)	08:26
	22:00	49	21:26 (5)	21:23			20:18	25	19:51 (3)	19:07			17:02	44	16:32 (1)	16:24
5	05:20		20:37 (4)	06:00			06:51		18:48 (2)	07:42			07:37		15:48 (1)	08:27
	21:59	49	21:26 (5)	21:21			20:16	27	19:48 (3)	19:05			17:00	42	16:30 (1)	16:24
6	05:20		20:37 (4)	06:02			06:53		18:46 (2)	07:43			07:39		15:49 (1)	08:28
	21:59	48	21:25 (5)	21:19			20:13	27	19:13 (2)	19:03			16:58	39	16:28 (1)	16:23
7	05:21		20:37 (4)	06:03			06:55		18:44 (2)	07:45			07:41		15:49 (1)	08:30
	21:58	47	21:24 (5)	21:17			20:11	31	19:15 (2)	19:01			16:56	37	16:26 (1)	16:23
8	05:22		20:37 (4)	06:05			06:56		18:41 (2)	07:47			07:42		15:50 (1)	08:31
	21:57	47	21:24 (5)	21:16			20:09	34	19:15 (2)	18:58			16:55	34	16:24 (1)	16:22
9	05:23		20:37 (4)	06:07			06:58		18:40 (2)	07:48			07:44		15:51 (1)	08:32
	21:57	46	21:23 (5)	21:14			20:06	37	19:17 (2)	18:56			16:53	32	16:23 (1)	16:22
10	05:24		20:37 (4)	06:08			07:00		18:38 (2)	07:50			07:46		15:52 (1)	08:33
	21:56	45	21:22 (5)	21:12			20:04	39	19:17 (2)	18:54			16:51	29	16:21 (1)	16:22
11	05:25		20:37 (4)	06:10			07:01		18:37 (2)	07:52			07:48		15:53 (1)	08:34
	21:55	45	21:22 (5)	21:10			20:02	41	19:18 (2)	18:51			16:50	26	16:19 (1)	16:22
12	05:26		20:37 (4)	06:12			07:03		18:36 (2)	07:54			07:50		15:53 (1)	08:35
	21:54	44	21:21 (5)	21:08			19:59	42	19:18 (2)	18:49			16:48	23	16:16 (1)	16:22
13	05:28		20:38 (4)	06:13			07:05		18:34 (2)	07:55			07:51		15:54 (1)	08:36
	21:53	42	21:20 (5)	21:06			19:57	44	19:18 (2)	18:47			16:47	21	16:15 (1)	16:22
14	05:29		20:38 (4)	06:15			07:06		18:34 (2)	07:57		17:06 (1)	07:53		15:55 (1)	08:37
	21:52	41	21:19 (5)	21:04			19:55	45	19:19 (2)	18:45	16	17:22 (1)	16:45	18	16:13 (1)	16:22
15	05:30		20:39 (4)	06:17		19:56 (3)	07:08		18:32 (2)	07:59		17:02 (1)	07:55		15:57 (1)	08:38
	21:51	40	21:19 (5)	21:02	9	20:05 (3)	19:52	46	19:18 (2)	18:42	23	17:25 (1)	16:44	15	16:12 (1)	16:22
16	05:31		20:39 (4)	06:18		19:53 (3)	07:10		18:32 (2)	08:01		17:00 (1)	07:57		15:59 (1)	08:39
	21:50	39	21:18 (5)	21:00	15	20:08 (3)	19:50	46	19:18 (2)	18:40	28	17:28 (1)	16:42	11	16:10 (1)	16:22
17	05:32		20:39 (4)	06:20		19:50 (3)	07:11		18:32 (2)	08:02		16:58 (1)	07:59		16:00 (1)	08:40
	21:49	38	21:17 (5)	20:58	20	20:10 (3)	19:48	46	19:18 (2)	18:38	32	17:30 (1)	16:41	9	16:09 (1)	16:22
18	05:34		20:39 (4)	06:21		19:48 (3)	07:13		18:31 (2)	08:04		16:56 (1)	08:00		16:03 (1)	08:41
	21:48	37	21:16 (5)	20:56	23	20:11 (3)	19:45	46	19:17 (2)	18:36	35	17:31 (1)	16:40	4	16:07 (1)	16:22
19	05:35		20:39 (4)	06:23		19:47 (3)	07:15		18:31 (2)	08:06		16:53 (1)	08:02			08:41
	21:47	35	21:14 (5)	20:54	26	20:13 (3)	19:43	45	19:16 (2)	18:34	38	17:31 (1)	16:38			16:22
20	05:36		20:40 (4)	06:25		19:46 (3)	07:16		18:31 (2)	08:08		16:52 (1)	08:04			08:42
	21:46	34	21:14 (5)	20:51	27	20:13 (3)	19:40	43	19:14 (2)	18:32	40	17:32 (1)	16:37			16:23
21	05:38		20:40 (4)	06:26		19:45 (3)	07:18		18:30 (2)	08:10		16:51 (1)	08:05			08:43
	21:44	33	21:13 (5)	20:49	29	20:14 (3)	19:38	41	19:11 (2)	18:29	42	17:33 (1)	16:36			16:23
22	05:39		20:40 (4)	06:28		19:43 (3)	07:20		18:30 (2)	08:11		16:50 (1)	08:07			08:43
	21:43	31	21:11 (5)	20:47	31	20:14 (3)	19:36	39	19:09 (2)	18:27	44	17:34 (1)	16:35			16:24
23	05:40		20:40 (4)	06:30		19:43 (3)	07:21		18:31 (2)	08:13		16:49 (1)	08:09			08:44
	21:42	30	21:10 (5)	20:45	32	20:15 (3)	19:33	36	19:07 (2)	18:25	45	17:34 (1)	16:33			16:24
24	05:42		20:41 (4)	06:31		19:42 (3)	07:23		18:30 (2)	08:15		16:49 (1)	08:10			08:44
	21:40	28	21:09 (4)	20:43	32	20:14 (3)	19:31	34	19:04 (2)	18:23	46	17:35 (1)	16:32			16:25
25	05:43		20:42 (4)	06:33		19:41 (3)	07:25		18:31 (2)	07:17		15:48 (1)	08:12			08:44
	21:39	26	21:08 (4)	20:41	32	20:13 (3)	19:29	30	19:01 (2)	17:21	47	16:35 (1)	16:31			16:25
26	05:45		20:43 (4)	06:35		19:41 (3)	07:26		18:32 (2)	07:19		15:48 (1)	08:14			08:45
	21:38	24	21:07 (4)	20:38	30	20:11 (3)	19:26	27	18:59 (2)	17:19	48	16:36 (1)	16:30			16:26
27	05:46		20:43 (4)	06:36		19:40 (3)	07:28		18:32 (2)	07:20		15:47 (1)	08:15			08:45
	21:36	22	21:05 (4)	20:36	29	20:09 (3)	19:24	24	18:56 (2)	17:17	49	16:36 (1)	16:29			16:27
28	05:48		20:43 (4)	06:38		19:41 (3)	07:30		18:33 (2)	07:22		15:47 (1)	08:17			08:45
	21:35	20	21:03 (4)	20:34	26	20:07 (3)	19:22	21	18:54 (2)	17:15	49	16:36 (1)	16:28			16:28
29	05:49		20:45 (4)	06:40		19:40 (3)	07:31		18:35 (2)	07:24		15:47 (1)	08:18			08:45
	21:33	18	21:03 (4)	20:32	24	20:04 (3)	19:19	17	18:52 (2)	17:13	49	16:36 (1)	16:28			16:28
30	05:51		20:45 (4)	06:41		19:40 (3)	07:33		18:35 (2)	07:26		15:47 (1)	08:20			08:45
	21:31	16	21:01 (4)	20:29	22	20:02 (3)	19:17	14	18:49 (2)	17:11	49	16:36 (1)	16:27			16:29
31	05:52		20:47 (4)	06:43		19:40 (3)				07:28		15:47 (1)				08:46
	21:30	13	21:00 (4)	20:27	19	19:59 (3)				17:09	49	16:36 (1)				16:30
Potential sun hours	504			455			381			331			264			241
Total, worst case		1138			447			993			744			529		
Sun reduction		0.33			0.35			0.34			0.28			0.26		
Oper. time red.		1.00			1.00			1.00			1.00			1.00		
Wind dir. red.		0.64			0.60			0.60			0.59			0.59		
Total reduction		0.21			0.21			0.20			0.17			0.16		
Total, real		241			96			202			124			82		

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
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F91 RHH9 Sligo
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Kathlyn Feeney / kfeeney@jodireland.com
Calculated:
09/06/2025 13:54/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Worst Case - V150 **Shadow receptor:** K - 11

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January			February			March			April			May			June		
1	08:45			08:18		16:34 (1)	07:23			07:12		18:50 (2)	06:06			05:20		20:24 (4)
	16:32			17:20	15	16:49 (1)	18:13			20:08	31	19:21 (2)	21:00			21:47	50	21:14 (5)
2	08:45			08:16		16:33 (1)	07:21			07:09		18:50 (2)	06:04			05:19		20:24 (4)
	16:33			17:22	19	16:52 (1)	18:15			20:10	28	19:18 (2)	21:02			21:48	51	21:15 (5)
3	08:45			08:15		16:32 (1)	07:19			07:07		18:53 (2)	06:02		20:31 (4)	05:18		20:24 (4)
	16:34			17:24	22	16:54 (1)	18:17			20:11	23	19:16 (2)	21:03	3	20:34 (4)	21:49	51	21:15 (5)
4	08:45			08:13		16:31 (1)	07:17			07:05		18:55 (2)	06:00		20:29 (4)	05:17		20:25 (4)
	16:35			17:26	25	16:56 (1)	18:18			20:13	18	19:13 (2)	21:05	6	20:35 (4)	21:50	52	21:17 (5)
5	08:45			08:11		16:31 (1)	07:15			07:02		18:58 (2)	05:58		20:28 (4)	05:17		20:25 (4)
	16:36			17:28	27	16:58 (1)	18:20			20:15	14	19:48 (3)	21:07	10	20:38 (4)	21:51	52	21:17 (5)
6	08:44			08:10		16:30 (1)	07:12			07:00		19:42 (3)	05:56		20:27 (4)	05:16		20:26 (4)
	16:37			17:30	30	17:00 (1)	18:22			20:17	8	19:50 (3)	21:08	12	20:39 (4)	21:52	51	21:17 (5)
7	08:44			08:08		16:30 (1)	07:10			06:58		19:41 (3)	05:55		20:25 (4)	05:15		20:26 (4)
	16:39			17:32	32	17:02 (1)	18:24			20:18	11	19:52 (3)	21:10	15	20:40 (4)	21:53	51	21:17 (5)
8	08:44			08:06		16:30 (1)	07:08			06:56		19:40 (3)	05:53		20:24 (4)	05:15		20:27 (4)
	16:40			17:34	34	17:04 (1)	18:26			20:20	14	19:54 (3)	21:12	18	20:42 (4)	21:54	50	21:17 (5)
9	08:43			08:04		16:29 (1)	07:05			06:53		19:39 (3)	05:51		20:24 (4)	05:14		20:27 (4)
	16:41			17:35	37	17:06 (1)	18:27			20:22	16	19:55 (3)	21:13	20	20:44 (4)	21:55	50	21:17 (5)
10	08:42			08:02		16:29 (1)	07:03			06:51		19:38 (3)	05:49		20:23 (4)	05:14		20:28 (4)
	16:43			17:37	39	17:08 (1)	18:29			20:24	19	19:57 (3)	21:15	22	20:45 (4)	21:55	49	21:17 (5)
11	08:42			08:01		16:29 (1)	07:01		18:01 (2)	06:49		19:38 (3)	05:48		20:23 (4)	05:13		20:29 (4)
	16:44			17:39	41	17:10 (1)	18:31	4	18:05 (2)	20:25	21	19:59 (3)	21:17	24	20:47 (4)	21:56	49	21:23 (8)
12	08:41			07:59		16:29 (1)	06:59		17:59 (2)	06:46		19:37 (3)	05:46		20:22 (4)	05:13		20:30 (4)
	16:46			17:41	44	17:13 (1)	18:33	8	18:07 (2)	20:27	24	20:01 (3)	21:18	26	20:48 (4)	21:57	48	21:18 (5)
13	08:40			07:57		16:29 (1)	06:56		17:56 (2)	06:44		19:36 (3)	05:44		20:22 (4)	05:13		20:29 (4)
	16:47			17:43	45	17:14 (1)	18:35	12	18:08 (2)	20:29	25	20:01 (3)	21:20	28	20:50 (4)	21:58	49	21:23 (8)
14	08:40			07:55		16:29 (1)	06:54		17:54 (2)	06:42		19:36 (3)	05:43		20:21 (4)	05:13		20:30 (4)
	16:49			17:45	45	17:14 (1)	18:36	17	18:11 (2)	20:31	27	20:03 (3)	21:21	30	20:51 (4)	21:58	49	21:24 (8)
15	08:39			07:53		16:29 (1)	06:52		17:53 (2)	06:40		19:37 (3)	05:41		20:21 (4)	05:12		20:30 (4)
	16:50			17:47	45	17:14 (1)	18:38	20	18:13 (2)	20:32	28	20:05 (3)	21:23	32	20:53 (5)	21:59	50	21:25 (8)
16	08:38			07:51		16:29 (1)	06:49		17:51 (2)	06:37		19:37 (3)	05:39		20:20 (4)	05:12		20:31 (4)
	16:52			17:49	44	17:13 (1)	18:40	23	18:14 (2)	20:34	30	20:07 (3)	21:25	34	20:54 (5)	21:59	48	21:25 (8)
17	08:37			07:49		16:30 (1)	06:47		17:50 (2)	06:35		19:37 (3)	05:38		20:21 (4)	05:12		20:31 (4)
	16:54			17:51	43	17:13 (1)	18:42	26	18:16 (2)	20:36	29	20:06 (3)	21:26	34	20:55 (5)	22:00	50	21:26 (8)
18	08:36			07:47		16:29 (1)	06:45		17:50 (2)	06:33		19:38 (3)	05:36		20:20 (4)	05:12		20:31 (4)
	16:55			17:52	43	17:12 (1)	18:43	28	18:18 (2)	20:37	27	20:05 (3)	21:28	36	20:56 (5)	22:00	50	21:26 (8)
19	08:35			07:45		16:30 (1)	06:42		17:48 (2)	06:31		19:39 (3)	05:35		20:20 (4)	05:12		20:32 (4)
	16:57			17:54	41	17:11 (1)	18:45	31	18:19 (2)	20:39	25	20:04 (3)	21:29	38	20:58 (5)	22:01	49	21:26 (8)
20	08:34			07:43		16:30 (1)	06:40		17:48 (2)	06:29		19:39 (3)	05:34		20:21 (4)	05:12		20:32 (4)
	16:59			17:56	41	17:11 (1)	18:47	33	18:21 (2)	20:41	23	20:02 (3)	21:31	38	20:59 (5)	22:01	49	21:26 (8)
21	08:33			07:41		16:31 (1)	06:38		17:48 (2)	06:27		19:40 (3)	05:32		20:21 (4)	05:12		20:32 (4)
	17:00			17:58	39	17:10 (1)	18:49	35	18:23 (2)	20:43	21	20:01 (3)	21:32	40	21:01 (5)	22:01	49	21:26 (8)
22	08:32			07:39		16:32 (1)	06:35		17:47 (2)	06:24		19:42 (3)	05:31		20:20 (4)	05:13		20:33 (4)
	17:02			18:00	37	17:09 (1)	18:50	38	18:25 (2)	20:44	17	19:59 (3)	21:34	41	21:01 (5)	22:01	49	21:27 (8)
23	08:30			07:36		16:34 (1)	06:33		17:47 (2)	06:22		19:44 (3)	05:30		20:20 (4)	05:13		20:33 (4)
	17:04			18:02	34	17:08 (1)	18:52	40	18:27 (2)	20:46	12	19:56 (3)	21:35	43	21:03 (5)	22:01	49	21:27 (8)
24	08:29			07:34		16:34 (1)	06:31		17:46 (2)	06:20			05:28		20:21 (4)	05:13		20:33 (4)
	17:06			18:04	32	17:06 (1)	18:54	42	18:28 (2)	20:48			21:36	43	21:04 (5)	22:02	49	21:27 (8)
25	08:28			07:32		16:36 (1)	06:28		17:46 (2)	06:18			05:27		20:21 (4)	05:13		20:33 (4)
	17:07			18:06	29	17:05 (1)	18:56	42	18:28 (2)	20:50			21:38	45	21:06 (5)	22:02	50	21:28 (8)
26	08:27			07:30		16:38 (1)	06:26		17:46 (2)	06:16			05:26		20:21 (4)	05:14		20:33 (4)
	17:09			18:07	25	17:03 (1)	18:57	41	18:27 (2)	20:51			21:39	46	21:07 (5)	22:02	49	21:27 (8)
27	08:25			07:28		16:41 (1)	06:23		17:46 (2)	06:14			05:25		20:22 (4)	05:14		20:34 (4)
	17:11			18:09	20	17:01 (1)	18:59	40	18:26 (2)	20:53			21:40	46	21:08 (5)	22:02	48	21:28 (8)
28	08:24		16:40 (1)	07:26		16:45 (1)	06:21		17:46 (2)	06:12			05:24		20:22 (4)	05:15		20:33 (4)
	17:13	1	16:41 (1)	18:11	12	16:57 (1)	19:01	39	18:25 (2)	20:55			21:42	47	21:09 (5)	22:01	49	21:27 (8)
29	08:22		16:38 (1)				07:19		18:47 (2)	06:10			05:23		20:22 (4)	05:15		20:33 (4)
	17:15	5	16:43 (1)				20:03	38	19:25 (2)	20:56			21:43	48	21:10 (5)	22:01	50	21:28 (8)
30	08:21		16:37 (1)				07:16		18:47 (2)	06:08			05:22		20:23 (4)	05:16		20:33 (4)
	17:17	9	16:46 (1)				20:04	36	19:23 (2)	20:58			21:44	48	21:11 (5)	22:01	49	21:27 (8)
31	08:19		16:35 (1)				07:14		18:48 (2)				05:21		20:24 (4)			
	17:18	12	16:47 (1)				20:06	34	19:22 (2)				21:45	49	21:13 (5)			
Potential sun hours	257			277			367			417			487			501		
Total, worst case		27			940			627			491			922			1489	
Sun reduction		0.22			0.24			0.28			0.38			0.39			0.35	
Oper. time red.		1.00			1.00			1.00			1.00			1.00			1.00	
Wind dir. red.		0.60			0.60			0.60			0.60			0.64			0.64	
Total reduction		0.13			0.15			0.17			0.23			0.25			0.22	
Total, real		4			137			105			113			231			329	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
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+353719161416
Kathlyn Feeney / kfeeney@jodireland.com

Calculated:
09/06/2025 13:54/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Worst Case - V150 **Shadow receptor:** K - 11

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	July		August		September		October		November		December
1	05:17		20:33 (4)	05:54	20:32 (4)	06:45	19:37 (3)	07:35	18:37 (2)	07:30	15:59 (1)	08:21
	22:01	50	21:27 (8)	21:28 26	20:58 (4)	20:25 21	19:58 (3)	19:14 10	18:47 (2)	17:07 39	16:38 (1)	16:26
2	05:17		20:33 (4)	05:55	20:32 (4)	06:46	19:37 (3)	07:36	18:39 (2)	07:31	15:59 (1)	08:23
	22:00	49	21:22 (5)	21:26 24	20:56 (4)	20:23 19	19:56 (3)	19:12 6	18:45 (2)	17:05 37	16:36 (1)	16:25
3	05:18		20:33 (4)	05:57	20:33 (4)	06:48	19:37 (3)	07:38	18:41 (2)	07:33	16:00 (1)	08:24
	22:00	49	21:22 (5)	21:25 22	20:55 (4)	20:20 16	19:53 (3)	19:10 1	18:42 (2)	17:04 34	16:34 (1)	16:25
4	05:19		20:33 (4)	05:59	20:34 (4)	06:50	19:37 (3)	07:40		07:35	16:00 (1)	08:26
	22:00	50	21:23 (5)	21:23 19	20:53 (4)	20:18 14	19:51 (3)	19:07		17:02 32	16:32 (1)	16:24
5	05:20		20:33 (4)	06:00	20:35 (4)	06:51	19:37 (3)	07:42		07:37	16:01 (1)	08:27
	21:59	50	21:23 (5)	21:21 16	20:51 (4)	20:16 11	19:48 (3)	19:05		17:00 29	16:30 (1)	16:24
6	05:20		20:33 (4)	06:02	20:35 (4)	06:53	19:38 (3)	07:43		07:39	16:02 (1)	08:28
	21:59	51	21:24 (5)	21:19 14	20:49 (4)	20:13 8	19:46 (3)	19:03		16:58 26	16:28 (1)	16:23
7	05:21		20:32 (4)	06:03	20:37 (4)	06:55	18:55 (2)	07:45		07:41	16:02 (1)	08:30
	21:58	51	21:23 (5)	21:17 11	20:48 (4)	20:11 13	19:44 (3)	19:01		16:56 24	16:26 (1)	16:23
8	05:22		20:32 (4)	06:05	20:37 (4)	06:56	18:50 (2)	07:47		07:42	16:03 (1)	08:31
	21:57	52	21:24 (5)	21:16 9	20:46 (4)	20:09 17	19:07 (2)	18:58		16:55 21	16:24 (1)	16:22
9	05:23		20:32 (4)	06:07	20:39 (4)	06:58	18:47 (2)	07:48		07:44	16:04 (1)	08:32
	21:57	51	21:23 (5)	21:14 5	20:44 (4)	20:06 23	19:10 (2)	18:56		16:53 19	16:23 (1)	16:22
10	05:24		20:32 (4)	06:08	20:42 (4)	07:00	18:44 (2)	07:50		07:46	16:06 (1)	08:33
	21:56	50	21:22 (5)	21:12 1	20:43 (4)	20:04 27	19:11 (2)	18:54		16:51 15	16:21 (1)	16:22
11	05:25		20:31 (4)	06:10		07:01	18:42 (2)	07:52		07:48	16:07 (1)	08:34
	21:55	51	21:22 (5)	21:10		20:02 31	19:13 (2)	18:51		16:50 12	16:19 (1)	16:22
12	05:26		20:31 (4)	06:12		07:03	18:41 (2)	07:54		07:50	16:08 (1)	08:35
	21:54	50	21:21 (5)	21:08		19:59 33	19:14 (2)	18:49		16:48 8	16:16 (1)	16:22
13	05:28		20:31 (4)	06:13		07:05	18:39 (2)	07:55	17:22 (1)	07:51	16:10 (1)	08:36
	21:53	49	21:20 (5)	21:06		19:57 35	19:14 (2)	18:47 2	17:24 (1)	16:47 5	16:15 (1)	16:22
14	05:29		20:31 (4)	06:15		07:06	18:38 (2)	07:57	17:15 (1)	07:53	16:12 (1)	08:37
	21:52	48	21:19 (5)	21:04		19:55 37	19:15 (2)	18:45 16	17:31 (1)	16:45 1	16:13 (1)	16:21
15	05:30		20:32 (4)	06:16		07:08	18:36 (2)	07:59	17:12 (1)	07:55		08:38
	21:51	47	21:19 (5)	21:02		19:52 39	19:15 (2)	18:42 22	17:34 (1)	16:44		16:22
16	05:31		20:31 (4)	06:18		07:10	18:35 (2)	08:01	17:09 (1)	07:57		08:39
	21:50	47	21:18 (5)	21:00		19:50 40	19:15 (2)	18:40 27	17:36 (1)	16:42		16:22
17	05:32		20:31 (4)	06:20		07:11	18:35 (2)	08:02	17:07 (1)	07:59		08:40
	21:49	46	21:17 (5)	20:58		19:48 41	19:16 (2)	18:38 31	17:38 (1)	16:41		16:22
18	05:34		20:31 (4)	06:21		07:13	18:33 (2)	08:04	17:06 (1)	08:00		08:41
	21:48	45	21:16 (5)	20:56		19:45 42	19:15 (2)	18:36 33	17:39 (1)	16:40		16:22
19	05:35		20:30 (4)	06:23	19:55 (3)	07:15	18:33 (2)	08:06	17:03 (1)	08:02		08:41
	21:47	44	21:14 (5)	20:54 3	19:58 (3)	19:43 42	19:15 (2)	18:34 36	17:39 (1)	16:38		16:22
20	05:36		20:31 (4)	06:25	19:49 (3)	07:16	18:33 (2)	08:08	17:02 (1)	08:04		08:42
	21:46	43	21:14 (5)	20:51 13	20:02 (3)	19:40 41	19:14 (2)	18:32 38	17:40 (1)	16:37		16:23
21	05:38		20:31 (4)	06:26	19:47 (3)	07:18	18:32 (2)	08:10	17:01 (1)	08:05		08:43
	21:44	42	21:13 (5)	20:49 18	20:05 (3)	19:38 39	19:11 (2)	18:29 40	17:41 (1)	16:36		16:23
22	05:39		20:31 (4)	06:28	19:44 (3)	07:20	18:32 (2)	08:11	17:01 (1)	08:07		08:43
	21:43	40	21:11 (5)	20:47 22	20:06 (3)	19:36 37	19:09 (2)	18:27 40	17:41 (1)	16:35		16:24
23	05:40		20:30 (4)	06:30	19:43 (3)	07:21	18:32 (2)	08:13	17:00 (1)	08:09		08:44
	21:42	40	21:10 (5)	20:45 24	20:07 (3)	19:33 35	19:07 (2)	18:25 42	17:42 (1)	16:33		16:24
24	05:42		20:31 (4)	06:31	19:41 (3)	07:23	18:32 (2)	08:15	16:59 (1)	08:10		08:44
	21:40	38	21:09 (5)	20:43 26	20:07 (3)	19:31 32	19:04 (2)	18:23 43	17:42 (1)	16:32		16:25
25	05:43		20:31 (4)	06:33	19:41 (3)	07:25	18:32 (2)	07:17	15:59 (1)	08:12		08:44
	21:39	37	21:08 (5)	20:41 27	20:08 (3)	19:29 29	19:01 (2)	17:21 44	16:43 (1)	16:31		16:25
26	05:45		20:31 (4)	06:35	19:40 (3)	07:26	18:33 (2)	07:19	15:59 (1)	08:14		08:45
	21:38	36	21:07 (5)	20:38 29	20:09 (3)	19:26 26	18:59 (2)	17:19 44	16:43 (1)	16:30		16:26
27	05:46		20:31 (4)	06:36	19:39 (3)	07:28	18:33 (2)	07:20	15:58 (1)	08:15		08:45
	21:36	34	21:05 (5)	20:36 30	20:09 (3)	19:24 23	18:56 (2)	17:17 45	16:43 (1)	16:29		16:27
28	05:48		20:31 (4)	06:38	19:38 (3)	07:30	18:33 (2)	07:22	15:58 (1)	08:17		08:45
	21:35	32	21:03 (5)	20:34 29	20:07 (3)	19:22 21	18:54 (2)	17:15 45	16:43 (1)	16:28		16:28
29	05:49		20:32 (4)	06:40	19:37 (3)	07:31	18:35 (2)	07:24	15:58 (1)	08:18		08:45
	21:33	31	21:03 (5)	20:32 27	20:04 (3)	19:19 17	18:52 (2)	17:13 45	16:43 (1)	16:28		16:28
30	05:51		20:32 (4)	06:41	19:37 (3)	07:33	18:35 (2)	07:26	15:58 (1)	08:20		08:45
	21:31	29	21:01 (4)	20:29 25	20:02 (3)	19:17 14	18:49 (2)	17:11 44	16:42 (1)	16:27		16:29
31	05:52		20:32 (4)	06:43	19:36 (3)			07:28	15:58 (1)			08:46
	21:30	28	21:00 (4)	20:27 23	19:59 (3)			17:09 42	16:40 (1)			16:30
Potential sun hours	504		455		381		331		264			241
Total, worst case		1360		443		823		696		302		
Sun reduction		0.33		0.35		0.34		0.28		0.26		
Oper. time red.		1.00		1.00		1.00		1.00		1.00		
Wind dir. red.		0.64		0.61		0.60		0.60		0.60		
Total reduction		0.21		0.22		0.20		0.17		0.16		
Total, real		287		96		167		117		47		

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
Jennings O'Donovan
Finisklin Business Park
F91 RHH9 Sligo
+353719161416
Kathlyn Feeney / kfeeney@jodireland.com
Calculated:
09/06/2025 13:54/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Worst Case - V150 **Shadow receptor:** L - 12

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January	February	March		April		May		June		
1	08:45	08:18	07:23		07:12		18:50 (1)		06:06		19:50 (2)		05:20		
	16:32	17:20	18:13		20:08	31	19:21 (1)		21:00	39	20:31 (3)		21:47		
2	08:45	08:16	07:21		07:09		18:50 (1)		06:04		19:51 (2)		05:19		21:14 (4)
	16:33	17:22	18:15		20:10	29	19:19 (1)		21:02	39	20:33 (3)		21:48	1	21:15 (4)
3	08:45	08:15	07:19		07:07		18:52 (1)		06:02		19:52 (2)		05:18		21:13 (4)
	16:34	17:24	18:17		20:11	25	19:17 (1)		21:03	38	20:34 (3)		21:49	2	21:15 (4)
4	08:45	08:13	07:17		07:05		18:54 (1)		06:00		19:53 (2)		05:17		21:14 (4)
	16:35	17:26	18:18		20:13	21	19:15 (1)		21:05	36	20:35 (3)		21:50	3	21:17 (4)
5	08:45	08:11	07:15		07:02		18:57 (1)		05:58		19:56 (2)		05:17		21:13 (4)
	16:36	17:28	18:20		20:15	13	19:10 (1)		21:07	33	20:38 (3)		21:51	4	21:17 (4)
6	08:44	08:10	07:12		07:00				05:56		20:00 (2)		05:16		21:13 (4)
	16:37	17:30	18:22		20:17				21:08	27	20:39 (3)		21:52	6	21:19 (4)
7	08:44	08:08	07:10		06:58				05:55		20:18 (3)		05:15		21:12 (4)
	16:39	17:32	18:24		20:18				21:10	22	20:40 (3)		21:53	7	21:19 (4)
8	08:44	08:06	07:08		06:56				05:53		20:18 (3)		05:15		21:13 (4)
	16:40	17:34	18:26		20:20				21:12	24	20:42 (3)		21:54	7	21:20 (4)
9	08:43	08:04	07:05		06:53				05:51		20:19 (3)		05:14		21:12 (4)
	16:41	17:35	18:27		20:22				21:13	25	20:44 (3)		21:55	8	21:20 (4)
10	08:42	08:02	07:03		06:51				05:49		20:20 (3)		05:14		21:12 (4)
	16:43	17:37	18:29		20:24				21:15	22	20:42 (3)		21:55	10	21:22 (4)
11	08:42	08:00	07:01		06:49				05:48		20:21 (3)		05:13		21:13 (4)
	16:44	17:39	18:31		20:25				21:17	21	20:42 (3)		21:56	10	21:23 (4)
12	08:41	07:59	06:59	18:01 (1)	06:46		19:58 (2)		05:46		20:21 (3)		05:13		21:13 (4)
	16:46	17:41	18:33	6 18:07 (1)	20:27	3	20:01 (2)		21:18	20	20:41 (3)		21:57	10	21:23 (4)
13	08:40	07:57	06:56	17:58 (1)	06:44		19:55 (2)		05:44		20:23 (3)		05:13		21:12 (4)
	16:47	17:43	18:35	10 18:08 (1)	20:29	6	20:01 (2)		21:20	17	20:40 (3)		21:58	11	21:23 (4)
14	08:40	07:55	06:54	17:56 (1)	06:42		19:53 (2)		05:43		20:24 (3)		05:13		21:13 (4)
	16:49	17:45	18:36	15 18:11 (1)	20:31	10	20:03 (2)		21:21	15	20:39 (3)		21:58	11	21:24 (5)
15	08:39	07:53	06:52	17:55 (1)	06:40		19:52 (2)		05:41		20:26 (3)		05:12		21:13 (4)
	16:50	17:47	18:38	18 18:13 (1)	20:32	13	20:05 (2)		21:23	11	20:37 (3)		21:59	12	21:25 (5)
16	08:38	07:51	06:49	17:52 (1)	06:37		19:51 (2)		05:39		20:28 (3)		05:12		21:13 (4)
	16:52	17:49	18:40	22 18:14 (1)	20:34	16	20:07 (2)		21:25	6	20:34 (3)		21:59	12	21:25 (5)
17	08:37	07:49	06:47	17:52 (1)	06:35		19:50 (2)		05:38				05:12		21:13 (4)
	16:54	17:51	18:42	24 18:16 (1)	20:36	19	20:09 (2)		21:26				22:00	13	21:26 (5)
18	08:36	07:47	06:45	17:51 (1)	06:33		19:49 (2)		05:36				05:12		21:13 (4)
	16:55	17:52	18:43	27 18:18 (1)	20:37	21	20:10 (2)		21:28				22:00	13	21:26 (5)
19	08:35	07:45	06:42	17:49 (1)	06:31		19:49 (2)		05:35				05:12		21:13 (4)
	16:57	17:54	18:45	30 18:19 (1)	20:39	23	20:12 (2)		21:29				22:00	13	21:26 (5)
20	08:34	07:43	06:40	17:49 (1)	06:29		19:47 (2)		05:34				05:12		21:13 (4)
	16:59	17:56	18:47	32 18:21 (1)	20:41	26	20:13 (2)		21:31				22:01	13	21:26 (5)
21	08:33	07:41	06:38	17:48 (1)	06:27		19:47 (2)		05:32				05:12		21:13 (4)
	17:00	17:58	18:49	35 18:23 (1)	20:43	28	20:15 (2)		21:32				22:01	13	21:26 (5)
22	08:32	07:39	06:35	17:47 (1)	06:24		19:47 (2)		05:31				05:13		21:14 (4)
	17:02	18:00	18:50	38 18:25 (1)	20:44	29	20:16 (2)		21:34				22:01	13	21:27 (5)
23	08:30	07:36	06:33	17:47 (1)	06:22		19:46 (2)		05:30				05:13		21:14 (4)
	17:04	18:02	18:52	40 18:27 (1)	20:46	32	20:18 (2)		21:35				22:01	13	21:27 (5)
24	08:29	07:34	06:31	17:46 (1)	06:20		19:46 (2)		05:28				05:13		21:14 (4)
	17:06	18:04	18:54	42 18:28 (1)	20:48	34	20:20 (2)		21:36				22:02	13	21:27 (5)
25	08:28	07:32	06:28	17:46 (1)	06:18		19:46 (2)		05:27				05:13		21:15 (4)
	17:07	18:05	18:56	42 18:28 (1)	20:50	35	20:21 (2)		21:38				22:02	13	21:28 (5)
26	08:27	07:30	06:26	17:47 (1)	06:16		19:47 (2)		05:26				05:14		21:15 (4)
	17:09	18:07	18:57	40 18:27 (1)	20:51	34	20:21 (2)		21:39				22:02	12	21:27 (5)
27	08:25	07:28	06:23	17:46 (1)	06:14		19:47 (2)		05:25				05:14		21:16 (4)
	17:11	18:09	18:59	40 18:26 (1)	20:53	35	20:24 (3)		21:40				22:01	12	21:28 (5)
28	08:24	07:26	06:21	17:47 (1)	06:12		19:47 (2)		05:24				05:15		21:16 (4)
	17:13	18:11	19:01	39 18:26 (1)	20:55	37	20:26 (3)		21:42				22:01	11	21:27 (5)
29	08:22		07:19	18:47 (1)	06:10		19:48 (2)		05:23				05:15		21:16 (4)
	17:15		20:03	38 19:25 (1)	20:56	37	20:27 (3)		21:43				22:01	12	21:28 (5)
30	08:21		07:16	18:47 (1)	06:08		19:49 (2)		05:22				05:16		21:16 (4)
	17:17		20:04	36 19:23 (1)	20:58	39	20:30 (3)		21:44				22:01	11	21:27 (4)
31	08:19		07:14	18:48 (1)					05:21						
	17:18		20:06	34 19:22 (1)					21:45						
Potential sun hours	257	277	367		417		487		501						
Total, worst case				608		596		395		289					
Sun reduction				0.28		0.38		0.39		0.35					
Oper. time red.				1.00		1.00		1.00		1.00					
Wind dir. red.				0.60		0.61		0.62		0.65					
Total reduction				0.17		0.23		0.25		0.22					
Total, real				102		138		97		65					

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
Jennings O'Donovan
Finisklin Business Park
F91 RHH9 Sligo
+353719161416
Kathlyn Feeney / kfeeney@jodireland.com
Calculated:
09/06/2025 13:54/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Worst Case - V150 **Shadow receptor:** L - 12

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	July			August			September			October			November	December
1	05:17		21:17 (4)	05:54		20:31 (3)	06:45			07:35		18:39 (1)	07:30	08:21
	22:01	10	21:27 (4)	21:28	21	20:52 (3)	20:25			19:14	8	18:47 (1)	17:07	16:26
2	05:17		21:18 (4)	05:55		20:30 (3)	06:46			07:36		18:42 (1)	07:31	08:23
	22:00	9	21:27 (4)	21:26	22	20:52 (3)	20:23			19:12	3	18:45 (1)	17:05	16:25
3	05:18		21:17 (4)	05:57		20:30 (3)	06:48			07:38			07:33	08:24
	22:00	9	21:26 (4)	21:25	23	20:53 (3)	20:20			19:10			17:04	16:25
4	05:19		21:18 (4)	05:59		20:29 (3)	06:50			07:40			07:35	08:26
	22:00	8	21:26 (4)	21:23	24	20:53 (3)	20:18			19:07			17:02	16:24
5	05:20		21:19 (4)	06:00		20:29 (3)	06:51			07:42			07:37	08:27
	21:59	7	21:26 (4)	21:21	22	20:51 (3)	20:16			19:05			17:00	16:24
6	05:20		21:19 (4)	06:02		20:28 (3)	06:53			07:43			07:39	08:28
	21:59	6	21:25 (4)	21:19	21	20:49 (3)	20:13			19:03			16:58	16:23
7	05:21		21:19 (4)	06:03		20:07 (2)	06:55		18:53 (1)	07:45			07:41	08:30
	21:58	5	21:24 (4)	21:17	30	20:48 (3)	20:11	13	19:06 (1)	19:01			16:56	16:23
8	05:22		21:20 (4)	06:05		20:04 (2)	06:56		18:49 (1)	07:47			07:42	08:31
	21:57	4	21:24 (4)	21:16	35	20:46 (3)	20:09	20	19:09 (1)	18:58			16:55	16:22
9	05:23		21:20 (4)	06:07		20:02 (2)	06:58		18:46 (1)	07:48			07:44	08:32
	21:57	3	21:23 (4)	21:14	37	20:44 (3)	20:06	25	19:11 (1)	18:56			16:53	16:22
10	05:24		21:21 (4)	06:08		20:01 (2)	07:00		18:44 (1)	07:50			07:46	08:33
	21:56	1	21:22 (4)	21:12	38	20:43 (3)	20:04	28	19:12 (1)	18:54			16:51	16:22
11	05:25			06:10		19:59 (2)	07:01		18:42 (1)	07:52			07:48	08:34
	21:55			21:10	39	20:41 (3)	20:02	31	19:13 (1)	18:51			16:50	16:22
12	05:26			06:12		19:58 (2)	07:03		18:41 (1)	07:54			07:50	08:35
	21:54			21:08	39	20:39 (3)	19:59	33	19:14 (1)	18:49			16:48	16:22
13	05:28			06:13		19:56 (2)	07:05		18:39 (1)	07:55			07:51	08:36
	21:53			21:06	39	20:37 (3)	19:57	35	19:14 (1)	18:47			16:47	16:22
14	05:29			06:15		19:56 (2)	07:06		18:38 (1)	07:57			07:53	08:37
	21:52			21:04	38	20:36 (3)	19:55	37	19:15 (1)	18:45			16:45	16:22
15	05:30			06:16		19:55 (2)	07:08		18:36 (1)	07:59			07:55	08:38
	21:51			21:02	36	20:33 (3)	19:52	39	19:15 (1)	18:42			16:44	16:22
16	05:31			06:18		19:54 (2)	07:10		18:36 (1)	08:01			07:57	08:39
	21:50			21:00	36	20:32 (3)	19:50	39	19:15 (1)	18:40			16:42	16:22
17	05:32			06:20		19:53 (2)	07:11		18:35 (1)	08:02			07:58	08:40
	21:49			20:58	34	20:27 (2)	19:48	41	19:16 (1)	18:38			16:41	16:22
18	05:34			06:21		19:53 (2)	07:13		18:34 (1)	08:04			08:00	08:41
	21:48			20:56	34	20:27 (2)	19:45	41	19:15 (1)	18:36			16:40	16:22
19	05:35			06:23		19:52 (2)	07:15		18:34 (1)	08:06			08:02	08:41
	21:47			20:54	33	20:25 (2)	19:43	41	19:15 (1)	18:34			16:38	16:22
20	05:36			06:25		19:52 (2)	07:16		18:34 (1)	08:08			08:04	08:42
	21:46			20:51	31	20:23 (2)	19:40	40	19:14 (1)	18:32			16:37	16:23
21	05:38			06:26		19:52 (2)	07:18		18:33 (1)	08:10			08:05	08:43
	21:44			20:49	30	20:22 (2)	19:38	38	19:11 (1)	18:29			16:36	16:23
22	05:39			06:28		19:52 (2)	07:20		18:33 (1)	08:11			08:07	08:43
	21:43			20:47	27	20:19 (2)	19:36	36	19:09 (1)	18:27			16:35	16:24
23	05:40			06:30		19:52 (2)	07:21		18:33 (1)	08:13			08:09	08:44
	21:42			20:45	25	20:17 (2)	19:33	34	19:07 (1)	18:25			16:33	16:24
24	05:42			06:31		19:51 (2)	07:23		18:33 (1)	08:15			08:10	08:44
	21:40			20:43	24	20:15 (2)	19:31	31	19:04 (1)	18:23			16:32	16:25
25	05:43			06:33		19:52 (2)	07:25		18:33 (1)	07:17			08:12	08:44
	21:39			20:41	21	20:13 (2)	19:29	28	19:01 (1)	17:21			16:31	16:25
26	05:45			06:35		19:53 (2)	07:26		18:34 (1)	07:19			08:14	08:45
	21:38			20:38	18	20:11 (2)	19:26	25	18:59 (1)	17:19			16:30	16:26
27	05:46			06:36		19:53 (2)	07:28		18:34 (1)	07:20			08:15	08:45
	21:36			20:36	16	20:09 (2)	19:24	22	18:56 (1)	17:17			16:29	16:27
28	05:48		20:37 (3)	06:38		19:54 (2)	07:30		18:35 (1)	07:22			08:17	08:45
	21:34	9	20:46 (3)	20:34	13	20:07 (2)	19:22	19	18:54 (1)	17:15			16:28	16:28
29	05:49		20:35 (3)	06:40		19:54 (2)	07:31		18:36 (1)	07:24			08:18	08:45
	21:33	14	20:49 (3)	20:32	10	20:04 (2)	19:19	16	18:52 (1)	17:13			16:28	16:28
30	05:51		20:33 (3)	06:41		19:56 (2)	07:33		18:37 (1)	07:26			08:20	08:45
	21:31	17	20:50 (3)	20:29	6	20:02 (2)	19:17	12	18:49 (1)	17:11			16:27	16:29
31	05:52		20:33 (3)	06:43		19:57 (2)				07:28				08:45
	21:30	18	20:51 (3)	20:27	2	19:59 (2)				17:09				16:30
Potential sun hours	504			455			381			331			265	241
Total, worst case		120			824			724			11			
Sun reduction		0.33			0.35			0.34			0.28			
Oper. time red.		1.00			1.00			1.00			1.00			
Wind dir. red.		0.64			0.61			0.60			0.60			
Total reduction		0.21			0.22			0.20			0.17			
Total, real		25			179			147			2			

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
Jennings O'Donovan
Finisklin Business Park
F91 RHH9 Sligo
+353719161416
Kathlyn Feeney / kfeeney@jodireland.com

Calculated:
09/06/2025 13:54/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Worst Case - V150 **Shadow receptor:** M - 13

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January	February	March		April		May		June
1	08:45	08:18	07:23		07:12		18:47 (1)	06:06	19:52 (2)	05:20
	16:32	17:20	18:13		20:08	43	19:30 (1)	21:00	39	20:31 (3)	21:47
2	08:45	08:16	07:21		07:09		18:46 (1)	06:04	19:52 (2)	05:19
	16:33	17:22	18:15		20:10	42	19:28 (1)	21:02	41	20:33 (3)	21:48
3	08:45	08:15	07:19		07:07		18:47 (1)	06:02	19:52 (2)	05:18
	16:34	17:24	18:17		20:11	40	19:27 (1)	21:03	42	20:34 (3)	21:49
4	08:45	08:13	07:17		07:05		18:48 (1)	06:00	19:53 (2)	05:17
	16:35	17:26	18:18		20:13	38	19:26 (1)	21:05	42	20:35 (3)	21:50
5	08:45	08:11	07:15		07:02		18:48 (1)	05:58	19:54 (2)	05:17
	16:36	17:28	18:20		20:15	36	19:24 (1)	21:07	44	20:38 (3)	21:51
6	08:44	08:10	07:12		07:00		18:50 (1)	05:56	19:54 (2)	05:16
	16:37	17:30	18:22		20:17	33	19:23 (1)	21:08	45	20:39 (3)	21:52
7	08:44	08:08	07:10		06:58		18:51 (1)	05:55	19:54 (2)	05:15
	16:39	17:32	18:24		20:18	30	19:21 (1)	21:10	46	20:40 (3)	21:53
8	08:44	08:06	07:08		06:56		18:53 (1)	05:53	19:55 (2)	05:15
	16:40	17:34	18:26		20:20	27	19:20 (1)	21:12	47	20:42 (3)	21:54
9	08:43	08:04	07:05		06:53		18:54 (1)	05:51	19:56 (2)	05:14
	16:41	17:35	18:27		20:22	22	19:16 (1)	21:13	48	20:44 (3)	21:55
10	08:42	08:02	07:03		06:51		18:58 (1)	05:49	19:57 (2)	05:14
	16:43	17:37	18:29		20:24	15	19:13 (1)	21:15	47	20:45 (3)	21:55
11	08:42	08:00	07:01		06:49			05:48	19:59 (2)	05:13
	16:44	17:39	18:31		20:25			21:17	46	20:47 (3)	21:56
12	08:41	07:59	06:59		06:46			05:46	20:00 (2)	05:13
	16:46	17:41	18:33		20:27			21:18	44	20:48 (3)	21:57
13	08:40	07:57	06:56	18:07 (1)	06:44			05:44	20:02 (2)	05:13
	16:47	17:43	18:35	1	18:08 (1)	20:29			21:20	42	20:50 (3)	21:58
14	08:40	07:55	06:54	18:03 (1)	06:42			05:43	20:04 (2)	05:13
	16:49	17:45	18:36	8	18:11 (1)	20:31			21:21	39	20:51 (3)	21:58
15	08:39	07:53	06:52	18:00 (1)	06:40			05:41	20:08 (2)	05:12
	16:50	17:47	18:38	13	18:13 (1)	20:32			21:23	31	20:52 (3)	21:59
16	08:38	07:51	06:49	17:57 (1)	06:38		20:05 (2)	05:39	20:26 (3)	05:12
	16:52	17:49	18:40	17	18:14 (1)	20:34	2	20:07 (2)	21:25	25	20:51 (3)	21:59
17	08:37	07:49	06:47	17:56 (1)	06:35		20:03 (2)	05:38	20:27 (3)	05:12
	16:54	17:51	18:42	20	18:16 (1)	20:36	6	20:09 (2)	21:26	24	20:51 (3)	22:00
18	08:36	07:47	06:45	17:54 (1)	06:33		20:01 (2)	05:36	20:27 (3)	05:12
	16:55	17:52	18:43	24	18:18 (1)	20:37	9	20:10 (2)	21:28	23	20:50 (3)	22:00
19	08:35	07:45	06:42	17:52 (1)	06:31		20:00 (2)	05:35	20:28 (3)	05:12
	16:57	17:54	18:45	27	18:19 (1)	20:39	12	20:12 (2)	21:29	21	20:49 (3)	22:00
20	08:34	07:43	06:40	17:51 (1)	06:29		19:57 (2)	05:34	20:29 (3)	05:12
	16:59	17:56	18:47	30	18:21 (1)	20:41	16	20:13 (2)	21:31	20	20:49 (3)	22:01
21	08:33	07:41	06:38	17:51 (1)	06:27		19:56 (2)	05:32	20:31 (3)	05:12
	17:00	17:58	18:49	32	18:23 (1)	20:43	19	20:15 (2)	21:32	17	20:48 (3)	22:01
22	08:32	07:39	06:35	17:49 (1)	06:24		19:55 (2)	05:31	20:31 (3)	05:13
	17:02	18:00	18:50	36	18:25 (1)	20:44	21	20:16 (2)	21:34	15	20:46 (3)	22:01
23	08:30	07:36	06:33	17:49 (1)	06:22		19:54 (2)	05:30	20:33 (3)	05:13
	17:04	18:02	18:52	38	18:27 (1)	20:46	24	20:18 (2)	21:35	12	20:45 (3)	22:01
24	08:29	07:34	06:31	17:47 (1)	06:20		19:54 (2)	05:28	20:35 (3)	05:13
	17:06	18:04	18:54	41	18:28 (1)	20:48	26	20:20 (2)	21:36	8	20:43 (3)	22:02
25	08:28	07:32	06:28	17:47 (1)	06:18		19:53 (2)	05:27		05:13
	17:07	18:06	18:56	43	18:30 (1)	20:50	28	20:21 (2)	21:38			22:02
26	08:27	07:30	06:26	17:47 (1)	06:16		19:53 (2)	05:26		05:14
	17:09	18:07	18:57	45	18:32 (1)	20:51	30	20:23 (2)	21:39			22:02
27	08:25	07:28	06:23	17:46 (1)	06:14		19:52 (2)	05:25		05:14
	17:11	18:09	18:59	46	18:32 (1)	20:53	32	20:24 (2)	21:40			22:02
28	08:24	07:26	06:21	17:46 (1)	06:12		19:52 (2)	05:24		05:15
	17:13	18:11	19:01	46	18:32 (1)	20:55	34	20:26 (2)	21:42			22:01
29	08:22		07:19		18:46 (1)	06:10		19:52 (2)	05:23			05:15
	17:15		20:03	46	19:32 (1)	20:56	35	20:27 (2)	21:43			22:01
30	08:21		07:16		18:46 (1)	06:08		19:53 (2)	05:22			05:16
	17:17		20:04	44	19:30 (1)	20:58	37	20:30 (2)	21:44			22:01
31	08:19		07:14		18:46 (1)				05:21			
	17:18		20:06	44	19:30 (1)				21:45			
Potential sun hours	257	277	367		417			487			501
Total, worst case				601		657			808		
Sun reduction				0.28		0.38			0.39		
Oper. time red.				1.00		1.00			1.00		
Wind dir. red.				0.60		0.61			0.62		
Total reduction				0.17		0.23			0.25		
Total, real				101		153			199		

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

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SHADOW - Calendar

Calculation: 6839 Garrane WF Worst Case - V150 **Shadow receptor:** M - 13

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	July		August		September		October	November	December
1	05:17		05:54		20:10 (2)	06:45	07:35	07:30	08:21
	22:01		21:28	45	20:58 (3)	20:25	19:14	17:07	16:26
2	05:17		05:55		20:08 (2)	06:46	18:57 (1)	07:36	07:31	08:23
	22:00		21:26	46	20:56 (3)	20:23	15	19:12 (1)	19:12	17:05	16:25
3	05:18		05:57		20:07 (2)	06:48	18:52 (1)	07:38	07:33	08:24
	22:00		21:25	47	20:55 (3)	20:20	22	19:14 (1)	19:10	17:04	16:25
4	05:19		05:59		20:05 (2)	06:50	18:50 (1)	07:40	07:35	08:26
	22:00		21:23	48	20:53 (3)	20:18	27	19:17 (1)	19:07	17:02	16:24
5	05:20		06:00		20:05 (2)	06:51	18:47 (1)	07:42	07:37	08:27
	21:59		21:21	46	20:51 (3)	20:16	30	19:17 (1)	19:05	17:00	16:24
6	05:21		06:02		20:04 (2)	06:53	18:46 (1)	07:43	07:39	08:28
	21:59		21:19	45	20:49 (3)	20:13	33	19:19 (1)	19:03	16:58	16:23
7	05:21		06:03		20:03 (2)	06:55	18:44 (1)	07:45	07:41	08:30
	21:58		21:17	45	20:48 (3)	20:11	36	19:20 (1)	19:01	16:56	16:23
8	05:22		06:05		20:02 (2)	06:56	18:42 (1)	07:47	07:42	08:31
	21:57		21:16	44	20:46 (3)	20:09	38	19:20 (1)	18:58	16:55	16:22
9	05:23		06:07		20:02 (2)	06:58	18:41 (1)	07:48	07:44	08:32
	21:57		21:14	42	20:44 (3)	20:06	40	19:21 (1)	18:56	16:53	16:22
10	05:24		06:08		20:02 (2)	07:00	18:40 (1)	07:50	07:46	08:33
	21:56		21:12	41	20:43 (3)	20:04	41	19:21 (1)	18:54	16:51	16:22
11	05:25		06:10		20:01 (2)	07:01	18:39 (1)	07:52	07:48	08:34
	21:55		21:10	40	20:41 (3)	20:02	43	19:22 (1)	18:51	16:50	16:22
12	05:27		06:12		20:01 (2)	07:03	18:38 (1)	07:54	07:50	08:35
	21:54		21:08	38	20:39 (2)	19:59	44	19:22 (1)	18:49	16:48	16:22
13	05:28		06:13		20:00 (2)	07:05	18:37 (1)	07:55	07:51	08:36
	21:53		21:06	37	20:37 (2)	19:57	45	19:22 (1)	18:47	16:47	16:22
14	05:29		06:15		20:00 (2)	07:06	18:37 (1)	07:57	07:53	08:37
	21:52		21:04	36	20:36 (2)	19:55	45	19:22 (1)	18:45	16:45	16:22
15	05:30		06:17		20:00 (2)	07:08	18:35 (1)	07:59	07:55	08:38
	21:51		21:02	33	20:33 (2)	19:52	46	19:21 (1)	18:42	16:44	16:22
16	05:31		06:18		20:00 (2)	07:10	18:35 (1)	08:01	07:57	08:39
	21:50		21:00	32	20:32 (2)	19:50	46	19:21 (1)	18:40	16:42	16:22
17	05:32		06:20		19:59 (2)	07:11	18:35 (1)	08:02	07:59	08:40
	21:49		20:58	30	20:29 (2)	19:48	46	19:21 (1)	18:38	16:41	16:22
18	05:34		06:21		20:00 (2)	07:13	18:34 (1)	08:04	08:00	08:41
	21:48		20:56	27	20:27 (2)	19:45	44	19:18 (1)	18:36	16:40	16:22
19	05:35		20:47 (3)	06:23		20:00 (2)	07:15	18:35 (1)	08:06	08:02	08:41
	21:47	4	20:51 (3)	20:54	26	20:26 (2)	19:43	41	19:16 (1)	18:34	16:38	16:22
20	05:36		20:44 (3)	06:25		20:00 (2)	07:16	18:35 (1)	08:08	08:04	08:42
	21:46	10	20:54 (3)	20:51	23	20:23 (2)	19:40	39	19:14 (1)	18:32	16:37	16:23
21	05:38		20:43 (3)	06:26		20:01 (2)	07:18	18:34 (1)	08:10	08:05	08:43
	21:44	13	20:56 (3)	20:49	21	20:22 (2)	19:38	37	19:11 (1)	18:29	16:36	16:23
22	05:39		20:41 (3)	06:28		20:01 (2)	07:20	18:35 (1)	08:11	08:07	08:43
	21:43	16	20:57 (3)	20:47	18	20:19 (2)	19:36	34	19:09 (1)	18:27	16:35	16:24
23	05:40		20:40 (3)	06:30		20:02 (2)	07:21	18:36 (1)	08:13	08:09	08:44
	21:42	18	20:58 (3)	20:45	15	20:17 (2)	19:33	31	19:07 (1)	18:25	16:33	16:24
24	05:42		20:39 (3)	06:31		20:02 (2)	07:23	18:36 (1)	08:15	08:10	08:44
	21:40	20	20:59 (3)	20:43	13	20:15 (2)	19:31	28	19:04 (1)	18:23	16:32	16:25
25	05:43		20:38 (3)	06:33		20:04 (2)	07:25	18:37 (1)	07:17	08:12	08:44
	21:39	22	21:00 (3)	20:41	9	20:13 (2)	19:29	24	19:01 (1)	17:21	16:31	16:25
26	05:45		20:38 (3)	06:35		20:06 (2)	07:26	18:38 (1)	07:19	08:14	08:45
	21:38	23	21:01 (3)	20:38	5	20:11 (2)	19:26	21	18:59 (1)	17:19	16:30	16:26
27	05:46		20:37 (3)	06:36		20:07 (2)	07:28	18:38 (1)	07:20	08:15	08:45
	21:36	25	21:02 (3)	20:36	2	20:09 (2)	19:24	18	18:56 (1)	17:17	16:29	16:27
28	05:48		20:36 (3)	06:38			07:30	18:40 (1)	07:22	08:17	08:45
	21:34	26	21:02 (3)	20:34			19:22	14	18:54 (1)	17:15	16:28	16:28
29	05:49		20:17 (2)	06:40			07:31	18:42 (1)	07:24	08:18	08:45
	21:33	36	21:03 (3)	20:32			19:19	10	18:52 (1)	17:13	16:28	16:28
30	05:51		20:13 (2)	06:41			07:33	18:45 (1)	07:26	08:20	08:45
	21:31	40	21:01 (3)	20:29			19:17	4	18:49 (1)	17:11	16:27	16:29
31	05:52		20:12 (2)	06:43					07:28		08:45
	21:30	43	21:00 (3)	20:27					17:09		16:30
Potential sun hours	504		455		381		331	265	241
Total, worst case	296		854		942				
Sun reduction	0.33		0.35		0.34				
Oper. time red.	1.00		1.00		1.00				
Wind dir. red.	0.63		0.62		0.60				
Total reduction	0.21		0.22		0.20				
Total, real	62		188		192				

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
Jennings O'Donovan
Finisklin Business Park
F91 RHH9 Sligo
+353719161416
Kathlyn Feeney / kfeeney@jodireland.com
Calculated:
09/06/2025 13:54/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Worst Case - V150 **Shadow receptor:** N - 14

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:45	08:18	07:23	07:12	06:06	19:46 (1)	05:20	20:42 (2)	05:17	20:50 (2)	05:54	20:05 (1)	06:45	07:35	07:30	08:21
	16:32	17:20	18:13	20:08	21:00 40	20:26 (1)	21:47 32	21:14 (2)	22:01 37	21:27 (3)	21:28 22	20:58 (2)	20:25	19:14	17:07	16:26
2	08:45	08:16	07:21	07:09	06:04	19:46 (1)	05:19	20:42 (2)	05:17	20:51 (2)	05:55	20:03 (1)	06:46	07:36	07:31	08:23
	16:33	17:22	18:15	20:10	21:02 39	20:25 (1)	21:48 33	21:15 (3)	22:00 36	21:27 (3)	21:26 23	20:26 (1)	20:23	19:12	17:05	16:25
3	08:45	08:15	07:19	07:07	06:02	19:46 (1)	05:18	20:42 (2)	05:18	20:50 (2)	05:57	20:02 (1)	06:48	07:38	07:33	08:24
	16:34	17:24	18:17	20:11	21:03 38	20:24 (1)	21:49 33	21:15 (3)	22:00 36	21:26 (3)	21:25 26	20:28 (1)	20:20	19:10	17:04	16:25
4	08:45	08:13	07:17	07:05	06:00	19:47 (1)	05:17	20:43 (2)	05:19	20:50 (2)	05:59	20:00 (1)	06:50	07:40	07:35	08:26
	16:35	17:26	18:18	20:13	21:05 36	20:23 (1)	21:50 34	21:17 (3)	22:00 36	21:26 (3)	21:23 29	20:29 (1)	20:18	19:07	17:02	16:24
5	08:45	08:11	07:15	07:02	05:58	19:48 (1)	05:17	20:43 (2)	05:20	20:50 (2)	06:00	20:00 (1)	06:51	07:42	07:37	08:27
	16:36	17:28	18:20	20:15	21:07 35	20:23 (1)	21:51 34	21:17 (3)	21:59 36	21:26 (3)	21:21 30	20:30 (1)	20:16	19:05	17:00	16:24
6	08:44	08:10	07:12	07:00	05:56	19:48 (1)	05:16	20:44 (2)	05:21	20:50 (2)	06:02	19:58 (1)	06:53	07:43	07:39	08:28
	16:37	17:30	18:22	20:17	21:08 34	20:22 (1)	21:52 35	21:19 (3)	21:58 35	21:25 (3)	21:19 33	20:31 (1)	20:13	19:03	16:58	16:23
7	08:44	08:08	07:10	06:58	05:55	19:49 (1)	05:15	20:44 (2)	05:21	20:50 (2)	06:03	19:58 (1)	06:55	07:45	07:40	08:30
	16:39	17:32	18:24	20:18	21:10 32	20:21 (1)	21:53 35	21:19 (3)	21:58 34	21:24 (3)	21:17 34	20:32 (1)	20:11	19:01	16:56	16:23
8	08:43	08:06	07:08	06:56	05:53	19:50 (1)	05:15	20:45 (2)	05:22	20:50 (2)	06:05	19:56 (1)	06:56	07:47	07:42	08:31
	16:40	17:34	18:26	20:20	21:12 30	20:20 (1)	21:54 35	21:20 (3)	21:57 33	21:23 (3)	21:16 36	20:32 (1)	20:09	18:58	16:55	16:22
9	08:43	08:04	07:05	06:53	05:51	19:51 (1)	05:14	20:45 (2)	05:23	20:50 (2)	06:07	19:56 (1)	06:58	07:48	07:44	08:32
	16:41	17:35	18:27	20:22	21:13 28	20:19 (1)	21:55 35	21:20 (3)	21:57 33	21:23 (3)	21:14 37	20:33 (1)	20:06	18:56	16:53	16:22
10	08:42	08:02	07:03	06:51	05:49	19:52 (1)	05:14	20:45 (2)	05:24	20:50 (2)	06:08	19:56 (1)	07:00	07:50	07:46	08:33
	16:43	17:37	18:29	20:24	21:15 25	20:17 (1)	21:55 37	21:22 (3)	21:56 32	21:22 (3)	21:12 38	20:34 (1)	20:04	18:54	16:51	16:22
11	08:42	08:00	07:01	06:49	05:48	19:54 (1)	05:13	20:46 (2)	05:25	20:50 (2)	06:10	19:55 (1)	07:01	07:52	07:48	08:34
	16:44	17:39	18:31	20:25	21:17 22	20:16 (1)	21:56 37	21:23 (3)	21:55 32	21:22 (3)	21:10 39	20:34 (1)	20:02	18:51	16:50	16:22
12	08:41	07:59	06:59	06:46	05:46	19:56 (1)	05:13	20:47 (2)	05:27	20:49 (2)	06:12	19:54 (1)	07:03	07:54	07:50	08:35
	16:46	17:41	18:33	20:27	21:18 21	20:48 (2)	21:57 36	21:23 (3)	21:54 32	21:21 (2)	21:08 40	20:34 (1)	19:59	18:49	16:48	16:22
13	08:40	07:57	06:56	06:44	05:44	19:59 (1)	05:13	20:46 (2)	05:28	20:49 (2)	06:13	19:53 (1)	07:05	07:55	07:51	08:36
	16:47	17:43	18:35	20:29	21:20 18	20:50 (2)	21:58 37	21:23 (3)	21:53 31	21:20 (2)	21:06 41	20:34 (1)	19:57	18:47	16:47	16:22
14	08:40	07:55	06:54	06:42	19:58 (1) 05:43	20:03 (1)	05:13	20:47 (2)	05:29	20:49 (2)	06:15	19:53 (1)	07:06	07:57	07:53	08:37
	16:49	17:45	18:36	20:31 5	20:03 (1) 21:21 12	20:51 (2)	21:58 37	21:24 (3)	21:52 30	21:19 (2)	21:04 41	20:34 (1)	19:55	18:45	16:45	16:22
15	08:39	07:53	06:52	06:40	19:56 (1) 05:41	20:43 (2)	05:12	20:47 (2)	05:30	20:50 (2)	06:17	19:53 (1)	07:08	07:59	07:55	08:38
	16:50	17:47	18:38	20:32 9	20:05 (1) 21:23 10	20:53 (2)	21:59 38	21:25 (3)	21:51 29	21:19 (2)	21:02 40	20:33 (1)	19:52	18:42	16:44	16:22
16	08:38	07:51	06:49	06:38	19:54 (1) 05:39	20:42 (2)	05:12	20:48 (2)	05:31	20:50 (2)	06:18	19:53 (1)	07:10	08:01	07:57	08:39
	16:52	17:49	18:40	20:34 13	20:07 (1) 21:25 12	20:54 (2)	21:59 37	21:25 (3)	21:50 28	21:18 (2)	21:00 39	20:32 (1)	19:50	18:40	16:42	16:22
17	08:37	07:49	06:47	06:35	19:53 (1) 05:38	20:42 (2)	05:12	20:48 (2)	05:32	20:50 (2)	06:20	19:52 (1)	07:11	08:02	07:58	08:40
	16:54	17:51	18:42	20:36 16	20:09 (1) 21:26 13	20:55 (2)	22:00 38	21:26 (3)	21:49 27	21:17 (2)	20:58 37	20:29 (1)	19:48	18:38	16:41	16:22
18	08:36	07:47	06:45	06:33	19:51 (1) 05:36	20:41 (2)	05:12	20:48 (2)	05:34	20:50 (2)	06:21	19:52 (1)	07:13	08:04	08:00	08:41
	16:55	17:52	18:43	20:37 19	20:10 (1) 21:28 15	20:56 (2)	22:00 38	21:26 (3)	21:48 26	21:16 (2)	20:56 35	20:27 (1)	19:45	18:36	16:40	16:22
19	08:35	07:45	06:42	06:31	19:50 (1) 05:35	20:41 (2)	05:12	20:48 (2)	05:35	20:50 (2)	06:23	19:53 (1)	07:15	08:06	08:02	08:41
	16:57	17:54	18:45	20:39 22	20:12 (1) 21:29 17	20:58 (2)	22:00 38	21:26 (3)	21:47 24	21:14 (2)	20:54 33	20:26 (1)	19:43	18:34	16:38	16:22
20	08:34	07:43	06:40	06:29	19:48 (1) 05:34	20:41 (2)	05:12	20:49 (2)	05:36	20:51 (2)	06:25	19:52 (1)	07:16	08:08	08:04	08:42
	16:59	17:56	18:47	20:41 25	20:13 (1) 21:31 18	20:59 (2)	22:01 37	21:26 (3)	21:46 23	21:14 (2)	20:51 31	20:23 (1)	19:40	18:32	16:37	16:23
21	08:33	07:41	06:38	06:27	19:48 (1) 05:32	20:41 (2)	05:12	20:49 (2)	05:38	20:50 (2)	06:26	19:53 (1)	07:18	08:10	08:05	08:43
	17:00	17:58	18:49	20:43 27	20:15 (1) 21:32 20	21:01 (2)	22:01 37	21:26 (3)	21:44 23	21:13 (2)	20:49 29	20:22 (1)	19:38	18:29	16:36	16:23
22	08:32	07:39	06:35	06:24	19:47 (1) 05:31	20:40 (2)	05:13	20:50 (2)	05:39	20:50 (2)	06:28	19:53 (1)	07:20	08:11	08:07	08:43
	17:02	18:00	18:50	20:44 29	20:16 (1) 21:34 21	21:01 (2)	22:01 37	21:27 (3)	21:43 21	21:11 (2)	20:47 26	20:19 (1)	19:36	18:27	16:35	16:24
23	08:30	07:36	06:33	06:22	19:46 (1) 05:30	20:40 (2)	05:13	20:50 (2)	05:40	20:50 (2)	06:30	19:53 (1)	07:21	08:13	08:09	08:44
	17:04	18:02	18:52	20:46 32	20:18 (1) 21:35 23	21:03 (2)	22:01 37	21:27 (3)	21:42 20	21:10 (2)	20:45 24	20:17 (1)	19:33	18:25	16:33	16:24
24	08:29	07:34	06:31	06:20	19:46 (1) 05:28	20:40 (2)	05:13	20:49 (2)	05:42	20:51 (2)	06:31	19:53 (1)	07:23	08:15	08:10	08:44
	17:06	18:04	18:54	20:48 34	20:20 (1) 21:36 24	21:04 (2)	22:02 38	21:27 (3)	21:40 18	21:09 (2)	20:43 22	20:15 (1)	19:31	18:23	16:32	16:25
25	08:28	07:32	06:28	06:18	19:46 (1) 05:27	20:40 (2)	05:14	20:50 (2)	05:43	20:51 (2)	06:33	19:54 (1)	07:25	07:17	08:12	08:44
	17:07	18:06	18:56	20:50 35	20:21 (1) 21:38 26	21:06 (2)	22:02 38	21:28 (3)	21:39 17	21:08 (2)	20:41 19	20:13 (1)	19:29	17:21	16:31	16:25
26	08:27	07:30	06:26	06:16	19:45 (1) 05:26	20:40 (2)	05:14	20:50 (2)	05:45	20:52 (2)	06:35	19:56 (1)	07:26	07:19	08:14	08:45
	17:09	18:07	18:57	20:51 38	20:23 (1) 21:39 27	21:07 (2)	22:02 37	21:27 (3)	21:37 15	21:07 (2)	20:38 15	20:11 (1)	19:26	17:19	16:30	16:26
27	08:25	07:28	06:23	06:14	19:45 (1) 05:25	20:41 (2)	05:14	20:50 (2)	05:46	20:52 (2)	06:36	19:56 (1)	07:28	07:20	08:15	08:45
	17:11	18:09	18:59	20:53 39	20:24 (1) 21:40 27	21:08 (2)	22:01 38	21:28 (3)	21:36 13	21:05 (2)	20:36 13	20:09 (1)	19:24	17:17	16:29	16:27
28	08:24	07:26	06:21	06:12	19:45 (1) 05:24	20:41 (2)	05:15	20:50 (2)	05:48	20:53 (2)	06:38	19:58 (1)	07:30	07:22	08:17	08:45
	17:13	18:11	19:01	20:55 41	20:26 (1) 21:42 28	21:09 (2)	22:01 37	21:27 (3)	21:34 10	21:03 (2)	20:34 9	20:07 (1)	19:22	17:15	16:28	16:28
29	08:22		07:19	06:10	19:45 (1) 05:23	20:41 (2)	05:15	20:50 (2)	05:49	20:54 (2)	06:40	19:59 (1)	07:31	07:24	08:18	08:45
	17:15		20:03	20:56 41	20:26 (1) 21:43 29	21:10 (2)	22:01 38	21:28 (3)	21:33 9	21:03 (2)	20:32 5	20:04 (1)	19:19	17:13	16:28	16:28
30	08:21		07:16	06:08	19:46 (1) 05:22	20:41 (2)	05:16	20:50 (2)	05:51	20:11 (1)	06:41		07:33	07:26	08:20	08:45
	17:17		20:04	20:58 40	20:26 (1) 21:44 30	21:11 (2)	22:01 37	21:27 (3)	21:31 16	21:01 (2)	20:29		19:17	17:11	16:27	16:29
31	08:19		07:14		05:21	20:42 (2)			05:52	20:08 (1)	06:43			07:28		08:45
	17:18		20:06		21:45 31	21:13 (2)			21:30 20	21:00 (2)	20:27			17:09		16:30
Potential sun hours	257	277	367	417	487	501	504	455	381	331	265	241
Total, worst case				465	781	1090	812	846				
Sun reduction				0.38	0.39	0.35	0.33	0.35				
Oper. time red.				1.00	1.00	1.00	1.00	1.00				
Wind dir. red.				0.61	0.63	0.64	0.64	0.61				
Total reduction				0.23	0.25	0.22	0.21	0.22				
Total, real				109	193	241	172	184				

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
Jennings O'Donovan
Finisklin Business Park
F91 RHH9 Sligo
+353719161416
Kathlyn Feeney / kfeeney@jodireland.com
Calculated:
09/06/2025 13:54/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Worst Case - V150 **Shadow receptor:** O - 15

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:45 16:32	08:18 17:20	07:23 18:13	07:12 20:08	06:06 21:00 7	20:24 (1) 20:31 (1) 21:47 37	05:20 21:14 (2) 22:01 36	20:21 (1) 21:27 (2) 21:28 33	05:17 20:32 (1) 05:54	20:25 (1) 20:58 (1) 20:25	06:45 19:14	07:35 17:07	07:30 16:26	08:21
2	08:45 16:33	08:16 17:22	07:21 18:15	07:09 20:10	06:04 21:02 11	20:22 (1) 20:33 (1) 21:48 37	05:19 21:15 (2) 22:00 37	20:21 (1) 21:27 (2) 21:26 31	05:17 20:32 (1) 05:55	20:26 (1) 20:57 (1) 20:23	06:46 19:12	07:36 17:05	07:31 16:25	08:23
3	08:45 16:34	08:15 17:24	07:19 18:17	07:07 20:11	06:02 21:03 13	20:21 (1) 20:34 (1) 21:49 36	05:18 21:15 (2) 22:00 37	20:22 (1) 21:26 (2) 21:25 29	05:18 20:31 (1) 05:57	20:26 (1) 20:55 (1) 20:20	06:48 19:10	07:38 17:04	07:33 16:25	08:24
4	08:45 16:35	08:13 17:26	07:17 18:18	07:05 20:13	06:00 21:05 16	20:19 (1) 20:35 (1) 21:50 37	05:17 21:17 (2) 22:00 37	20:23 (1) 21:26 (2) 21:23 27	05:19 20:31 (1) 05:59	20:26 (1) 20:53 (1) 20:18	06:50 19:07	07:40 17:02	07:35 16:24	08:26
5	08:45 16:36	08:11 17:28	07:15 18:20	07:02 20:15	05:58 21:07 19	20:19 (1) 20:38 (1) 21:51 37	05:17 21:17 (2) 21:59 37	20:23 (1) 21:26 (2) 21:21 24	05:20 20:31 (1) 06:00	20:27 (1) 20:51 (1) 20:16	06:51 19:05	07:42 17:00	07:37 16:24	08:27
6	08:44 16:37	08:10 17:30	07:12 18:22	07:00 20:17	05:56 21:08 21	20:18 (1) 20:39 (1) 21:52 36	05:16 21:19 (2) 21:58 36	20:25 (1) 21:25 (2) 21:19 22	05:21 20:31 (1) 06:02	20:27 (1) 20:49 (1) 20:13	06:53 19:03	07:43 16:58	07:39 16:23	08:28
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11	08:42 16:44	08:00 17:39	07:01 18:31	06:49 20:25	05:48 21:17 31	20:16 (1) 20:47 (1) 21:56 36	05:13 21:23 (2) 21:55 36	20:28 (1) 21:22 (2) 21:10 10	05:25 20:29 (1) 06:10	20:31 (1) 20:41 (1) 20:02	07:01 18:51	07:52 16:50	07:48 16:22	08:34
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Potential sun hours	257	277	367	417	487	501	504	455	381	331	265	241		
Total, worst case				4	977	1041	1154	250						
Sun reduction				0.38	0.39	0.35	0.33	0.35						
Oper. time red.				1.00	1.00	1.00	1.00	1.00						
Wind dir. red.				0.63	0.63	0.64	0.63	0.63						
Total reduction				0.24	0.25	0.22	0.21	0.22						
Total, real				1	244	230	243	56						

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
Jennings O'Donovan
Finisklin Business Park
F91 RHH9 Sligo
+353719161416
Kathlyn Feeney / kfeeney@jodireland.com

Calculated:
09/06/2025 13:54/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Worst Case - V150 **Shadow receptor:** P - 16

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:45	08:18	07:23	07:12	06:06	05:20	20:27 (1)	05:17	20:37 (1)	05:54	20:35 (1)	06:45	07:35	07:29	08:21
	16:32	17:20	18:13	20:08	21:00	21:47 34	21:01 (1)	22:01 35	21:27 (2)	21:28 23	20:58 (1)	20:25	19:14	17:07	16:26
2	08:45	08:16	07:21	07:09	06:04	05:19	20:28 (1)	05:17	20:37 (1)	05:55	20:36 (1)	06:46	07:36	07:31	08:23
	16:33	17:22	18:15	20:10	21:02	21:48 32	21:00 (1)	22:00 35	21:27 (2)	21:26 21	20:57 (1)	20:23	19:12	17:05	16:25
3	08:45	08:15	07:19	07:07	06:02	05:18	20:28 (1)	05:18	20:37 (1)	05:57	20:36 (1)	06:48	07:38	07:33	08:24
	16:34	17:24	18:17	20:11	21:03	21:49 33	21:15 (2)	22:00 35	21:26 (2)	21:25 19	20:55 (1)	20:20	19:10	17:04	16:25
4	08:45	08:13	07:17	07:05	06:00	20:32 (1)	05:17	20:29 (1)	05:19	20:37 (1)	05:59	20:37 (1)	06:50	07:40	07:35	08:26
	16:35	17:26	18:18	20:13	21:05 3	20:35 (1)	21:50 34	21:17 (2)	22:00 35	21:26 (2)	21:23 16	20:53 (1)	20:18	19:07	17:02	16:24
5	08:45	08:11	07:15	07:02	05:58	20:31 (1)	05:17	20:29 (1)	05:20	20:37 (1)	06:00	20:38 (1)	06:51	07:42	07:37	08:27
	16:36	17:28	18:20	20:15	21:07 7	20:38 (1)	21:51 34	21:17 (2)	21:59 35	21:26 (2)	21:21 13	20:51 (1)	20:16	19:05	17:00	16:24
6	08:44	08:09	07:12	07:00	05:56	20:30 (1)	05:16	20:30 (1)	05:21	20:37 (1)	06:02	20:38 (1)	06:53	07:43	07:39	08:28
	16:37	17:30	18:22	20:17	21:08 9	20:39 (1)	21:52 35	21:19 (2)	21:58 34	21:25 (2)	21:19 11	20:49 (1)	20:13	19:03	16:58	16:23
7	08:44	08:08	07:10	06:58	05:55	20:28 (1)	05:15	20:30 (1)	05:21	20:36 (1)	06:03	20:40 (1)	06:55	07:45	07:40	08:30
	16:39	17:32	18:24	20:18	21:10 12	20:40 (1)	21:53 35	21:19 (2)	21:58 34	21:24 (2)	21:17 8	20:48 (1)	20:11	19:01	16:56	16:23
8	08:43	08:06	07:08	06:56	05:53	20:27 (1)	05:15	20:31 (1)	05:22	20:36 (1)	06:05	20:40 (1)	06:56	07:47	07:42	08:31
	16:40	17:34	18:26	20:20	21:12 14	20:41 (1)	21:54 35	21:20 (2)	21:57 34	21:23 (2)	21:16 6	20:46 (1)	20:09	18:58	16:55	16:22
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	16:43	17:37	18:29	20:24	21:15 19	20:45 (1)	21:55 36	21:22 (2)	21:56 33	21:08 (1)	21:12		20:04	18:54	16:51	16:22
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	17:09	18:07	18:57	20:51	21:39 37	21:02 (1)	22:02 35	21:27 (2)	21:37 33	21:07 (1)	20:38		19:26	17:19	16:30	16:26
27	08:25	07:28	06:23	06:14	05:25	20:25 (1)	05:14	20:38 (1)	05:46	20:34 (1)	06:36		07:28	07:20	08:15	08:45
	17:11	18:09	18:59	20:53	21:40 37	21:02 (1)	22:01 35	21:28 (2)	21:36 31	21:05 (1)	20:36		19:24	17:17	16:29	16:27
28	08:24	07:26	06:21	06:12	05:24	20:25 (1)	05:15	20:37 (1)	05:48	20:34 (1)	06:38		07:30	07:22	08:17	08:45
	17:13	18:11	19:01	20:55	21:42 36	21:01 (1)	22:01 35	21:27 (2)	21:34 29	21:03 (1)	20:34		19:22	17:15	16:28	16:28
29	08:22		07:19	06:10	05:23	20:26 (1)	05:15	20:38 (1)	05:49	20:35 (1)	06:40		07:31	07:24	08:18	08:45
	17:15		20:03	20:56	21:43 35	21:01 (1)	22:01 36	21:28 (2)	21:33 27	21:02 (1)	20:32		19:19	17:13	16:28	16:28
30	08:21		07:16	06:08	05:22	20:26 (1)	05:16	20:37 (1)	05:51	20:34 (1)	06:41		07:33	07:26	08:20	08:45
	17:17		20:04	20:58	21:44 35	21:01 (1)	22:01 36	21:27 (2)	21:31 27	21:01 (1)	20:29		19:17	17:11	16:27	16:29
31	08:19		07:14		05:21	20:27 (1)			05:52	20:35 (1)	06:43			07:28		08:45
	17:18		20:06		21:45 34	21:01 (1)			21:30 25	21:00 (1)	20:27			17:09		16:30
Potential sun hours	257	277	367	417	487	501	504	455	381	331	265	241
Total, worst case					774	1046	1055	118				
Sun reduction					0.39	0.35	0.33	0.35				
Oper. time red.					1.00	1.00	1.00	1.00				
Wind dir. red.					0.64	0.64	0.64	0.64				
Total reduction					0.25	0.22	0.21	0.23				
Total, real					194	232	223	27				

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
Jennings O'Donovan
Finisklin Business Park
F91 RHH9 Sligo
+353719161416
Kathlyn Feeney / kfeeney@jodireland.com
Calculated:
09/06/2025 13:54/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Worst Case - V150 **Shadow receptor:** Q - 17

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:45	08:18	07:23	07:12	06:06	05:20	20:42 (1)	05:17	20:48 (1)	05:54	06:45	07:35	07:29	08:21
	16:32	17:20	18:13	20:08	21:00	21:47	21:14 (1)	22:01	21:27 (1)	21:28	20:25	19:14	17:07	16:26
2	08:45	08:16	07:21	07:09	06:04	05:19	20:41 (1)	05:17	20:48 (1)	05:55	06:46	07:36	07:31	08:23
	16:33	17:22	18:15	20:10	21:02	21:48	21:15 (1)	22:00	21:27 (1)	21:26	20:23	19:12	17:05	16:25
3	08:45	08:15	07:19	07:07	06:02	05:18	20:41 (1)	05:18	20:48 (1)	05:57	06:48	07:38	07:33	08:24
	16:34	17:24	18:17	20:11	21:03	21:49	21:15 (1)	22:00	21:26 (1)	21:25	20:20	19:10	17:04	16:25
4	08:45	08:13	07:17	07:05	06:00	05:17	20:42 (1)	05:19	20:48 (1)	05:59	06:50	07:40	07:35	08:26
	16:35	17:26	18:18	20:13	21:05	21:50	21:17 (1)	22:00	21:26 (1)	21:23	20:18	19:07	17:02	16:24
5	08:45	08:11	07:15	07:02	05:58	05:17	20:42 (1)	05:20	20:48 (1)	06:00	06:51	07:42	07:37	08:27
	16:36	17:28	18:20	20:15	21:07	21:51	21:17 (1)	21:59	21:26 (1)	21:21	20:16	19:05	17:00	16:24
6	08:44	08:09	07:12	07:00	05:56	05:16	20:42 (1)	05:21	20:49 (1)	06:02	06:53	07:43	07:39	08:28
	16:37	17:30	18:22	20:17	21:08	21:52	21:19 (1)	21:58	21:25 (1)	21:19	20:13	19:03	16:58	16:23
7	08:44	08:08	07:10	06:58	05:55	05:15	20:42 (1)	05:21	20:48 (1)	06:03	06:55	07:45	07:40	08:30
	16:39	17:32	18:24	20:18	21:10	21:53	21:19 (1)	21:58	21:24 (1)	21:17	20:11	19:01	16:56	16:23
8	08:43	08:06	07:08	06:56	05:53	05:15	20:43 (1)	05:22	20:48 (1)	06:05	06:56	07:47	07:42	08:31
	16:40	17:34	18:26	20:20	21:12	21:54	21:20 (1)	21:57	21:23 (1)	21:16	20:09	18:58	16:55	16:22
9	08:43	08:04	07:05	06:53	05:51	05:14	20:42 (1)	05:23	20:49 (1)	06:07	06:58	07:48	07:44	08:32
	16:41	17:35	18:27	20:22	21:13	21:55	21:20 (1)	21:57	21:23 (1)	21:14	20:06	18:56	16:53	16:22
10	08:42	08:02	07:03	06:51	05:49	05:14	20:43 (1)	05:24	20:49 (1)	06:08	07:00	07:50	07:46	08:33
	16:43	17:37	18:29	20:24	21:15	21:55	21:22 (1)	21:56	21:22 (1)	21:12	20:04	18:54	16:51	16:22
11	08:42	08:00	07:01	06:49	05:48	05:14	20:43 (1)	05:25	20:49 (1)	06:10	07:01	07:52	07:48	08:34
	16:44	17:39	18:31	20:25	21:17	21:56	21:23 (1)	21:55	21:22 (1)	21:10	20:02	18:51	16:50	16:22
12	08:41	07:59	06:59	06:46	05:46	05:13	20:44 (1)	05:27	20:49 (1)	06:12	07:03	07:54	07:50	08:35
	16:46	17:41	18:33	20:27	21:18	21:57	21:23 (1)	21:54	21:21 (1)	21:08	19:59	18:49	16:48	16:22
13	08:40	07:57	06:56	06:44	05:44	05:13	20:43 (1)	05:28	20:49 (1)	06:13	07:05	07:55	07:51	08:36
	16:47	17:43	18:35	20:29	21:20	21:58	21:23 (1)	21:53	21:20 (1)	21:06	19:57	18:47	16:47	16:22
14	08:40	07:55	06:54	06:42	05:43	20:50 (1)	05:13	20:44 (1)	05:29	20:50 (1)	06:15	07:06	07:57	07:53	08:37
	16:49	17:45	18:36	20:30	21:21	1 20:51 (1)	21:58	21:23 (1)	21:52	29 21:19 (1)	21:04	19:55	18:45	16:45	16:22
15	08:39	07:53	06:52	06:40	05:41	20:49 (1)	05:12	20:44 (1)	05:30	20:51 (1)	06:17	07:08	07:59	07:55	08:38
	16:50	17:47	18:38	20:32	21:23	4 20:53 (1)	21:59	21:23 (1)	21:51	28 21:19 (1)	21:02	19:52	18:42	16:44	16:22
16	08:38	07:51	06:49	06:38	05:39	20:47 (1)	05:12	20:44 (1)	05:31	20:51 (1)	06:18	07:10	08:01	07:57	08:39
	16:52	17:49	18:40	20:34	21:25	7 20:54 (1)	21:59	21:23 (1)	21:50	27 21:18 (1)	21:00	19:50	18:40	16:42	16:22
17	08:37	07:49	06:47	06:35	05:38	20:46 (1)	05:12	20:45 (1)	05:32	20:51 (1)	06:20	07:11	08:02	07:58	08:40
	16:54	17:51	18:42	20:36	21:26	9 20:55 (1)	22:00	21:24 (1)	21:49	26 21:17 (1)	20:58	19:48	18:38	16:41	16:22
18	08:36	07:47	06:45	06:33	05:36	20:45 (1)	05:12	20:45 (1)	05:34	20:51 (1)	06:21	07:13	08:04	08:00	08:41
	16:55	17:52	18:43	20:37	21:28	11 20:56 (1)	22:00	21:24 (1)	21:48	25 21:16 (1)	20:56	19:45	18:36	16:40	16:22
19	08:35	07:45	06:42	06:31	05:35	20:44 (1)	05:12	20:45 (1)	05:35	20:51 (1)	06:23	07:15	08:06	08:02	08:41
	16:57	17:54	18:45	20:39	21:29	14 20:58 (1)	22:00	21:24 (1)	21:47	23 21:14 (1)	20:54	19:43	18:34	16:38	16:22
20	08:34	07:43	06:40	06:29	05:34	20:44 (1)	05:12	20:45 (1)	05:36	20:53 (1)	06:25	07:16	08:08	08:04	08:42
	16:59	17:56	18:47	20:41	21:31	15 20:59 (1)	22:01	21:24 (1)	21:46	21 21:14 (1)	20:51	19:40	18:32	16:37	16:23
21	08:33	07:41	06:38	06:27	05:32	20:44 (1)	05:12	20:46 (1)	05:38	20:53 (1)	06:26	07:18	08:10	08:05	08:43
	17:00	17:58	18:49	20:43	21:32	17 21:01 (1)	22:01	21:25 (1)	21:44	20 21:13 (1)	20:49	19:38	18:29	16:36	16:23
22	08:32	07:39	06:35	06:24	05:31	20:42 (1)	05:13	20:46 (1)	05:39	20:53 (1)	06:28	07:20	08:11	08:07	08:43
	17:02	18:00	18:50	20:44	21:34	19 21:01 (1)	22:01	21:25 (1)	21:43	18 21:11 (1)	20:47	19:36	18:27	16:35	16:24
23	08:30	07:36	06:33	06:22	05:30	20:42 (1)	05:13	20:46 (1)	05:41	20:53 (1)	06:30	07:21	08:13	08:09	08:44
	17:04	18:02	18:52	20:46	21:35	21 21:03 (1)	22:01	21:25 (1)	21:42	17 21:10 (1)	20:45	19:33	18:25	16:33	16:24
24	08:29	07:34	06:31	06:20	05:28	20:42 (1)	05:13	20:46 (1)	05:42	20:55 (1)	06:31	07:23	08:15	08:10	08:44
	17:06	18:04	18:54	20:48	21:36	22 21:04 (1)	22:01	21:25 (1)	21:40	14 21:09 (1)	20:43	19:31	18:23	16:32	16:25
25	08:28	07:32	06:28	06:18	05:27	20:42 (1)	05:14	20:47 (1)	05:43	20:55 (1)	06:33	07:25	07:17	08:12	08:44
	17:07	18:06	18:56	20:50	21:38	24 21:06 (1)	22:02	21:26 (1)	21:39	13 21:08 (1)	20:41	19:29	17:21	16:31	16:25
26	08:27	07:30	06:26	06:16	05:26	20:42 (1)	05:14	20:47 (1)	05:45	20:57 (1)	06:35	07:26	07:19	08:14	08:45
	17:09	18:07	18:57	20:51	21:39	25 21:07 (1)	22:02	21:25 (1)	21:37	10 21:07 (1)	20:38	19:26	17:19	16:30	16:26
27	08:25	07:28	06:23	06:14	05:25	20:42 (1)	05:14	20:47 (1)	05:46	20:57 (1)	06:36	07:28	07:20	08:15	08:45
	17:11	18:09	18:59	20:53	21:40	26 21:08 (1)	22:01	21:26 (1)	21:36	8 21:05 (1)	20:36	19:24	17:17	16:29	16:27
28	08:24	07:26	06:21	06:12	05:24	20:41 (1)	05:15	20:47 (1)	05:48	20:58 (1)	06:38	07:30	07:22	08:17	08:45
	17:13	18:11	19:01	20:55	21:42	28 21:09 (1)	22:01	21:26 (1)	21:34	5 21:03 (1)	20:34	19:22	17:15	16:28	16:28
29	08:22		07:19	06:10	05:23	20:41 (1)	05:15	20:48 (1)	05:49	21:00 (1)	06:40	07:31	07:24	08:18	08:45
	17:15		20:03	20:56	21:43	29 21:10 (1)	22:01	21:27 (1)	21:33	2 21:02 (1)	20:32	19:19	17:13	16:28	16:28
30	08:21		07:16	06:08	05:22	20:41 (1)	05:16	20:47 (1)	05:51		06:41	07:33	07:26	08:20	08:45
	17:17		20:04	20:58	21:44	30 21:11 (1)	22:01	21:26 (1)	21:31		20:29	19:17	17:11	16:27	16:29
31	08:19		07:14		05:21	20:42 (1)			05:52		06:43		07:28		08:45
	17:18		20:06		21:45	31 21:13 (1)			21:30		20:27		17:09		16:30
Potential sun hours	257	277	367	417	487		501		504		455	381	331	265	241
Total, worst case						333		1139		748						
Sun reduction						0.39		0.35		0.33						
Oper. time red.						1.00		1.00		1.00						
Wind dir. red.						0.64		0.64		0.64						
Total reduction						0.25		0.22		0.21						
Total, real						84		252		158						

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
Jennings O'Donovan
Finisklin Business Park
F91 RHH9 Sligo
+353719161416
Kathlyn Feeney / kfeeney@jodireland.com
Calculated:
09/06/2025 13:54/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Worst Case - V150 **Shadow receptor:** R - 18

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:45	08:18	07:23	07:12	06:06	05:20	20:38 (1)	05:17	20:45 (1)	05:54	20:53 (1)	06:45	07:35	07:29	08:21
	16:32	17:20	18:13	20:08	21:00	21:47 36	21:14 (1)	22:01 33	21:18 (1)	21:28 5	20:58 (1)	20:25	19:14	17:07	16:26
2	08:45	08:16	07:21	07:09	06:04	05:19	20:38 (1)	05:17	20:46 (1)	05:55	20:55 (1)	06:46	07:36	07:31	08:23
	16:33	17:22	18:15	20:10	21:02	21:48 35	21:13 (1)	22:00 33	21:19 (1)	21:26 2	20:57 (1)	20:23	19:12	17:05	16:25
3	08:45	08:15	07:19	07:07	06:02	05:18	20:38 (1)	05:18	20:45 (1)	05:57		06:48	07:38	07:33	08:24
	16:34	17:24	18:17	20:11	21:03	21:49 35	21:13 (1)	22:00 34	21:19 (1)	21:25		20:20	19:10	17:04	16:25
4	08:45	08:13	07:17	07:05	06:00	05:17	20:39 (1)	05:19	20:45 (1)	05:59		06:50	07:40	07:35	08:26
	16:35	17:26	18:18	20:13	21:05	21:50 35	21:14 (1)	22:00 34	21:19 (1)	21:23		20:18	19:07	17:02	16:24
5	08:45	08:11	07:14	07:02	05:58	05:17	20:38 (1)	05:20	20:45 (1)	06:00		06:51	07:42	07:37	08:27
	16:36	17:28	18:20	20:15	21:07	21:51 35	21:13 (1)	21:59 35	21:20 (1)	21:21		20:16	19:05	17:00	16:24
6	08:44	08:09	07:12	07:00	05:56	05:16	20:39 (1)	05:21	20:46 (1)	06:02		06:53	07:43	07:39	08:28
	16:37	17:30	18:22	20:17	21:08	21:52 35	21:14 (1)	21:58 34	21:20 (1)	21:19		20:13	19:03	16:58	16:23
7	08:44	08:08	07:10	06:58	05:55	05:15	20:39 (1)	05:21	20:45 (1)	06:03		06:55	07:45	07:40	08:30
	16:39	17:32	18:24	20:18	21:10	21:53 35	21:14 (1)	21:58 35	21:20 (1)	21:17		20:11	19:01	16:56	16:23
8	08:43	08:06	07:08	06:56	05:53	05:15	20:40 (1)	05:22	20:45 (1)	06:05		06:56	07:47	07:42	08:31
	16:40	17:34	18:26	20:20	21:12	21:54 34	21:14 (1)	21:57 35	21:20 (1)	21:16		20:09	18:58	16:55	16:22
9	08:43	08:04	07:05	06:53	05:51	05:14	20:40 (1)	05:23	20:45 (1)	06:07		06:58	07:48	07:44	08:32
	16:41	17:35	18:27	20:22	21:13	21:55 33	21:13 (1)	21:57 36	21:21 (1)	21:14		20:06	18:56	16:53	16:22
10	08:42	08:02	07:03	06:51	05:49	05:14	20:40 (1)	05:24	20:45 (1)	06:08		07:00	07:50	07:46	08:33
	16:43	17:37	18:29	20:24	21:15	21:55 34	21:14 (1)	21:56 36	21:21 (1)	21:12		20:04	18:54	16:51	16:22
11	08:42	08:00	07:01	06:49	05:48	20:44 (1) 05:13	20:41 (1)	05:25	20:45 (1)	06:10		07:01	07:52	07:48	08:34
	16:44	17:39	18:31	20:25	21:17 3	20:47 (1) 21:56 33	21:14 (1)	21:55 36	21:21 (1)	21:10		20:02	18:51	16:50	16:22
12	08:41	07:59	06:59	06:46	05:46	20:42 (1) 05:13	20:42 (1)	05:27	20:45 (1)	06:12		07:03	07:54	07:50	08:35
	16:46	17:41	18:33	20:27	21:18 6	20:48 (1) 21:57 33	21:15 (1)	21:54 36	21:21 (1)	21:08		19:59	18:49	16:48	16:22
13	08:40	07:57	06:56	06:44	05:44	20:42 (1) 05:13	20:41 (1)	05:28	20:45 (1)	06:13		07:05	07:55	07:51	08:36
	16:47	17:43	18:35	20:29	21:20 8	20:50 (1) 21:57 33	21:14 (1)	21:53 35	21:20 (1)	21:06		19:57	18:47	16:47	16:22
14	08:40	07:55	06:54	06:42	05:43	20:40 (1) 05:13	20:42 (1)	05:29	20:45 (1)	06:15		07:06	07:57	07:53	08:37
	16:49	17:45	18:36	20:30	21:21 11	20:51 (1) 21:58 32	21:14 (1)	21:52 34	21:19 (1)	21:04		19:55	18:45	16:45	16:22
15	08:39	07:53	06:52	06:40	05:41	20:40 (1) 05:12	20:42 (1)	05:30	20:46 (1)	06:17		07:08	07:59	07:55	08:38
	16:50	17:47	18:38	20:32	21:23 13	20:53 (1) 21:59 33	21:25 (2)	21:51 33	21:19 (1)	21:02		19:52	18:42	16:44	16:22
16	08:38	07:51	06:49	06:38	05:39	20:39 (1) 05:12	20:42 (1)	05:31	20:46 (1)	06:18		07:10	08:01	07:57	08:39
	16:52	17:49	18:40	20:34	21:25 15	20:54 (1) 21:59 33	21:25 (2)	21:50 32	21:18 (1)	21:00		19:50	18:40	16:42	16:22
17	08:37	07:49	06:47	06:35	05:38	20:38 (1) 05:12	20:43 (1)	05:32	20:46 (1)	06:20		07:11	08:02	07:58	08:40
	16:54	17:51	18:42	20:36	21:26 17	20:55 (1) 22:00 34	21:26 (2)	21:49 31	21:17 (1)	20:58		19:48	18:38	16:41	16:22
18	08:36	07:47	06:45	06:33	05:36	20:37 (1) 05:12	20:43 (1)	05:34	20:46 (1)	06:21		07:13	08:04	08:00	08:41
	16:55	17:52	18:43	20:37	21:28 19	20:56 (1) 22:00 33	21:26 (2)	21:48 30	21:16 (1)	20:56		19:45	18:36	16:40	16:22
19	08:35	07:45	06:42	06:31	05:35	20:37 (1) 05:12	20:43 (1)	05:35	20:46 (1)	06:23		07:15	08:06	08:02	08:41
	16:57	17:54	18:45	20:39	21:29 21	20:58 (1) 22:00 33	21:26 (2)	21:47 28	21:14 (1)	20:54		19:43	18:34	16:38	16:22
20	08:34	07:43	06:40	06:29	05:34	20:37 (1) 05:12	20:43 (1)	05:36	20:47 (1)	06:25		07:16	08:08	08:04	08:42
	16:59	17:56	18:47	20:41	21:31 22	20:59 (1) 22:01 33	21:26 (2)	21:46 27	21:14 (1)	20:51		19:40	18:32	16:37	16:23
21	08:33	07:41	06:38	06:27	05:32	20:37 (1) 05:12	20:43 (1)	05:38	20:47 (1)	06:26		07:18	08:10	08:05	08:43
	17:00	17:58	18:49	20:43	21:32 24	21:01 (1) 22:01 33	21:26 (2)	21:44 26	21:13 (1)	20:49		19:38	18:29	16:36	16:23
22	08:32	07:39	06:35	06:24	05:31	20:36 (1) 05:13	20:44 (1)	05:39	20:47 (1)	06:28		07:20	08:11	08:07	08:43
	17:02	18:00	18:50	20:44	21:34 25	21:01 (1) 22:01 33	21:27 (2)	21:43 24	21:11 (1)	20:47		19:36	18:27	16:35	16:24
23	08:30	07:36	06:33	06:22	05:30	20:36 (1) 05:13	20:44 (1)	05:41	20:47 (1)	06:30		07:21	08:13	08:09	08:44
	17:04	18:02	18:52	20:46	21:35 27	21:03 (1) 22:01 33	21:27 (2)	21:42 23	21:10 (1)	20:45		19:33	18:25	16:33	16:24
24	08:29	07:34	06:31	06:20	05:28	20:36 (1) 05:13	20:44 (1)	05:42	20:48 (1)	06:31		07:23	08:15	08:10	08:44
	17:06	18:04	18:54	20:48	21:36 28	21:04 (1) 22:01 33	21:27 (2)	21:40 21	21:09 (1)	20:43		19:31	18:23	16:32	16:25
25	08:28	07:32	06:28	06:18	05:27	20:36 (1) 05:14	20:45 (1)	05:43	20:48 (1)	06:33		07:25	07:17	08:12	08:44
	17:07	18:06	18:56	20:50	21:38 30	21:06 (1) 22:02 33	21:28 (2)	21:39 20	21:08 (1)	20:41		19:29	17:21	16:31	16:25
26	08:27	07:30	06:26	06:16	05:26	20:36 (1) 05:14	20:44 (1)	05:45	20:49 (1)	06:35		07:26	07:19	08:14	08:45
	17:09	18:07	18:57	20:51	21:39 31	21:07 (1) 22:02 33	21:27 (2)	21:37 18	21:07 (1)	20:38		19:26	17:19	16:30	16:26
27	08:25	07:28	06:23	06:14	05:25	20:37 (1) 05:14	20:45 (1)	05:46	20:49 (1)	06:36		07:28	07:20	08:15	08:45
	17:11	18:09	18:59	20:53	21:40 31	21:08 (1) 22:01 33	21:28 (2)	21:36 16	21:05 (1)	20:36		19:24	17:17	16:29	16:27
28	08:24	07:26	06:21	06:12	05:24	20:37 (1) 05:15	20:45 (1)	05:48	20:49 (1)	06:38		07:30	07:22	08:17	08:45
	17:13	18:11	19:01	20:55	21:42 32	21:09 (1) 22:01 32	21:17 (1)	21:34 14	21:03 (1)	20:34		19:22	17:15	16:28	16:28
29	08:22		07:19	06:10	05:23	20:37 (1) 05:15	20:45 (1)	05:49	20:51 (1)	06:40		07:31	07:24	08:18	08:45
	17:15		20:03	20:56	21:43 33	21:10 (1) 22:01 33	21:18 (1)	21:33 11	21:02 (1)	20:32		19:19	17:13	16:28	16:28
30	08:21		07:16	06:08	05:22	20:37 (1) 05:16	20:45 (1)	05:51	20:51 (1)	06:41		07:33	07:26	08:20	08:45
	17:17		20:04	20:58	21:44 34	21:11 (1) 22:01 33	21:18 (1)	21:31 10	21:01 (1)	20:29		19:17	17:11	16:27	16:29
31	08:19		07:14		05:21	20:38 (1)		05:52	20:53 (1)	06:43			07:28		08:45
	17:18		20:06		21:45 35	21:13 (1)		21:30 7	21:00 (1)	20:27			17:09		16:30
Potential sun hours	257	277	367	417	487	501	504	455	381	331	265	241
Total, worst case					465	1006	857	7				
Sun reduction					0.39	0.35	0.33	0.35				
Oper. time red.					1.00	1.00	1.00	1.00				
Wind dir. red.					0.64	0.64	0.64	0.64				
Total reduction					0.25	0.22	0.21	0.23				
Total, real					117	223	181	2				

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

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SHADOW - Calendar

Calculation: 6839 Garrane WF Worst Case - V150 **Shadow receptor:** S - 19

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:45	08:18	07:23	07:12	06:06	05:20	05:17	05:54	06:45	07:35	07:30	08:21
	16:32	17:20	18:13	20:08	21:00	21:47	22:01	21:28	20:25	19:14	17:07	16:26
2	08:45	08:16	07:21	07:09	06:04	05:19	05:17	05:56	06:46	07:36	07:31	08:23
	16:33	17:22	18:15	20:10	21:02	21:48	22:00	21:26	20:23	19:12	17:05	16:25
3	08:45	08:15	07:19	07:07	06:02	05:18	05:18	05:57	06:48	07:38	07:33	08:24
	16:34	17:24	18:17	20:11	21:03	21:49	22:00	21:25	20:20	19:10	17:04	16:25
4	08:45	08:13	07:17	07:05	06:00	05:17	05:19	05:59	06:50	07:40	07:35	08:26
	16:35	17:26	18:18	20:13	21:05	21:50	22:00	21:23	20:18	19:07	17:02	16:24
5	08:45	08:11	07:15	07:03	05:58	05:17	05:20	06:00	06:51	07:42	07:37	08:27
	16:36	17:28	18:20	20:15	21:07	21:51	21:59	21:21	20:16	19:05	17:00	16:24
6	08:44	08:10	07:12	07:00	05:56	05:16	05:21	06:02	06:53	07:43	07:39	08:28
	16:38	17:30	18:22	20:17	21:08	21:52	21:58	21:19	20:13	19:03	16:58	16:23
7	08:44	08:08	07:10	06:58	05:55	05:15	05:21	06:03	06:55	07:45	07:40	08:30
	16:39	17:32	18:24	20:18	21:10	21:53	21:58	21:17	20:11	19:01	16:57	16:23
8	08:43	08:06	07:08	06:56	05:53	05:15	05:22	06:05	06:56	07:47	07:42	08:31
	16:40	17:34	18:26	20:20	21:12	21:54	21:57	21:16	20:09	18:58	16:55	16:22
9	08:43	08:04	07:05	06:53	05:51	05:14	05:23	06:07	06:58	07:48	07:44	08:32
	16:42	17:35	18:27	20:22	21:13	21:55	21:57	21:14	20:06	18:56	16:53	16:22
10	08:42	08:02	07:03	06:51	05:49	05:14	05:24	06:08	07:00	07:50	07:46	08:33
	16:43	17:37	18:29	20:24	21:15	21:55	21:56	21:12	20:04	18:54	16:51	16:22
11	08:42	08:00	07:01	06:49	05:48	05:14	05:25	06:10	07:01	07:52	07:48	08:34
	16:44	17:39	18:31	20:25	21:17	21:56	21:55	21:10	20:02	18:51	16:50	16:22
12	08:41	07:59	06:59	06:46	05:46	05:13	05:27	06:12	07:03	07:54	07:50	08:35
	16:46	17:41	18:33	20:27	21:18	21:57	21:54	21:08	19:59	18:49	16:48	16:22
13	08:40	07:57	06:56	06:44	05:44	05:13	05:28	06:13	07:05	07:55	07:51	08:36
	16:47	17:43	18:35	20:29	21:20	21:58	21:53	21:06	19:57	18:47	16:47	16:22
14	08:40	07:55	06:54	06:42	05:43	05:13	05:29	06:15	07:06	07:57	07:53	08:37
	16:49	17:45	18:36	20:31	21:21	21:58	21:52	21:04	19:55	18:45	16:45	16:22
15	08:39	07:53	06:52	06:40	05:41	05:12	05:30	06:17	07:08	07:59	07:55	08:38
	16:50	17:47	18:38	20:32	21:23	21:59	21:51	21:02	19:52	18:42	16:44	16:22
16	08:38	07:51	06:49	06:38	05:40	05:12	05:31	06:18	07:10	08:01	07:57	08:39
	16:52	17:49	18:40	20:34	21:25	21:59	21:50	21:00	19:50	18:40	16:42	16:22
17	08:37	07:49	06:47	06:35	05:38	05:12	05:33	06:20	07:11	08:02	07:58	08:40
	16:54	17:51	18:42	20:36	21:26	22:00	21:49	20:58	19:48	18:38	16:41	16:22
18	08:36	07:47	06:45	06:33	05:36	05:12	05:34	06:21	07:13	08:04	08:00	08:41
	16:55	17:52	18:43	20:37	21:28	22:00	21:48	20:56	19:45	18:36	16:40	16:22
19	08:35	07:45	06:42	06:31	05:35	05:12	05:35	06:23	07:15	08:06	08:02	08:41
	16:57	17:54	18:45	20:39	21:29	22:00	21:47	20:54	19:43	18:34	16:38	16:22
20	08:34	07:43	06:40	06:29	05:34	05:12	05:36	06:25	07:16	08:08	08:04	08:42
	16:59	17:56	18:47	20:41	21:31	22:01	21:46	20:51	19:40	18:32	16:37	16:23
21	08:33	07:41	06:38	06:27	05:32	05:12	05:38	06:26	07:18	08:10	08:05	08:43
	17:00	17:58	18:49	20:43	21:32	22:01	21:44	20:49	19:38	18:29	16:36	16:23
22	08:32	07:39	06:35	06:24	05:31	05:13	05:39	06:28	07:20	08:11	08:07	08:43
	17:02	18:00	18:50	20:44	21:34	22:01	21:43	20:47	19:36	18:27	16:35	16:24
23	08:30	07:36	06:33	06:22	05:30	05:13	05:41	06:30	07:21	08:13	08:09	08:44
	17:04	18:02	18:52	20:46	21:35	22:01	21:42	20:45	19:33	18:25	16:33	16:24
24	08:29	07:34	06:31	06:20	05:28	05:13	05:42	06:31	07:23	08:15	08:10	08:44
	17:06	18:04	18:54	20:48	21:36	22:01	21:40	20:43	19:31	18:23	16:32	16:25
25	08:28	07:32	06:28	06:18	05:27	05:14	05:43	06:33	07:25	07:17	08:12	08:44
	17:07	18:06	18:56	20:50	21:38	22:02	21:39	20:41	19:29	17:21	16:31	16:25
26	08:27	07:30	06:26	06:16	05:26	05:14	05:45	06:35	07:26	07:19	08:14	08:45
	17:09	18:07	18:57	20:51	21:39	22:02	21:37	20:38	19:26	17:19	16:30	16:26
27	08:25	07:28	06:23	06:14	05:25	05:14	05:46	06:36	07:28	07:20	08:15	08:45
	17:11	18:09	18:59	20:53	21:40	22:01	21:36	20:36	19:24	17:17	16:29	16:27
28	08:24	07:26	06:21	06:12	05:24	05:15	05:48	06:38	07:30	07:22	08:17	08:45
	17:13	18:11	19:01	20:55	21:42	22:01	21:34	20:34	19:22	17:15	16:29	16:28
29	08:22		07:19	06:10	05:23	05:15	05:49	06:40	07:31	07:24	08:18	08:45
	17:15		20:03	20:56	21:43	22:01	21:33	20:32	19:19	17:13	16:28	16:29
30	08:21		07:16	06:08	05:22	05:16	05:51	06:41	07:33	07:26	08:20	08:45
	17:17		20:04	20:58	21:44	22:01	21:31	20:29	19:17	17:11	16:27	16:29
31	08:19		07:14		05:21		05:52	06:43		07:28		08:45
	17:18		20:06		21:45		21:30	20:27		17:09		16:30
Potential sun hours	257	277	367	417	487	501	504	455	381	331	265	241
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

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SHADOW - Calendar

Calculation: 6839 Garrane WF Worst Case - V150 **Shadow receptor:** T - 20

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:46	08:18	07:24	07:12	06:06	05:20	05:17	05:54	06:45	07:35	07:30	08:21
	16:32	17:20	18:13	20:08	21:00	21:47	22:01	21:28	20:25	19:15	17:07	16:26
2	08:45	08:16	07:21	07:10	06:04	05:19	05:17	05:56	06:46	07:36	07:31	08:23
	16:33	17:22	18:15	20:10	21:02	21:48	22:00	21:26	20:23	19:12	17:06	16:26
3	08:45	08:15	07:19	07:07	06:02	05:18	05:18	05:57	06:48	07:38	07:33	08:24
	16:34	17:24	18:17	20:11	21:03	21:49	22:00	21:25	20:20	19:10	17:04	16:25
4	08:45	08:13	07:17	07:05	06:00	05:17	05:19	05:59	06:50	07:40	07:35	08:26
	16:35	17:26	18:18	20:13	21:05	21:50	22:00	21:23	20:18	19:08	17:02	16:24
5	08:45	08:11	07:15	07:03	05:58	05:17	05:20	06:00	06:51	07:42	07:37	08:27
	16:36	17:28	18:20	20:15	21:07	21:51	21:59	21:21	20:16	19:05	17:00	16:24
6	08:44	08:10	07:12	07:00	05:57	05:16	05:21	06:02	06:53	07:43	07:39	08:28
	16:38	17:30	18:22	20:17	21:08	21:52	21:59	21:19	20:13	19:03	16:58	16:23
7	08:44	08:08	07:10	06:58	05:55	05:16	05:22	06:04	06:55	07:45	07:41	08:30
	16:39	17:32	18:24	20:18	21:10	21:53	21:58	21:18	20:11	19:01	16:57	16:23
8	08:44	08:06	07:08	06:56	05:53	05:15	05:22	06:05	06:56	07:47	07:42	08:31
	16:40	17:34	18:26	20:20	21:12	21:54	21:57	21:16	20:09	18:58	16:55	16:23
9	08:43	08:04	07:06	06:53	05:51	05:14	05:23	06:07	06:58	07:48	07:44	08:32
	16:42	17:36	18:28	20:22	21:13	21:55	21:57	21:14	20:06	18:56	16:53	16:22
10	08:43	08:02	07:03	06:51	05:49	05:14	05:24	06:08	07:00	07:50	07:46	08:33
	16:43	17:37	18:29	20:24	21:15	21:55	21:56	21:12	20:04	18:54	16:52	16:22
11	08:42	08:01	07:01	06:49	05:48	05:14	05:26	06:10	07:01	07:52	07:48	08:34
	16:44	17:39	18:31	20:25	21:17	21:56	21:55	21:10	20:02	18:52	16:50	16:22
12	08:41	07:59	06:59	06:47	05:46	05:13	05:27	06:12	07:03	07:54	07:50	08:35
	16:46	17:41	18:33	20:27	21:18	21:57	21:54	21:08	19:59	18:49	16:48	16:22
13	08:40	07:57	06:56	06:44	05:44	05:13	05:28	06:13	07:05	07:55	07:51	08:36
	16:47	17:43	18:35	20:29	21:20	21:58	21:53	21:06	19:57	18:47	16:47	16:22
14	08:40	07:55	06:54	06:42	05:43	05:13	05:29	06:15	07:06	07:57	07:53	08:37
	16:49	17:45	18:36	20:31	21:21	21:58	21:52	21:04	19:55	18:45	16:45	16:22
15	08:39	07:53	06:52	06:40	05:41	05:13	05:30	06:17	07:08	07:59	07:55	08:38
	16:51	17:47	18:38	20:32	21:23	21:59	21:51	21:02	19:52	18:43	16:44	16:22
16	08:38	07:51	06:49	06:38	05:40	05:12	05:31	06:18	07:10	08:01	07:57	08:39
	16:52	17:49	18:40	20:34	21:25	21:59	21:50	21:00	19:50	18:40	16:42	16:22
17	08:37	07:49	06:47	06:35	05:38	05:12	05:33	06:20	07:11	08:02	07:59	08:40
	16:54	17:51	18:42	20:36	21:26	22:00	21:49	20:58	19:48	18:38	16:41	16:22
18	08:36	07:47	06:45	06:33	05:37	05:12	05:34	06:22	07:13	08:04	08:00	08:41
	16:55	17:53	18:44	20:38	21:28	22:00	21:48	20:56	19:45	18:36	16:40	16:22
19	08:35	07:45	06:42	06:31	05:35	05:12	05:35	06:23	07:15	08:06	08:02	08:41
	16:57	17:54	18:45	20:39	21:29	22:01	21:47	20:54	19:43	18:34	16:38	16:23
20	08:34	07:43	06:40	06:29	05:34	05:12	05:36	06:25	07:16	08:08	08:04	08:42
	16:59	17:56	18:47	20:41	21:31	22:01	21:46	20:52	19:41	18:32	16:37	16:23
21	08:33	07:41	06:38	06:27	05:32	05:13	05:38	06:27	07:18	08:10	08:05	08:43
	17:01	17:58	18:49	20:43	21:32	22:01	21:44	20:49	19:38	18:30	16:36	16:23
22	08:32	07:39	06:35	06:25	05:31	05:13	05:39	06:28	07:20	08:11	08:07	08:43
	17:02	18:00	18:51	20:44	21:34	22:01	21:43	20:47	19:36	18:27	16:35	16:24
23	08:31	07:37	06:33	06:22	05:30	05:13	05:41	06:30	07:21	08:13	08:09	08:44
	17:04	18:02	18:52	20:46	21:35	22:01	21:42	20:45	19:33	18:25	16:34	16:24
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	17:06	18:04	18:54	20:48	21:36	22:02	21:40	20:43	19:31	18:23	16:32	16:25
25	08:28	07:32	06:28	06:18	05:27	05:14	05:43	06:33	07:25	07:17	08:12	08:45
	17:08	18:06	18:56	20:50	21:38	22:02	21:39	20:41	19:29	17:21	16:31	16:25
26	08:27	07:30	06:26	06:16	05:26	05:14	05:45	06:35	07:26	07:19	08:14	08:45
	17:09	18:07	18:58	20:51	21:39	22:02	21:38	20:39	19:26	17:19	16:30	16:26
27	08:25	07:28	06:24	06:14	05:25	05:14	05:46	06:36	07:28	07:20	08:15	08:45
	17:11	18:09	18:59	20:53	21:40	22:02	21:36	20:36	19:24	17:17	16:29	16:27
28	08:24	07:26	06:21	06:12	05:24	05:15	05:48	06:38	07:30	07:22	08:17	08:45
	17:13	18:11	19:01	20:55	21:42	22:01	21:35	20:34	19:22	17:15	16:29	16:28
29	08:22		07:19	06:10	05:23	05:16	05:49	06:40	07:31	07:24	08:18	08:45
	17:15		20:03	20:57	21:43	22:01	21:33	20:32	19:19	17:13	16:28	16:29
30	08:21		07:17	06:08	05:22	05:16	05:51	06:41	07:33	07:26	08:20	08:46
	17:17		20:05	20:58	21:44	22:01	21:31	20:30	19:17	17:11	16:27	16:30
31	08:19		07:14		05:21		05:52	06:43		07:28		08:46
	17:19		20:06		21:45		21:30	20:27		17:09		16:30
Potential sun hours	257	277	367	417	487	501	504	455	381	331	265	241
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
Jennings O'Donovan
Finisklin Business Park
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+353719161416
Kathlyn Feeney / kfeeney@jodireland.com

Calculated:
09/06/2025 13:54/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Worst Case - V150 **Shadow receptor:** U - 21

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:46	08:18	07:24	07:12	06:06	05:20	05:17	05:54	06:45	07:35	07:30	08:21
	16:32	17:20	18:13	20:08	21:00	21:47	22:01	21:28	20:25	19:15	17:07	16:26
2	08:45	08:16	07:21	07:10	06:04	05:19	05:17	05:56	06:46	07:36	07:31	08:23
	16:33	17:22	18:15	20:10	21:02	21:48	22:00	21:26	20:23	19:12	17:06	16:26
3	08:45	08:15	07:19	07:07	06:02	05:18	05:18	05:57	06:48	07:38	07:33	08:24
	16:34	17:24	18:17	20:11	21:03	21:49	22:00	21:25	20:20	19:10	17:04	16:25
4	08:45	08:13	07:17	07:05	06:00	05:17	05:19	05:59	06:50	07:40	07:35	08:26
	16:35	17:26	18:18	20:13	21:05	21:50	22:00	21:23	20:18	19:08	17:02	16:24
5	08:45	08:11	07:15	07:03	05:58	05:17	05:20	06:00	06:51	07:42	07:37	08:27
	16:36	17:28	18:20	20:15	21:07	21:51	21:59	21:21	20:16	19:05	17:00	16:24
6	08:44	08:10	07:12	07:00	05:57	05:16	05:21	06:02	06:53	07:43	07:39	08:28
	16:38	17:30	18:22	20:17	21:08	21:52	21:59	21:19	20:13	19:03	16:58	16:23
7	08:44	08:08	07:10	06:58	05:55	05:16	05:22	06:04	06:55	07:45	07:41	08:30
	16:39	17:32	18:24	20:18	21:10	21:53	21:58	21:18	20:11	19:01	16:57	16:23
8	08:44	08:06	07:08	06:56	05:53	05:15	05:22	06:05	06:56	07:47	07:42	08:31
	16:40	17:34	18:26	20:20	21:12	21:54	21:57	21:16	20:09	18:58	16:55	16:23
9	08:43	08:04	07:06	06:53	05:51	05:14	05:23	06:07	06:58	07:48	07:44	08:32
	16:42	17:36	18:28	20:22	21:13	21:55	21:57	21:14	20:06	18:56	16:53	16:22
10	08:43	08:02	07:03	06:51	05:49	05:14	05:24	06:08	07:00	07:50	07:46	08:33
	16:43	17:37	18:29	20:24	21:15	21:55	21:56	21:12	20:04	18:54	16:52	16:22
11	08:42	08:01	07:01	06:49	05:48	05:14	05:26	06:10	07:01	07:52	07:48	08:34
	16:44	17:39	18:31	20:25	21:17	21:56	21:55	21:10	20:02	18:52	16:50	16:22
12	08:41	07:59	06:59	06:47	05:46	05:13	05:27	06:12	07:03	07:54	07:50	08:35
	16:46	17:41	18:33	20:27	21:18	21:57	21:54	21:08	19:59	18:49	16:48	16:22
13	08:40	07:57	06:56	06:44	05:44	05:13	05:28	06:13	07:05	07:55	07:51	08:36
	16:47	17:43	18:35	20:29	21:20	21:58	21:53	21:06	19:57	18:47	16:47	16:22
14	08:40	07:55	06:54	06:42	05:43	05:13	05:29	06:15	07:06	07:57	07:53	08:37
	16:49	17:45	18:36	20:31	21:21	21:58	21:52	21:04	19:55	18:45	16:45	16:22
15	08:39	07:53	06:52	06:40	05:41	05:13	05:30	06:17	07:08	07:59	07:55	08:38
	16:51	17:47	18:38	20:32	21:23	21:59	21:51	21:02	19:52	18:43	16:44	16:22
16	08:38	07:51	06:49	06:38	05:40	05:12	05:31	06:18	07:10	08:01	07:57	08:39
	16:52	17:49	18:40	20:34	21:25	21:59	21:50	21:00	19:50	18:40	16:42	16:22
17	08:37	07:49	06:47	06:35	05:38	05:12	05:33	06:20	07:11	08:02	07:59	08:40
	16:54	17:51	18:42	20:36	21:26	22:00	21:49	20:58	19:48	18:38	16:41	16:22
18	08:36	07:47	06:45	06:33	05:37	05:12	05:34	06:22	07:13	08:04	08:00	08:41
	16:55	17:53	18:44	20:38	21:28	22:00	21:48	20:56	19:45	18:36	16:40	16:22
19	08:35	07:45	06:42	06:31	05:35	05:12	05:35	06:23	07:15	08:06	08:02	08:41
	16:57	17:54	18:45	20:39	21:29	22:01	21:47	20:54	19:43	18:34	16:38	16:23
20	08:34	07:43	06:40	06:29	05:34	05:12	05:36	06:25	07:16	08:08	08:04	08:42
	16:59	17:56	18:47	20:41	21:31	22:01	21:46	20:52	19:41	18:32	16:37	16:23
21	08:33	07:41	06:38	06:27	05:32	05:13	05:38	06:27	07:18	08:10	08:05	08:43
	17:01	17:58	18:49	20:43	21:32	22:01	21:44	20:49	19:38	18:30	16:36	16:23
22	08:32	07:39	06:35	06:25	05:31	05:13	05:39	06:28	07:20	08:11	08:07	08:43
	17:02	18:00	18:51	20:44	21:34	22:01	21:43	20:47	19:36	18:27	16:35	16:24
23	08:31	07:37	06:33	06:22	05:30	05:13	05:41	06:30	07:21	08:13	08:09	08:44
	17:04	18:02	18:52	20:46	21:35	22:01	21:42	20:45	19:33	18:25	16:34	16:24
24	08:29	07:34	06:31	06:20	05:28	05:13	05:42	06:32	07:23	08:15	08:11	08:44
	17:06	18:04	18:54	20:48	21:36	22:02	21:40	20:43	19:31	18:23	16:32	16:25
25	08:28	07:32	06:28	06:18	05:27	05:14	05:43	06:33	07:25	07:17	08:12	08:45
	17:08	18:06	18:56	20:50	21:38	22:02	21:39	20:41	19:29	17:21	16:31	16:25
26	08:27	07:30	06:26	06:16	05:26	05:14	05:45	06:35	07:26	07:19	08:14	08:45
	17:09	18:07	18:58	20:51	21:39	22:02	21:38	20:39	19:26	17:19	16:30	16:26
27	08:25	07:28	06:24	06:14	05:25	05:14	05:46	06:36	07:28	07:20	08:15	08:45
	17:11	18:09	18:59	20:53	21:41	22:02	21:36	20:36	19:24	17:17	16:29	16:27
28	08:24	07:26	06:21	06:12	05:24	05:15	05:48	06:38	07:30	07:22	08:17	08:45
	17:13	18:11	19:01	20:55	21:42	22:01	21:35	20:34	19:22	17:15	16:29	16:28
29	08:22		07:19	06:10	05:23	05:16	05:49	06:40	07:31	07:24	08:18	08:45
	17:15		20:03	20:57	21:43	22:01	21:33	20:32	19:19	17:13	16:28	16:29
30	08:21		07:17	06:08	05:22	05:16	05:51	06:41	07:33	07:26	08:20	08:46
	17:17		20:05	20:58	21:44	22:01	21:31	20:30	19:17	17:11	16:27	16:30
31	08:19		07:14		05:21		05:52	06:43		07:28		08:46
	17:19		20:06		21:45		21:30	20:27		17:09		16:30
Potential sun hours	257	277	367	417	487	501	504	455	381	331	265	241
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
Jennings O'Donovan
Finisklin Business Park
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+353719161416
Kathlyn Feeney / kfeeney@jodireland.com

Calculated:
09/06/2025 13:54/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Worst Case - V150 **Shadow receptor:** V - 22

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January	February	March	April	May	June		July		August	September	October	November	December
1	08:46	08:18	07:24	07:12	06:06	05:20		05:17	05:48 (1)	05:54	06:45	07:35	07:30	08:21
	16:32	17:20	18:13	20:08	21:00	21:47		22:01	5 05:53 (1)	21:28	20:25	19:15	17:07	16:26
2	08:45	08:16	07:21	07:10	06:04	05:19		05:17	05:49 (1)	05:56	06:46	07:36	07:31	08:23
	16:33	17:22	18:15	20:10	21:02	21:48		22:00	4 05:53 (1)	21:26	20:23	19:12	17:06	16:26
3	08:45	08:15	07:19	07:07	06:02	05:18		05:18	05:49 (1)	05:57	06:48	07:38	07:33	08:24
	16:34	17:24	18:17	20:11	21:03	21:49		22:00	3 05:52 (1)	21:25	20:20	19:10	17:04	16:25
4	08:45	08:13	07:17	07:05	06:00	05:17		05:19	05:50 (1)	05:59	06:50	07:40	07:35	08:26
	16:35	17:26	18:18	20:13	21:05	21:50		22:00	2 05:52 (1)	21:23	20:18	19:08	17:02	16:24
5	08:45	08:11	07:15	07:03	05:58	05:17		05:20		06:00	06:51	07:42	07:37	08:27
	16:36	17:28	18:20	20:15	21:07	21:51		21:59		21:21	20:16	19:05	17:00	16:24
6	08:44	08:10	07:12	07:00	05:57	05:16		05:21		06:02	06:53	07:43	07:39	08:28
	16:38	17:30	18:22	20:17	21:08	21:52		21:59		21:19	20:13	19:03	16:58	16:23
7	08:44	08:08	07:10	06:58	05:55	05:16		05:22		06:04	06:55	07:45	07:41	08:30
	16:39	17:32	18:24	20:18	21:10	21:53		21:58		21:18	20:11	19:01	16:57	16:23
8	08:44	08:06	07:08	06:56	05:53	05:15	05:45 (1)	05:22		06:05	06:56	07:47	07:42	08:31
	16:40	17:34	18:26	20:20	21:12	21:54	1 05:46 (1)	21:57		21:16	20:09	18:58	16:55	16:23
9	08:43	08:04	07:06	06:53	05:51	05:14	05:45 (1)	05:23		06:07	06:58	07:48	07:44	08:32
	16:42	17:36	18:28	20:22	21:13	21:55	2 05:47 (1)	21:57		21:14	20:06	18:56	16:53	16:22
10	08:43	08:02	07:03	06:51	05:49	05:14	05:44 (1)	05:24		06:08	07:00	07:50	07:46	08:33
	16:43	17:37	18:29	20:24	21:15	21:55	3 05:47 (1)	21:56		21:12	20:04	18:54	16:52	16:22
11	08:42	08:01	07:01	06:49	05:48	05:14	05:44 (1)	05:26		06:10	07:01	07:52	07:48	08:34
	16:44	17:39	18:31	20:25	21:17	21:56	4 05:48 (1)	21:55		21:10	20:02	18:52	16:50	16:22
12	08:41	07:59	06:59	06:47	05:46	05:13	05:44 (1)	05:27		06:12	07:03	07:54	07:50	08:35
	16:46	17:41	18:33	20:27	21:18	21:57	5 05:49 (1)	21:54		21:08	19:59	18:49	16:48	16:22
13	08:41	07:57	06:56	06:44	05:44	05:13	05:43 (1)	05:28		06:13	07:05	07:55	07:51	08:36
	16:47	17:43	18:35	20:29	21:20	21:58	6 05:49 (1)	21:53		21:06	19:57	18:47	16:47	16:22
14	08:40	07:55	06:54	06:42	05:43	05:13	05:43 (1)	05:29		06:15	07:06	07:57	07:53	08:37
	16:49	17:45	18:36	20:31	21:21	21:58	7 05:50 (1)	21:52		21:04	19:55	18:45	16:45	16:22
15	08:39	07:53	06:52	06:40	05:41	05:13	05:43 (1)	05:30		06:17	07:08	07:59	07:55	08:38
	16:51	17:47	18:38	20:32	21:23	21:59	7 05:50 (1)	21:51		21:02	19:52	18:43	16:44	16:22
16	08:38	07:51	06:49	06:38	05:40	05:12	05:43 (1)	05:31		06:18	07:10	08:01	07:57	08:39
	16:52	17:49	18:40	20:34	21:25	21:59	8 05:51 (1)	21:50		21:00	19:50	18:40	16:42	16:22
17	08:37	07:49	06:47	06:35	05:38	05:12	05:43 (1)	05:33		06:20	07:11	08:02	07:59	08:40
	16:54	17:51	18:42	20:36	21:26	22:00	8 05:51 (1)	21:49		20:58	19:48	18:38	16:41	16:22
18	08:36	07:47	06:45	06:33	05:37	05:12	05:43 (1)	05:34		06:22	07:13	08:04	08:00	08:41
	16:55	17:53	18:44	20:38	21:28	22:00	8 05:51 (1)	21:48		20:56	19:45	18:36	16:40	16:22
19	08:35	07:45	06:42	06:31	05:35	05:12	05:43 (1)	05:35		06:23	07:15	08:06	08:02	08:41
	16:57	17:54	18:45	20:39	21:29	22:01	8 05:51 (1)	21:47		20:54	19:43	18:34	16:38	16:23
20	08:34	07:43	06:40	06:29	05:34	05:12	05:43 (1)	05:36		06:25	07:16	08:08	08:04	08:42
	16:59	17:56	18:47	20:41	21:31	22:01	9 05:52 (1)	21:46		20:52	19:41	18:32	16:37	16:23
21	08:33	07:41	06:38	06:27	05:32	05:13	05:44 (1)	05:38		06:27	07:18	08:10	08:05	08:43
	17:01	17:58	18:49	20:43	21:32	22:01	9 05:53 (1)	21:44		20:49	19:38	18:30	16:36	16:23
22	08:32	07:39	06:35	06:25	05:31	05:13	05:44 (1)	05:39		06:28	07:20	08:11	08:07	08:43
	17:02	18:00	18:51	20:44	21:34	22:01	9 05:53 (1)	21:43		20:47	19:36	18:27	16:35	16:24
23	08:31	07:37	06:33	06:22	05:30	05:13	05:44 (1)	05:41		06:30	07:21	08:13	08:09	08:44
	17:04	18:02	18:52	20:46	21:35	22:01	9 05:53 (1)	21:42		20:45	19:33	18:25	16:34	16:24
24	08:29	07:34	06:31	06:20	05:28	05:13	05:44 (1)	05:42		06:32	07:23	08:15	08:11	08:44
	17:06	18:04	18:54	20:48	21:36	22:02	8 05:52 (1)	21:40		20:43	19:31	18:23	16:32	16:25
25	08:28	07:32	06:28	06:18	05:27	05:14	05:45 (1)	05:43		06:33	07:25	07:17	08:12	08:45
	17:08	18:06	18:56	20:50	21:38	22:02	8 05:53 (1)	21:39		20:41	19:29	17:21	16:31	16:25
26	08:27	07:30	06:26	06:16	05:26	05:14	05:45 (1)	05:45		06:35	07:26	07:19	08:14	08:45
	17:09	18:07	18:58	20:51	21:39	22:02	8 05:53 (1)	21:38		20:39	19:26	17:19	16:30	16:26
27	08:25	07:28	06:24	06:14	05:25	05:14	05:46 (1)	05:46		06:36	07:28	07:20	08:15	08:45
	17:11	18:09	18:59	20:53	21:41	22:02	7 05:53 (1)	21:36		20:36	19:24	17:17	16:29	16:27
28	08:24	07:26	06:21	06:12	05:24	05:15	05:46 (1)	05:48		06:38	07:30	07:22	08:17	08:45
	17:13	18:11	19:01	20:55	21:42	22:01	7 05:53 (1)	21:35		20:34	19:22	17:15	16:29	16:28
29	08:22		07:19	06:10	05:23	05:16	05:47 (1)	05:49		06:40	07:31	07:24	08:18	08:45
	17:15		20:03	20:57	21:43	22:01	6 05:53 (1)	21:33		20:32	19:19	17:13	16:28	16:29
30	08:21		07:17	06:08	05:22	05:16	05:47 (1)	05:51		06:41	07:33	07:26	08:20	08:46
	17:17		20:05	20:58	21:44	22:01	5 05:52 (1)	21:31		20:30	19:17	17:11	16:27	16:30
31	08:19		07:14		05:21			05:52		06:43		07:28		08:46
	17:19		20:06		21:45			21:30		20:27		17:09		16:30
Potential sun hours	257	277	367	417	487	501		504		455	381	331	265	241
Total, worst case						152		14						
Sun reduction						0.35		0.33						
Oper. time red.						1.00		1.00						
Wind dir. red.						0.61		0.61						
Total reduction						0.21		0.20						
Total, real						32		3						

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
Jennings O'Donovan
Finisklin Business Park
F91 RHH9 Sligo
+353719161416
Kathlyn Feeney / kfeeney@jodireland.com
Calculated:
09/06/2025 13:54/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Worst Case - V150 **Shadow receptor:** W - 23

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:46	08:18	07:24	07:12	06:06	05:20	05:49 (1)	05:17	05:48 (1)	05:54	06:45	07:35	07:30	08:21
	16:32	17:20	18:13	20:08	21:00	21:47	05:54 (1)	22:01	06:04 (1)	21:28	20:25	19:15	17:07	16:26
2	08:45	08:16	07:21	07:10	06:04	05:19	05:48 (1)	05:17	05:49 (1)	05:56	06:46	07:36	07:31	08:23
	16:33	17:22	18:15	20:10	21:02	21:48	05:54 (1)	22:00	06:05 (1)	21:26	20:23	19:12	17:06	16:26
3	08:45	08:15	07:19	07:07	06:02	05:18	05:48 (1)	05:18	05:49 (1)	05:57	06:48	07:38	07:33	08:24
	16:34	17:24	18:17	20:11	21:03	21:49	05:56 (1)	22:00	06:04 (1)	21:25	20:20	19:10	17:04	16:25
4	08:45	08:13	07:17	07:05	06:00	05:17	05:47 (1)	05:19	05:50 (1)	05:59	06:50	07:40	07:35	08:26
	16:35	17:26	18:18	20:13	21:05	21:50	05:56 (1)	22:00	06:04 (1)	21:23	20:18	19:08	17:02	16:24
5	08:45	08:11	07:15	07:03	05:58	05:17	05:46 (1)	05:20	05:51 (1)	06:00	06:51	07:42	07:37	08:27
	16:36	17:28	18:20	20:15	21:07	21:51	05:56 (1)	21:59	06:04 (1)	21:21	20:16	19:05	17:00	16:24
6	08:44	08:10	07:12	07:00	05:57	05:16	05:46 (1)	05:21	05:52 (1)	06:02	06:53	07:43	07:39	08:28
	16:38	17:30	18:22	20:17	21:08	21:52	05:58 (1)	21:59	06:04 (1)	21:19	20:13	19:03	16:58	16:23
7	08:44	08:08	07:10	06:58	05:55	05:16	05:45 (1)	05:22	05:53 (1)	06:04	06:55	07:45	07:41	08:30
	16:39	17:32	18:24	20:18	21:10	21:53	05:58 (1)	21:58	06:04 (1)	21:18	20:11	19:01	16:57	16:23
8	08:44	08:06	07:08	06:56	05:53	05:15	05:45 (1)	05:22	05:53 (1)	06:05	06:56	07:47	07:42	08:31
	16:40	17:34	18:26	20:20	21:12	21:54	05:59 (1)	21:57	06:03 (1)	21:16	20:09	18:58	16:55	16:23
9	08:43	08:04	07:06	06:53	05:51	05:14	05:45 (1)	05:23	05:54 (1)	06:07	06:58	07:48	07:44	08:32
	16:42	17:36	18:28	20:22	21:13	21:55	05:59 (1)	21:57	06:03 (1)	21:14	20:07	18:56	16:53	16:22
10	08:43	08:02	07:03	06:51	05:49	05:14	05:44 (1)	05:24	05:55 (1)	06:08	07:00	07:50	07:46	08:33
	16:43	17:37	18:29	20:24	21:15	21:55	05:59 (1)	21:56	06:02 (1)	21:12	20:04	18:54	16:52	16:22
11	08:42	08:01	07:01	06:49	05:48	05:14	05:44 (1)	05:26	05:56 (1)	06:10	07:01	07:52	07:48	08:34
	16:44	17:39	18:31	20:25	21:17	21:56	06:00 (1)	21:55	06:02 (1)	21:10	20:02	18:52	16:50	16:22
12	08:41	07:59	06:59	06:47	05:46	05:13	05:44 (1)	05:27	05:57 (1)	06:12	07:03	07:54	07:50	08:35
	16:46	17:41	18:33	20:27	21:18	21:57	06:01 (1)	21:54	06:01 (1)	21:08	19:59	18:49	16:48	16:22
13	08:41	07:57	06:56	06:44	05:44	05:13	05:43 (1)	05:28	05:58 (1)	06:13	07:05	07:55	07:51	08:36
	16:47	17:43	18:35	20:29	21:20	21:58	06:00 (1)	21:53	06:00 (1)	21:06	19:57	18:47	16:47	16:22
14	08:40	07:55	06:54	06:42	05:43	05:13	05:43 (1)	05:29		06:15	07:06	07:57	07:53	08:37
	16:49	17:45	18:36	20:31	21:21	21:58	06:01 (1)	21:52		21:04	19:55	18:45	16:45	16:22
15	08:39	07:53	06:52	06:40	05:41	05:13	05:43 (1)	05:30		06:17	07:08	07:59	07:55	08:38
	16:51	17:47	18:38	20:32	21:23	21:59	06:01 (1)	21:51		21:02	19:52	18:43	16:44	16:22
16	08:38	07:51	06:49	06:38	05:40	05:12	05:43 (1)	05:31		06:18	07:10	08:01	07:57	08:39
	16:52	17:49	18:40	20:34	21:25	21:59	06:01 (1)	21:50		21:00	19:50	18:40	16:42	16:22
17	08:37	07:49	06:47	06:35	05:38	05:12	05:43 (1)	05:33		06:20	07:11	08:02	07:59	08:40
	16:54	17:51	18:42	20:36	21:26	22:00	06:02 (1)	21:49		20:58	19:48	18:38	16:41	16:22
18	08:36	07:47	06:45	06:33	05:37	05:12	05:43 (1)	05:34		06:22	07:13	08:04	08:00	08:41
	16:55	17:53	18:44	20:38	21:28	22:00	06:02 (1)	21:48		20:56	19:45	18:36	16:40	16:22
19	08:35	07:45	06:42	06:31	05:35	05:12	05:43 (1)	05:35		06:23	07:15	08:06	08:02	08:41
	16:57	17:54	18:45	20:39	21:29	22:01	06:02 (1)	21:47		20:54	19:43	18:34	16:38	16:23
20	08:34	07:43	06:40	06:29	05:34	05:12	05:43 (1)	05:36		06:25	07:16	08:08	08:04	08:42
	16:59	17:56	18:47	20:41	21:31	22:01	06:02 (1)	21:46		20:52	19:41	18:32	16:37	16:23
21	08:33	07:41	06:38	06:27	05:32	05:13	05:44 (1)	05:38		06:27	07:18	08:10	08:05	08:43
	17:01	17:58	18:49	20:43	21:32	22:01	06:03 (1)	21:44		20:49	19:38	18:30	16:36	16:23
22	08:32	07:39	06:35	06:25	05:31	05:13	05:44 (1)	05:39		06:28	07:20	08:11	08:07	08:43
	17:02	18:00	18:51	20:44	21:34	22:01	06:03 (1)	21:43		20:47	19:36	18:27	16:35	16:24
23	08:31	07:37	06:33	06:22	05:30	05:13	05:44 (1)	05:41		06:30	07:21	08:13	08:09	08:44
	17:04	18:02	18:52	20:46	21:35	22:01	06:03 (1)	21:42		20:45	19:33	18:25	16:34	16:24
24	08:29	07:34	06:31	06:20	05:28	05:13	05:44 (1)	05:42		06:32	07:23	08:15	08:11	08:44
	17:06	18:04	18:54	20:48	21:36	22:02	06:03 (1)	21:40		20:43	19:31	18:23	16:32	16:25
25	08:28	07:32	06:28	06:18	05:27	05:14	05:45 (1)	05:43		06:33	07:25	07:17	08:12	08:45
	17:08	18:06	18:56	20:50	21:38	22:02	06:04 (1)	21:39		20:41	19:29	17:21	16:31	16:25
26	08:27	07:30	06:26	06:16	05:26	05:14	05:45 (1)	05:45		06:35	07:26	07:19	08:14	08:45
	17:09	18:07	18:58	20:51	21:39	22:02	06:04 (1)	21:38		20:39	19:26	17:19	16:30	16:26
27	08:25	07:28	06:24	06:14	05:25	05:14	05:46 (1)	05:46		06:36	07:28	07:20	08:15	08:45
	17:11	18:09	18:59	20:53	21:41	22:02	06:04 (1)	21:36		20:36	19:24	17:17	16:29	16:27
28	08:24	07:26	06:21	06:12	05:24	05:15	05:46 (1)	05:48		06:38	07:30	07:22	08:17	08:45
	17:13	18:11	19:01	20:55	21:42	22:01	06:04 (1)	21:35		20:34	19:22	17:15	16:29	16:28
29	08:22		07:19	06:10	05:23	05:16	05:47 (1)	05:49		06:40	07:31	07:24	08:18	08:45
	17:15		20:03	20:57	21:43	22:01	06:04 (1)	21:33		20:32	19:19	17:13	16:28	16:29
30	08:21		07:17	06:08	05:22	05:51 (1)	05:47 (1)	05:51		06:41	07:33	07:26	08:20	08:46
	17:17		20:05	20:58	21:44	05:52 (1)	06:04 (1)	21:31		20:30	19:17	17:11	16:27	16:30
31	08:19		07:14		05:21	05:50 (1)		05:52		06:43		07:28		08:46
	17:19		20:06		21:46	05:53 (1)		21:30		20:27		17:09		16:30
Potential sun hours	257	277	367	417	487	501	504	455	381	331	265	241
Total, worst case					4	470	135					
Sun reduction					0.39	0.35	0.33					
Oper. time red.					1.00	1.00	1.00					
Wind dir. red.					0.60	0.60	0.60					
Total reduction					0.24	0.21	0.20					
Total, real					1	98	27					

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
Jennings O'Donovan
Finisklin Business Park
F91 RHH9 Sligo
+353719161416
Kathlyn Feeney / kfeeney@jodireland.com
Calculated:
09/06/2025 13:54/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Worst Case - V150 **Shadow receptor:** X - 24

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January	February	March	April		May		June	
1	08:46	08:18	07:24	07:12		06:06		05:20	05:49 (2)
	16:32	17:20	18:13	20:08		21:00		21:47 35	06:24 (2)
2	08:45	08:16	07:21	07:10		06:04		05:19	05:48 (2)
	16:33	17:22	18:15	20:10		21:02		21:48 36	06:24 (2)
3	08:45	08:15	07:19	07:07		06:02		05:18	05:48 (2)
	16:34	17:24	18:17	20:11		21:03		21:49 37	06:25 (2)
4	08:45	08:13	07:17	07:05	07:28 (1)	06:00		05:17	05:47 (2)
	16:35	17:26	18:18	20:13 5	07:33 (1)	21:05		21:50 38	06:25 (2)
5	08:45	08:11	07:15	07:03	07:26 (1)	05:58		05:17	05:46 (2)
	16:36	17:28	18:20	20:15 10	07:36 (1)	21:07		21:51 39	06:25 (2)
6	08:44	08:10	07:12	07:00	07:23 (1)	05:57		05:16	05:46 (2)
	16:38	17:30	18:22	20:17 13	07:36 (1)	21:08		21:52 39	06:25 (2)
7	08:44	08:08	07:10	06:58	07:21 (1)	05:55		05:15	05:45 (2)
	16:39	17:32	18:24	20:18 16	07:37 (1)	21:10		21:53 40	06:25 (2)
8	08:44	08:06	07:08	06:56	07:19 (1)	05:53		05:15	05:45 (2)
	16:40	17:34	18:26	20:20 19	07:38 (1)	21:12		21:54 41	06:26 (2)
9	08:43	08:04	07:06	06:53	07:16 (1)	05:51		05:14	05:45 (2)
	16:42	17:36	18:28	20:22 22	07:38 (1)	21:13		21:55 41	06:26 (2)
10	08:43	08:02	07:03	06:51	07:14 (1)	05:49		05:14	05:45 (2)
	16:43	17:37	18:29	20:24 25	07:39 (1)	21:15		21:55 41	06:26 (2)
11	08:42	08:01	07:01	06:49	07:12 (1)	05:48		05:14	05:45 (2)
	16:44	17:39	18:31	20:25 27	07:39 (1)	21:17		21:56 41	06:26 (2)
12	08:41	07:59	06:59	06:47	07:10 (1)	05:46		05:13	05:46 (2)
	16:46	17:41	18:33	20:27 30	07:40 (1)	21:18		21:57 41	06:27 (2)
13	08:41	07:57	06:56	06:44	07:08 (1)	05:44	06:11 (2)	05:13	05:45 (2)
	16:47	17:43	18:35	20:29 32	07:40 (1)	21:20 1	06:12 (2)	21:58 41	06:26 (2)
14	08:40	07:55	06:54	06:42	07:05 (1)	05:43	06:09 (2)	05:13	05:45 (2)
	16:49	17:45	18:36	20:31 34	07:39 (1)	21:22 4	06:13 (2)	21:58 41	06:26 (2)
15	08:39	07:53	06:52	06:40	07:03 (1)	05:41	06:08 (2)	05:13	05:46 (2)
	16:51	17:47	18:38	20:32 36	07:39 (1)	21:23 7	06:15 (2)	21:59 41	06:27 (2)
16	08:38	07:51	06:49	06:38	07:01 (1)	05:40	06:06 (2)	05:12	05:46 (2)
	16:52	17:49	18:40	20:34 38	07:39 (1)	21:25 10	06:16 (2)	21:59 41	06:27 (2)
17	08:37	07:49	06:47	06:35	07:01 (1)	05:38	06:05 (2)	05:12	05:46 (2)
	16:54	17:51	18:42	20:36 37	07:38 (1)	21:26 12	06:17 (2)	22:00 41	06:27 (2)
18	08:36	07:47	06:45	06:33	07:01 (1)	05:37	06:04 (2)	05:12	05:47 (2)
	16:55	17:53	18:44	20:38 37	07:38 (1)	21:28 14	06:18 (2)	22:00 40	06:27 (2)
19	08:35	07:45	06:42	06:31	07:02 (1)	05:35	06:02 (2)	05:12	05:47 (2)
	16:57	17:54	18:45	20:39 35	07:37 (1)	21:29 17	06:19 (2)	22:01 40	06:27 (2)
20	08:34	07:43	06:40	06:29	07:02 (1)	05:34	06:01 (2)	05:12	05:47 (2)
	16:59	17:56	18:47	20:41 35	07:37 (1)	21:31 18	06:19 (2)	22:01 40	06:27 (2)
21	08:33	07:41	06:38	06:27	07:02 (1)	05:32	06:00 (2)	05:13	05:48 (2)
	17:00	17:58	18:49	20:43 33	07:35 (1)	21:32 20	06:20 (2)	22:01 40	06:28 (2)
22	08:32	07:39	06:35	06:25	07:02 (1)	05:31	05:59 (2)	05:13	05:48 (2)
	17:02	18:00	18:51	20:44 32	07:34 (1)	21:34 22	06:21 (2)	22:01 40	06:28 (2)
23	08:31	07:37	06:33	06:22	07:03 (1)	05:30	05:57 (2)	05:13	05:48 (2)
	17:04	18:02	18:52	20:46 30	07:33 (1)	21:35 24	06:21 (2)	22:02 40	06:28 (2)
24	08:29	07:34	06:31	06:20	07:04 (1)	05:28	05:56 (2)	05:13	05:48 (2)
	17:06	18:04	18:54	20:48 27	07:31 (1)	21:36 25	06:21 (2)	22:02 40	06:28 (2)
25	08:28	07:32	06:28	06:18	07:05 (1)	05:27	05:55 (2)	05:14	05:48 (2)
	17:08	18:06	18:56	20:50 24	07:29 (1)	21:38 27	06:22 (2)	22:02 41	06:29 (2)
26	08:27	07:30	06:26	06:16	07:07 (1)	05:26	05:54 (2)	05:14	05:48 (2)
	17:09	18:07	18:58	20:51 20	07:27 (1)	21:39 28	06:22 (2)	22:02 41	06:29 (2)
27	08:25	07:28	06:24	06:14	07:09 (1)	05:25	05:53 (2)	05:14	05:49 (2)
	17:11	18:09	18:59	20:53 16	07:25 (1)	21:41 30	06:23 (2)	22:02 41	06:30 (2)
28	08:24	07:26	06:21	06:12	07:12 (1)	05:24	05:52 (2)	05:15	05:49 (2)
	17:13	18:11	19:01	20:55 9	07:21 (1)	21:42 31	06:23 (2)	22:01 40	06:29 (2)
29	08:22		07:19	06:10		05:23	05:51 (2)	05:15	05:49 (2)
	17:15		20:03	20:57		21:43 32	06:23 (2)	22:01 41	06:30 (2)
30	08:21		07:17	06:08		05:22	05:51 (2)	05:16	05:49 (2)
	17:17		20:05	20:58		21:44 33	06:24 (2)	22:01 41	06:30 (2)
31	08:19		07:14			05:21	05:50 (2)		
	17:19		20:06			21:46 34	06:24 (2)		
Potential sun hours	257	277	367	417		487		501	
Total, worst case					642		389		1199
Sun reduction					0.38		0.39		0.35
Oper. time red.					1.00		1.00		1.00
Wind dir. red.					0.60		0.60		0.60
Total reduction					0.23		0.24		0.21
Total, real					146		92		249

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

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Kathlyn Feeney / kfeeney@jodireland.com

SHADOW - Calendar

Calculation: 6839 Garrane WF Worst Case - V150 **Shadow receptor:** X - 24

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	July		August		September		October	November	December
1	05:17		05:49 (2)	05:54		06:45	07:11 (1)	07:35	07:30	08:21
	22:01	41	06:30 (2)	21:28		20:25	27	07:38 (1)	19:15	17:07	16:26
2	05:17		05:50 (2)	05:56		06:46		07:13 (1)	07:36	07:31	08:23
	22:00	41	06:31 (2)	21:26		20:23	25	07:38 (1)	19:12	17:06	16:26
3	05:18		05:49 (2)	05:57		06:48		07:14 (1)	07:38	07:33	08:24
	22:00	41	06:30 (2)	21:25		20:20	22	07:36 (1)	19:10	17:04	16:25
4	05:19		05:50 (2)	05:59		06:50		07:16 (1)	07:40	07:35	08:26
	22:00	41	06:31 (2)	21:23		20:18	19	07:35 (1)	19:08	17:02	16:24
5	05:20		05:51 (2)	06:00		06:51		07:17 (1)	07:42	07:37	08:27
	21:59	40	06:31 (2)	21:21		20:16	16	07:33 (1)	19:05	17:00	16:24
6	05:21		05:52 (2)	06:02		06:53		07:19 (1)	07:43	07:39	08:28
	21:59	40	06:32 (2)	21:19		20:14	13	07:32 (1)	19:03	16:58	16:23
7	05:22		05:53 (2)	06:04		06:55		07:21 (1)	07:45	07:41	08:30
	21:58	39	06:32 (2)	21:18		20:11	10	07:31 (1)	19:01	16:57	16:23
8	05:22		05:53 (2)	06:05		06:56		07:22 (1)	07:47	07:42	08:31
	21:57	38	06:31 (2)	21:16		20:09	6	07:28 (1)	18:58	16:55	16:23
9	05:23		05:54 (2)	06:07		06:58		07:24 (1)	07:49	07:44	08:32
	21:57	37	06:31 (2)	21:14		20:07	1	07:25 (1)	18:56	16:53	16:22
10	05:24		05:55 (2)	06:08		07:00			07:50	07:46	08:33
	21:56	37	06:32 (2)	21:12		20:04			18:54	16:52	16:22
11	05:26		05:56 (2)	06:10		07:01			07:52	07:48	08:34
	21:55	36	06:32 (2)	21:10		20:02			18:52	16:50	16:22
12	05:27		05:57 (2)	06:12		07:03			07:54	07:50	08:35
	21:54	35	06:32 (2)	21:08		19:59			18:49	16:48	16:22
13	05:28		05:58 (2)	06:13		07:05			07:55	07:51	08:36
	21:53	34	06:32 (2)	21:06		19:57			18:47	16:47	16:22
14	05:29		06:00 (2)	06:15		07:06			07:57	07:53	08:37
	21:52	33	06:33 (2)	21:04		19:55			18:45	16:45	16:22
15	05:30		06:01 (2)	06:17	07:19 (1)	07:08			07:59	07:55	08:38
	21:51	31	06:32 (2)	21:02	11	07:30 (1)	19:52			18:43	16:44	16:22
16	05:31		06:02 (2)	06:18	07:16 (1)	07:10			08:01	07:57	08:39
	21:50	30	06:32 (2)	21:00	17	07:33 (1)	19:50			18:40	16:42	16:22
17	05:33		06:03 (2)	06:20	07:13 (1)	07:11			08:03	07:59	08:40
	21:49	29	06:32 (2)	20:58	21	07:34 (1)	19:48			18:38	16:41	16:22
18	05:34		06:04 (2)	06:22	07:12 (1)	07:13			08:04	08:00	08:41
	21:48	28	06:32 (2)	20:56	24	07:36 (1)	19:45			18:36	16:40	16:22
19	05:35		06:05 (2)	06:23	07:11 (1)	07:15			08:06	08:02	08:41
	21:47	26	06:31 (2)	20:54	27	07:38 (1)	19:43			18:34	16:38	16:22
20	05:36		06:07 (2)	06:25	07:09 (1)	07:16			08:08	08:04	08:42
	21:46	25	06:32 (2)	20:52	29	07:38 (1)	19:41			18:32	16:37	16:23
21	05:38		06:08 (2)	06:27	07:08 (1)	07:18			08:10	08:06	08:43
	21:44	23	06:31 (2)	20:49	32	07:40 (1)	19:38			18:30	16:36	16:23
22	05:39		06:09 (2)	06:28	07:06 (1)	07:20			08:11	08:07	08:43
	21:43	21	06:30 (2)	20:47	34	07:40 (1)	19:36			18:27	16:35	16:24
23	05:41		06:11 (2)	06:30	07:06 (1)	07:21			08:13	08:09	08:44
	21:42	20	06:31 (2)	20:45	34	07:40 (1)	19:33			18:25	16:34	16:24
24	05:42		06:12 (2)	06:32	07:04 (1)	07:23			08:15	08:11	08:44
	21:40	18	06:30 (2)	20:43	36	07:40 (1)	19:31			18:23	16:32	16:25
25	05:43		06:13 (2)	06:33	07:04 (1)	07:25			07:17	08:12	08:45
	21:39	16	06:29 (2)	20:41	37	07:41 (1)	19:29			17:21	16:31	16:25
26	05:45		06:15 (2)	06:35	07:04 (1)	07:26			07:19	08:14	08:45
	21:38	13	06:28 (2)	20:39	37	07:41 (1)	19:26			17:19	16:30	16:26
27	05:46		06:16 (2)	06:36	07:03 (1)	07:28			07:20	08:15	08:45
	21:36	11	06:27 (2)	20:36	38	07:41 (1)	19:24			17:17	16:29	16:27
28	05:48		06:17 (2)	06:38	07:05 (1)	07:30			07:22	08:17	08:45
	21:35	9	06:26 (2)	20:34	36	07:41 (1)	19:22			17:15	16:29	16:28
29	05:49		06:19 (2)	06:40	07:06 (1)	07:31			07:24	08:19	08:45
	21:33	6	06:25 (2)	20:32	34	07:40 (1)	19:19			17:13	16:28	16:29
30	05:51		06:20 (2)	06:41	07:08 (1)	07:33			07:26	08:20	08:46
	21:31	3	06:23 (2)	20:30	32	07:40 (1)	19:17			17:11	16:27	16:29
31	05:52			06:43	07:10 (1)				07:28			08:46
	21:30			20:27	30	07:40 (1)				17:09		16:30
Potential sun hours	504			455			381			331	265	241
Total, worst case		842			509			139				
Sun reduction		0.33			0.35			0.34				
Oper. time red.		1.00			1.00			1.00				
Wind dir. red.		0.60			0.60			0.60				
Total reduction		0.20			0.21			0.20				
Total, real		167			107			28				

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

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Kathlyn Feeney / kfeeney@jodireland.com

Calculated:
09/06/2025 13:54/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Worst Case - V150 **Shadow receptor:** Y - 25

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January		February		March		April		May		June	
1	08:46		08:18		07:24		07:12		07:35 (1)		06:06	
	16:32		17:20		18:13		20:08	29	08:04 (1)		21:00	9
2	08:45		08:16		07:21		07:10		07:32 (1)		06:04	
	16:33		17:22		18:15		20:10	32	08:04 (1)		21:02	12
3	08:45		08:15		07:19		07:07		07:30 (1)		06:02	
	16:34		17:24		18:17		20:11	34	08:04 (1)		21:03	15
4	08:45		08:13		07:17		07:05		07:28 (1)		06:00	
	16:35		17:26		18:18		20:13	36	08:04 (1)		21:05	18
5	08:45		08:11		07:15		07:03		07:27 (1)		05:58	
	16:36		17:28		18:20		20:15	37	08:04 (1)		21:07	21
6	08:44		08:10		07:12		07:00		07:26 (1)		05:57	
	16:38		17:30		18:22		20:17	36	08:02 (1)		21:08	23
7	08:44		08:08		07:10		06:58		07:26 (1)		05:55	
	16:39		17:32		18:24		20:18	36	08:02 (1)		21:10	25
8	08:44		08:06		07:08		06:56		07:27 (1)		05:53	
	16:40		17:34		18:26		20:20	34	08:01 (1)		21:12	27
9	08:43		08:04		07:06		06:53		07:26 (1)		05:51	
	16:42		17:36		18:28		20:22	34	08:00 (1)		21:13	29
10	08:43		08:02		07:03		06:51		07:27 (1)		05:49	
	16:43		17:37		18:29		20:24	32	07:59 (1)		21:15	31
11	08:42		08:01		07:01		06:49		07:28 (1)		05:48	
	16:44		17:39		18:31		20:25	29	07:57 (1)		21:17	33
12	08:41		07:59		06:59		06:47		07:29 (1)		05:46	
	16:46		17:41		18:33		20:27	27	07:56 (1)		21:18	35
13	08:41		07:57		06:56		06:44		07:31 (1)		05:44	
	16:47		17:43		18:35		20:29	23	07:54 (1)		21:20	37
14	08:40		07:55		06:54		06:42		07:32 (1)		05:43	
	16:49		17:45		18:36		20:31	19	07:51 (1)		21:22	38
15	08:39		07:53		06:52		06:40		07:34 (1)		05:41	
	16:51		17:47		18:38		20:32	14	07:48 (1)		21:23	40
16	08:38		07:51		06:49		06:38				05:40	
	16:52		17:49		18:40		20:34				21:25	41
17	08:37		07:49		06:47		06:35				05:38	
	16:54		17:51		18:42		20:36				21:26	41
18	08:36		07:47		06:45		06:33				05:37	
	16:55		17:53		18:44		20:38				21:28	42
19	08:35		07:45		06:42		06:31				05:35	
	16:57		17:54		18:45		20:39				21:29	41
20	08:34		07:43		06:40		06:29				05:34	
	16:59		17:56		18:47		20:41				21:31	41
21	08:33		07:41		06:38		06:27				05:32	
	17:00		17:58		18:49		20:43				21:32	41
22	08:32		07:39		06:35		06:25				05:31	
	17:02		18:00		18:51		20:44				21:34	40
23	08:31		07:37		06:33		06:22				05:30	
	17:04		18:02		18:52		20:46				21:35	40
24	08:29		07:34		06:31		06:54 (1)		06:20		05:28	
	17:06		18:04		18:54	4	06:58 (1)		20:48		21:36	39
25	08:28		07:32		06:28		06:51 (1)		06:18		05:27	
	17:08		18:06		18:56	8	06:59 (1)		20:50		21:38	39
26	08:27		07:30		06:26		06:49 (1)		06:16		05:26	
	17:09		18:07		18:58	12	07:01 (1)		20:51		21:39	38
27	08:25		07:28		06:24		06:46 (1)		06:14		05:25	
	17:11		18:09		18:59	15	07:01 (1)		20:53		21:41	37
28	08:24		07:26		06:21		06:44 (1)		06:12		05:24	
	17:13		18:11		19:01	19	07:03 (1)		20:55		21:42	36
29	08:22				07:19		07:42 (1)		06:10		05:23	
	17:15				20:03	22	08:04 (1)		20:57	2	06:37 (2)		21:43	36
30	08:21				07:17		07:39 (1)		06:08		06:33 (2)		05:22	
	17:17				20:05	24	08:03 (1)		20:58	6	06:39 (2)		21:44	34
31	08:19				07:14		07:37 (1)						05:21	
	17:19				20:06	27	08:04 (1)						21:46	34
Potential sun hours	257		277		367		417		487		501	
Total, worst case						131		460		1013		668
Sun reduction						0.28		0.38		0.39		0.35
Oper. time red.						1.00		1.00		1.00		1.00
Wind dir. red.						0.61		0.61		0.60		0.60
Total reduction						0.17		0.23		0.24		0.21
Total, real						22		106		241		140

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

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Kathlyn Feeney / kfeeney@jodireland.com
Calculated:
09/06/2025 13:54/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Worst Case - V150 **Shadow receptor:** Y - 25

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	July		August		September		October	November	December
1	05:17		06:22 (2)	05:54		06:23 (2)	06:45		07:27 (1)	07:35	07:30	08:22
	22:01	23	06:45 (2)	21:28	34	06:57 (2)	20:25	29	07:56 (1)	19:15	17:07	16:26
2	05:17		06:22 (2)	05:56		06:25 (2)	06:46		07:26 (1)	07:36	07:31	08:23
	22:00	24	06:46 (2)	21:26	32	06:57 (2)	20:23	32	07:58 (1)	19:12	17:06	16:26
3	05:18		06:21 (2)	05:57		06:26 (2)	06:48		07:24 (1)	07:38	07:33	08:24
	22:00	25	06:46 (2)	21:25	31	06:57 (2)	20:20	34	07:58 (1)	19:10	17:04	16:25
4	05:19		06:21 (2)	05:59		06:28 (2)	06:50		07:24 (1)	07:40	07:35	08:26
	22:00	26	06:47 (2)	21:23	29	06:57 (2)	20:18	34	07:58 (1)	19:08	17:02	16:24
5	05:20		06:21 (2)	06:00		06:29 (2)	06:51		07:22 (1)	07:42	07:37	08:27
	21:59	27	06:48 (2)	21:21	27	06:56 (2)	20:16	36	07:58 (1)	19:05	17:00	16:24
6	05:21		06:21 (2)	06:02		06:31 (2)	06:53		07:22 (1)	07:43	07:39	08:28
	21:59	27	06:48 (2)	21:19	24	06:55 (2)	20:14	36	07:58 (1)	19:03	16:58	16:23
7	05:22		06:21 (2)	06:04		06:32 (2)	06:55		07:22 (1)	07:45	07:41	08:30
	21:58	28	06:49 (2)	21:18	22	06:54 (2)	20:11	37	07:59 (1)	19:01	16:57	16:23
8	05:22		06:20 (2)	06:05		06:34 (2)	06:56		07:22 (1)	07:47	07:42	08:31
	21:57	29	06:49 (2)	21:16	20	06:54 (2)	20:09	36	07:58 (1)	18:58	16:55	16:23
9	05:23		06:19 (2)	06:07		06:35 (2)	06:58		07:24 (1)	07:49	07:44	08:32
	21:57	31	06:50 (2)	21:14	17	06:52 (2)	20:07	34	07:58 (1)	18:56	16:53	16:22
10	05:24		06:19 (2)	06:08		06:37 (2)	07:00		07:25 (1)	07:50	07:46	08:33
	21:56	31	06:50 (2)	21:12	15	06:52 (2)	20:04	32	07:57 (1)	18:54	16:52	16:22
11	05:26		06:19 (2)	06:10		06:38 (2)	07:01		07:27 (1)	07:52	07:48	08:34
	21:55	32	06:51 (2)	21:10	12	06:50 (2)	20:02	30	07:57 (1)	18:52	16:50	16:22
12	05:27		06:19 (2)	06:12		06:40 (2)	07:03		07:29 (1)	07:54	07:50	08:35
	21:54	33	06:52 (2)	21:08	8	06:48 (2)	19:59	27	07:56 (1)	18:49	16:48	16:22
13	05:28		06:18 (2)	06:13		06:41 (2)	07:05		07:30 (1)	07:55	07:51	08:36
	21:53	34	06:52 (2)	21:06	5	06:46 (2)	19:57	25	07:55 (1)	18:47	16:47	16:22
14	05:29		06:19 (2)	06:15			07:06		07:32 (1)	07:57	07:53	08:37
	21:52	35	06:54 (2)	21:04			19:55	22	07:54 (1)	18:45	16:45	16:22
15	05:30		06:18 (2)	06:17			07:08		07:34 (1)	07:59	07:55	08:38
	21:51	36	06:54 (2)	21:02			19:52	19	07:53 (1)	18:43	16:44	16:22
16	05:31		06:18 (2)	06:18			07:10		07:35 (1)	08:01	07:57	08:39
	21:50	37	06:55 (2)	21:00			19:50	16	07:51 (1)	18:40	16:42	16:22
17	05:33		06:18 (2)	06:20			07:11		07:37 (1)	08:03	07:59	08:40
	21:49	37	06:55 (2)	20:58			19:48	13	07:50 (1)	18:38	16:41	16:22
18	05:34		06:17 (2)	06:22			07:13		07:38 (1)	08:04	08:00	08:41
	21:48	38	06:55 (2)	20:56			19:45	9	07:47 (1)	18:36	16:40	16:22
19	05:35		06:17 (2)	06:23			07:15		07:40 (1)	08:06	08:02	08:41
	21:47	38	06:55 (2)	20:54			19:43	5	07:45 (1)	18:34	16:38	16:22
20	05:36		06:17 (2)	06:25			07:16			08:08	08:04	08:42
	21:46	40	06:57 (2)	20:52			19:41			18:32	16:37	16:23
21	05:38		06:17 (2)	06:27			07:18			08:10	08:06	08:43
	21:44	40	06:57 (2)	20:49			19:38			18:30	16:36	16:23
22	05:39		06:16 (2)	06:28			07:20			08:11	08:07	08:43
	21:43	41	06:57 (2)	20:47			19:36			18:27	16:35	16:24
23	05:41		06:17 (2)	06:30			07:21			08:13	08:09	08:44
	21:42	41	06:58 (2)	20:45			19:33			18:25	16:34	16:24
24	05:42		06:16 (2)	06:32			07:23			08:15	08:11	08:44
	21:40	42	06:58 (2)	20:43			19:31			18:23	16:32	16:25
25	05:43		06:16 (2)	06:33			07:25			07:17	08:12	08:45
	21:39	41	06:57 (2)	20:41			19:29			17:21	16:31	16:25
26	05:45		06:16 (2)	06:35			07:26			07:19	08:14	08:45
	21:38	42	06:58 (2)	20:39			19:26			17:19	16:30	16:26
27	05:46		06:16 (2)	06:36		07:41 (1)	07:28			07:20	08:15	08:45
	21:36	42	06:58 (2)	20:36	4	07:45 (1)	19:24			17:17	16:29	16:27
28	05:48		06:17 (2)	06:38		07:36 (1)	07:30			07:22	08:17	08:45
	21:35	40	06:57 (2)	20:34	14	07:50 (1)	19:22			17:15	16:29	16:28
29	05:49		06:19 (2)	06:40		07:32 (1)	07:31			07:24	08:19	08:45
	21:33	39	06:58 (2)	20:32	20	07:52 (1)	19:19			17:13	16:28	16:29
30	05:51		06:20 (2)	06:41		07:31 (1)	07:33			07:26	08:20	08:46
	21:31	38	06:58 (2)	20:30	23	07:54 (1)	19:17			17:11	16:27	16:29
31	05:52		06:22 (2)	06:43		07:29 (1)				07:28		08:46
	21:30	36	06:58 (2)	20:27	27	07:56 (1)				17:09		16:30
Potential sun hours	504			455			381			331	265	241
Total, worst case		1073			364			506				
Sun reduction		0.33			0.35			0.34				
Oper. time red.		1.00			1.00			1.00				
Wind dir. red.		0.60			0.60			0.61				
Total reduction		0.20			0.21			0.20				
Total, real		215			78			104				

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

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SHADOW - Calendar

Calculation: 6839 Garrane WF Worst Case - V150 **Shadow receptor:** Z - 26

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January	February	March		April		May		June		
1	08:46	08:18	07:24		07:12		07:35 (1)		06:06		06:31 (2)		05:20		06:26 (2)
	16:32	17:20	18:13		20:08	33	08:08 (1)		21:00	20	06:51 (2)		21:47	16	06:42 (2)
2	08:45	08:16	07:21		07:10		07:32 (1)		06:04		06:29 (2)		05:19		06:28 (2)
	16:33	17:22	18:15		20:10	35	08:07 (1)		21:02	23	06:52 (2)		21:48	13	06:41 (2)
3	08:45	08:15	07:19		07:07		07:31 (1)		06:02		06:27 (2)		05:18		06:30 (2)
	16:34	17:24	18:17		20:11	35	08:06 (1)		21:03	25	06:52 (2)		21:49	9	06:39 (2)
4	08:45	08:13	07:17		07:05		07:31 (1)		06:00		06:25 (2)		05:17		06:34 (2)
	16:35	17:26	18:18		20:13	35	08:06 (1)		21:05	27	06:52 (2)		21:50	2	06:36 (2)
5	08:45	08:11	07:15		07:03		07:32 (1)		05:58		06:24 (2)		05:17		
	16:36	17:28	18:20		20:15	34	08:06 (1)		21:07	29	06:53 (2)		21:51		
6	08:44	08:10	07:12		07:00		07:32 (1)		05:57		06:22 (2)		05:16		
	16:38	17:30	18:22		20:17	32	08:04 (1)		21:08	31	06:53 (2)		21:52		
7	08:44	08:08	07:10		06:58		07:32 (1)		05:55		06:20 (2)		05:15		
	16:39	17:32	18:24		20:18	31	08:03 (1)		21:10	33	06:53 (2)		21:53		
8	08:44	08:06	07:08		06:56		07:33 (1)		05:53		06:19 (2)		05:15		
	16:40	17:34	18:26		20:20	29	08:02 (1)		21:12	35	06:54 (2)		21:54		
9	08:43	08:04	07:06		06:53		07:33 (1)		05:51		06:17 (2)		05:14		
	16:42	17:36	18:28		20:22	27	08:00 (1)		21:13	37	06:54 (2)		21:55		
10	08:43	08:02	07:03		06:51		07:35 (1)		05:49		06:15 (2)		05:14		
	16:43	17:37	18:29		20:24	23	07:58 (1)		21:15	38	06:53 (2)		21:55		
11	08:42	08:01	07:01		06:49		07:37 (1)		05:48		06:14 (2)		05:14		
	16:44	17:39	18:31		20:25	19	07:56 (1)		21:17	40	06:54 (2)		21:56		
12	08:41	07:59	06:59		06:47		07:39 (1)		05:46		06:13 (2)		05:13		
	16:46	17:41	18:33		20:27	14	07:53 (1)		21:18	40	06:53 (2)		21:57		
13	08:41	07:57	06:56		06:44				05:44		06:14 (2)		05:13		
	16:47	17:43	18:35		20:29				21:20	40	06:54 (2)		21:58		
14	08:40	07:55	06:54		06:42				05:43		06:13 (2)		05:13		
	16:49	17:45	18:36		20:31				21:22	40	06:53 (2)		21:58		
15	08:39	07:53	06:52		06:40				05:41		06:14 (2)		05:13		
	16:51	17:47	18:38		20:32				21:23	39	06:53 (2)		21:59		
16	08:38	07:51	06:49		06:38				05:40		06:14 (2)		05:12		
	16:52	17:49	18:40		20:34				21:25	38	06:52 (2)		21:59		
17	08:37	07:49	06:47		06:35				05:38		06:14 (2)		05:12		
	16:54	17:51	18:42		20:36				21:26	38	06:52 (2)		22:00		
18	08:36	07:47	06:45		06:33				05:37		06:15 (2)		05:12		
	16:55	17:53	18:44		20:38				21:28	37	06:52 (2)		22:00		
19	08:35	07:45	06:42		06:31				05:35		06:15 (2)		05:12		
	16:57	17:54	18:45		20:39				21:29	36	06:51 (2)		22:01		
20	08:34	07:43	06:40		06:29				05:34		06:16 (2)		05:12		
	16:59	17:56	18:47		20:41				21:31	35	06:51 (2)		22:01		
21	08:33	07:41	06:38		06:27				05:32		06:16 (2)		05:13		
	17:00	17:58	18:49		20:43				21:32	35	06:51 (2)		22:01		
22	08:32	07:39	06:35	06:58 (1)	06:25				05:31		06:17 (2)		05:13		
	17:02	18:00	18:51	3 07:01 (1)	20:44				21:34	33	06:50 (2)		22:01		
23	08:31	07:37	06:33	06:56 (1)	06:22				05:30		06:17 (2)		05:13		
	17:04	18:02	18:52	7 07:03 (1)	20:46				21:35	32	06:49 (2)		22:02		
24	08:29	07:34	06:31	06:54 (1)	06:20				05:28		06:18 (2)		05:13		
	17:06	18:04	18:54	11 07:05 (1)	20:48				21:36	30	06:48 (2)		22:02		
25	08:28	07:32	06:28	06:51 (1)	06:18				05:27		06:19 (2)		05:14		
	17:08	18:06	18:56	15 07:06 (1)	20:50				21:38	29	06:48 (2)		22:02		
26	08:27	07:30	06:26	06:49 (1)	06:16		06:40 (2)		05:26		06:19 (2)		05:14		
	17:09	18:07	18:58	18 07:07 (1)	20:51	5	06:45 (2)		21:39	28	06:47 (2)		22:02		
27	08:25	07:28	06:24	06:46 (1)	06:14		06:38 (2)		05:25		06:20 (2)		05:14		
	17:11	18:09	18:59	21 07:07 (1)	20:53	9	06:47 (2)		21:41	26	06:46 (2)		22:02		
28	08:24	07:26	06:21	06:44 (1)	06:12		06:36 (2)		05:24		06:21 (2)		05:15		
	17:13	18:11	19:01	23 07:07 (1)	20:55	12	06:48 (2)		21:42	25	06:46 (2)		22:01		
29	08:22		07:19	07:42 (1)	06:10		06:35 (2)		05:23		06:22 (2)		05:15		
	17:15		20:03	26 08:08 (1)	20:57	15	06:50 (2)		21:43	23	06:45 (2)		22:01		
30	08:21		07:17	07:39 (1)	06:08		06:33 (2)		05:22		06:24 (2)		05:16		
	17:17		20:05	28 08:07 (1)	20:58	18	06:51 (2)		21:44	21	06:45 (2)		22:01		
31	08:19		07:14	07:37 (1)					05:21		06:25 (2)				
	17:19		20:06	31 08:08 (1)					21:46	18	06:43 (2)				
Potential sun hours	257	277	367		417				487				501		
Total, worst case				183		406				981				40	
Sun reduction				0.28		0.38				0.39				0.35	
Oper. time red.				1.00		1.00				1.00				1.00	
Wind dir. red.				0.61		0.61				0.60				0.60	
Total reduction				0.17		0.23				0.24				0.21	
Total, real				31		94				234				8	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

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Calculated:
09/06/2025 13:54/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Worst Case - V150 **Shadow receptor:** Z - 26

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	July		August		September		October	November	December
1	05:17		05:54		06:23 (2)	06:45	07:36 (1)	07:35	07:30	08:22
	22:01		21:28	41	07:04 (2)	20:25	19	07:55 (1)	19:15	17:07	16:26
2	05:17		05:56		06:25 (2)	06:46		07:34 (1)	07:36	07:31	08:23
	22:00		21:26	39	07:04 (2)	20:23	23	07:57 (1)	19:12	17:06	16:26
3	05:18		05:57		06:26 (2)	06:48		07:31 (1)	07:38	07:33	08:24
	22:00		21:25	38	07:04 (2)	20:20	27	07:58 (1)	19:10	17:04	16:25
4	05:19		05:59		06:28 (2)	06:50		07:30 (1)	07:40	07:35	08:26
	22:00		21:23	36	07:04 (2)	20:18	29	07:59 (1)	19:08	17:02	16:24
5	05:20		06:00		06:29 (2)	06:51		07:28 (1)	07:42	07:37	08:27
	21:59		21:21	34	07:03 (2)	20:16	31	07:59 (1)	19:05	17:00	16:24
6	05:21		06:02		06:31 (2)	06:53		07:28 (1)	07:43	07:39	08:28
	21:59		21:19	33	07:04 (2)	20:14	32	08:00 (1)	19:03	16:58	16:23
7	05:22		06:04		06:32 (2)	06:55		07:27 (1)	07:45	07:41	08:30
	21:58		21:18	31	07:03 (2)	20:11	34	08:01 (1)	19:01	16:57	16:23
8	05:22		06:05		06:34 (2)	06:56		07:26 (1)	07:47	07:42	08:31
	21:57		21:16	29	07:03 (2)	20:09	34	08:00 (1)	18:58	16:55	16:23
9	05:23		06:38 (2)	06:07		06:35 (2)	06:58		07:25 (1)	07:49	07:44	08:32
	21:57	7	06:45 (2)	21:14	27	07:02 (2)	20:07	36	08:01 (1)	18:56	16:53	16:22
10	05:24		06:36 (2)	06:08		06:37 (2)	07:00		07:25 (1)	07:50	07:46	08:33
	21:56	11	06:47 (2)	21:12	24	07:01 (2)	20:04	35	08:00 (1)	18:54	16:52	16:22
11	05:26		06:34 (2)	06:10		06:38 (2)	07:01		07:27 (1)	07:52	07:48	08:34
	21:55	15	06:49 (2)	21:10	22	07:00 (2)	20:02	33	08:00 (1)	18:52	16:50	16:22
12	05:27		06:33 (2)	06:12		06:40 (2)	07:03		07:29 (1)	07:54	07:50	08:35
	21:54	17	06:50 (2)	21:08	20	07:00 (2)	19:59	31	08:00 (1)	18:49	16:48	16:22
13	05:28		06:32 (2)	06:13		06:41 (2)	07:05		07:30 (1)	07:55	07:51	08:36
	21:53	20	06:52 (2)	21:06	17	06:58 (2)	19:57	29	07:59 (1)	18:47	16:47	16:22
14	05:29		06:32 (2)	06:15		06:43 (2)	07:06		07:32 (1)	07:57	07:53	08:37
	21:52	22	06:54 (2)	21:04	14	06:57 (2)	19:55	26	07:58 (1)	18:45	16:45	16:22
15	05:30		06:31 (2)	06:17		06:44 (2)	07:08		07:34 (1)	07:59	07:55	08:38
	21:51	24	06:55 (2)	21:02	11	06:55 (2)	19:52	24	07:58 (1)	18:43	16:44	16:22
16	05:31		06:30 (2)	06:18		06:46 (2)	07:10		07:35 (1)	08:01	07:57	08:39
	21:50	26	06:56 (2)	21:00	8	06:54 (2)	19:50	21	07:56 (1)	18:40	16:42	16:22
17	05:33		06:29 (2)	06:20		06:47 (2)	07:11		07:37 (1)	08:03	07:59	08:40
	21:49	27	06:56 (2)	20:58	4	06:51 (2)	19:48	18	07:55 (1)	18:38	16:41	16:22
18	05:34		06:28 (2)	06:22			07:13		07:38 (1)	08:04	08:00	08:41
	21:48	29	06:57 (2)	20:56			19:45	15	07:53 (1)	18:36	16:40	16:22
19	05:35		06:28 (2)	06:23			07:15		07:40 (1)	08:06	08:02	08:41
	21:47	30	06:58 (2)	20:54			19:43	12	07:52 (1)	18:34	16:38	16:22
20	05:36		06:28 (2)	06:25			07:16		07:42 (1)	08:08	08:04	08:42
	21:46	31	06:59 (2)	20:52			19:41	8	07:50 (1)	18:32	16:37	16:23
21	05:38		06:27 (2)	06:27			07:18		07:43 (1)	08:10	08:06	08:43
	21:44	33	07:00 (2)	20:49			19:38	4	07:47 (1)	18:30	16:36	16:23
22	05:39		06:26 (2)	06:28			07:20			08:11	08:07	08:43
	21:43	34	07:00 (2)	20:47			19:36			18:27	16:35	16:24
23	05:41		06:26 (2)	06:30			07:21			08:13	08:09	08:44
	21:42	35	07:01 (2)	20:45			19:33			18:25	16:34	16:24
24	05:42		06:26 (2)	06:32			07:23			08:15	08:11	08:44
	21:40	36	07:02 (2)	20:43			19:31			18:23	16:32	16:25
25	05:43		06:25 (2)	06:33			07:25			07:17	08:12	08:45
	21:39	37	07:02 (2)	20:41			19:29			17:21	16:31	16:25
26	05:45		06:25 (2)	06:35			07:26			07:19	08:14	08:45
	21:38	38	07:03 (2)	20:39			19:26			17:19	16:30	16:26
27	05:46		06:24 (2)	06:36			07:28			07:20	08:15	08:45
	21:36	39	07:03 (2)	20:36			19:24			17:17	16:29	16:27
28	05:48		06:24 (2)	06:38			07:30			07:22	08:17	08:45
	21:35	39	07:03 (2)	20:34			19:22			17:15	16:29	16:28
29	05:49		06:24 (2)	06:40			07:31			07:24	08:19	08:45
	21:33	40	07:04 (2)	20:32			19:19			17:13	16:28	16:29
30	05:51		06:23 (2)	06:41		07:44 (1)	07:33			07:26	08:20	08:46
	21:31	40	07:03 (2)	20:30	4	07:48 (1)	19:17			17:11	16:27	16:29
31	05:52		06:24 (2)	06:43		07:39 (1)				07:28		08:46
	21:30	40	07:04 (2)	20:27	14	07:53 (1)				17:09		16:30
Potential sun hours	504			455			381			331	265	241
Total, worst case		670			446			521				
Sun reduction		0.33			0.35			0.34				
Oper. time red.		1.00			1.00			1.00				
Wind dir. red.		0.60			0.60			0.61				
Total reduction		0.20			0.21			0.21				
Total, real		134			95			107				

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

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SHADOW - Calendar

Calculation: 6839 Garrane WF Worst Case - V150 **Shadow receptor:** AA - 27

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January	February	March			April			May			June
1	08:46	08:18	07:24			07:12		07:35 (1)	06:06		06:31 (2)	05:20
	16:32	17:20	18:13			20:08	25	08:00 (1)	21:00	17	06:48 (2)	21:47
2	08:45	08:16	07:21			07:10		07:32 (1)	06:04		06:29 (2)	05:19
	16:33	17:22	18:15			20:10	27	07:59 (1)	21:02	20	06:49 (2)	21:48
3	08:45	08:15	07:19			07:07		07:30 (1)	06:02		06:27 (2)	05:18
	16:34	17:24	18:17			20:11	29	07:59 (1)	21:03	22	06:49 (2)	21:49
4	08:45	08:13	07:17			07:05		07:28 (1)	06:00		06:25 (2)	05:17
	16:35	17:26	18:18			20:13	31	07:59 (1)	21:05	24	06:49 (2)	21:50
5	08:45	08:11	07:15			07:03		07:26 (1)	05:58		06:24 (2)	05:17
	16:36	17:28	18:20			20:15	33	07:59 (1)	21:07	26	06:50 (2)	21:51
6	08:44	08:10	07:12			07:00		07:25 (1)	05:57		06:22 (2)	05:16
	16:38	17:30	18:22			20:17	32	07:57 (1)	21:08	28	06:50 (2)	21:52
7	08:44	08:08	07:10			06:58		07:26 (1)	05:55		06:20 (2)	05:15
	16:39	17:32	18:24			20:18	31	07:57 (1)	21:10	30	06:50 (2)	21:53
8	08:44	08:06	07:08			06:56		07:27 (1)	05:53		06:19 (2)	05:15
	16:40	17:34	18:26			20:20	29	07:56 (1)	21:12	32	06:51 (2)	21:54
9	08:43	08:04	07:06			06:53		07:26 (1)	05:51		06:17 (2)	05:14
	16:42	17:36	18:28			20:22	28	07:54 (1)	21:13	33	06:50 (2)	21:55
10	08:43	08:02	07:03			06:51		07:28 (1)	05:49		06:15 (2)	05:14
	16:43	17:37	18:29			20:24	25	07:53 (1)	21:15	35	06:50 (2)	21:55
11	08:42	08:01	07:01			06:49		07:29 (1)	05:48		06:14 (2)	05:14
	16:44	17:39	18:31			20:25	22	07:51 (1)	21:17	36	06:50 (2)	21:56
12	08:41	07:59	06:59			06:47		07:31 (1)	05:46		06:13 (2)	05:13
	16:46	17:41	18:33			20:27	18	07:49 (1)	21:18	37	06:50 (2)	21:57
13	08:41	07:57	06:56			06:44		07:33 (1)	05:44		06:14 (2)	05:13
	16:47	17:43	18:35			20:29	14	07:47 (1)	21:20	36	06:50 (2)	21:58
14	08:40	07:55	06:54			06:42		07:38 (1)	05:43		06:13 (2)	05:13
	16:49	17:45	18:36			20:31	2	07:40 (1)	21:22	36	06:49 (2)	21:58
15	08:39	07:53	06:52			06:40			05:41		06:14 (2)	05:13
	16:51	17:47	18:38			20:32			21:23	35	06:49 (2)	21:59
16	08:38	07:51	06:49			06:38			05:40		06:14 (2)	05:12
	16:52	17:49	18:40			20:34			21:25	34	06:48 (2)	21:59
17	08:37	07:49	06:47			06:35			05:38		06:15 (2)	05:12
	16:54	17:51	18:42			20:36			21:26	33	06:48 (2)	22:00
18	08:36	07:47	06:45			06:33			05:37		06:16 (2)	05:12
	16:55	17:53	18:44			20:38			21:28	32	06:48 (2)	22:00
19	08:35	07:45	06:42			06:31			05:35		06:16 (2)	05:12
	16:57	17:54	18:45			20:39			21:29	31	06:47 (2)	22:01
20	08:34	07:43	06:40			06:29			05:34		06:17 (2)	05:12
	16:59	17:56	18:47			20:41			21:31	29	06:46 (2)	22:01
21	08:33	07:41	06:38			06:27			05:32		06:18 (2)	05:13
	17:00	17:58	18:49			20:43			21:32	28	06:46 (2)	22:01
22	08:32	07:39	06:35			06:25			05:31		06:19 (2)	05:13
	17:02	18:00	18:51			20:44			21:34	26	06:45 (2)	22:01
23	08:31	07:37	06:33			06:22			05:30		06:19 (2)	05:13
	17:04	18:02	18:52			20:46			21:35	25	06:44 (2)	22:02
24	08:29	07:34	06:31			06:20			05:28		06:20 (2)	05:13
	17:06	18:04	18:54			20:48			21:36	23	06:43 (2)	22:02
25	08:28	07:32	06:28		06:51 (1)	06:18			05:27		06:21 (2)	05:14
	17:08	18:06	18:56	3	06:54 (1)	20:50			21:38	21	06:42 (2)	22:02
26	08:27	07:30	06:26		06:49 (1)	06:16		06:40 (2)	05:26		06:22 (2)	05:14
	17:09	18:07	18:58	7	06:56 (1)	20:51	2	06:42 (2)	21:39	19	06:41 (2)	22:02
27	08:25	07:28	06:24		06:46 (1)	06:14		06:38 (2)	05:25		06:24 (2)	05:14
	17:11	18:09	18:59	11	06:57 (1)	20:53	6	06:44 (2)	21:41	16	06:40 (2)	22:02
28	08:24	07:26	06:21		06:44 (1)	06:12		06:36 (2)	05:24		06:25 (2)	05:15
	17:13	18:11	19:01	14	06:58 (1)	20:55	9	06:45 (2)	21:42	13	06:38 (2)	22:01
29	08:22		07:19		07:42 (1)	06:10		06:35 (2)	05:23		06:28 (2)	05:15
	17:15		20:03	17	07:59 (1)	20:57	12	06:47 (2)	21:43	8	06:36 (2)	22:01
30	08:21		07:17		07:39 (1)	06:08		06:33 (2)	05:22			05:16
	17:17		20:05	20	07:59 (1)	20:58	15	06:48 (2)	21:44			22:01
31	08:19		07:14		07:37 (1)				05:21			
	17:19		20:06	22	07:59 (1)				21:46			
Potential sun hours	257	277	367			417			487			501
Total, worst case				94			390			785		
Sun reduction				0.28			0.38			0.39		
Oper. time red.				1.00			1.00			1.00		
Wind dir. red.				0.61			0.61			0.60		
Total reduction				0.17			0.23			0.24		
Total, real				16			90			187		

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

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SHADOW - Calendar

Calculation: 6839 Garrane WF Worst Case - V150 **Shadow receptor:** AA - 27

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	July			August			September			October		November	December
1	05:17			05:54		06:23 (2)	06:45		07:28 (1)	07:35		07:30	08:22
	22:01			21:28	37	07:00 (2)	20:25	22	07:50 (1)	19:15		17:07	16:26
2	05:17			05:56		06:25 (2)	06:46		07:26 (1)	07:36		07:31	08:23
	22:00			21:26	36	07:01 (2)	20:23	26	07:52 (1)	19:12		17:06	16:26
3	05:18			05:57		06:26 (2)	06:48		07:24 (1)	07:38		07:33	08:24
	22:00			21:25	34	07:00 (2)	20:20	28	07:52 (1)	19:10		17:04	16:25
4	05:19			05:59		06:28 (2)	06:50		07:24 (1)	07:40		07:35	08:26
	22:00			21:23	33	07:01 (2)	20:18	29	07:53 (1)	19:08		17:02	16:24
5	05:20			06:00		06:29 (2)	06:51		07:22 (1)	07:42		07:37	08:27
	21:59			21:21	31	07:00 (2)	20:16	31	07:53 (1)	19:05		17:00	16:24
6	05:21			06:02		06:31 (2)	06:53		07:21 (1)	07:43		07:39	08:28
	21:59			21:19	29	07:00 (2)	20:14	32	07:53 (1)	19:03		16:58	16:23
7	05:22			06:04		06:32 (2)	06:55		07:21 (1)	07:45		07:41	08:30
	21:58			21:18	28	07:00 (2)	20:11	33	07:54 (1)	19:01		16:57	16:23
8	05:22			06:05		06:34 (2)	06:56		07:22 (1)	07:47		07:42	08:31
	21:57			21:16	26	07:00 (2)	20:09	31	07:53 (1)	18:58		16:55	16:23
9	05:23			06:07		06:35 (2)	06:58		07:24 (1)	07:49		07:44	08:32
	21:57			21:14	24	06:59 (2)	20:07	29	07:53 (1)	18:56		16:53	16:22
10	05:24			06:08		06:37 (2)	07:00		07:25 (1)	07:50		07:46	08:33
	21:56			21:12	21	06:58 (2)	20:04	27	07:52 (1)	18:54		16:52	16:22
11	05:26			06:10		06:38 (2)	07:01		07:27 (1)	07:52		07:48	08:34
	21:55			21:10	19	06:57 (2)	20:02	25	07:52 (1)	18:52		16:50	16:22
12	05:27			06:12		06:40 (2)	07:03		07:29 (1)	07:54		07:50	08:35
	21:54			21:08	17	06:57 (2)	19:59	23	07:52 (1)	18:49		16:48	16:22
13	05:28			06:13		06:41 (2)	07:05		07:30 (1)	07:55		07:51	08:36
	21:53			21:06	14	06:55 (2)	19:57	20	07:50 (1)	18:47		16:47	16:22
14	05:29		06:39 (2)	06:15		06:43 (2)	07:06		07:32 (1)	07:57		07:53	08:37
	21:52	4	06:43 (2)	21:04	11	06:54 (2)	19:55	18	07:50 (1)	18:45		16:45	16:22
15	05:30		06:36 (2)	06:17		06:44 (2)	07:08		07:34 (1)	07:59		07:55	08:38
	21:51	10	06:46 (2)	21:02	8	06:52 (2)	19:52	15	07:49 (1)	18:43		16:44	16:22
16	05:31		06:34 (2)	06:18		06:46 (2)	07:10		07:35 (1)	08:01		07:57	08:39
	21:50	14	06:48 (2)	21:00	5	06:51 (2)	19:50	12	07:47 (1)	18:40		16:42	16:22
17	05:33		06:32 (2)	06:20		06:47 (2)	07:11		07:37 (1)	08:03		07:59	08:40
	21:49	18	06:50 (2)	20:58	1	06:48 (2)	19:48	8	07:45 (1)	18:38		16:41	16:22
18	05:34		06:31 (2)	06:22			07:13		07:38 (1)	08:04		08:00	08:41
	21:48	20	06:51 (2)	20:56			19:45	4	07:42 (1)	18:36		16:40	16:22
19	05:35		06:30 (2)	06:23			07:15			08:06		08:02	08:41
	21:47	22	06:52 (2)	20:54			19:43			18:34		16:38	16:22
20	05:36		06:30 (2)	06:25			07:16			08:08		08:04	08:42
	21:46	24	06:54 (2)	20:52			19:41			18:32		16:37	16:23
21	05:38		06:29 (2)	06:27			07:18			08:10		08:06	08:43
	21:44	25	06:54 (2)	20:49			19:38			18:30		16:36	16:23
22	05:39		06:28 (2)	06:28			07:20			08:11		08:07	08:43
	21:43	27	06:55 (2)	20:47			19:36			18:27		16:35	16:24
23	05:41		06:28 (2)	06:30			07:21			08:13		08:09	08:44
	21:42	29	06:57 (2)	20:45			19:33			18:25		16:34	16:24
24	05:42		06:27 (2)	06:32			07:23			08:15		08:11	08:44
	21:40	30	06:57 (2)	20:43			19:31			18:23		16:32	16:25
25	05:43		06:26 (2)	06:33			07:25			07:17		08:12	08:45
	21:39	31	06:57 (2)	20:41			19:29			17:21		16:31	16:25
26	05:45		06:26 (2)	06:35			07:26			07:19		08:14	08:45
	21:38	32	06:58 (2)	20:39			19:26			17:19		16:30	16:26
27	05:46		06:25 (2)	06:37			07:28			07:20		08:15	08:45
	21:36	34	06:59 (2)	20:36			19:24			17:17		16:29	16:27
28	05:48		06:24 (2)	06:38			07:30			07:22		08:17	08:45
	21:35	35	06:59 (2)	20:34			19:22			17:15		16:29	16:28
29	05:49		06:24 (2)	06:40		07:38 (1)	07:31			07:24		08:19	08:45
	21:33	36	07:00 (2)	20:32	4	07:42 (1)	19:19			17:13		16:28	16:29
30	05:51		06:24 (2)	06:41		07:33 (1)	07:33			07:26		08:20	08:46
	21:31	36	07:00 (2)	20:30	14	07:47 (1)	19:17			17:11		16:27	16:29
31	05:52		06:24 (2)	06:43		07:30 (1)				07:28			08:46
	21:30	36	07:00 (2)	20:27	19	07:49 (1)				17:09			16:30
Potential sun hours	504			455			381			331		265	241
Total, worst case		463			411			413					
Sun reduction		0.33			0.35			0.34					
Oper. time red.		1.00			1.00			1.00					
Wind dir. red.		0.60			0.60			0.61					
Total reduction		0.20			0.21			0.20					
Total, real		93			88			85					

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

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SHADOW - Calendar

Calculation: 6839 Garrane WF Worst Case - V150 **Shadow receptor:** AB - 28

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January	February	March			April			May			June		
1	08:46	08:18	07:24			07:12		08:09 (1)	06:06		06:31 (2)	05:20		06:09 (2)
	16:32	17:20	18:13			20:08	37	08:46 (1)	21:00	34	07:05 (2)	21:47	64	07:13 (2)
2	08:45	08:16	07:21			07:10		08:10 (1)	06:04		06:29 (2)	05:19		06:09 (2)
	16:33	17:22	18:15			20:10	33	08:43 (1)	21:02	37	07:06 (2)	21:48	64	07:13 (2)
3	08:45	08:15	07:19			07:07		08:12 (1)	06:02		06:27 (2)	05:18		06:10 (2)
	16:34	17:24	18:17			20:11	29	08:41 (1)	21:03	39	07:06 (2)	21:49	63	07:13 (2)
4	08:45	08:13	07:17			07:05		08:14 (1)	06:00		06:25 (2)	05:17		06:10 (2)
	16:35	17:26	18:18			20:13	25	08:39 (1)	21:05	42	07:07 (2)	21:50	63	07:13 (2)
5	08:45	08:11	07:15		07:38 (1)	07:03		08:17 (1)	05:58		06:24 (2)	05:17		06:10 (2)
	16:36	17:28	18:20	5	07:43 (1)	20:15	18	08:35 (1)	21:07	44	07:08 (2)	21:51	63	07:13 (2)
6	08:44	08:10	07:12		07:36 (1)	07:00		08:22 (1)	05:57		06:22 (2)	05:16		06:11 (2)
	16:38	17:30	18:22	11	07:47 (1)	20:17	6	08:28 (1)	21:08	47	07:09 (2)	21:52	62	07:13 (2)
7	08:44	08:08	07:10		07:34 (1)	06:58			05:55		06:20 (2)	05:15		06:11 (2)
	16:39	17:32	18:24	16	07:50 (1)	20:18			21:10	49	07:09 (2)	21:53	62	07:13 (2)
8	08:44	08:06	07:08		07:31 (1)	06:56			05:53		06:18 (2)	05:15		06:12 (2)
	16:40	17:34	18:26	20	07:51 (1)	20:20			21:12	51	07:09 (2)	21:54	61	07:13 (2)
9	08:43	08:04	07:06		07:29 (1)	06:53			05:51		06:17 (2)	05:14		06:11 (2)
	16:42	17:35	18:28	24	07:53 (1)	20:22			21:13	53	07:10 (2)	21:55	62	07:13 (2)
10	08:43	08:02	07:03		07:27 (1)	06:51			05:49		06:15 (2)	05:14		06:12 (2)
	16:43	17:37	18:29	27	07:54 (1)	20:24			21:15	55	07:10 (2)	21:55	61	07:13 (2)
11	08:42	08:01	07:01		07:24 (1)	06:49			05:48		06:14 (2)	05:14		06:13 (2)
	16:44	17:39	18:31	31	07:55 (1)	20:25			21:17	57	07:11 (2)	21:56	60	07:13 (2)
12	08:41	07:59	06:59		07:22 (1)	06:47			05:46		06:12 (2)	05:13		06:13 (2)
	16:46	17:41	18:33	34	07:56 (1)	20:27			21:18	59	07:11 (2)	21:57	61	07:14 (2)
13	08:41	07:57	06:56		07:19 (1)	06:44			05:44		06:11 (2)	05:13		06:13 (2)
	16:47	17:43	18:35	37	07:56 (1)	20:29			21:20	61	07:12 (2)	21:58	60	07:13 (2)
14	08:40	07:55	06:54		07:17 (1)	06:42			05:43		06:09 (2)	05:13		06:13 (2)
	16:49	17:45	18:36	40	07:57 (1)	20:31			21:22	63	07:12 (2)	21:58	60	07:13 (2)
15	08:39	07:53	06:52		07:15 (1)	06:40			05:41		06:08 (2)	05:12		06:13 (2)
	16:51	17:47	18:38	42	07:57 (1)	20:32			21:23	64	07:12 (2)	21:59	60	07:13 (2)
16	08:38	07:51	06:49		07:12 (1)	06:38			05:40		06:08 (2)	05:12		06:14 (2)
	16:52	17:49	18:40	45	07:57 (1)	20:34			21:25	64	07:12 (2)	21:59	60	07:14 (2)
17	08:37	07:49	06:47		07:10 (1)	06:35			05:38		06:08 (2)	05:12		06:14 (2)
	16:54	17:51	18:42	48	07:58 (1)	20:36			21:26	65	07:13 (2)	22:00	60	07:14 (2)
18	08:36	07:47	06:45		07:08 (1)	06:33			05:37		06:08 (2)	05:12		06:14 (2)
	16:55	17:53	18:44	50	07:58 (1)	20:38			21:28	65	07:13 (2)	22:00	60	07:14 (2)
19	08:35	07:45	06:42		07:06 (1)	06:31			05:35		06:07 (2)	05:12		06:14 (2)
	16:57	17:54	18:45	51	07:57 (1)	20:39			21:29	65	07:12 (2)	22:01	60	07:14 (2)
20	08:34	07:43	06:40		07:06 (1)	06:29			05:34		06:07 (2)	05:12		06:15 (2)
	16:59	17:56	18:47	51	07:57 (1)	20:41			21:31	66	07:13 (2)	22:01	59	07:14 (2)
21	08:33	07:41	06:38		07:06 (1)	06:27			05:32		06:08 (2)	05:13		06:16 (2)
	17:00	17:58	18:49	51	07:57 (1)	20:43			21:32	65	07:13 (2)	22:01	59	07:15 (2)
22	08:32	07:39	06:35		07:05 (1)	06:25			05:31		06:08 (2)	05:13		06:16 (2)
	17:02	18:00	18:51	51	07:56 (1)	20:44			21:34	65	07:13 (2)	22:01	59	07:15 (2)
23	08:31	07:37	06:33		07:05 (1)	06:22			05:30		06:07 (2)	05:13		06:16 (2)
	17:04	18:02	18:52	51	07:56 (1)	20:46			21:35	65	07:12 (2)	22:02	59	07:15 (2)
24	08:29	07:34	06:31		07:05 (1)	06:20		06:44 (2)	05:28		06:07 (2)	05:13		06:15 (2)
	17:06	18:04	18:54	51	07:56 (1)	20:48	7	06:51 (2)	21:36	66	07:13 (2)	22:02	60	07:15 (2)
25	08:28	07:32	06:28		07:05 (1)	06:18		06:42 (2)	05:27		06:08 (2)	05:14		06:16 (2)
	17:08	18:06	18:56	49	07:54 (1)	20:50	12	06:54 (2)	21:38	65	07:13 (2)	22:02	60	07:16 (2)
26	08:27	07:30	06:26		07:05 (1)	06:16		06:40 (2)	05:26		06:08 (2)	05:14		06:16 (2)
	17:09	18:07	18:58	49	07:54 (1)	20:51	17	06:57 (2)	21:39	65	07:13 (2)	22:02	60	07:16 (2)
27	08:25	07:28	06:24		07:05 (1)	06:14		06:38 (2)	05:25		06:08 (2)	05:14		06:17 (2)
	17:11	18:09	18:59	47	07:52 (1)	20:53	21	06:59 (2)	21:41	65	07:13 (2)	22:02	59	07:16 (2)
28	08:24	07:26	06:21		07:06 (1)	06:12		06:36 (2)	05:24		06:08 (2)	05:15		06:16 (2)
	17:13	18:11	19:01	46	07:52 (1)	20:55	24	07:00 (2)	21:42	65	07:13 (2)	22:01	60	07:16 (2)
29	08:22		07:19		08:07 (1)	06:10		06:35 (2)	05:23		06:08 (2)	05:15		06:17 (2)
	17:15		20:03	44	08:51 (1)	20:57	28	07:03 (2)	21:43	65	07:13 (2)	22:01	60	07:17 (2)
30	08:21		07:17		08:07 (1)	06:08		06:33 (2)	05:22		06:09 (2)	05:16		06:16 (2)
	17:17		20:05	42	08:49 (1)	20:58	31	07:04 (2)	21:44	64	07:13 (2)	22:01	61	07:17 (2)
31	08:19		07:14		08:08 (1)				05:21		06:09 (2)			
	17:19		20:06	39	08:47 (1)				21:46	64	07:13 (2)			
Potential sun hours	257	277	367			417			487			501		
Total, worst case				1052			288			1794			1822	
Sun reduction				0.28			0.38			0.39			0.35	
Oper. time red.				1.00			1.00			1.00			1.00	
Wind dir. red.				0.60			0.60			0.60			0.60	
Total reduction				0.17			0.23			0.24			0.21	
Total, real				177			66			427			382	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
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+353719161416
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SHADOW - Calendar

Calculation: 6839 Garrane WF Worst Case - V150 **Shadow receptor:** AB - 28

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	July		August		September		October		November	December
1	05:17		06:17 (2)	05:54	06:23 (2)	06:45		07:35	08:00 (1)	07:30	08:21
	22:01	60	07:17 (2)	21:28 59	07:22 (2)	20:25		19:15 35	08:35 (1)	17:07	16:26
2	05:17		06:17 (2)	05:56	06:25 (2)	06:46		07:36	08:02 (1)	07:31	08:23
	22:00	61	07:18 (2)	21:26 57	07:22 (2)	20:23		19:12 32	08:34 (1)	17:06	16:25
3	05:18		06:17 (2)	05:57	06:26 (2)	06:48		07:38	08:04 (1)	07:33	08:24
	22:00	61	07:18 (2)	21:25 55	07:21 (2)	20:20		19:10 29	08:33 (1)	17:04	16:25
4	05:19		06:17 (2)	05:59	06:28 (2)	06:50		07:40	08:05 (1)	07:35	08:26
	22:00	61	07:18 (2)	21:23 53	07:21 (2)	20:18		19:08 25	08:30 (1)	17:02	16:24
5	05:20		06:17 (2)	06:00	06:29 (2)	06:51		07:42	08:07 (1)	07:37	08:27
	21:59	62	07:19 (2)	21:21 51	07:20 (2)	20:16		19:05 22	08:29 (1)	17:00	16:24
6	05:21		06:17 (2)	06:02	06:31 (2)	06:53	08:18 (1)	07:43	08:09 (1)	07:39	08:28
	21:59	62	07:19 (2)	21:19 48	07:19 (2)	20:13 6	08:24 (1)	19:03 18	08:27 (1)	16:58	16:23
7	05:21		06:18 (2)	06:04	06:32 (2)	06:55	08:12 (1)	07:45	08:11 (1)	07:41	08:30
	21:58	62	07:20 (2)	21:18 46	07:18 (2)	20:11 18	08:30 (1)	19:01 14	08:25 (1)	16:57	16:23
8	05:22		06:17 (2)	06:05	06:34 (2)	06:56	08:08 (1)	07:47	08:12 (1)	07:42	08:31
	21:57	62	07:19 (2)	21:16 44	07:18 (2)	20:09 25	08:33 (1)	18:58 8	08:20 (1)	16:55	16:23
9	05:23		06:17 (2)	06:07	06:35 (2)	06:58	08:06 (1)	07:48	08:14 (1)	07:44	08:32
	21:57	63	07:20 (2)	21:14 41	07:16 (2)	20:06 29	08:35 (1)	18:56 1	08:15 (1)	16:53	16:22
10	05:24		06:17 (2)	06:08	06:37 (2)	07:00	08:03 (1)	07:50		07:46	08:33
	21:56	63	07:20 (2)	21:12 39	07:16 (2)	20:04 33	08:36 (1)	18:54		16:52	16:22
11	05:25		06:17 (2)	06:10	06:38 (2)	07:01	08:02 (1)	07:52		07:48	08:34
	21:55	63	07:20 (2)	21:10 36	07:14 (2)	20:02 36	08:38 (1)	18:51		16:50	16:22
12	05:27		06:17 (2)	06:12	06:40 (2)	07:03	08:00 (1)	07:54		07:50	08:35
	21:54	64	07:21 (2)	21:08 33	07:13 (2)	19:59 39	08:39 (1)	18:49		16:48	16:22
13	05:28		06:17 (2)	06:13	06:41 (2)	07:05	07:58 (1)	07:55		07:51	08:36
	21:53	64	07:21 (2)	21:06 30	07:11 (2)	19:57 42	08:40 (1)	18:47		16:47	16:22
14	05:29		06:18 (2)	06:15	06:43 (2)	07:06	07:57 (1)	07:57		07:53	08:37
	21:52	64	07:22 (2)	21:04 27	07:10 (2)	19:55 44	08:41 (1)	18:45		16:45	16:22
15	05:30		06:18 (2)	06:17	06:44 (2)	07:08	07:55 (1)	07:59		07:55	08:38
	21:51	64	07:22 (2)	21:02 24	07:08 (2)	19:52 46	08:41 (1)	18:43		16:44	16:22
16	05:31		06:18 (2)	06:18	06:46 (2)	07:10	07:54 (1)	08:01		07:57	08:39
	21:50	64	07:22 (2)	21:00 20	07:06 (2)	19:50 48	08:42 (1)	18:40		16:42	16:22
17	05:33		06:17 (2)	06:20	06:47 (2)	07:11	07:54 (1)	08:02		07:59	08:40
	21:49	65	07:22 (2)	20:58 16	07:03 (2)	19:48 48	08:42 (1)	18:38		16:41	16:22
18	05:34		06:17 (2)	06:22	06:49 (2)	07:13	07:52 (1)	08:04		08:00	08:41
	21:48	65	07:22 (2)	20:56 11	07:00 (2)	19:45 50	08:42 (1)	18:36		16:40	16:22
19	05:35		06:17 (2)	06:23	06:51 (2)	07:15	07:52 (1)	08:06		08:02	08:41
	21:47	65	07:22 (2)	20:54 5	06:56 (2)	19:43 50	08:42 (1)	18:34		16:38	16:22
20	05:36		06:18 (2)	06:25		07:16	07:52 (1)	08:08		08:04	08:42
	21:46	65	07:23 (2)	20:52		19:41 51	08:43 (1)	18:32		16:37	16:23
21	05:38		06:18 (2)	06:27		07:18	07:50 (1)	08:10		08:06	08:43
	21:44	65	07:23 (2)	20:49		19:38 52	08:42 (1)	18:30		16:36	16:23
22	05:39		06:17 (2)	06:28		07:20	07:50 (1)	08:11		08:07	08:43
	21:43	66	07:23 (2)	20:47		19:36 52	08:42 (1)	18:27		16:35	16:24
23	05:41		06:18 (2)	06:30		07:21	07:50 (1)	08:13		08:09	08:44
	21:42	65	07:23 (2)	20:45		19:33 52	08:42 (1)	18:25		16:34	16:24
24	05:42		06:18 (2)	06:31		07:23	07:49 (1)	08:15		08:11	08:44
	21:40	65	07:23 (2)	20:43		19:31 52	08:41 (1)	18:23		16:32	16:25
25	05:43		06:18 (2)	06:33		07:25	07:50 (1)	07:17		08:12	08:45
	21:39	65	07:23 (2)	20:41		19:29 51	08:41 (1)	17:21		16:31	16:25
26	05:45		06:18 (2)	06:35		07:26	07:52 (1)	07:19		08:14	08:45
	21:38	65	07:23 (2)	20:39		19:26 48	08:40 (1)	17:19		16:30	16:26
27	05:46		06:18 (2)	06:36		07:28	07:53 (1)	07:20		08:15	08:45
	21:36	65	07:23 (2)	20:36		19:24 46	08:39 (1)	17:17		16:29	16:27
28	05:48		06:18 (2)	06:38		07:30	07:55 (1)	07:22		08:17	08:45
	21:35	64	07:22 (2)	20:34		19:22 43	08:38 (1)	17:15		16:29	16:28
29	05:49		06:19 (2)	06:40		07:31	07:57 (1)	07:24		08:18	08:45
	21:33	64	07:23 (2)	20:32		19:19 41	08:38 (1)	17:13		16:28	16:29
30	05:51		06:20 (2)	06:41		07:33	07:58 (1)	07:26		08:20	08:46
	21:31	62	07:22 (2)	20:30		19:17 38	08:36 (1)	17:11		16:27	16:29
31	05:52		06:22 (2)	06:43				07:28			08:46
	21:30	60	07:22 (2)	20:27				17:09			16:30
Potential sun hours	504		455		381		331		264	241	
Total, worst case		1966		695		1040		184			
Sun reduction		0.33		0.35		0.34		0.28			
Oper. time red.		1.00		1.00		1.00		1.00			
Wind dir. red.		0.60		0.60		0.60		0.60			
Total reduction		0.20		0.21		0.20		0.17			
Total, real		394		149		212		31			

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
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Kathlyn Feeney / kfeeney@jodireland.com
Calculated:
09/06/2025 13:54/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Worst Case - V150 **Shadow receptor:** AC - 29

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January	February	March		April		May		June
1	08:46	08:18	07:24		07:12		07:55 (1)	06:06	06:32 (2)	05:20
	16:32	17:20	18:13		20:08	25	08:20 (1)	21:00	42	07:14 (2)	21:47
2	08:45	08:16	07:21		07:10		07:56 (1)	06:04		06:32 (2)	05:19
	16:33	17:22	18:15		20:10	21	08:17 (1)	21:02	42	07:14 (2)	21:48
3	08:45	08:15	07:19		07:07		07:58 (1)	06:02		06:32 (2)	05:18
	16:34	17:24	18:17		20:11	17	08:15 (1)	21:03	41	07:13 (2)	21:49
4	08:45	08:13	07:17		07:05		08:01 (1)	06:00		06:32 (2)	05:17
	16:35	17:26	18:18		20:13	11	08:12 (1)	21:05	41	07:13 (2)	21:50
5	08:45	08:11	07:15		07:03			05:58		06:33 (2)	05:17
	16:36	17:28	18:20		20:15			21:07	40	07:13 (2)	21:51
6	08:44	08:10	07:12		07:00			05:57		06:33 (2)	05:16
	16:38	17:30	18:22		20:17			21:08	39	07:12 (2)	21:52
7	08:44	08:08	07:10		06:58			05:55		06:33 (2)	05:15
	16:39	17:32	18:24		20:18			21:10	38	07:11 (2)	21:53
8	08:44	08:06	07:08		06:56			05:53		06:34 (2)	05:15
	16:40	17:34	18:26		20:20			21:12	37	07:11 (2)	21:54
9	08:43	08:04	07:06		06:53			05:51		06:34 (2)	05:14
	16:42	17:36	18:28		20:22			21:13	36	07:10 (2)	21:55
10	08:43	08:02	07:03		06:51			05:49		06:35 (2)	05:14
	16:43	17:37	18:29		20:24			21:15	34	07:09 (2)	21:55
11	08:42	08:01	07:01		06:49			05:48		06:36 (2)	05:14
	16:44	17:39	18:31		20:25			21:17	33	07:09 (2)	21:56
12	08:41	07:59	06:59		06:47			05:46		06:36 (2)	05:13
	16:46	17:41	18:33		20:27			21:18	31	07:07 (2)	21:57
13	08:41	07:57	06:56		06:44			05:44		06:38 (2)	05:13
	16:47	17:43	18:35		20:29			21:20	29	07:07 (2)	21:58
14	08:40	07:55	06:54		07:17 (1)	06:42		05:43		06:39 (2)	05:13
	16:49	17:45	18:36	5	07:22 (1)	20:31		21:22	26	07:05 (2)	21:58
15	08:39	07:53	06:52		07:15 (1)	06:40		05:41		06:40 (2)	05:13
	16:51	17:47	18:38	9	07:24 (1)	20:32		21:23	24	07:04 (2)	21:59
16	08:38	07:51	06:49		07:12 (1)	06:38	07:01 (2)	05:40		06:41 (2)	05:12
	16:52	17:49	18:40	13	07:25 (1)	20:34	4	07:05 (2)	21:25	21	07:02 (2)	21:59
17	08:37	07:49	06:47		07:10 (1)	06:35		06:59 (2)	05:38		06:43 (2)	05:12
	16:54	17:51	18:42	16	07:26 (1)	20:36	8	07:07 (2)	21:26	18	07:01 (2)	22:00
18	08:36	07:47	06:45		07:08 (1)	06:33		06:57 (2)	05:37		06:46 (2)	05:12
	16:55	17:53	18:44	20	07:28 (1)	20:38	12	07:09 (2)	21:28	12	06:58 (2)	22:00
19	08:35	07:45	06:42		07:05 (1)	06:31		06:55 (2)	05:35		06:50 (2)	05:12
	16:57	17:54	18:45	22	07:27 (1)	20:39	15	07:10 (2)	21:29	3	06:53 (2)	22:01
20	08:34	07:43	06:40		07:03 (1)	06:29		06:53 (2)	05:34			05:12
	16:59	17:56	18:47	25	07:28 (1)	20:41	19	07:12 (2)	21:31			22:01
21	08:33	07:41	06:38		07:01 (1)	06:27		06:50 (2)	05:32			05:13
	17:00	17:58	18:49	28	07:29 (1)	20:43	22	07:12 (2)	21:32			22:01
22	08:32	07:39	06:35		06:58 (1)	06:25		06:48 (2)	05:31			05:13
	17:02	18:00	18:51	30	07:28 (1)	20:44	24	07:12 (2)	21:34			22:01
23	08:31	07:37	06:33		06:56 (1)	06:22		06:46 (2)	05:30			05:13
	17:04	18:02	18:52	32	07:28 (1)	20:46	27	07:13 (2)	21:35			22:02
24	08:29	07:34	06:31		06:54 (1)	06:20		06:44 (2)	05:28			05:13
	17:06	18:04	18:54	35	07:29 (1)	20:48	29	07:13 (2)	21:36			22:02
25	08:28	07:32	06:28		06:52 (1)	06:18		06:42 (2)	05:27			05:14
	17:08	18:06	18:56	35	07:27 (1)	20:50	32	07:14 (2)	21:38			22:02
26	08:27	07:30	06:26		06:52 (1)	06:16		06:40 (2)	05:26			05:14
	17:09	18:07	18:58	35	07:27 (1)	20:51	34	07:14 (2)	21:39			22:02
27	08:25	07:28	06:24		06:51 (1)	06:14		06:38 (2)	05:25			05:14
	17:11	18:09	18:59	35	07:26 (1)	20:53	36	07:14 (2)	21:41			22:02
28	08:24	07:26	06:21		06:52 (1)	06:12		06:36 (2)	05:24			05:15
	17:13	18:11	19:01	33	07:25 (1)	20:55	38	07:14 (2)	21:42			22:01
29	08:22		07:19		07:52 (1)	06:10		06:35 (2)	05:23			05:15
	17:15		20:03	33	08:25 (1)	20:57	40	07:15 (2)	21:43			22:01
30	08:21		07:17		07:52 (1)	06:08		06:33 (2)	05:22			05:16
	17:17		20:05	31	08:23 (1)	20:58	42	07:15 (2)	21:44			22:01
31	08:19		07:14		07:54 (1)				05:21			
	17:19		20:06	28	08:22 (1)				21:46			
Potential sun hours	257	277	367			417			487			501
Total, worst case				465			456			587		
Sun reduction				0.28			0.38			0.39		
Oper. time red.				1.00			1.00			1.00		
Wind dir. red.				0.61			0.60			0.60		
Total reduction				0.17			0.23			0.24		
Total, real				79			104			139		

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

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Kathlyn Feeney / kfeeney@jodireland.com

Calculated:
09/06/2025 13:54/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Worst Case - V150 **Shadow receptor:** AC - 29

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	July		August		September		October	November	December
1	05:17		05:54		06:47 (2)	06:45	07:35	07:30	08:22
	22:01		21:28	31	07:18 (2)	20:25	19:15	17:07	16:26
2	05:17		05:56		06:46 (2)	06:46	07:36	07:31	08:23
	22:00		21:26	33	07:19 (2)	20:23	19:12	17:06	16:26
3	05:18		05:57		06:45 (2)	06:48	07:38	07:33	08:24
	22:00		21:25	35	07:20 (2)	20:20	19:10	17:04	16:25
4	05:19		05:59		06:45 (2)	06:50	07:40	07:35	08:26
	22:00		21:23	36	07:21 (2)	20:18	19:08	17:02	16:24
5	05:20		06:00		06:44 (2)	06:51	07:42	07:37	08:27
	21:59		21:21	37	07:21 (2)	20:16	19:05	17:00	16:24
6	05:21		06:02		06:43 (2)	06:53	07:43	07:39	08:28
	21:59		21:19	39	07:22 (2)	20:14	19:03	16:58	16:23
7	05:22		06:04		06:42 (2)	06:55	07:45	07:41	08:30
	21:58		21:18	40	07:22 (2)	20:11	19:01	16:57	16:23
8	05:22		06:05		06:42 (2)	06:56	07:56 (1)	07:47	07:42	08:31
	21:57		21:16	41	07:23 (2)	20:09	9	08:05 (1)	18:58	16:55	16:23
9	05:23		06:07		06:41 (2)	06:58	07:52 (1)	07:49	07:44	08:32
	21:57		21:14	41	07:22 (2)	20:07	17	08:09 (1)	18:56	16:53	16:22
10	05:24		06:08		06:42 (2)	07:00	07:49 (1)	07:50	07:46	08:33
	21:56		21:12	41	07:23 (2)	20:04	21	08:10 (1)	18:54	16:52	16:22
11	05:26		06:10		06:41 (2)	07:01	07:47 (1)	07:52	07:48	08:34
	21:55		21:10	41	07:22 (2)	20:02	25	08:12 (1)	18:52	16:50	16:22
12	05:27		06:12		06:41 (2)	07:03	07:46 (1)	07:54	07:50	08:35
	21:54		21:08	42	07:23 (2)	19:59	28	08:14 (1)	18:49	16:48	16:22
13	05:28		06:13		06:41 (2)	07:05	07:44 (1)	07:55	07:51	08:36
	21:53		21:06	41	07:22 (2)	19:57	30	08:14 (1)	18:47	16:47	16:22
14	05:29		06:15		06:43 (2)	07:06	07:43 (1)	07:57	07:53	08:37
	21:52		21:04	39	07:22 (2)	19:55	32	08:15 (1)	18:45	16:45	16:22
15	05:30		06:17		06:44 (2)	07:08	07:42 (1)	07:59	07:55	08:38
	21:51		21:02	37	07:21 (2)	19:52	34	08:16 (1)	18:43	16:44	16:22
16	05:31		06:18		06:46 (2)	07:10	07:41 (1)	08:01	07:57	08:39
	21:50		21:00	35	07:21 (2)	19:50	34	08:15 (1)	18:40	16:42	16:22
17	05:33		06:20		06:47 (2)	07:11	07:40 (1)	08:03	07:59	08:40
	21:49		20:58	33	07:20 (2)	19:48	36	08:16 (1)	18:38	16:41	16:22
18	05:34		06:22		06:49 (2)	07:13	07:39 (1)	08:04	08:00	08:41
	21:48		20:56	31	07:20 (2)	19:45	36	08:15 (1)	18:36	16:40	16:22
19	05:35		06:23		06:51 (2)	07:15	07:40 (1)	08:06	08:02	08:41
	21:47		20:54	29	07:20 (2)	19:43	35	08:15 (1)	18:34	16:38	16:22
20	05:36		06:25		06:52 (2)	07:16	07:42 (1)	08:08	08:04	08:42
	21:46		20:52	26	07:18 (2)	19:41	33	08:15 (1)	18:32	16:37	16:23
21	05:38		06:27		06:54 (2)	07:18	07:43 (1)	08:10	08:06	08:43
	21:44		20:49	24	07:18 (2)	19:38	31	08:14 (1)	18:30	16:36	16:23
22	05:39		06:28		06:55 (2)	07:20	07:45 (1)	08:11	08:07	08:43
	21:43		20:47	21	07:16 (2)	19:36	28	08:13 (1)	18:27	16:35	16:24
23	05:41		06:30		06:57 (2)	07:21	07:47 (1)	08:13	08:09	08:44
	21:42		20:45	18	07:15 (2)	19:33	26	08:13 (1)	18:25	16:34	16:24
24	05:42		06:32		06:58 (2)	07:23	07:48 (1)	08:15	08:11	08:44
	21:40		20:43	15	07:13 (2)	19:31	23	08:11 (1)	18:23	16:32	16:25
25	05:43	06:58 (2)	06:33		07:00 (2)	07:25	07:50 (1)	07:17	08:12	08:45
	21:39	8	07:06 (2)	20:41	12	07:12 (2)	19:29	20	08:10 (1)	17:21	16:31	16:25
26	05:45	06:55 (2)	06:35		07:02 (2)	07:26	07:52 (1)	07:19	08:14	08:45
	21:38	15	07:10 (2)	20:39	8	07:10 (2)	19:26	17	08:09 (1)	17:19	16:30	16:26
27	05:46	06:53 (2)	06:36		07:03 (2)	07:28	07:53 (1)	07:20	08:15	08:45
	21:36	19	07:12 (2)	20:36	3	07:06 (2)	19:24	14	08:07 (1)	17:17	16:29	16:27
28	05:48	06:51 (2)	06:38			07:30	07:55 (1)	07:22	08:17	08:45
	21:35	22	07:13 (2)	20:34		19:22	11	08:06 (1)	17:15	16:29	16:28
29	05:49	06:50 (2)	06:40			07:31	07:57 (1)	07:24	08:19	08:45
	21:33	25	07:15 (2)	20:32		19:19	6	08:03 (1)	17:13	16:28	16:29
30	05:51	06:48 (2)	06:41			07:33	07:58 (1)	07:26	08:20	08:46
	21:31	28	07:16 (2)	20:30		19:17	2	08:00 (1)	17:11	16:27	16:29
31	05:52	06:48 (2)	06:43					07:28		08:46
	21:30	30	07:18 (2)	20:27				17:09		16:30
Potential sun hours	504		455		381		331	265	241
Total, worst case	147		829		548				
Sun reduction	0.33		0.35		0.34				
Oper. time red.	1.00		1.00		1.00				
Wind dir. red.	0.60		0.60		0.61				
Total reduction	0.20		0.21		0.21				
Total, real	29		176		113				

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

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SHADOW - Calendar

Calculation: 6839 Garrane WF Worst Case - V150 **Shadow receptor:** AD - 30

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January		February		March		April		May		June	
1	08:46		08:18		08:45 (1)		07:24		07:52 (2)		07:12	
	16:32		17:20	11	08:56 (1)		18:13	32	08:24 (2)		20:08	45
2	08:46		08:16		08:43 (1)		07:21		07:52 (2)		07:10	
	16:33		17:22	13	08:56 (1)		18:15	31	08:23 (2)		20:10	45
3	08:45		08:15		08:41 (1)		07:19		07:53 (2)		07:07	
	16:34		17:24	16	08:57 (1)		18:17	30	08:23 (2)		20:12	43
4	08:45		08:13		08:39 (1)		07:17		07:54 (2)		07:05	
	16:35		17:26	18	08:57 (1)		18:18	28	08:22 (2)		20:13	38
5	08:45		08:11		08:37 (1)		07:15		07:38 (3)		07:03	
	16:36		17:28	20	08:57 (1)		18:20	30	08:20 (2)		20:15	25
6	08:45		08:10		08:36 (1)		07:12		07:36 (3)		07:00	
	16:38		17:30	22	08:58 (1)		18:22	33	08:18 (2)		20:17	27
7	08:44		08:08		08:34 (1)		07:10		07:34 (3)		06:58	
	16:39		17:32	24	08:58 (1)		18:24	34	08:16 (2)		20:18	30
8	08:44		08:06		08:32 (1)		07:08		07:31 (3)		06:56	
	16:40		17:34	26	08:58 (1)		18:26	31	08:12 (2)		20:20	32
9	08:43		08:04		08:31 (1)		07:06		07:29 (3)		06:53	
	16:42		17:35	27	08:58 (1)		18:28	24	07:53 (3)		20:22	34
10	08:43		08:02		08:32 (1)		07:03		07:27 (3)		06:51	
	16:43		17:37	25	08:57 (1)		18:29	28	07:55 (3)		20:24	34
11	08:42		08:01		08:33 (1)		07:01		07:24 (3)		06:49	
	16:44		17:39	24	08:57 (1)		18:31	31	07:55 (3)		20:25	34
12	08:41		07:59		08:34 (1)		06:59		07:22 (3)		06:47	
	16:46		17:41	22	08:56 (1)		18:33	34	07:56 (3)		20:27	34
13	08:41		07:57		08:35 (1)		06:56		07:20 (3)		06:44	
	16:47		17:43	20	08:55 (1)		18:35	37	07:57 (3)		20:29	32
14	08:40		07:55		08:36 (1)		06:54		07:17 (3)		06:42	
	16:49		17:45	17	08:53 (1)		18:36	40	07:57 (3)		20:31	31
15	08:39		07:53		08:38 (1)		06:52		07:15 (3)		06:40	
	16:51		17:47	13	08:51 (1)		18:38	43	07:58 (3)		20:32	29
16	08:38		07:51		08:16 (2)		06:49		07:12 (3)		06:38	
	16:52		17:49	6	08:47 (1)		18:40	45	07:57 (3)		20:34	27
17	08:37		07:49		08:14 (2)		06:47		07:10 (3)		06:35	
	16:54		17:51	6	08:20 (2)		18:42	48	07:58 (3)		20:36	25
18	08:36		07:47		08:12 (2)		06:45		07:09 (3)		06:33	
	16:55		17:53	10	08:22 (2)		18:44	49	07:58 (3)		20:38	21
19	08:35		07:45		08:09 (2)		06:42		07:08 (3)		06:31	
	16:57		17:54	13	08:22 (2)		18:45	49	07:57 (3)		20:39	16
20	08:34		07:43		08:07 (2)		06:40		07:08 (3)		06:29	
	16:59		17:56	16	08:23 (2)		18:47	50	07:58 (3)		20:41	10
21	08:33		07:41		08:05 (2)		06:38		07:08 (3)		06:27	
	17:00		17:58	19	08:24 (2)		18:49	50	07:58 (3)		20:43	
22	08:32		07:39		08:03 (2)		06:35		07:08 (3)		06:25	
	17:02		18:00	22	08:25 (2)		18:51	48	07:56 (3)		20:45	
23	08:31		07:37		08:01 (2)		06:33		07:08 (3)		06:22	
	17:04		18:02	24	08:25 (2)		18:52	48	07:56 (3)		20:46	
24	08:29		07:34		07:59 (2)		06:31		07:08 (3)		06:20	
	17:06		18:04	27	08:26 (2)		18:54	48	07:56 (3)		20:48	
25	08:28		07:32		07:56 (2)		06:28		07:08 (3)		06:18	
	17:08		18:06	29	08:25 (2)		18:56	46	07:54 (3)		20:50	
26	08:27		07:30		07:54 (2)		06:26		07:08 (3)		06:16	
	17:09		18:07	31	08:25 (2)		18:58	46	07:54 (3)		20:51	
27	08:25		07:28		07:52 (2)		06:24		07:08 (3)		06:14	
	17:11		18:09	33	08:25 (2)		18:59	44	07:52 (3)		20:53	
28	08:24		07:26		07:52 (2)		06:21		07:09 (3)		06:12	
	17:13		18:11	33	08:25 (2)		19:01	42	07:51 (3)		20:55	2
29	08:22	08:50 (1)					07:19		07:42 (4)		06:10	
	17:15	3 08:53 (1)					20:03	41	08:50 (3)		20:57	6
30	08:21	08:48 (1)					07:17		07:39 (4)		06:08	
	17:17	6 08:54 (1)					20:05	44	08:48 (3)		20:58	9
31	08:19	08:46 (1)					07:14		07:37 (4)			
	17:19	8 08:54 (1)					20:06	46	08:47 (3)			
Potential sun hours	257		277		367		417		487		501	
Total, worst case	17		567		1230		629		1120		1196	
Sun reduction	0.22		0.24		0.28		0.38		0.39		0.35	
Oper. time red.	1.00		1.00		1.00		1.00		1.00		1.00	
Wind dir. red.	0.64		0.63		0.61		0.60		0.60		0.60	
Total reduction	0.14		0.15		0.17		0.23		0.24		0.21	
Total, real	2		87		208		144		267		251	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

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Calculated:
09/06/2025 13:54/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Worst Case - V150 **Shadow receptor:** AD - 30

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	July		August		September		October		November		December	
1	05:17		06:13 (5)	05:54	06:23 (5)	06:45	07:14 (4)	07:35	08:00 (3)	07:30	08:02 (1)	08:22
	22:01	40	06:53 (5)	21:28 34	06:57 (5)	20:25 34	07:48 (4)	19:15 36	08:36 (3)	17:07 25	08:27 (1)	16:26
2	05:17		06:13 (5)	05:56	06:25 (5)	06:46	07:14 (4)	07:37	08:02 (3)	07:31	08:01 (1)	08:23
	22:01	41	06:54 (5)	21:26 32	06:57 (5)	20:23 34	07:48 (4)	19:12 32	08:34 (3)	17:06 26	08:27 (1)	16:25
3	05:18		06:13 (5)	05:57	06:26 (5)	06:48	07:14 (4)	07:38	08:04 (3)	07:33	08:02 (1)	08:24
	22:00	40	06:53 (5)	21:25 30	06:56 (5)	20:20 34	07:48 (4)	19:10 29	08:33 (3)	17:04 26	08:28 (1)	16:25
4	05:19		06:13 (5)	05:59	06:28 (5)	06:50	07:16 (4)	07:40	08:05 (3)	07:35	08:04 (1)	08:26
	22:00	41	06:54 (5)	21:23 27	06:55 (5)	20:18 32	07:48 (4)	19:08 26	08:31 (3)	17:02 24	08:28 (1)	16:24
5	05:20		06:13 (5)	06:00	06:29 (5)	06:51	07:17 (4)	07:42	08:07 (3)	07:37	08:06 (1)	08:27
	21:59	42	06:55 (5)	21:21 25	06:54 (5)	20:16 30	07:47 (4)	19:05 28	08:46 (2)	17:00 22	08:28 (1)	16:24
6	05:21		06:13 (5)	06:02	06:31 (5)	06:53	07:19 (4)	07:43	08:09 (3)	07:39	08:08 (1)	08:28
	21:59	42	06:55 (5)	21:19 24	06:55 (6)	20:14 27	07:46 (4)	19:03 33	08:51 (2)	16:58 20	08:28 (1)	16:23
7	05:21		06:13 (5)	06:04	06:32 (5)	06:55	07:21 (4)	07:45	08:11 (3)	07:41	08:10 (1)	08:30
	21:58	43	06:56 (5)	21:18 22	06:54 (6)	20:11 25	07:46 (4)	19:01 34	08:53 (2)	16:57 18	08:28 (1)	16:23
8	05:22		06:13 (5)	06:05	06:34 (5)	06:56	07:22 (4)	07:47	08:12 (3)	07:42	08:12 (1)	08:31
	21:57	42	06:55 (5)	21:16 20	06:54 (6)	20:09 39	08:30 (3)	18:58 32	08:54 (2)	16:55 16	08:28 (1)	16:23
9	05:23		06:13 (5)	06:07	06:35 (5)	06:58	07:24 (4)	07:49	08:29 (2)	07:44	08:14 (1)	08:32
	21:57	43	06:56 (5)	21:14 18	06:53 (6)	20:07 42	08:33 (3)	18:56 26	08:55 (2)	16:53 13	08:27 (1)	16:22
10	05:24		06:13 (5)	06:08	06:37 (5)	07:00	07:25 (4)	07:50	08:28 (2)	07:46	08:16 (1)	08:33
	21:56	43	06:56 (5)	21:12 16	06:53 (6)	20:04 45	08:35 (3)	18:54 28	08:56 (2)	16:52 11	08:27 (1)	16:22
11	05:25		06:13 (5)	06:10	06:38 (5)	07:01	07:27 (4)	07:52	08:27 (2)	07:48	08:18 (1)	08:34
	21:55	43	06:56 (5)	21:10 13	06:51 (6)	20:02 46	08:37 (3)	18:52 30	08:57 (2)	16:50 8	08:26 (1)	16:22
12	05:27		06:12 (5)	06:12	06:40 (6)	07:03	07:29 (4)	07:54	08:26 (2)	07:50	08:20 (1)	08:35
	21:54	45	06:57 (5)	21:08 11	06:51 (6)	19:59 45	08:39 (3)	18:49 32	08:58 (2)	16:48 6	08:26 (1)	16:22
13	05:28		06:12 (5)	06:13	06:41 (6)	07:05	07:30 (4)	07:55	08:25 (2)	07:52	08:22 (1)	08:36
	21:53	45	06:57 (5)	21:06 8	06:49 (6)	19:57 43	08:39 (3)	18:47 32	08:57 (2)	16:47 3	08:25 (1)	16:22
14	05:29		06:13 (5)	06:15	06:43 (6)	07:06	07:32 (4)	07:57	08:24 (2)	07:53		08:37
	21:52	45	06:58 (5)	21:04 5	06:48 (6)	19:55 42	08:40 (3)	18:45 33	08:57 (2)	16:45		16:22
15	05:30		06:13 (5)	06:17	06:44 (6)	07:08	07:59 (3)	07:59	08:25 (2)	07:55		08:38
	21:51	45	06:58 (5)	21:02 1	06:45 (6)	19:52 42	08:41 (3)	18:43 32	08:57 (2)	16:44		16:22
16	05:31		06:13 (5)	06:18		07:10	07:58 (3)	08:01	08:27 (2)	07:57		08:39
	21:50	46	06:59 (5)	21:00		19:50 43	08:41 (3)	18:40 30	08:57 (2)	16:42		16:22
17	05:33		06:13 (5)	06:20		07:11	07:57 (3)	08:03	08:29 (2)	07:59		08:40
	21:49	46	06:59 (5)	20:58		19:48 45	08:42 (3)	18:38 28	08:57 (2)	16:41		16:22
18	05:34		06:13 (5)	06:22		07:13	07:55 (3)	08:04	08:31 (2)	08:00		08:41
	21:48	46	06:59 (5)	20:56		19:45 47	08:42 (3)	18:36 26	08:57 (2)	16:40		16:22
19	05:35		06:12 (5)	06:23		07:15	07:55 (3)	08:06	08:33 (2)	08:02		08:41
	21:47	47	06:59 (5)	20:54		19:43 47	08:42 (3)	18:34 24	08:57 (2)	16:38		16:22
20	05:36		06:13 (5)	06:25		07:16	07:54 (3)	08:08	08:34 (2)	08:04		08:42
	21:46	46	06:59 (5)	20:52		19:41 49	08:43 (3)	18:32 21	08:55 (2)	16:37		16:23
21	05:38		06:13 (5)	06:27		07:18	07:53 (3)	08:10	08:36 (2)	08:06		08:43
	21:45	46	06:59 (5)	20:49		19:38 49	08:42 (3)	18:30 18	08:54 (2)	16:36		16:23
22	05:39		06:13 (5)	06:28		07:20	07:53 (3)	08:11	08:38 (2)	08:07		08:43
	21:43	46	06:59 (5)	20:47		19:36 49	08:42 (3)	18:27 15	08:53 (2)	16:35		16:24
23	05:41		06:13 (5)	06:30	07:28 (4)	07:21	07:53 (3)	08:13	08:40 (2)	08:09		08:44
	21:42	47	07:00 (5)	20:45 11	07:39 (4)	19:33 49	08:42 (3)	18:25 12	08:52 (2)	16:34		16:24
24	05:42		06:13 (5)	06:32	07:24 (4)	07:23	07:52 (3)	08:15	08:42 (2)	08:11		08:44
	21:41	46	06:59 (5)	20:43 18	07:42 (4)	19:31 49	08:41 (3)	18:23 9	08:51 (2)	16:32		16:25
25	05:43		06:13 (5)	06:33	07:22 (4)	07:25	07:52 (3)	07:17	07:44 (2)	08:12		08:45
	21:39	46	06:59 (5)	20:41 22	07:44 (4)	19:29 49	08:41 (3)	17:21 5	07:49 (2)	16:31		16:25
26	05:45		06:15 (5)	06:35	07:21 (4)	07:26	07:52 (3)	07:19	07:46 (2)	08:14		08:45
	21:38	44	06:59 (5)	20:39 25	07:46 (4)	19:26 49	08:41 (3)	17:19 8	08:18 (1)	16:30		16:26
27	05:46		06:16 (5)	06:36	07:19 (4)	07:28	07:53 (3)	07:21	08:07 (1)	08:15		08:45
	21:36	43	06:59 (5)	20:36 27	07:46 (4)	19:24 46	08:39 (3)	17:17 14	08:21 (1)	16:29		16:27
28	05:48		06:17 (5)	06:38	07:18 (4)	07:30	07:55 (3)	07:22	08:05 (1)	08:17		08:45
	21:35	41	06:58 (5)	20:34 29	07:47 (4)	19:22 44	08:39 (3)	17:15 18	08:23 (1)	16:29		16:28
29	05:49		06:19 (5)	06:40	07:16 (4)	07:31	07:57 (3)	07:24	08:04 (1)	08:19		08:46
	21:33	40	06:59 (5)	20:32 31	07:47 (4)	19:19 41	08:38 (3)	17:13 20	08:24 (1)	16:28		16:29
30	05:51		06:20 (5)	06:41	07:16 (4)	07:33	07:58 (3)	07:26	08:03 (1)	08:20		08:46
	21:31	38	06:58 (5)	20:30 32	07:48 (4)	19:17 38	08:36 (3)	17:11 22	08:25 (1)	16:27		16:29
31	05:52		06:22 (5)	06:43	07:15 (4)			07:28	08:02 (1)			08:46
	21:30	36	06:58 (5)	20:27 34	07:49 (4)			17:09 24	08:26 (1)			16:30
Potential sun hours	504			455		381		331		264		241
Total, worst case		1344		515		1254		757		218		
Sun reduction		0.33		0.35		0.34		0.28		0.26		
Oper. time red.		1.00		1.00		1.00		1.00		1.00		
Wind dir. red.		0.60		0.60		0.60		0.62		0.64		
Total reduction		0.20		0.21		0.20		0.18		0.17		
Total, real		269		110		256		133		36		

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
Jennings O'Donovan
Finisklin Business Park
F91 RHH9 Sligo
+353719161416
Kathlyn Feeney / kfeeney@jodireland.com
Calculated:
09/06/2025 13:54/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Worst Case - V150 **Shadow receptor:** AE - 31

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January		February		March		April		May		June	
1	08:46		08:18		08:45 (1)		07:24		07:47 (3)		07:12	
	16:32		17:20	19	09:04 (1)		18:13	36	08:23 (3)		20:08	14
2	08:46		08:16		08:43 (1)		07:21		07:45 (3)		07:10	
	16:33		17:22	20	09:03 (1)		18:15	39	08:24 (3)		20:10	6
3	08:45		08:15		08:41 (1)		07:19		07:44 (3)		07:07	
	16:34		17:24	22	09:03 (1)		18:17	40	08:24 (3)		20:12	
4	08:45		08:13		08:41 (1)		07:17		07:44 (3)		07:05	
	16:35		17:26	21	09:02 (1)		18:18	40	08:24 (3)		20:13	
5	08:45		08:11		08:42 (1)		07:15		07:43 (3)		07:03	
	16:36		17:28	19	09:01 (1)		18:20	39	08:22 (3)		20:15	
6	08:45		08:10		08:44 (1)		07:12		07:44 (3)		07:00	
	16:38		17:30	17	09:01 (1)		18:22	38	08:22 (3)		20:17	
7	08:44		08:08		08:46 (1)		07:10		07:44 (3)		06:58	
	16:39		17:32	13	08:59 (1)		18:24	38	08:22 (3)		20:18	2
8	08:44		08:06		08:32 (2)		07:08		07:44 (3)		06:56	
	16:40		17:34	11	08:57 (1)		18:26	36	08:20 (3)		20:20	7
9	08:43		08:04		08:30 (2)		07:06		07:45 (3)		06:53	
	16:42		17:36	5	08:35 (2)		18:28	34	08:19 (3)		20:22	11
10	08:43		08:02		08:28 (2)		07:03		07:46 (3)		06:51	
	16:43		17:37	8	08:36 (2)		18:29	32	08:18 (3)		20:24	15
11	08:42		08:01		08:26 (2)		07:01		07:47 (3)		06:49	
	16:44		17:39	11	08:37 (2)		18:31	29	08:16 (3)		20:25	18
12	08:41		07:59		08:24 (2)		06:59		07:48 (3)		06:47	
	16:46		17:41	14	08:38 (2)		18:33	26	08:14 (3)		20:27	21
13	08:41		07:57		08:22 (2)		06:56		07:50 (3)		06:44	
	16:47		17:43	16	08:38 (2)		18:35	22	08:12 (3)		20:29	24
14	08:40		07:55		08:20 (2)		06:54		07:52 (3)		06:42	
	16:49		17:45	18	08:38 (2)		18:36	17	08:09 (3)		20:31	27
15	08:39		07:53		08:18 (2)		06:52		07:57 (3)		06:40	
	16:51		17:47	21	08:39 (2)		18:38	6	08:03 (3)		20:32	29
16	08:38		07:51		08:16 (2)		06:49		07:12 (4)		06:38	
	16:52		17:49	23	08:39 (2)		18:40	4	07:16 (4)		20:34	32
17	08:37		07:49		08:14 (2)		06:47		07:10 (4)		06:35	
	16:54		17:51	25	08:39 (2)		18:42	8	07:18 (4)		20:36	34
18	08:36		07:47		08:12 (2)		06:45		07:08 (4)		06:33	
	16:55		17:53	26	08:38 (2)		18:44	11	07:19 (4)		20:38	36
19	08:35		07:45		08:09 (3)		06:42		07:05 (4)		06:31	
	16:57		17:54	28	08:37 (2)		18:45	14	07:19 (4)		20:39	38
20	08:34		07:43		08:07 (3)		06:40		07:03 (4)		06:29	
	16:59		17:56	29	08:36 (2)		18:47	17	07:20 (4)		20:41	40
21	08:33		07:41		08:05 (3)		06:38		07:01 (4)		06:27	
	17:00		17:58	31	08:36 (2)		18:49	20	07:21 (4)		20:43	42
22	08:32		07:39		08:03 (3)		06:35		06:58 (4)		06:25	
	17:02		18:00	32	08:35 (2)		18:51	22	07:20 (4)		20:45	43
23	08:31		07:37		08:01 (3)		06:33		06:56 (4)		06:22	
	17:04		18:02	32	08:33 (2)		18:52	24	07:20 (4)		20:46	43
24	08:29		08:57 (1)		07:34		07:59 (3)		06:31		06:54 (4)	
	17:06	3	09:00 (1)		18:04	32	08:31 (2)		18:54	26	07:20 (4)	
25	08:28		08:56 (1)		07:32		07:56 (3)		06:28		06:51 (4)	
	17:08	5	09:01 (1)		18:06	31	08:27 (2)		18:56	28	07:19 (4)	
26	08:27		08:54 (1)		07:30		07:54 (3)		06:26		06:49 (4)	
	17:09	7	09:01 (1)		18:07	29	08:23 (3)		18:58	30	07:19 (4)	
27	08:25		08:53 (1)		07:28		07:52 (3)		06:24		06:49 (4)	
	17:11	9	09:02 (1)		18:09	32	08:24 (3)		18:59	28	07:17 (4)	
28	08:24		08:51 (1)		07:26		07:50 (3)		06:21		06:49 (4)	
	17:13	11	09:02 (1)		18:11	34	08:24 (3)		19:01	27	07:16 (4)	
29	08:23		08:50 (1)						07:19		07:50 (4)	
	17:15	13	09:03 (1)						20:03	25	08:15 (4)	
30	08:21		08:48 (1)						07:17		07:51 (4)	
	17:17	15	09:03 (1)						20:05	22	08:13 (4)	
31	08:19		08:46 (1)						07:14		07:52 (4)	
	17:19	17	09:03 (1)						20:06	19	08:11 (4)	
Potential sun hours	257		277		367		417		487		501	
Total, worst case		80		619		797		739		391		723
Sun reduction		0.22		0.24		0.28		0.38		0.39		0.35
Oper. time red.		1.00		1.00		1.00		1.00		1.00		1.00
Wind dir. red.		0.64		0.63		0.62		0.59		0.60		0.60
Total reduction		0.14		0.15		0.17		0.23		0.24		0.21
Total, real		11		95		137		167		92		150

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
Jennings O'Donovan
Finisklin Business Park
F91 RHH9 Sligo
+353719161416
Kathlyn Feeney / kfeeney@jodireland.com
Calculated:
09/06/2025 13:54/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Worst Case - V150 **Shadow receptor:** AE - 31

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	July		August		September		October		November		December	
1	05:17		05:56 (7)	05:54		06:45		07:11 (5)	07:35		08:28 (3)	07:30		07:58 (2)	08:22
	22:01	24	06:20 (7)	21:28		20:25	18	07:29 (5)	19:15	24	08:52 (3)	17:07	8	08:06 (2)	16:26
2	05:17		05:56 (7)	05:56		06:46		07:13 (5)	07:37		08:26 (3)	07:31		08:00 (2)	08:23
	22:01	25	06:21 (7)	21:27		20:23	15	07:28 (5)	19:12	28	08:54 (3)	17:06	5	08:05 (2)	16:25
3	05:18		05:56 (7)	05:57		06:48		07:14 (5)	07:38		08:25 (3)	07:33		08:02 (2)	08:24
	22:00	25	06:21 (7)	21:25		20:20	11	07:25 (5)	19:10	31	08:56 (3)	17:04	11	08:27 (1)	16:25
4	05:19		05:56 (7)	05:59		06:50		07:16 (5)	07:40		08:22 (3)	07:35		08:15 (1)	08:26
	22:00	25	06:21 (7)	21:23		20:18	7	07:23 (5)	19:08	34	08:56 (3)	17:02	14	08:29 (1)	16:24
5	05:20		05:56 (7)	06:00		06:51		07:17 (5)	07:42		08:21 (3)	07:37		08:14 (1)	08:27
	21:59	26	06:22 (7)	21:21		20:16	3	07:20 (5)	19:05	36	08:57 (3)	17:00	17	08:31 (1)	16:24
6	05:21		05:56 (7)	06:02		06:53			07:43		08:21 (3)	07:39		08:13 (1)	08:28
	21:59	27	06:23 (7)	21:19		20:14			19:03	36	08:57 (3)	16:58	19	08:32 (1)	16:23
7	05:21		05:56 (7)	06:04		06:55			07:45		08:20 (3)	07:41		08:12 (1)	08:30
	21:58	27	06:23 (7)	21:18		20:11			19:01	38	08:58 (3)	16:57	21	08:33 (1)	16:23
8	05:22		05:55 (7)	06:05	07:13 (5)	06:56			07:47		08:18 (3)	07:42		08:12 (1)	08:31
	21:57	28	06:23 (7)	21:16	12 07:25 (5)	20:09			18:58	39	08:57 (3)	16:55	22	08:34 (1)	16:23
9	05:23		05:55 (7)	06:07	07:09 (5)	06:58			07:49		08:18 (3)	07:44		08:14 (1)	08:32
	21:57	28	06:23 (7)	21:14	18 07:27 (5)	20:07			18:56	40	08:58 (3)	16:53	20	08:34 (1)	16:22
10	05:24		05:55 (7)	06:08	07:08 (5)	07:00		07:52 (4)	07:50		08:18 (3)	07:46		08:16 (1)	08:33
	21:56	28	06:23 (7)	21:12	22 07:30 (5)	20:04	4	07:56 (4)	18:54	40	08:58 (3)	16:52	19	08:35 (1)	16:22
11	05:25		05:56 (7)	06:10	07:05 (5)	07:01		07:47 (4)	07:52		08:18 (3)	07:48		08:18 (1)	08:34
	21:55	28	06:24 (7)	21:10	26 07:31 (5)	20:02	14	08:01 (4)	18:52	40	08:58 (3)	16:50	17	08:35 (1)	16:22
12	05:27		05:57 (7)	06:12	07:04 (5)	07:03		07:45 (4)	07:54		08:20 (3)	07:50		08:20 (1)	08:35
	21:54	27	06:24 (7)	21:08	29 07:33 (5)	19:59	18	08:03 (4)	18:49	38	08:58 (3)	16:48	15	08:35 (1)	16:22
13	05:28		05:58 (7)	06:13	07:02 (5)	07:05		07:42 (4)	07:55		08:21 (3)	07:52		08:22 (1)	08:36
	21:53	26	06:24 (7)	21:06	31 07:33 (5)	19:57	22	08:04 (4)	18:47	36	08:57 (3)	16:47	13	08:35 (1)	16:22
14	05:29		06:00 (7)	06:15	07:02 (5)	07:06		07:41 (4)	07:57		08:23 (3)	07:53		08:24 (1)	08:37
	21:52	25	06:25 (7)	21:04	32 07:34 (5)	19:55	25	08:06 (4)	18:45	33	08:56 (3)	16:45	11	08:35 (1)	16:22
15	05:30		06:01 (7)	06:17	06:59 (6)	07:08		07:40 (4)	07:59		08:25 (3)	07:55		08:25 (1)	08:38
	21:51	24	06:25 (7)	21:02	36 07:35 (5)	19:52	27	08:07 (4)	18:43	31	08:56 (3)	16:44	9	08:34 (1)	16:22
16	05:31		06:02 (7)	06:18	06:58 (6)	07:10		07:38 (4)	08:01		08:27 (3)	07:57		08:27 (1)	08:39
	21:50	23	06:25 (7)	21:00	38 07:36 (5)	19:50	28	08:06 (4)	18:40	28	08:55 (3)	16:42	7	08:34 (1)	16:22
17	05:33		06:03 (7)	06:20	06:56 (6)	07:11		07:38 (4)	08:03		08:29 (3)	07:59		08:29 (1)	08:40
	21:49	22	06:25 (7)	20:58	40 07:36 (5)	19:48	29	08:07 (4)	18:38	32	09:01 (2)	16:41	5	08:34 (1)	16:22
18	05:34		06:04 (7)	06:22	06:55 (6)	07:13		07:38 (4)	08:04		08:31 (3)	08:00		08:31 (1)	08:41
	21:48	21	06:25 (7)	20:56	41 07:36 (5)	19:45	28	08:06 (4)	18:36	32	09:03 (2)	16:40	3	08:34 (1)	16:22
19	05:35		06:05 (7)	06:23	06:55 (6)	07:15		07:40 (4)	08:06		08:33 (3)	08:02			08:42
	21:47	20	06:25 (7)	20:54	42 07:37 (5)	19:43	27	08:07 (4)	18:34	32	09:05 (2)	16:38			16:22
20	05:36		06:07 (7)	06:25	06:53 (6)	07:16		07:42 (4)	08:08		08:34 (3)	08:04			08:42
	21:46	19	06:26 (7)	20:52	44 07:37 (5)	19:41	25	08:07 (4)	18:32	31	09:05 (2)	16:37			16:23
21	05:38		06:08 (7)	06:27	06:54 (6)	07:18		07:43 (4)	08:10		08:36 (3)	08:06			08:43
	21:45	17	06:25 (7)	20:49	43 07:37 (5)	19:38	23	08:06 (4)	18:30	30	09:06 (2)	16:36			16:23
22	05:39		06:09 (7)	06:28	06:55 (6)	07:20		07:45 (4)	08:11		08:38 (3)	08:07			08:43
	21:43	16	06:25 (7)	20:47	41 07:36 (5)	19:36	20	08:05 (4)	18:27	29	09:07 (2)	16:35			16:24
23	05:41		06:11 (7)	06:30	06:57 (5)	07:21		07:47 (4)	08:13		08:40 (2)	08:09			08:44
	21:42	15	06:26 (7)	20:45	40 07:37 (5)	19:33	18	08:05 (4)	18:25	28	09:08 (2)	16:34			16:24
24	05:42		06:12 (7)	06:32	06:58 (5)	07:23		07:48 (4)	08:15		08:42 (2)	08:11			08:44
	21:41	13	06:25 (7)	20:43	38 07:36 (5)	19:31	15	08:03 (4)	18:23	26	09:08 (2)	16:32			16:25
25	05:43		06:13 (7)	06:33	07:00 (5)	07:25		07:50 (4)	07:17		07:44 (2)	08:12			08:45
	21:39	11	06:24 (7)	20:41	36 07:36 (5)	19:29	12	08:02 (4)	17:21	24	08:08 (2)	16:31			16:25
26	05:45		06:15 (7)	06:35	07:02 (5)	07:26		07:52 (4)	07:19		07:46 (2)	08:14			08:45
	21:38	9	06:24 (7)	20:39	34 07:36 (5)	19:26	9	08:01 (4)	17:19	22	08:08 (2)	16:30			16:26
27	05:46		06:16 (7)	06:36	07:03 (5)	07:28		07:53 (4)	07:21		07:48 (2)	08:15			08:45
	21:36	7	06:23 (7)	20:36	31 07:34 (5)	19:24	6	07:59 (4)	17:17	20	08:08 (2)	16:29			16:27
28	05:48		06:17 (7)	06:38	07:05 (5)	07:30		07:55 (4)	07:22		07:50 (2)	08:17			08:45
	21:35	5	06:22 (7)	20:34	29 07:34 (5)	19:22	2	07:57 (4)	17:15	18	08:08 (2)	16:29			16:28
29	05:49		06:19 (7)	06:40	07:06 (5)	07:31		08:34 (3)	07:24		07:52 (2)	08:19			08:46
	21:33	3	06:22 (7)	20:32	27 07:33 (5)	19:19	14	08:48 (3)	17:13	16	08:08 (2)	16:28			16:29
30	05:51			06:41	07:08 (5)	07:33		08:30 (3)	07:26		07:54 (2)	08:20			08:46
	21:31			20:30	24 07:32 (5)	19:17	20	08:50 (3)	17:11	13	08:07 (2)	16:27			16:29
31	05:52			06:43	07:10 (5)				07:28		07:56 (2)				08:46
	21:30			20:27	21 07:31 (5)				17:09	10	08:06 (2)				16:30
Potential sun hours	504			455		381			331			264			241
Total, worst case		594			775		440			915			236		
Sun reduction		0.33			0.35		0.34			0.28			0.26		
Oper. time red.		1.00			1.00		1.00			1.00			1.00		
Wind dir. red.		0.60			0.59		0.61			0.63			0.64		
Total reduction		0.20			0.21		0.21			0.18			0.17		
Total, real		118			162		90			162			39		

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
Jennings O'Donovan
Finisklin Business Park
F91 RHH9 Sligo
+353719161416
Kathlyn Feeney / kfeeney@jodireland.com

Calculated:
09/06/2025 13:54/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Worst Case - V150 **Shadow receptor:** AF - 32

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January		February		March		April		May	June
1	08:46		09:30 (3)	08:18		08:45 (5)	07:24		07:54 (8)	07:12		07:37 (9)	06:06	05:20
	16:32	17	09:47 (3)	17:20	24	09:09 (5)	18:13	45	08:39 (8)	20:08	34	08:11 (9)	21:00	21:47
2	08:46		09:30 (3)	08:16		08:43 (5)	07:21		07:54 (8)	07:10		07:36 (9)	06:04	05:19
	16:33	16	09:46 (3)	17:22	26	09:09 (5)	18:15	44	08:38 (8)	20:10	34	08:10 (9)	21:02	21:48
3	08:45		09:31 (3)	08:15		08:41 (5)	07:19		07:55 (8)	07:07		07:37 (9)	06:02	05:18
	16:34	15	09:46 (3)	17:24	28	09:09 (5)	18:17	43	08:38 (8)	20:12	32	08:09 (9)	21:03	21:49
4	08:45		09:33 (3)	08:13		08:41 (5)	07:17		07:41 (7)	07:05		07:37 (9)	06:00	05:17
	16:35	14	09:47 (3)	17:26	27	09:08 (5)	18:18	44	08:37 (8)	20:13	32	08:09 (9)	21:05	21:50
5	08:45		09:33 (3)	08:11		08:42 (5)	07:15		07:38 (7)	07:03		07:38 (9)	05:58	05:17
	16:36	13	09:46 (3)	17:28	27	09:09 (5)	18:20	46	08:36 (8)	20:15	30	08:08 (9)	21:07	21:51
6	08:45		09:35 (3)	08:10		08:43 (5)	07:12		07:36 (7)	07:00		07:38 (9)	05:57	05:16
	16:38	11	09:46 (3)	17:30	25	09:08 (5)	18:22	47	08:35 (8)	20:17	27	08:05 (9)	21:09	21:52
7	08:44		09:36 (3)	08:08		08:43 (5)	07:10		07:34 (7)	06:58		07:40 (9)	05:55	05:15
	16:39	8	09:44 (3)	17:32	24	09:07 (5)	18:24	48	08:34 (8)	20:18	24	08:04 (9)	21:10	21:53
8	08:44		09:40 (3)	08:06		08:44 (5)	07:08		07:31 (7)	06:56		07:41 (9)	05:53	05:15
	16:40	3	09:43 (3)	17:34	22	09:06 (5)	18:26	49	08:32 (8)	20:20	21	08:02 (9)	21:12	21:54
9	08:43			08:04		08:46 (5)	07:06		07:29 (7)	06:53		07:43 (9)	05:51	05:14
	16:42			17:35	18	09:04 (5)	18:28	47	08:30 (8)	20:22	15	07:58 (9)	21:14	21:55
10	08:43			08:03		08:48 (5)	07:03		07:27 (7)	06:51		07:47 (9)	05:49	05:14
	16:43			17:37	14	09:02 (5)	18:29	47	08:29 (8)	20:24	7	07:54 (9)	21:15	21:56
11	08:42			08:01		08:51 (5)	07:01		07:24 (7)	06:49			05:48	05:14
	16:44			17:39	9	09:00 (5)	18:31	44	08:25 (8)	20:25			21:17	21:56
12	08:41			07:59		08:24 (8)	06:59		07:22 (7)	06:47			05:46	05:13
	16:46			17:41	2	08:26 (8)	18:33	39	08:22 (8)	20:27			21:18	21:57
13	08:41			07:57		08:22 (8)	06:56		07:20 (7)	06:44			05:44	05:13
	16:47			17:43	7	08:29 (8)	18:35	30	08:17 (8)	20:29			21:20	21:58
14	08:40			07:55		08:20 (8)	06:54		07:18 (7)	06:42			05:43	05:13
	16:49			17:45	11	08:31 (8)	18:36	25	07:43 (7)	20:31			21:22	21:58
15	08:39			07:53		08:18 (8)	06:52		07:19 (7)	06:40			05:41	05:12
	16:50			17:47	15	08:33 (8)	18:38	23	07:42 (7)	20:32			21:23	21:59
16	08:38			07:51		08:16 (8)	06:49		07:19 (7)	06:38			05:40	05:12
	16:52			17:49	19	08:35 (8)	18:40	21	07:40 (7)	20:34			21:25	21:59
17	08:37			07:49		08:14 (8)	06:47		07:21 (7)	06:35			05:38	05:12
	16:54			17:51	22	08:36 (8)	18:42	17	07:38 (7)	20:36			21:26	22:00
18	08:36			07:47		08:12 (8)	06:45		07:23 (7)	06:33			05:36	05:12
	16:55			17:53	25	08:37 (8)	18:44	13	07:36 (7)	20:38			21:28	22:00
19	08:35			07:45		08:09 (8)	06:42			06:31			05:35	05:12
	16:57			17:54	28	08:37 (8)	18:45			20:39			21:29	22:01
20	08:34		09:03 (4)	07:43		08:07 (8)	06:40		07:03 (9)	06:29			05:34	05:12
	16:59	2	09:05 (4)	17:56	31	08:38 (8)	18:47	4	07:07 (9)	20:41			21:31	22:01
21	08:33		09:01 (4)	07:41		08:05 (8)	06:38		07:01 (9)	06:27			05:32	05:12
	17:00	4	09:05 (4)	17:58	34	08:39 (8)	18:49	8	07:09 (9)	20:43			21:32	22:01
22	08:32		09:00 (5)	07:39		08:03 (8)	06:35		06:58 (9)	06:25			05:31	05:13
	17:02	6	09:06 (4)	18:00	36	08:39 (8)	18:51	12	07:10 (9)	20:45			21:34	22:01
23	08:31		08:59 (5)	07:37		08:01 (8)	06:33		06:56 (9)	06:22			05:30	05:13
	17:04	8	09:07 (4)	18:02	39	08:40 (8)	18:52	15	07:11 (9)	20:46			21:35	22:02
24	08:29		08:57 (5)	07:34		07:59 (8)	06:31		06:54 (9)	06:20			05:28	05:13
	17:06	10	09:07 (4)	18:04	41	08:40 (8)	18:54	18	07:12 (9)	20:48			21:37	22:02
25	08:28		08:56 (5)	07:32		07:56 (8)	06:28		06:51 (9)	06:18			05:27	05:14
	17:08	11	09:07 (4)	18:06	43	08:39 (8)	18:56	21	07:12 (9)	20:50			21:38	22:02
26	08:27		08:54 (5)	07:30		07:54 (8)	06:26		06:49 (9)	06:16			05:26	05:14
	17:09	13	09:07 (4)	18:07	46	08:40 (8)	18:58	24	07:13 (9)	20:51			21:39	22:02
27	08:25		08:53 (5)	07:28		07:54 (8)	06:24		06:47 (9)	06:14			05:25	05:14
	17:11	15	09:08 (4)	18:09	46	08:40 (8)	18:59	26	07:13 (9)	20:53			21:41	22:02
28	08:24		08:51 (5)	07:26		07:54 (8)	06:21		06:44 (9)	06:12			05:24	05:15
	17:13	16	09:07 (5)	18:11	46	08:40 (8)	19:01	29	07:13 (9)	20:55			21:42	22:02
29	08:23		08:50 (5)				07:19		07:42 (9)	06:10			05:23	05:15
	17:15	18	09:08 (5)				20:03	31	08:13 (9)	20:57			21:43	22:01
30	08:21		08:48 (5)				07:17		07:39 (9)	06:08			05:22	05:16
	17:17	20	09:08 (5)				20:05	33	08:12 (9)	20:58			21:44	22:01
31	08:20		08:46 (5)				07:14		07:37 (9)				05:21	
	17:18	22	09:08 (5)				20:06	35	08:12 (9)				21:46	
Potential sun hours	257			277			367			417			487	501
Total, worst case		242			735			928			256			
Sun reduction		0.22			0.24			0.28			0.38			
Oper. time red.		1.00			1.00			1.00			1.00			
Wind dir. red.		0.65			0.64			0.62			0.61			
Total reduction		0.14			0.15			0.17			0.23			
Total, real		34			113			159			59			

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
Jennings O'Donovan
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Kathlyn Feeney / kfeeney@jodireland.com
Calculated:
09/06/2025 13:54/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Worst Case - V150 **Shadow receptor:** AF - 32

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	July		August		September			October			November			December		
1	05:17		05:54		06:45			07:35		08:00 (7)	07:30		08:17 (5)	08:22		
	22:01		21:28		20:25			19:15	36	08:59 (8)	17:07	16	08:33 (5)	16:26		
2	05:17		05:56		06:46		07:46 (9)	07:37		08:02 (7)	07:32		08:15 (5)	08:23		
	22:01		21:27		20:23	7	07:53 (9)	19:12	42	09:03 (8)	17:06	19	08:34 (5)	16:25		
3	05:18		05:57		06:48		07:41 (9)	07:38		08:04 (7)	07:33		08:14 (5)	08:24		
	22:00		21:25		20:21	15	07:56 (9)	19:10	45	09:06 (8)	17:04	22	08:36 (5)	16:25		
4	05:19		05:59		06:50		07:38 (9)	07:40		08:05 (7)	07:35		08:13 (5)	08:26		09:24 (3)
	22:00		21:23		20:18	21	07:59 (9)	19:08	47	09:07 (8)	17:02	24	08:37 (5)	16:24	3	09:27 (3)
5	05:20		06:00		06:51		07:36 (9)	07:42		08:07 (7)	07:37		08:12 (5)	08:27		09:21 (3)
	21:59		21:21		20:16	24	08:00 (9)	19:05	48	09:08 (8)	17:00	26	08:38 (5)	16:24	8	09:29 (3)
6	05:21		06:02		06:53		07:34 (9)	07:43		08:09 (7)	07:39		08:12 (5)	08:29		09:21 (3)
	21:59		21:19		20:14	27	08:01 (9)	19:03	48	09:09 (8)	16:58	26	08:38 (5)	16:23	11	09:32 (3)
7	05:21		06:04		06:55		07:33 (9)	07:45		08:11 (7)	07:41		08:11 (5)	08:30		09:20 (3)
	21:58		21:18		20:11	30	08:03 (9)	19:01	48	09:11 (8)	16:57	28	08:39 (5)	16:23	13	09:33 (3)
8	05:22		06:05		06:56		07:31 (9)	07:47		08:12 (7)	07:43		08:12 (5)	08:31		09:20 (3)
	21:57		21:16		20:09	32	08:03 (9)	18:58	46	09:10 (8)	16:55	27	08:39 (5)	16:22	14	09:34 (3)
9	05:23		06:07		06:58		07:31 (9)	07:49		08:14 (7)	07:44		08:14 (5)	08:32		09:20 (3)
	21:57		21:14		20:07	32	08:03 (9)	18:56	45	09:11 (8)	16:53	26	08:40 (5)	16:22	15	09:35 (3)
10	05:24		06:08		07:00		07:29 (9)	07:50		08:29 (8)	07:46		08:16 (5)	08:33		09:20 (3)
	21:56		21:12		20:04	34	08:03 (9)	18:54	43	09:12 (8)	16:52	24	08:40 (5)	16:22	16	09:36 (3)
11	05:25		06:10		07:01		07:29 (9)	07:52		08:29 (8)	07:48		08:18 (5)	08:34		09:20 (3)
	21:55		21:10		20:02	35	08:04 (9)	18:52	43	09:12 (8)	16:50	22	08:40 (5)	16:22	17	09:37 (3)
12	05:27		06:12		07:03		07:29 (9)	07:54		08:28 (8)	07:50		08:20 (5)	08:36		09:20 (3)
	21:54		21:08		20:00	35	08:04 (9)	18:49	45	09:13 (8)	16:48	20	08:40 (5)	16:22	18	09:38 (3)
13	05:28		06:13		07:05		07:30 (9)	07:56		08:27 (8)	07:52		08:22 (5)	08:37		09:20 (3)
	21:53		21:06		19:57	33	08:03 (9)	18:47	45	09:12 (8)	16:47	18	08:40 (5)	16:22	18	09:38 (3)
14	05:29		06:15		07:06		07:32 (9)	07:57		08:27 (8)	07:53		08:24 (5)	08:38		09:20 (3)
	21:53		21:04		19:55	31	08:03 (9)	18:45	45	09:12 (8)	16:45	16	08:40 (5)	16:22	19	09:39 (3)
15	05:30		06:17		07:08		07:34 (9)	07:59		08:26 (8)	07:55		08:26 (5)	08:38		09:21 (3)
	21:52		21:02		19:52	29	08:03 (9)	18:43	46	09:12 (8)	16:44	15	08:41 (4)	16:22	19	09:40 (3)
16	05:31		06:18		07:10		07:35 (9)	08:01		08:27 (8)	07:57		08:27 (5)	08:39		09:21 (3)
	21:50		21:00		19:50	27	08:02 (9)	18:40	45	09:12 (8)	16:42	13	08:40 (4)	16:22	20	09:41 (3)
17	05:32		06:20		07:11		07:37 (9)	08:03		08:29 (8)	07:59		08:29 (5)	08:40		09:21 (3)
	21:49		20:58		19:48	24	08:01 (9)	18:38	43	09:12 (8)	16:41	11	08:40 (4)	16:22	20	09:41 (3)
18	05:34		06:22		07:13		07:38 (9)	08:04		08:31 (8)	08:00		08:31 (5)	08:41		09:21 (3)
	21:48		20:56		19:45	22	08:00 (9)	18:36	40	09:11 (8)	16:40	10	08:41 (4)	16:22	20	09:41 (3)
19	05:35		06:23		07:15		07:40 (9)	08:06		08:33 (8)	08:02		08:33 (5)	08:42		09:22 (3)
	21:47		20:54		19:43	19	07:59 (9)	18:34	38	09:11 (8)	16:38	8	08:41 (4)	16:22	20	09:42 (3)
20	05:36		06:25		07:16		07:42 (9)	08:08		08:34 (8)	08:04		08:35 (5)	08:42		09:23 (3)
	21:46		20:52		19:41	16	07:58 (9)	18:32	35	09:09 (8)	16:37	6	08:41 (4)	16:23	20	09:43 (3)
21	05:38		06:27		07:18		07:43 (9)	08:10		08:36 (8)	08:06		08:37 (4)	08:43		09:23 (3)
	21:45		20:50		19:38	13	07:56 (9)	18:30	33	09:09 (8)	16:36	4	08:41 (4)	16:23	20	09:43 (3)
22	05:39		06:28		07:20		07:45 (9)	08:11		08:38 (8)	08:07		08:39 (4)	08:43		09:24 (3)
	21:43		20:47		19:36	9	07:54 (9)	18:27	30	09:08 (8)	16:35	2	08:41 (4)	16:24	20	09:44 (3)
23	05:41		06:30		07:21		07:47 (9)	08:13		08:40 (8)	08:09			08:44		09:24 (3)
	21:42		20:45		19:33	5	07:52 (9)	18:25	27	09:07 (8)	16:34			16:24	20	09:44 (3)
24	05:42		06:31		07:23		07:48 (9)	08:15		08:42 (8)	08:11			08:44		09:24 (3)
	21:41		20:43		19:31	1	07:49 (9)	18:23	24	09:06 (8)	16:32			16:25	20	09:44 (3)
25	05:43		06:33		07:25		08:07 (7)	07:17		07:44 (8)	08:12			08:45		09:25 (3)
	21:39		20:41		19:29	10	08:17 (7)	17:21	21	08:05 (8)	16:31			16:25	20	09:45 (3)
26	05:45		06:35		07:26		08:04 (7)	07:19		07:46 (8)	08:14			08:45		09:25 (3)
	21:38		20:39		19:26	16	08:20 (7)	17:19	18	08:04 (8)	16:30			16:26	20	09:45 (3)
27	05:46		06:36		07:28		08:01 (7)	07:21		07:48 (8)	08:16			08:45		09:26 (3)
	21:36		20:36		19:24	20	08:21 (7)	17:17	14	08:02 (8)	16:29			16:27	19	09:45 (3)
28	05:48		06:38		07:30		08:00 (7)	07:22		07:50 (8)	08:17			08:45		09:26 (3)
	21:35		20:34		19:22	22	08:22 (7)	17:15	10	08:00 (8)	16:29			16:28	20	09:46 (3)
29	05:49		06:40		07:31		07:59 (7)	07:24		07:52 (8)	08:19			08:46		09:27 (3)
	21:33		20:32		19:19	24	08:23 (7)	17:13	6	07:58 (8)	16:28			16:29	19	09:46 (3)
30	05:51		06:41		07:33		07:58 (7)	07:26		07:54 (8)	08:20			08:46		09:28 (3)
	21:32		20:30		19:17	25	08:23 (7)	17:11	1	07:55 (8)	16:27			16:29	18	09:46 (3)
31	05:52		06:43					07:28		08:19 (5)				08:46		09:29 (3)
	21:30		20:27					17:09	11	08:30 (5)				16:30	18	09:47 (3)
Potential sun hours	504		455		381			331			264			241		
Total, worst case						638			1068			383			485	
Sun reduction						0.34			0.28			0.26			0.22	
Oper. time red.						1.00			1.00			1.00			1.00	
Wind dir. red.						0.61			0.63			0.64			0.67	
Total reduction						0.21			0.18			0.17			0.15	
Total, real						131			189			64			71	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
Jennings O'Donovan
Finisklin Business Park
F91 RHH9 Sligo
+353719161416
Kathlyn Feeney / kfeeney@jodireland.com
Calculated:
09/06/2025 13:54/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Worst Case - V150 **Shadow receptor:** AG - 33

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January		February		March		April	May	June
1	08:46		09:45 (8)	08:18		08:45 (7)	07:24		07:59 (9)	07:12	06:06	05:20
	16:32	53	10:38 (8)	17:20	4	08:49 (7)	18:13	48	08:47 (9)	20:08	21:00	21:47
2	08:46		09:45 (8)	08:16		08:43 (7)	07:21		08:00 (9)	07:10	06:04	05:19
	16:33	53	10:38 (8)	17:22	7	08:50 (7)	18:15	47	08:47 (9)	20:10	21:02	21:48
3	08:45		09:46 (8)	08:15		08:41 (7)	07:19		08:01 (9)	07:07	06:02	05:18
	16:34	53	10:39 (8)	17:24	10	08:51 (7)	18:17	45	08:46 (9)	20:12	21:03	21:49
4	08:45		09:47 (8)	08:13		08:39 (7)	07:17		08:01 (9)	07:05	06:00	05:17
	16:35	52	10:39 (8)	17:26	13	08:52 (7)	18:18	45	08:46 (9)	20:13	21:05	21:50
5	08:45		09:47 (8)	08:11		08:37 (7)	07:15		08:01 (9)	07:03	05:58	05:17
	16:36	52	10:39 (8)	17:28	15	08:52 (7)	18:20	43	08:44 (9)	20:15	21:07	21:51
6	08:45		09:16 (6)	08:10		08:36 (7)	07:12		08:02 (9)	07:00	05:56	05:16
	16:37	53	10:40 (8)	17:30	18	08:54 (7)	18:22	41	08:43 (9)	20:17	21:09	21:52
7	08:44		09:15 (6)	08:08		08:34 (7)	07:10		08:03 (9)	06:58	05:55	05:15
	16:39	54	10:40 (8)	17:32	20	08:54 (7)	18:24	39	08:42 (9)	20:18	21:10	21:53
8	08:44		09:15 (6)	08:06		08:32 (7)	07:08		08:04 (9)	06:56	05:53	05:15
	16:40	55	10:40 (8)	17:34	23	08:55 (7)	18:26	36	08:40 (9)	20:20	21:12	21:54
9	08:43		09:14 (6)	08:04		08:30 (7)	07:06		08:05 (9)	06:53	05:51	05:14
	16:41	56	10:40 (8)	17:35	25	08:55 (7)	18:28	33	08:38 (9)	20:22	21:14	21:55
10	08:43		09:13 (6)	08:03		08:28 (7)	07:03		08:07 (9)	06:51	05:49	05:14
	16:43	57	10:40 (8)	17:37	27	08:55 (7)	18:29	29	08:36 (9)	20:24	21:15	21:56
11	08:42		09:12 (6)	08:01		08:26 (7)	07:01		08:09 (9)	06:49	05:48	05:13
	16:44	58	10:40 (8)	17:39	29	08:55 (7)	18:31	24	08:33 (9)	20:25	21:17	21:56
12	08:41		09:11 (6)	07:59		08:24 (7)	06:59		08:12 (9)	06:47	05:46	05:13
	16:46	59	10:40 (8)	17:41	31	08:55 (7)	18:33	17	08:29 (9)	20:27	21:18	21:57
13	08:41		09:11 (6)	07:57		08:22 (7)	06:56		08:20 (9)	06:44	05:44	05:13
	16:47	60	10:41 (8)	17:43	33	08:55 (7)	18:35	2	08:22 (9)	20:29	21:20	21:58
14	08:40		09:10 (6)	07:55		08:20 (9)	06:54			06:42	05:43	05:13
	16:49	61	10:41 (8)	17:45	35	08:55 (7)	18:36			20:31	21:22	21:58
15	08:39		09:09 (6)	07:53		08:18 (9)	06:52			06:40	05:41	05:12
	16:50	61	10:41 (8)	17:47	36	08:54 (7)	18:38			20:32	21:23	21:59
16	08:38		09:08 (6)	07:51		08:16 (9)	06:49			06:38	05:39	05:12
	16:52	62	10:41 (8)	17:49	38	08:54 (7)	18:40			20:34	21:25	21:59
17	08:37		09:06 (6)	07:49		08:14 (9)	06:47			06:35	05:38	05:12
	16:54	62	10:40 (8)	17:51	39	08:53 (7)	18:42			20:36	21:26	22:00
18	08:36		09:05 (6)	07:47		08:12 (9)	06:45			06:33	05:36	05:12
	16:55	63	10:40 (8)	17:53	40	08:52 (7)	18:44			20:38	21:28	22:00
19	08:35		09:04 (6)	07:45		08:09 (9)	06:42			06:31	05:35	05:12
	16:57	62	10:39 (8)	17:54	41	08:50 (7)	18:45			20:39	21:29	22:01
20	08:34		09:03 (6)	07:43		08:07 (9)	06:40			06:29	05:34	05:12
	16:59	63	10:39 (8)	17:56	41	08:48 (7)	18:47			20:41	21:31	22:01
21	08:33		09:01 (6)	07:41		08:05 (9)	06:38			06:27	05:32	05:12
	17:00	62	10:38 (8)	17:58	43	08:48 (9)	18:49			20:43	21:32	22:01
22	08:32		09:00 (6)	07:39		08:03 (9)	06:35			06:25	05:31	05:13
	17:02	62	10:37 (8)	18:00	46	08:49 (9)	18:51			20:45	21:34	22:01
23	08:31		09:00 (6)	07:37		08:01 (9)	06:33			06:22	05:30	05:13
	17:04	60	10:37 (8)	18:02	48	08:49 (9)	18:52			20:46	21:35	22:02
24	08:29		09:00 (6)	07:34		08:00 (9)	06:31			06:20	05:28	05:13
	17:06	56	10:35 (8)	18:04	49	08:49 (9)	18:54			20:48	21:37	22:02
25	08:28		09:01 (6)	07:32		07:59 (9)	06:28			06:18	05:27	05:13
	17:07	53	10:34 (8)	18:06	50	08:49 (9)	18:56			20:50	21:38	22:02
26	08:27		09:02 (6)	07:30		08:00 (9)	06:26			06:16	05:26	05:14
	17:09	47	10:32 (8)	18:07	49	08:49 (9)	18:58			20:51	21:39	22:02
27	08:25		09:03 (6)	07:28		08:00 (9)	06:24			06:14	05:25	05:14
	17:11	40	10:30 (8)	18:09	49	08:49 (9)	18:59			20:53	21:41	22:02
28	08:24		09:04 (6)	07:26		08:00 (9)	06:21			06:12	05:24	05:15
	17:13	32	10:27 (8)	18:11	48	08:48 (9)	19:01			20:55	21:42	22:02
29	08:23		09:06 (6)				07:19			06:10	05:23	05:15
	17:15	16	09:22 (6)				20:03			20:57	21:43	22:01
30	08:21		09:08 (6)				07:17			06:08	05:22	05:16
	17:17	11	09:19 (6)				20:05			20:58	21:44	22:01
31	08:20		09:12 (6)				07:14				05:21	
	17:18	3	09:15 (6)				20:06				21:46	
Potential sun hours	257			277			367			417	487	502
Total, worst case		1591			907			449				
Sun reduction		0.22			0.24			0.28				
Oper. time red.		1.00			1.00			1.00				
Wind dir. red.		0.66			0.64			0.63				
Total reduction		0.14			0.15			0.18				
Total, real		229			140			79				

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
Jennings O'Donovan
Finisklin Business Park
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+353719161416
Kathlyn Feeney / kfeeney@jodireland.com

Calculated:
09/06/2025 13:54/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Worst Case - V150 **Shadow receptor:** AG - 33

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	July		August		September		October			November			December		
1	05:17		05:54		06:45		07:35		08:53 (9)	07:30		07:58 (7)	08:22		08:54 (6)
	22:01		21:28		20:25		19:15	13	09:06 (9)	17:07	27	08:25 (7)	16:26	58	10:22 (8)
2	05:17		05:56		06:46		07:37		08:49 (9)	07:32		08:00 (7)	08:23		08:56 (6)
	22:01		21:27		20:23		19:12	21	09:10 (9)	17:05	25	08:25 (7)	16:25	57	10:23 (8)
3	05:18		05:57		06:48		07:38		08:46 (9)	07:33		08:02 (7)	08:24		08:57 (6)
	22:00		21:25		20:20		19:10	27	09:13 (9)	17:04	22	08:24 (7)	16:25	55	10:23 (8)
4	05:19		05:59		06:50		07:40		08:43 (9)	07:35		08:04 (7)	08:26		08:59 (6)
	22:00		21:23		20:18		19:08	31	09:14 (9)	17:02	20	08:24 (7)	16:24	56	10:25 (8)
5	05:20		06:00		06:51		07:42		08:42 (9)	07:37		08:06 (7)	08:27		09:00 (6)
	21:59		21:21		20:16		19:05	34	09:16 (9)	17:00	17	08:23 (7)	16:24	54	10:25 (8)
6	05:21		06:02		06:53		07:43		08:40 (9)	07:39		08:08 (7)	08:29		09:02 (6)
	21:59		21:19		20:14		19:03	37	09:17 (9)	16:58	15	08:23 (7)	16:23	53	10:26 (8)
7	05:21		06:03		06:55		07:45		08:39 (9)	07:41		08:10 (7)	08:30		09:34 (8)
	21:58		21:18		20:11		19:01	39	09:18 (9)	16:57	12	08:22 (7)	16:23	52	10:26 (8)
8	05:22		06:05		06:56		07:47		08:37 (9)	07:42		08:12 (7)	08:31		09:34 (8)
	21:57		21:16		20:09		18:58	42	09:19 (9)	16:55	9	08:21 (7)	16:22	52	10:26 (8)
9	05:23		06:07		06:58		07:49		08:36 (9)	07:44		08:14 (7)	08:32		09:35 (8)
	21:57		21:14		20:07		18:56	43	09:19 (9)	16:53	7	08:21 (7)	16:22	53	10:28 (8)
10	05:24		06:08		07:00		07:50		08:35 (9)	07:46		08:16 (7)	08:33		09:35 (8)
	21:56		21:12		20:04		18:54	45	09:20 (9)	16:51	3	08:19 (7)	16:22	53	10:28 (8)
11	05:25		06:10		07:01		07:52		08:34 (9)	07:48		08:43 (6)	08:34		09:35 (8)
	21:55		21:10		20:02		18:52	47	09:21 (9)	16:50	5	08:48 (6)	16:22	53	10:28 (8)
12	05:27		06:12		07:03		07:54		08:34 (9)	07:50		08:40 (6)	08:36		09:35 (8)
	21:54		21:08		19:59		18:49	47	09:21 (9)	16:48	11	08:51 (6)	16:22	54	10:29 (8)
13	05:28		06:13		07:05		07:55		08:32 (9)	07:52		08:38 (6)	08:37		09:36 (8)
	21:53		21:06		19:57		18:47	48	09:20 (9)	16:47	15	08:53 (6)	16:22	53	10:29 (8)
14	05:29		06:15		07:06		07:57		08:32 (9)	07:53		08:37 (6)	08:37		09:36 (8)
	21:53		21:04		19:55		18:45	49	09:21 (9)	16:45	33	10:00 (8)	16:22	54	10:30 (8)
15	05:30		06:17		07:08		07:59		08:32 (9)	07:55		08:36 (6)	08:38		09:37 (8)
	21:52		21:02		19:52		18:43	49	09:21 (9)	16:44	42	10:04 (8)	16:22	53	10:30 (8)
16	05:31		06:18		07:10		08:01		08:32 (9)	07:57		08:34 (6)	08:39		09:37 (8)
	21:50		21:00		19:50		18:40	49	09:21 (9)	16:42	48	10:05 (8)	16:22	54	10:31 (8)
17	05:32		06:20		07:11		08:03		08:32 (9)	07:59		08:34 (6)	08:40		09:38 (8)
	21:49		20:58		19:48		18:38	49	09:21 (9)	16:41	52	10:07 (8)	16:22	54	10:32 (8)
18	05:34		06:22		07:13		08:04		08:32 (9)	08:00		08:34 (6)	08:41		09:38 (8)
	21:48		20:56		19:45		18:36	49	09:21 (9)	16:40	56	10:09 (8)	16:22	53	10:31 (8)
19	05:35		06:23		07:15		08:06		08:33 (9)	08:02		08:34 (6)	08:42		09:38 (8)
	21:47		20:54		19:43		18:34	47	09:20 (9)	16:38	60	10:11 (8)	16:22	54	10:32 (8)
20	05:36		06:25		07:16		08:08		08:34 (9)	08:04		08:35 (6)	08:42		09:38 (4)
	21:46		20:52		19:41		18:32	45	09:19 (9)	16:37	62	10:12 (8)	16:23	55	10:33 (8)
21	05:38		06:26		07:18		08:10		08:36 (9)	08:06		08:37 (6)	08:43		09:38 (4)
	21:45		20:49		19:38		18:30	43	09:19 (9)	16:36	62	10:14 (8)	16:23	55	10:33 (8)
22	05:39		06:28		07:20		08:11		08:38 (9)	08:07		08:39 (6)	08:43		09:39 (4)
	21:43		20:47		19:36		18:27	41	09:19 (7)	16:35	63	10:15 (8)	16:24	55	10:34 (8)
23	05:41		06:30		07:21		08:13		08:40 (9)	08:09		08:41 (6)	08:44		09:39 (4)
	21:42		20:45		19:33		18:25	41	09:21 (7)	16:33	62	10:16 (8)	16:24	55	10:34 (8)
24	05:42		06:31		07:23		08:15		08:42 (9)	08:11		08:42 (6)	08:44		09:40 (8)
	21:41		20:43		19:31		18:23	40	09:22 (7)	16:32	63	10:17 (8)	16:25	54	10:34 (8)
25	05:43		06:33		07:25		07:17		07:44 (9)	08:12		08:44 (6)	08:45		09:41 (4)
	21:39		20:41		19:29		17:21	39	08:23 (7)	16:31	62	10:18 (8)	16:25	54	10:35 (8)
26	05:45		06:35		07:26		07:19		07:46 (9)	08:14		08:46 (6)	08:45		09:42 (8)
	21:38		20:39		19:26		17:19	37	08:23 (7)	16:30	62	10:19 (8)	16:26	53	10:35 (8)
27	05:46		06:36		07:28		07:21		07:48 (9)	08:15		08:48 (6)	08:45		09:42 (8)
	21:36		20:36		19:24		17:17	36	08:24 (7)	16:29	61	10:20 (8)	16:27	54	10:36 (8)
28	05:48		06:38		07:30		07:22		07:50 (9)	08:17		08:49 (6)	08:45		09:43 (8)
	21:35		20:34		19:22		17:15	34	08:24 (7)	16:29	61	10:20 (8)	16:28	53	10:36 (8)
29	05:49		06:40		07:31		07:24		07:52 (7)	08:19		08:51 (6)	08:46		09:43 (8)
	21:33		20:32		19:19		17:13	33	08:25 (7)	16:28	59	10:21 (8)	16:28	54	10:37 (8)
30	05:51		06:41		07:33		07:26		07:54 (7)	08:20		08:53 (6)	08:46		09:44 (8)
	21:32		20:30		19:17		17:11	31	08:25 (7)	16:27	59	10:22 (8)	16:29	53	10:37 (8)
31	05:52		06:43				07:28		07:56 (7)				08:46		09:44 (8)
	21:30		20:27				17:09	29	08:25 (7)				16:30	54	10:38 (8)
Potential sun hours	504		455		381		331			264			241		
Total, worst case								1215			1155			1674	
Sun reduction								0.28			0.26			0.22	
Oper. time red.								1.00			1.00			1.00	
Wind dir. red.								0.63			0.66			0.66	
Total reduction								0.18			0.17			0.15	
Total, real								217			198			243	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
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Finisklin Business Park
F91 RHH9 Sligo
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Kathlyn Feeney / kfeeney@jodireland.com

Calculated:
09/06/2025 13:54/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Worst Case - V150 **Shadow receptor:** AH - 34

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January		February		March		April	May	June
1	08:46		09:18 (6)	08:18		08:45 (7)	07:24		08:14 (9)	07:12	06:06	05:20
	16:32	54	10:49 (8)	17:20	16	09:01 (7)	18:13	42	08:56 (9)	20:08	21:00	21:47
2	08:46		09:17 (6)	08:16		08:43 (7)	07:21		08:15 (9)	07:10	06:04	05:19
	16:33	55	10:49 (8)	17:22	18	09:01 (7)	18:15	40	08:55 (9)	20:10	21:02	21:48
3	08:45		09:17 (6)	08:15		08:41 (7)	07:19		08:16 (9)	07:07	06:02	05:18
	16:34	54	10:49 (8)	17:24	21	09:02 (7)	18:17	38	08:54 (9)	20:12	21:03	21:49
4	08:45		09:17 (6)	08:13		08:39 (7)	07:17		08:18 (9)	07:05	06:00	05:17
	16:35	56	10:50 (8)	17:26	23	09:02 (7)	18:18	34	08:52 (9)	20:13	21:05	21:50
5	08:45		09:16 (6)	08:11		08:37 (7)	07:15		08:19 (9)	07:03	05:58	05:17
	16:36	56	10:49 (8)	17:28	25	09:02 (7)	18:20	30	08:49 (9)	20:15	21:07	21:51
6	08:45		09:16 (6)	08:10		08:36 (7)	07:12		08:21 (9)	07:00	05:56	05:16
	16:37	57	10:50 (8)	17:30	27	09:03 (7)	18:22	26	08:47 (9)	20:17	21:09	21:52
7	08:44		09:15 (6)	08:08		08:34 (7)	07:10		08:24 (9)	06:58	05:55	05:15
	16:39	57	10:50 (8)	17:32	29	09:03 (7)	18:24	20	08:44 (9)	20:18	21:10	21:53
8	08:44		09:15 (6)	08:06		08:32 (7)	07:08		08:27 (9)	06:56	05:53	05:15
	16:40	57	10:50 (8)	17:34	31	09:03 (7)	18:26	12	08:39 (9)	20:20	21:12	21:54
9	08:43		09:14 (6)	08:04		08:30 (7)	07:06			06:53	05:51	05:14
	16:41	58	10:50 (8)	17:35	33	09:03 (7)	18:28			20:22	21:14	21:55
10	08:43		09:13 (6)	08:03		08:28 (9)	07:03			06:51	05:49	05:14
	16:43	59	10:50 (8)	17:37	35	09:03 (7)	18:29			20:24	21:15	21:56
11	08:42		09:12 (6)	08:01		08:26 (9)	07:01			06:49	05:48	05:13
	16:44	58	10:49 (8)	17:39	36	09:02 (7)	18:31			20:25	21:17	21:56
12	08:41		09:11 (6)	07:59		08:24 (9)	06:59			06:47	05:46	05:13
	16:46	59	10:49 (8)	17:41	38	09:02 (7)	18:33			20:27	21:18	21:57
13	08:41		09:11 (6)	07:57		08:22 (9)	06:56			06:44	05:44	05:13
	16:47	60	10:50 (8)	17:43	39	09:01 (7)	18:35			20:29	21:20	21:58
14	08:40		09:10 (6)	07:55		08:20 (9)	06:54			06:42	05:43	05:13
	16:49	59	10:49 (8)	17:45	40	09:00 (7)	18:36			20:31	21:22	21:58
15	08:39		09:09 (6)	07:53		08:18 (9)	06:52			06:40	05:41	05:12
	16:50	59	10:49 (8)	17:47	43	09:01 (9)	18:38			20:32	21:23	21:59
16	08:38		09:08 (6)	07:51		08:16 (9)	06:49			06:38	05:39	05:12
	16:52	58	10:48 (8)	17:49	45	09:01 (9)	18:40			20:34	21:25	21:59
17	08:37		09:06 (6)	07:49		08:14 (9)	06:47			06:35	05:38	05:12
	16:54	58	10:47 (8)	17:51	48	09:02 (9)	18:42			20:36	21:26	22:00
18	08:36		09:05 (6)	07:47		08:12 (9)	06:45			06:33	05:36	05:12
	16:55	56	10:46 (8)	17:52	50	09:02 (9)	18:44			20:38	21:28	22:00
19	08:35		09:05 (6)	07:45		08:11 (9)	06:42			06:31	05:35	05:12
	16:57	53	10:45 (8)	17:54	50	09:01 (9)	18:45			20:39	21:29	22:01
20	08:34		09:06 (6)	07:43		08:11 (9)	06:40			06:29	05:34	05:12
	16:59	50	10:44 (8)	17:56	50	09:01 (9)	18:47			20:41	21:31	22:01
21	08:33		09:06 (6)	07:41		08:11 (9)	06:38			06:27	05:32	05:12
	17:00	46	10:42 (8)	17:58	50	09:01 (9)	18:49			20:43	21:32	22:01
22	08:32		09:07 (6)	07:39		08:12 (9)	06:35			06:25	05:31	05:13
	17:02	40	10:40 (8)	18:00	49	09:01 (9)	18:51			20:45	21:34	22:01
23	08:31		09:08 (6)	07:37		08:12 (9)	06:33			06:22	05:30	05:13
	17:04	30	10:36 (8)	18:02	49	09:01 (9)	18:52			20:46	21:35	22:02
24	08:29		09:09 (6)	07:34		08:12 (9)	06:31			06:20	05:28	05:13
	17:06	19	09:28 (6)	18:04	49	09:01 (9)	18:54			20:48	21:37	22:02
25	08:28		09:11 (6)	07:32		08:12 (9)	06:28			06:18	05:27	05:13
	17:07	17	09:28 (6)	18:06	47	08:59 (9)	18:56			20:50	21:38	22:02
26	08:27		09:12 (6)	07:30		08:12 (9)	06:26			06:16	05:26	05:14
	17:09	14	09:26 (6)	18:07	47	08:59 (9)	18:58			20:51	21:39	22:02
27	08:25		08:53 (7)	07:28		08:13 (9)	06:24			06:14	05:25	05:14
	17:11	12	09:25 (6)	18:09	45	08:58 (9)	18:59			20:53	21:41	22:02
28	08:24		08:51 (7)	07:26		08:14 (9)	06:21			06:12	05:24	05:15
	17:13	5	08:56 (7)	18:11	44	08:58 (9)	19:01			20:55	21:42	22:02
29	08:23		08:50 (7)				07:19			06:10	05:23	05:15
	17:15	8	08:58 (7)				20:03			20:57	21:43	22:01
30	08:21		08:48 (7)				07:17			06:08	05:22	05:16
	17:17	11	08:59 (7)				20:05			20:58	21:44	22:01
31	08:20		08:46 (7)				07:14				05:21	
	17:18	13	08:59 (7)				20:06				21:46	
Potential sun hours	257			277			367			417	487	502
Total, worst case		1348			1077			242				
Sun reduction		0.22			0.24			0.28				
Oper. time red.		1.00			1.00			1.00				
Wind dir. red.		0.67			0.64			0.64				
Total reduction		0.14			0.15			0.18				
Total, real		195			167			43				

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
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Kathlyn Feeney / kfeeney@jodireland.com

Calculated:
09/06/2025 13:54/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Worst Case - V150 **Shadow receptor:** AH - 34

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	July		August		September		October			November			December		
1	05:17		05:54		06:45		07:35			07:30		07:58 (9)	08:22		08:54 (6)
	22:01		21:28		20:25		19:15			17:07	34	08:32 (7)	16:26	58	10:31 (8)
2	05:17		05:56		06:46		07:37			07:32		08:00 (7)	08:23		08:56 (6)
	22:01		21:27		20:23		19:12			17:05	33	08:33 (7)	16:25	59	10:33 (8)
3	05:18		05:57		06:48		07:38			07:33		08:02 (7)	08:24		08:57 (6)
	22:00		21:25		20:20		19:10			17:04	31	08:33 (7)	16:25	57	10:33 (8)
4	05:19		05:59		06:50		07:40			07:35		08:04 (7)	08:26		08:59 (6)
	22:00		21:23		20:18		19:08			17:02	29	08:33 (7)	16:24	57	10:34 (8)
5	05:20		06:00		06:51		07:42		09:08 (9)	07:37		08:06 (7)	08:27		09:00 (6)
	21:59		21:21		20:16		19:05	4	09:12 (9)	17:00	27	08:33 (7)	16:24	57	10:35 (8)
6	05:21		06:02		06:53		07:43		09:01 (9)	07:39		08:08 (7)	08:29		09:02 (6)
	21:59		21:19		20:14		19:03	18	09:19 (9)	16:58	25	08:33 (7)	16:23	57	10:36 (8)
7	05:21		06:03		06:55		07:45		08:58 (9)	07:41		08:10 (7)	08:30		09:03 (6)
	21:58		21:18		20:11		19:01	24	09:22 (9)	16:57	23	08:33 (7)	16:23	56	10:36 (8)
8	05:22		06:05		06:56		07:47		08:55 (9)	07:42		08:12 (7)	08:31		09:04 (6)
	21:57		21:16		20:09		18:58	28	09:23 (9)	16:55	20	08:32 (7)	16:22	56	10:37 (8)
9	05:23		06:07		06:58		07:49		08:53 (9)	07:44		08:14 (7)	08:32		09:06 (6)
	21:57		21:14		20:07		18:56	32	09:25 (9)	16:53	18	08:32 (7)	16:22	55	10:38 (8)
10	05:24		06:08		07:00		07:50		08:51 (9)	07:46		08:16 (7)	08:33		09:07 (6)
	21:56		21:12		20:04		18:54	36	09:27 (9)	16:51	16	08:32 (7)	16:22	55	10:39 (8)
11	05:25		06:10		07:01		07:52		08:50 (9)	07:48		08:18 (7)	08:34		09:08 (6)
	21:55		21:10		20:02		18:52	38	09:28 (9)	16:50	13	08:31 (7)	16:22	54	10:39 (8)
12	05:27		06:12		07:03		07:54		08:49 (9)	07:50		08:20 (7)	08:36		09:09 (6)
	21:54		21:08		19:59		18:49	40	09:29 (9)	16:48	10	08:30 (7)	16:22	54	10:40 (8)
13	05:28		06:13		07:05		07:55		08:47 (9)	07:52		08:22 (7)	08:37		09:10 (6)
	21:53		21:06		19:57		18:47	42	09:29 (9)	16:47	8	08:30 (7)	16:22	52	10:40 (8)
14	05:29		06:15		07:06		07:57		08:46 (9)	07:53		08:24 (7)	08:37		09:11 (6)
	21:53		21:04		19:55		18:45	44	09:30 (9)	16:45	5	08:29 (7)	16:22	52	10:41 (8)
15	05:30		06:17		07:08		07:59		08:45 (9)	07:55		08:26 (7)	08:38		09:12 (6)
	21:52		21:02		19:52		18:43	46	09:31 (9)	16:44	12	08:58 (6)	16:22	51	10:41 (8)
16	05:31		06:18		07:10		08:01		08:44 (9)	07:57		08:45 (6)	08:39		09:13 (6)
	21:50		21:00		19:50		18:40	47	09:31 (9)	16:42	14	08:59 (6)	16:22	51	10:42 (8)
17	05:32		06:20		07:11		08:03		08:44 (9)	07:59		08:44 (6)	08:40		09:14 (6)
	21:49		20:58		19:48		18:38	48	09:32 (9)	16:41	17	09:01 (6)	16:22	51	10:43 (8)
18	05:34		06:22		07:13		08:04		08:43 (9)	08:00		08:43 (6)	08:41		09:52 (8)
	21:48		20:56		19:45		18:36	49	09:32 (9)	16:40	19	09:02 (6)	16:22	51	10:43 (8)
19	05:35		06:23		07:15		08:06		08:43 (9)	08:02		08:42 (6)	08:42		09:53 (8)
	21:47		20:54		19:43		18:34	49	09:32 (9)	16:38	30	10:10 (8)	16:22	50	10:43 (8)
20	05:36		06:25		07:16		08:08		08:42 (9)	08:04		08:42 (6)	08:42		09:54 (8)
	21:46		20:52		19:41		18:32	50	09:32 (9)	16:37	40	10:15 (8)	16:23	50	10:44 (8)
21	05:38		06:26		07:18		08:10		08:42 (9)	08:06		08:42 (6)	08:43		09:54 (8)
	21:45		20:49		19:38		18:30	50	09:32 (9)	16:36	46	10:18 (8)	16:23	50	10:44 (8)
22	05:39		06:28		07:20		08:11		08:42 (9)	08:07		08:42 (6)	08:43		09:55 (8)
	21:43		20:47		19:36		18:27	50	09:32 (9)	16:35	50	10:20 (8)	16:24	50	10:45 (8)
23	05:41		06:30		07:21		08:13		08:42 (9)	08:09		08:42 (6)	08:44		09:55 (8)
	21:42		20:45		19:33		18:25	49	09:31 (9)	16:33	53	10:22 (8)	16:24	50	10:45 (8)
24	05:42		06:31		07:23		08:15		08:42 (9)	08:11		08:42 (6)	08:44		09:55 (8)
	21:41		20:43		19:31		18:23	49	09:31 (9)	16:32	56	10:23 (8)	16:25	50	10:45 (8)
25	05:43		06:33		07:25		07:17		07:44 (9)	08:12		08:44 (6)	08:45		09:56 (8)
	21:39		20:41		19:29		17:21	47	08:31 (9)	16:31	58	10:25 (8)	16:25	50	10:46 (8)
26	05:45		06:35		07:26		07:19		07:46 (9)	08:14		08:46 (6)	08:45		09:18 (6)
	21:38		20:39		19:26		17:19	45	08:31 (9)	16:30	58	10:26 (8)	16:26	51	10:47 (8)
27	05:46		06:36		07:28		07:21		07:48 (9)	08:15		08:48 (6)	08:45		09:18 (6)
	21:36		20:36		19:24		17:17	42	08:30 (9)	16:29	58	10:28 (8)	16:27	51	10:47 (8)
28	05:48		06:38		07:30		07:22		07:50 (9)	08:17		08:49 (6)	08:45		09:18 (6)
	21:35		20:34		19:22		17:15	40	08:30 (7)	16:28	59	10:28 (8)	16:28	51	10:47 (8)
29	05:49		06:40		07:31		07:24		07:52 (9)	08:19		08:51 (6)	08:46		09:18 (6)
	21:33		20:32		19:19		17:13	39	08:31 (7)	16:28	60	10:30 (8)	16:28	52	10:48 (8)
30	05:51		06:41		07:33		07:26		07:54 (9)	08:20		08:53 (6)	08:46		09:18 (6)
	21:32		20:30		19:17		17:11	38	08:32 (7)	16:27	58	10:31 (8)	16:29	52	10:48 (8)
31	05:52		06:43				07:28		07:56 (9)				08:46		09:18 (6)
	21:30		20:27				17:09	36	08:32 (7)				16:30	53	10:48 (8)
Potential sun hours	504		455		381		331			264			241		
Total, worst case								1080			980			1643	
Sun reduction								0.28			0.26			0.22	
Oper. time red.								1.00			1.00			1.00	
Wind dir. red.								0.64			0.66			0.67	
Total reduction								0.18			0.17			0.15	
Total, real								194			168			241	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
Jennings O'Donovan
Finisklin Business Park
F91 RHH9 Sligo
+353719161416
Kathlyn Feeney / kfeeney@jodireland.com
Calculated:
09/06/2025 13:54/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Worst Case - V150 **Shadow receptor:** AI - 35

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January		February		March	April	May	June	July	August	September	October		November		December	
1	08:46		09:18 (7)	08:18	09:16 (9)	07:24	07:12	06:06	05:20	05:17	05:54	06:45	07:35		07:30	08:58 (9)	08:22	08:54 (7)
	16:32	34	09:52 (6)	17:20 45	10:01 (9)	18:13	20:08	21:00	21:47	22:01	21:28	20:25	19:15		17:07 20	09:18 (9)	16:26 44	09:38 (9)
2	08:46		09:17 (7)	08:16	09:17 (9)	07:21	07:10	06:04	05:19	05:17	05:55	06:46	07:36		07:32	08:56 (9)	08:23	08:56 (7)
	16:33	34	09:51 (6)	17:22 43	10:00 (9)	18:15	20:10	21:02	21:48	22:01	21:27	20:23	19:12		17:05 25	09:21 (9)	16:25 43	09:39 (9)
3	08:45		09:17 (7)	08:15	09:17 (9)	07:19	07:07	06:02	05:18	05:18	05:57	06:48	07:38		07:33	08:54 (9)	08:24	08:57 (7)
	16:34	34	09:51 (9)	17:24 42	09:59 (9)	18:17	20:12	21:03	21:49	22:00	21:25	20:20	19:10		17:04 29	09:23 (9)	16:25 41	09:38 (9)
4	08:45		09:17 (7)	08:13	09:18 (9)	07:17	07:05	06:00	05:17	05:19	05:59	06:50	07:40		07:35	08:52 (9)	08:26	08:59 (7)
	16:35	35	09:52 (9)	17:26 40	09:58 (9)	18:18	20:13	21:05	21:50	22:00	21:23	20:18	19:08		17:02 33	09:25 (9)	16:24 40	09:39 (9)
5	08:45		09:16 (7)	08:11	09:19 (9)	07:15	07:03	05:58	05:17	05:20	06:00	06:51	07:42		07:37	08:51 (9)	08:27	09:00 (7)
	16:36	36	09:52 (9)	17:28 38	09:57 (9)	18:20	20:15	21:07	21:51	21:59	21:21	20:16	19:05		17:00 35	09:26 (9)	16:24 39	09:39 (9)
6	08:45		09:16 (7)	08:10	09:21 (9)	07:12	07:00	05:56	05:16	05:20	06:02	06:53	07:43		07:39	08:50 (9)	08:29	09:02 (7)
	16:37	37	09:53 (9)	17:30 36	09:57 (9)	18:22	20:17	21:09	21:52	21:59	21:19	20:14	19:03		16:58 38	09:28 (9)	16:23 38	09:40 (9)
7	08:44		09:15 (7)	08:08	09:23 (9)	07:10	06:58	05:55	05:15	05:21	06:03	06:55	07:45		07:41	08:49 (9)	08:30	09:03 (7)
	16:39	39	09:54 (9)	17:32 32	09:55 (9)	18:24	20:18	21:10	21:53	21:58	21:18	20:11	19:01		16:57 40	09:29 (9)	16:23 36	09:39 (9)
8	08:44		09:15 (7)	08:06	09:24 (9)	07:08	06:56	05:53	05:15	05:22	06:05	06:56	07:47		07:42	08:48 (9)	08:31	09:04 (7)
	16:40	40	09:55 (9)	17:34 29	09:53 (9)	18:26	20:20	21:12	21:54	21:57	21:16	20:09	18:58		16:55 42	09:30 (9)	16:22 35	09:39 (9)
9	08:43		09:14 (7)	08:04	09:26 (9)	07:06	06:53	05:51	05:14	05:23	06:07	06:58	07:49		07:44	08:47 (9)	08:32	09:06 (7)
	16:41	41	09:55 (9)	17:35 25	09:51 (9)	18:28	20:22	21:14	21:55	21:57	21:14	20:07	18:56		16:53 44	09:31 (9)	16:22 34	09:40 (9)
10	08:43		09:13 (7)	08:03	09:29 (9)	07:03	06:51	05:49	05:14	05:24	06:08	07:00	07:50		07:46	08:47 (9)	08:33	09:07 (7)
	16:43	43	09:56 (9)	17:37 19	09:48 (9)	18:29	20:24	21:15	21:56	21:56	21:12	20:04	18:54		16:51 45	09:32 (9)	16:22 34	09:41 (6)
11	08:42		09:12 (7)	08:01	09:34 (9)	07:01	06:49	05:48	05:13	05:25	06:10	07:01	07:52		07:48	08:46 (9)	08:34	09:08 (7)
	16:44	44	09:56 (9)	17:39 9	09:43 (9)	18:31	20:25	21:17	21:56	21:55	21:10	20:02	18:51		16:50 47	09:33 (9)	16:22 34	09:42 (6)
12	08:41		09:11 (7)	07:59		06:59	06:47	05:46	05:13	05:26	06:12	07:03	07:54		07:50	08:46 (9)	08:36	09:09 (7)
	16:46	46	09:57 (9)	17:41		18:33	20:27	21:18	21:57	21:54	21:08	19:59	18:49		16:48 47	09:33 (9)	16:22 34	09:43 (6)
13	08:41		09:11 (7)	07:57		06:56	06:44	05:44	05:13	05:28	06:13	07:05	07:55		07:52	08:46 (9)	08:37	09:10 (7)
	16:47	47	09:58 (9)	17:43		18:35	20:29	21:20	21:58	21:53	21:06	19:57	18:47		16:47 48	09:34 (9)	16:22 34	09:44 (6)
14	08:40		09:10 (7)	07:55		06:54	06:42	05:43	05:13	05:29	06:15	07:06	07:57		07:53	08:46 (9)	08:37	09:11 (7)
	16:49	49	09:59 (9)	17:45		18:36	20:31	21:22	21:58	21:53	21:04	19:55	18:45		16:45 48	09:34 (9)	16:22 33	09:44 (6)
15	08:39		09:09 (7)	07:53		06:52	06:40	05:41	05:12	05:30	06:17	07:08	07:59		07:55	08:46 (9)	08:38	09:12 (7)
	16:50	50	09:59 (9)	17:47		18:38	20:32	21:23	21:59	21:52	21:02	19:52	18:43		16:44 49	09:35 (9)	16:22 33	09:45 (6)
16	08:38		09:08 (7)	07:51		06:49	06:38	05:39	05:12	05:31	06:18	07:10	08:01		07:57	08:45 (9)	08:39	09:13 (7)
	16:52	52	10:00 (9)	17:49		18:40	20:34	21:25	21:59	21:50	21:00	19:50	18:40		16:42 50	09:35 (9)	16:22 33	09:46 (6)
17	08:37		09:06 (7)	07:49		06:47	06:35	05:38	05:12	05:32	06:20	07:11	08:03		07:59	08:45 (7)	08:40	09:14 (7)
	16:54	53	09:59 (9)	17:51		18:42	20:36	21:26	22:00	21:49	20:58	19:48	18:38		16:41 50	09:35 (9)	16:22 33	09:47 (6)
18	08:36		09:07 (7)	07:47		06:45	06:33	05:36	05:12	05:34	06:21	07:13	08:04		08:00	08:45 (7)	08:41	09:14 (7)
	16:55	53	10:00 (9)	17:52		18:44	20:38	21:28	22:00	21:48	20:56	19:45	18:36		16:40 50	09:35 (9)	16:22 33	09:47 (6)
19	08:35		09:08 (7)	07:45		06:42	06:31	05:35	05:12	05:35	06:23	07:15	08:06		08:02	08:44 (7)	08:42	09:15 (7)
	16:57	53	10:01 (9)	17:54		18:45	20:39	21:29	22:01	21:47	20:54	19:43	18:34		16:38 52	09:36 (9)	16:22 33	09:48 (6)
20	08:34		09:08 (7)	07:43		06:40	06:29	05:34	05:12	05:36	06:25	07:16	08:08		08:04	08:44 (7)	08:42	09:16 (7)
	16:59	53	10:01 (9)	17:56		18:47	20:41	21:31	22:01	21:46	20:52	19:41	18:32		16:37 52	09:36 (9)	16:23 33	09:49 (6)
21	08:33		09:08 (7)	07:41		06:38	06:27	05:32	05:12	05:38	06:26	07:18	08:10		08:06	08:44 (7)	08:43	09:16 (7)
	17:00	53	10:01 (9)	17:58		18:49	20:43	21:32	22:01	21:45	20:49	19:38	18:30		16:36 53	09:37 (9)	16:23 33	09:49 (6)
22	08:32		09:09 (7)	07:39		06:35	06:24	05:31	05:13	05:39	06:28	07:20	08:11		08:07	08:44 (7)	08:43	09:17 (7)
	17:02	52	10:01 (9)	18:00		18:51	20:45	21:34	22:01	21:43	20:47	19:36	18:27		16:35 53	09:37 (9)	16:24 33	09:50 (6)
23	08:31		09:10 (7)	07:37		06:33	06:22	05:30	05:13	05:40	06:30	07:21	08:13		08:09	08:45 (7)	08:44	09:17 (7)
	17:04	52	10:02 (9)	18:02		18:52	20:46	21:35	22:02	21:42	20:45	19:33	18:25		16:33 53	09:38 (9)	16:24 33	09:50 (6)
24	08:29		09:11 (7)	07:34		06:31	06:20	05:28	05:13	05:42	06:31	07:23	08:15		08:11	08:44 (7)	08:44	09:17 (7)
	17:06	51	10:02 (9)	18:04		18:54	20:48	21:37	22:02	21:41	20:43	19:31	18:23		16:32 53	09:37 (9)	16:25 33	09:50 (6)
25	08:28		09:12 (7)	07:32		06:28	06:18	05:27	05:13	05:43	06:33	07:25	07:17		08:12	08:44 (7)	08:45	09:18 (7)
	17:07	50	10:02 (9)	18:06		18:56	20:50	21:38	22:02	21:39	20:41	19:29	17:21		16:31 53	09:37 (9)	16:25 33	09:51 (6)
26	08:27		09:12 (9)	07:30		06:26	06:16	05:26	05:14	05:45	06:35	07:26	07:19		08:14	08:46 (7)	08:45	09:18 (7)
	17:09	50	10:02 (9)	18:07		18:58	20:51	21:39	22:02	21:38	20:39	19:26	17:19		16:30 52	09:38 (9)	16:26 33	09:51 (6)
27	08:25		09:13 (9)	07:28		06:24	06:14	05:25	05:14	05:46	06:36	07:28	07:21		08:15	08:48 (7)	08:45	09:18 (7)
	17:11	49	10:02 (9)	18:09		18:59	20:53	21:41	22:02	21:36	20:36	19:24	17:17		16:29 50	09:38 (9)	16:27 33	09:51 (6)
28	08:24		09:13 (9)	07:26		06:21	06:12	05:24	05:15	05:48	06:38	07:30	07:22		08:17	08:49 (7)	08:45	09:18 (7)
	17:13	49	10:02 (9)	18:11		19:01	20:55	21:42	22:02	21:35	20:34	19:22	17:15		16:28 49	09:38 (9)	16:28 33	09:51 (6)
29	08:23		09:14 (9)			07:19	06:10	05:23	05:15	05:49	06:40	07:31	07:24		08:19	08:51 (7)	08:46	09:18 (7)
	17:15	48	10:02 (9)			20:03	20:57	21:43	22:01	21:33	20:32	19:19	17:13		16:28 47	09:38 (9)	16:28 33	09:51 (6)
30	08:21		09:14 (9)			07:17	06:08	05:22	05:16	05:51	06:41	07:33	07:26		08:20	08:53 (7)	08:46	09:18 (7)
	17:17	47	10:01 (9)			20:05	20:58	21:44	22:01	21:32	20:30	19:17	17:11		16:27 46	09:39 (9)	16:29 33	09:51 (6)
31	08:20		09:15 (9)			07:14		05:21		05:52	06:43		07:28	09:02 (9)			08:46	09:18 (7)
	17:18	46	10:01 (9)			20:06		21:46		21:30	20:27		17:09 12	09:14 (9)			16:30 34	09:52 (6)
Potential sun hours	257		277		367	417	487	502	504	455	381	331	12		264		241	
Total, worst case		1420		358									12			1353		1081
Sun reduction		0.22		0.24									0.28			0.26		0.22
Oper. time red.		1.00		1.00									1.00			1.00		1.00
Wind dir. red.		0.66		0.66									0.66			0.66		0.66
Total reduction		0.14		0.16									0.19			0.17		0.15
Total, real		205		58									2			234		157

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
Jennings O'Donovan
Finisklin Business Park
F91 RHH9 Sligo
+353719161416
Kathlyn Feeney / kfeeney@jodireland.com

Calculated:
09/06/2025 13:54/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Worst Case - V150 **Shadow receptor:** AJ - 36

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:46	08:18	07:24	07:12	06:06	05:20	05:17	05:54	06:45	07:35	07:30	08:22
	16:32	17:20	18:13	20:08	21:00	21:47	22:01	21:28	20:25	19:15	17:07	16:26
2	08:46	08:16	07:21	07:10	06:04	05:19	05:17	05:55	06:46	07:37	07:32	08:23
	16:33	17:22	18:15	20:10	21:02	21:48	22:01	21:27	20:23	19:12	17:05	16:25
3	08:45	08:15	07:19	07:07	06:02	05:18	05:18	05:57	06:48	07:38	07:33	08:25
	16:34	17:24	18:17	20:12	21:03	21:49	22:00	21:25	20:20	19:10	17:04	16:25
4	08:45	08:13	07:17	07:05	06:00	05:17	05:19	05:59	06:50	07:40	07:35	08:26
	16:35	17:26	18:18	20:13	21:05	21:50	22:00	21:23	20:18	19:08	17:02	16:24
5	08:45	08:11	07:15	07:03	05:58	05:17	05:20	06:00	06:51	07:42	07:37	08:27
	16:36	17:28	18:20	20:15	21:07	21:51	21:59	21:21	20:16	19:05	17:00	16:24
6	08:45	08:10	07:12	07:00	05:56	05:16	05:20	06:02	06:53	07:43	07:39	08:29
	16:37	17:30	18:22	20:17	21:09	21:52	21:59	21:19	20:14	19:03	16:58	16:23
7	08:44	08:08	07:10	06:58	05:55	05:15	05:21	06:03	06:55	07:45	07:41	08:30
	16:39	17:32	18:24	20:18	21:10	21:53	21:58	21:18	20:11	19:01	16:56	16:23
8	08:44	08:06	07:08	06:56	05:53	05:15	05:22	06:05	06:56	07:47	07:43	08:31
	16:40	17:34	18:26	20:20	21:12	21:54	21:58	21:16	20:09	18:58	16:55	16:22
9	08:43	08:04	07:06	06:53	05:51	05:14	05:23	06:07	06:58	07:49	07:44	08:32
	16:41	17:35	18:28	20:22	21:14	21:55	21:57	21:14	20:07	18:56	16:53	16:22
10	08:43	08:03	07:03	06:51	05:49	05:14	05:24	06:08	07:00	07:50	07:46	08:33
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25	08:28	07:32	06:28	06:18	05:27	05:13	05:43	06:33	07:25	07:17	08:12	08:45
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	17:17		20:05	20:58	21:44	22:01	21:32	20:30	19:17	17:11	16:27	16:29
31	08:20		07:14		05:21		05:52	06:43		07:28		08:46
	17:18		20:06		21:46		21:30	20:27		17:09		16:30
Potential sun hours	257	277	367	417	487	502	504	455	381	331	264	241
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
Jennings O'Donovan
Finisklin Business Park
F91 RHH9 Sligo
+353719161416
Kathlyn Feeney / kfeeney@jodireland.com

Calculated:
09/06/2025 13:54/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Worst Case - V150 **Shadow receptor:** AK - 37

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:46	08:18	07:24	07:12	06:06	05:20	05:17	05:54	06:45	07:35	07:30	08:22
	16:32	17:20	18:13	20:08	21:00	21:47	22:01	21:28	20:25	19:15	17:07	16:26
2	08:46	08:16	07:21	07:10	06:04	05:19	05:17	05:55	06:46	07:37	07:32	08:23
	16:33	17:22	18:15	20:10	21:02	21:48	22:01	21:27	20:23	19:12	17:05	16:25
3	08:45	08:15	07:19	07:07	06:02	05:18	05:18	05:57	06:48	07:38	07:33	08:25
	16:34	17:24	18:17	20:12	21:03	21:49	22:00	21:25	20:21	19:10	17:04	16:25
4	08:45	08:13	07:17	07:05	06:00	05:17	05:19	05:59	06:50	07:40	07:35	08:26
	16:35	17:26	18:18	20:13	21:05	21:50	22:00	21:23	20:18	19:08	17:02	16:24
5	08:45	08:11	07:15	07:03	05:58	05:17	05:20	06:00	06:51	07:42	07:37	08:27
	16:36	17:28	18:20	20:15	21:07	21:51	21:59	21:21	20:16	19:05	17:00	16:24
6	08:45	08:10	07:12	07:00	05:56	05:16	05:20	06:02	06:53	07:43	07:39	08:29
	16:37	17:30	18:22	20:17	21:09	21:52	21:59	21:19	20:14	19:03	16:58	16:23
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	16:39	17:32	18:24	20:18	21:10	21:53	21:58	21:18	20:11	19:01	16:56	16:23
8	08:44	08:06	07:08	06:56	05:53	05:15	05:22	06:05	06:56	07:47	07:43	08:31
	16:40	17:34	18:26	20:20	21:12	21:54	21:58	21:16	20:09	18:58	16:55	16:22
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	16:41	17:35	18:28	20:22	21:14	21:55	21:57	21:14	20:07	18:56	16:53	16:22
10	08:43	08:03	07:03	06:51	05:49	05:14	05:24	06:08	07:00	07:50	07:46	08:33
	16:43	17:37	18:29	20:24	21:15	21:56	21:56	21:12	20:04	18:54	16:51	16:22
11	08:42	08:01	07:01	06:49	05:48	05:13	05:25	06:10	07:01	07:52	07:48	08:35
	16:44	17:39	18:31	20:25	21:17	21:56	21:55	21:10	20:02	18:51	16:50	16:22
12	08:41	07:59	06:59	06:47	05:46	05:13	05:26	06:12	07:03	07:54	07:50	08:36
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	16:50	17:47	18:38	20:32	21:23	21:59	21:52	21:02	19:52	18:43	16:44	16:22
16	08:38	07:51	06:49	06:38	05:39	05:12	05:31	06:18	07:10	08:01	07:57	08:39
	16:52	17:49	18:40	20:34	21:25	22:00	21:51	21:00	19:50	18:40	16:42	16:22
17	08:37	07:49	06:47	06:35	05:38	05:12	05:32	06:20	07:11	08:03	07:59	08:40
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18	08:36	07:47	06:45	06:33	05:36	05:12	05:34	06:21	07:13	08:04	08:00	08:41
	16:55	17:52	18:44	20:38	21:28	22:00	21:48	20:56	19:45	18:36	16:40	16:22
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	16:57	17:54	18:45	20:39	21:29	22:01	21:47	20:54	19:43	18:34	16:38	16:22
20	08:34	07:43	06:40	06:29	05:34	05:12	05:36	06:25	07:16	08:08	08:04	08:42
	16:59	17:56	18:47	20:41	21:31	22:01	21:46	20:52	19:41	18:32	16:37	16:23
21	08:33	07:41	06:38	06:27	05:32	05:12	05:38	06:26	07:18	08:10	08:06	08:43
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	17:02	18:00	18:51	20:45	21:34	22:02	21:43	20:47	19:36	18:27	16:35	16:24
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29	08:23		07:19	06:10	05:23	05:15	05:49	06:40	07:31	07:24	08:19	08:46
	17:15		20:03	20:57	21:43	22:01	21:33	20:32	19:19	17:13	16:28	16:28
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31	08:20		07:14		05:21		05:52	06:43		07:28		08:46
	17:18		20:06		21:46		21:30	20:27		17:09		16:30
Potential sun hours	257	277	367	417	487	502	504	455	381	331	264	241
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
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Kathlyn Feeney / kfeeney@jodireland.com

SHADOW - Calendar

Calculation: 6839 Garrane WF Worst Case - V150 **Shadow receptor:** AL - 38

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:46	08:18	07:24	07:12	06:06	05:20	05:17	05:54	06:45	07:35	07:30	08:22
	16:32	17:20	18:13	20:08	21:00	21:47	22:01	21:28	20:25	19:15	17:07	16:26
2	08:46	08:16	07:21	07:10	06:04	05:19	05:17	05:55	06:46	07:37	07:32	08:23
	16:33	17:22	18:15	20:10	21:02	21:48	22:01	21:27	20:23	19:12	17:05	16:25
3	08:45	08:15	07:19	07:07	06:02	05:18	05:18	05:57	06:48	07:38	07:33	08:25
	16:34	17:24	18:17	20:12	21:03	21:49	22:00	21:25	20:21	19:10	17:04	16:25
4	08:45	08:13	07:17	07:05	06:00	05:17	05:19	05:59	06:50	07:40	07:35	08:26
	16:35	17:26	18:18	20:13	21:05	21:50	22:00	21:23	20:18	19:08	17:02	16:24
5	08:45	08:11	07:15	07:03	05:58	05:17	05:20	06:00	06:51	07:42	07:37	08:27
	16:36	17:28	18:20	20:15	21:07	21:51	21:59	21:21	20:16	19:05	17:00	16:24
6	08:45	08:10	07:12	07:00	05:56	05:16	05:20	06:02	06:53	07:43	07:39	08:29
	16:37	17:30	18:22	20:17	21:09	21:52	21:59	21:19	20:14	19:03	16:58	16:23
7	08:44	08:08	07:10	06:58	05:55	05:15	05:21	06:03	06:55	07:45	07:41	08:30
	16:39	17:32	18:24	20:18	21:10	21:53	21:58	21:18	20:11	19:01	16:56	16:23
8	08:44	08:06	07:08	06:56	05:53	05:15	05:22	06:05	06:56	07:47	07:43	08:31
	16:40	17:34	18:26	20:20	21:12	21:54	21:58	21:16	20:09	18:58	16:55	16:22
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	16:41	17:35	18:28	20:22	21:14	21:55	21:57	21:14	20:07	18:56	16:53	16:22
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	16:43	17:37	18:29	20:24	21:15	21:56	21:56	21:12	20:04	18:54	16:51	16:22
11	08:42	08:01	07:01	06:49	05:48	05:13	05:25	06:10	07:01	07:52	07:48	08:35
	16:44	17:39	18:31	20:25	21:17	21:56	21:55	21:10	20:02	18:51	16:50	16:22
12	08:41	07:59	06:59	06:47	05:46	05:13	05:26	06:12	07:03	07:54	07:50	08:36
	16:46	17:41	18:33	20:27	21:18	21:57	21:54	21:08	19:59	18:49	16:48	16:22
13	08:41	07:57	06:56	06:44	05:44	05:13	05:28	06:13	07:05	07:56	07:52	08:37
	16:47	17:43	18:35	20:29	21:20	21:58	21:54	21:06	19:57	18:47	16:47	16:21
14	08:40	07:55	06:54	06:42	05:43	05:13	05:29	06:15	07:06	07:57	07:53	08:38
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	16:50	17:47	18:38	20:32	21:23	21:59	21:52	21:02	19:52	18:43	16:44	16:22
16	08:38	07:51	06:49	06:38	05:39	05:12	05:31	06:18	07:10	08:01	07:57	08:39
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19	08:35	07:45	06:42	06:31	05:35	05:12	05:35	06:23	07:15	08:06	08:02	08:42
	16:57	17:54	18:45	20:39	21:29	22:01	21:47	20:54	19:43	18:34	16:38	16:22
20	08:34	07:43	06:40	06:29	05:34	05:12	05:36	06:25	07:16	08:08	08:04	08:42
	16:59	17:56	18:47	20:41	21:31	22:01	21:46	20:52	19:41	18:32	16:37	16:23
21	08:33	07:41	06:38	06:27	05:32	05:12	05:38	06:26	07:18	08:10	08:06	08:43
	17:00	17:58	18:49	20:43	21:32	22:01	21:45	20:50	19:38	18:30	16:36	16:23
22	08:32	07:39	06:35	06:24	05:31	05:13	05:39	06:28	07:20	08:11	08:07	08:43
	17:02	18:00	18:51	20:45	21:34	22:02	21:43	20:47	19:36	18:27	16:35	16:24
23	08:31	07:37	06:33	06:22	05:30	05:13	05:40	06:30	07:21	08:13	08:09	08:44
	17:04	18:02	18:52	20:46	21:35	22:02	21:42	20:45	19:33	18:25	16:33	16:24
24	08:29	07:34	06:31	06:20	05:28	05:13	05:42	06:31	07:23	08:15	08:11	08:44
	17:06	18:04	18:54	20:48	21:37	22:02	21:41	20:43	19:31	18:23	16:32	16:25
25	08:28	07:32	06:28	06:18	05:27	05:13	05:43	06:33	07:25	07:17	08:12	08:45
	17:07	18:06	18:56	20:50	21:38	22:02	21:39	20:41	19:29	17:21	16:31	16:25
26	08:27	07:30	06:26	06:16	05:26	05:14	05:45	06:35	07:26	07:19	08:14	08:45
	17:09	18:07	18:58	20:51	21:39	22:02	21:38	20:39	19:26	17:19	16:30	16:26
27	08:25	07:28	06:24	06:14	05:25	05:14	05:46	06:36	07:28	07:21	08:16	08:45
	17:11	18:09	18:59	20:53	21:41	22:02	21:36	20:36	19:24	17:17	16:29	16:27
28	08:24	07:26	06:21	06:12	05:24	05:15	05:48	06:38	07:30	07:22	08:17	08:45
	17:13	18:11	19:01	20:55	21:42	22:02	21:35	20:34	19:22	17:15	16:28	16:28
29	08:23		07:19	06:10	05:23	05:15	05:49	06:40	07:31	07:24	08:19	08:46
	17:15		20:03	20:57	21:43	22:01	21:33	20:32	19:19	17:13	16:28	16:28
30	08:21		07:17	06:08	05:22	05:16	05:51	06:41	07:33	07:26	08:20	08:46
	17:17		20:05	20:58	21:44	22:01	21:32	20:30	19:17	17:11	16:27	16:29
31	08:20		07:14		05:21		05:52	06:43		07:28		08:46
	17:18		20:06		21:46		21:30	20:27		17:09		16:30
Potential sun hours	257	277	367	417	487	502	504	455	381	331	264	241
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
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Kathlyn Feeney / kfeeney@jodireland.com

Calculated:
09/06/2025 13:54/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Worst Case - V150 **Shadow receptor:** AM - 39

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:46	08:18	07:24	07:12	06:06	05:20	05:17	05:54	06:45	07:35	07:30	08:22
	16:32	17:20	18:13	20:08	21:00	21:47	22:01	21:28	20:25	19:15	17:07	16:26
2	08:46	08:16	07:21	07:10	06:04	05:19	05:17	05:55	06:46	07:37	07:32	08:23
	16:33	17:22	18:15	20:10	21:02	21:48	22:01	21:27	20:23	19:12	17:05	16:25
3	08:45	08:15	07:19	07:07	06:02	05:18	05:18	05:57	06:48	07:38	07:33	08:25
	16:34	17:24	18:17	20:12	21:03	21:49	22:00	21:25	20:21	19:10	17:04	16:25
4	08:45	08:13	07:17	07:05	06:00	05:17	05:19	05:59	06:50	07:40	07:35	08:26
	16:35	17:26	18:18	20:13	21:05	21:50	22:00	21:23	20:18	19:08	17:02	16:24
5	08:45	08:11	07:15	07:03	05:58	05:17	05:20	06:00	06:51	07:42	07:37	08:27
	16:36	17:28	18:20	20:15	21:07	21:51	21:59	21:21	20:16	19:05	17:00	16:24
6	08:45	08:10	07:12	07:00	05:56	05:16	05:20	06:02	06:53	07:43	07:39	08:29
	16:37	17:30	18:22	20:17	21:09	21:52	21:59	21:20	20:14	19:03	16:58	16:23
7	08:44	08:08	07:10	06:58	05:55	05:15	05:21	06:03	06:55	07:45	07:41	08:30
	16:39	17:32	18:24	20:19	21:10	21:53	21:58	21:18	20:11	19:01	16:57	16:23
8	08:44	08:06	07:08	06:56	05:53	05:15	05:22	06:05	06:56	07:47	07:43	08:31
	16:40	17:34	18:26	20:20	21:12	21:54	21:58	21:16	20:09	18:58	16:55	16:22
9	08:43	08:04	07:06	06:53	05:51	05:14	05:23	06:07	06:58	07:49	07:44	08:32
	16:41	17:35	18:28	20:22	21:14	21:55	21:57	21:14	20:07	18:56	16:53	16:22
10	08:43	08:03	07:03	06:51	05:49	05:14	05:24	06:08	07:00	07:50	07:46	08:33
	16:43	17:37	18:29	20:24	21:15	21:56	21:56	21:12	20:04	18:54	16:51	16:22
11	08:42	08:01	07:01	06:49	05:48	05:13	05:25	06:10	07:01	07:52	07:48	08:35
	16:44	17:39	18:31	20:25	21:17	21:56	21:55	21:10	20:02	18:52	16:50	16:22
12	08:41	07:59	06:59	06:47	05:46	05:13	05:26	06:12	07:03	07:54	07:50	08:36
	16:46	17:41	18:33	20:27	21:18	21:57	21:54	21:08	20:00	18:49	16:48	16:22
13	08:41	07:57	06:56	06:44	05:44	05:13	05:28	06:13	07:05	07:56	07:52	08:37
	16:47	17:43	18:35	20:29	21:20	21:58	21:54	21:06	19:57	18:47	16:47	16:22
14	08:40	07:55	06:54	06:42	05:43	05:13	05:29	06:15	07:06	07:57	07:53	08:38
	16:49	17:45	18:36	20:31	21:22	21:58	21:53	21:04	19:55	18:45	16:45	16:21
15	08:39	07:53	06:52	06:40	05:41	05:12	05:30	06:17	07:08	07:59	07:55	08:38
	16:50	17:47	18:38	20:32	21:23	21:59	21:52	21:02	19:52	18:43	16:44	16:22
16	08:38	07:51	06:49	06:38	05:39	05:12	05:31	06:18	07:10	08:01	07:57	08:39
	16:52	17:49	18:40	20:34	21:25	22:00	21:51	21:00	19:50	18:40	16:42	16:22
17	08:37	07:49	06:47	06:35	05:38	05:12	05:32	06:20	07:11	08:03	07:59	08:40
	16:54	17:51	18:42	20:36	21:26	22:00	21:49	20:58	19:48	18:38	16:41	16:22
18	08:36	07:47	06:45	06:33	05:36	05:12	05:34	06:22	07:13	08:04	08:00	08:41
	16:55	17:52	18:44	20:38	21:28	22:00	21:48	20:56	19:45	18:36	16:40	16:22
19	08:35	07:45	06:42	06:31	05:35	05:12	05:35	06:23	07:15	08:06	08:02	08:42
	16:57	17:54	18:45	20:39	21:29	22:01	21:47	20:54	19:43	18:34	16:38	16:22
20	08:34	07:43	06:40	06:29	05:34	05:12	05:36	06:25	07:16	08:08	08:04	08:42
	16:59	17:56	18:47	20:41	21:31	22:01	21:46	20:52	19:41	18:32	16:37	16:23
21	08:33	07:41	06:38	06:27	05:32	05:12	05:38	06:26	07:18	08:10	08:06	08:43
	17:00	17:58	18:49	20:43	21:32	22:01	21:45	20:50	19:38	18:30	16:36	16:23
22	08:32	07:39	06:35	06:24	05:31	05:13	05:39	06:28	07:20	08:11	08:07	08:43
	17:02	18:00	18:51	20:45	21:34	22:02	21:43	20:47	19:36	18:27	16:35	16:24
23	08:31	07:37	06:33	06:22	05:30	05:13	05:40	06:30	07:21	08:13	08:09	08:44
	17:04	18:02	18:52	20:46	21:35	22:02	21:42	20:45	19:33	18:25	16:33	16:24
24	08:29	07:34	06:31	06:20	05:28	05:13	05:42	06:31	07:23	08:15	08:11	08:44
	17:06	18:04	18:54	20:48	21:37	22:02	21:41	20:43	19:31	18:23	16:32	16:25
25	08:28	07:32	06:28	06:18	05:27	05:13	05:43	06:33	07:25	07:17	08:12	08:45
	17:07	18:06	18:56	20:50	21:38	22:02	21:39	20:41	19:29	17:21	16:31	16:25
26	08:27	07:30	06:26	06:16	05:26	05:14	05:45	06:35	07:26	07:19	08:14	08:45
	17:09	18:07	18:58	20:51	21:39	22:02	21:38	20:39	19:26	17:19	16:30	16:26
27	08:25	07:28	06:24	06:14	05:25	05:14	05:46	06:36	07:28	07:21	08:16	08:45
	17:11	18:09	18:59	20:53	21:41	22:02	21:36	20:36	19:24	17:17	16:29	16:27
28	08:24	07:26	06:21	06:12	05:24	05:15	05:48	06:38	07:30	07:22	08:17	08:45
	17:13	18:11	19:01	20:55	21:42	22:02	21:35	20:34	19:22	17:15	16:28	16:28
29	08:23		07:19	06:10	05:23	05:15	05:49	06:40	07:31	07:24	08:19	08:46
	17:15		20:03	20:57	21:43	22:01	21:33	20:32	19:19	17:13	16:28	16:28
30	08:21		07:17	06:08	05:22	05:16	05:51	06:41	07:33	07:26	08:20	08:46
	17:17		20:05	20:58	21:44	22:01	21:32	20:30	19:17	17:11	16:27	16:29
31	08:20		07:14		05:21		05:52	06:43		07:28		08:46
	17:18		20:06		21:46		21:30	20:27		17:09		16:30
Potential sun hours	257	277	367	417	487	502	504	455	381	331	264	241
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
Jennings O'Donovan
Finisklin Business Park
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+353719161416
Kathlyn Feeney / kfeeney@jodireland.com

Calculated:
09/06/2025 13:54/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Worst Case - V150 **Shadow receptor:** AN - 40

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January			February	March	April	May	June	July	August	September	October	November	December		
1	08:46		09:43 (9)	08:18	07:24	07:12	06:06	05:20	05:17	05:54	06:45	07:35	07:30	08:22		
	16:32	7	09:50 (9)	17:20	18:13	20:08	21:00	21:47	22:01	21:28	20:25	19:15	17:07	16:26		
2	08:46		09:45 (9)	08:16	07:21	07:10	06:04	05:19	05:17	05:55	06:46	07:37	07:32	08:23		
	16:33	3	09:48 (9)	17:22	18:15	20:10	21:02	21:48	22:01	21:27	20:23	19:12	17:05	16:25		
3	08:45			08:15	07:19	07:07	06:02	05:18	05:18	05:57	06:48	07:38	07:33	08:25		
	16:34			17:24	18:17	20:12	21:03	21:49	22:00	21:25	20:21	19:10	17:04	16:25		
4	08:45			08:13	07:17	07:05	06:00	05:17	05:19	05:59	06:50	07:40	07:35	08:26		
	16:35			17:26	18:18	20:13	21:05	21:50	22:00	21:23	20:18	19:08	17:02	16:24		
5	08:45			08:11	07:15	07:03	05:58	05:17	05:20	06:00	06:51	07:42	07:37	08:27		
	16:36			17:28	18:20	20:15	21:07	21:51	21:59	21:21	20:16	19:05	17:00	16:24		
6	08:45			08:10	07:12	07:00	05:56	05:16	05:20	06:02	06:53	07:43	07:39	08:29		
	16:37			17:30	18:22	20:17	21:09	21:52	21:59	21:20	20:14	19:03	16:58	16:23		
7	08:44			08:08	07:10	06:58	05:55	05:15	05:21	06:03	06:55	07:45	07:41	08:30		
	16:39			17:32	18:24	20:19	21:10	21:53	21:58	21:18	20:11	19:01	16:57	16:23		
8	08:44			08:06	07:08	06:56	05:53	05:15	05:22	06:05	06:56	07:47	07:43	08:31		
	16:40			17:34	18:26	20:20	21:12	21:54	21:58	21:16	20:09	18:58	16:55	16:22		
9	08:43			08:04	07:06	06:53	05:51	05:14	05:23	06:07	06:58	07:49	07:44	08:32		
	16:41			17:35	18:28	20:22	21:14	21:55	21:57	21:14	20:07	18:56	16:53	16:22		
10	08:43			08:03	07:03	06:51	05:49	05:14	05:24	06:08	07:00	07:50	07:46	08:33		09:35 (9)
	16:43			17:37	18:29	20:24	21:15	21:56	21:56	21:12	20:04	18:54	16:51	16:22	2	09:37 (9)
11	08:42			08:01	07:01	06:49	05:48	05:13	05:25	06:10	07:01	07:52	07:48	08:35		09:33 (9)
	16:44			17:39	18:31	20:25	21:17	21:56	21:55	21:10	20:02	18:52	16:50	16:22	7	09:40 (9)
12	08:41			07:59	06:59	06:47	05:46	05:13	05:26	06:12	07:03	07:54	07:50	08:36		09:33 (9)
	16:46			17:41	18:33	20:27	21:18	21:57	21:54	21:08	20:00	18:49	16:48	16:22	9	09:42 (9)
13	08:41			07:57	06:56	06:44	05:44	05:13	05:28	06:13	07:05	07:56	07:52	08:37		09:32 (9)
	16:47			17:43	18:35	20:29	21:20	21:58	21:54	21:06	19:57	18:47	16:47	16:22	11	09:43 (9)
14	08:40			07:55	06:54	06:42	05:43	05:13	05:29	06:15	07:06	07:57	07:53	08:38		09:25 (7)
	16:49			17:45	18:36	20:31	21:22	21:58	21:53	21:04	19:55	18:45	16:45	16:21	16	09:44 (9)
15	08:39			07:53	06:52	06:40	05:41	05:12	05:30	06:17	07:08	07:59	07:55	08:38		09:25 (7)
	16:50			17:47	18:38	20:32	21:23	21:59	21:52	21:02	19:52	18:43	16:44	16:22	19	09:45 (9)
16	08:38			07:51	06:49	06:38	05:39	05:12	05:31	06:18	07:10	08:01	07:57	08:39		09:25 (7)
	16:52			17:49	18:40	20:34	21:25	22:00	21:51	21:00	19:50	18:40	16:42	16:22	21	09:46 (9)
17	08:37			07:49	06:47	06:35	05:38	05:12	05:32	06:20	07:11	08:03	07:59	08:40		09:25 (7)
	16:54			17:51	18:42	20:36	21:26	22:00	21:49	20:58	19:48	18:38	16:41	16:22	22	09:47 (9)
18	08:36			07:47	06:45	06:33	05:36	05:12	05:34	06:22	07:13	08:04	08:00	08:41		09:24 (7)
	16:55			17:52	18:44	20:38	21:28	22:00	21:48	20:56	19:45	18:36	16:40	16:22	23	09:47 (9)
19	08:35			07:45	06:42	06:31	05:35	05:12	05:35	06:23	07:15	08:06	08:02	08:42		09:25 (7)
	16:57			17:54	18:45	20:39	21:29	22:01	21:47	20:54	19:43	18:34	16:38	16:22	23	09:48 (9)
20	08:34			07:43	06:40	06:29	05:34	05:12	05:36	06:25	07:16	08:08	08:04	08:42		09:26 (7)
	16:59			17:56	18:47	20:41	21:31	22:01	21:46	20:52	19:41	18:32	16:37	16:23	23	09:49 (9)
21	08:33			07:41	06:38	06:27	05:32	05:12	05:38	06:26	07:18	08:10	08:06	08:43		09:25 (7)
	17:00			17:58	18:49	20:43	21:32	22:01	21:45	20:50	19:38	18:30	16:36	16:23	24	09:49 (9)
22	08:32			07:39	06:35	06:24	05:31	05:13	05:39	06:28	07:20	08:12	08:07	08:43		09:26 (7)
	17:02			18:00	18:51	20:45	21:34	22:02	21:43	20:47	19:36	18:27	16:35	16:24	24	09:50 (9)
23	08:31			07:37	06:33	06:22	05:30	05:13	05:40	06:30	07:21	08:13	08:09	08:44		09:27 (7)
	17:04			18:02	18:52	20:46	21:35	22:02	21:42	20:45	19:33	18:25	16:33	16:24	23	09:50 (9)
24	08:29			07:34	06:31	06:20	05:28	05:13	05:42	06:31	07:23	08:15	08:11	08:44		09:27 (7)
	17:06			18:04	18:54	20:48	21:37	22:02	21:41	20:43	19:31	18:23	16:32	16:25	23	09:50 (9)
25	08:28			07:32	06:28	06:18	05:27	05:13	05:43	06:33	07:25	07:17	08:12	08:45		09:28 (7)
	17:07			18:06	18:56	20:50	21:38	22:02	21:39	20:41	19:29	17:21	16:31	16:25	23	09:51 (9)
26	08:27			07:30	06:26	06:16	05:26	05:14	05:45	06:35	07:26	07:19	08:14	08:45		09:29 (7)
	17:09			18:07	18:58	20:51	21:39	22:02	21:38	20:39	19:26	17:19	16:30	16:26	22	09:51 (9)
27	08:25			07:28	06:24	06:14	05:25	05:14	05:46	06:36	07:28	07:21	08:16	08:45		09:29 (7)
	17:11			18:09	18:59	20:53	21:41	22:02	21:36	20:36	19:24	17:17	16:29	16:27	22	09:51 (9)
28	08:24			07:26	06:21	06:12	05:24	05:15	05:48	06:38	07:30	07:22	08:17	08:45		09:30 (7)
	17:13			18:11	19:01	20:55	21:42	22:02	21:35	20:34	19:22	17:15	16:28	16:28	20	09:51 (9)
29	08:23				07:19	06:10	05:23	05:15	05:49	06:40	07:31	07:24	08:19	08:46		09:32 (7)
	17:15				20:03	20:57	21:43	22:01	21:33	20:32	19:19	17:13	16:28	16:28	16	09:51 (9)
30	08:21				07:17	06:08	05:22	05:16	05:51	06:41	07:33	07:26	08:20	08:46		09:40 (9)
	17:17				20:05	20:58	21:44	22:01	21:32	20:30	19:17	17:11	16:27	16:29	11	09:51 (9)
31	08:20				07:14		05:21		05:52	06:43		07:28		08:46		09:41 (9)
	17:18				20:06		21:46		21:30	20:27		17:09		16:30	10	09:51 (9)
Potential sun hours	257			277	367	417	487	502	504	455	381	331	264	241		
Total, worst case		10													394	
Sun reduction		0.22													0.22	
Oper. time red.		1.00													1.00	
Wind dir. red.		0.67													0.67	
Total reduction		0.14													0.15	
Total, real		1													57	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
Jennings O'Donovan
Finisklin Business Park
F91 RHH9 Sligo
+353719161416
Kathlyn Feeney / kfeeney@jodireland.com
Calculated:
09/06/2025 13:54/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Worst Case - V150 **Shadow receptor:** AO - 41

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January			February	March	April	May	June	July	August	September	October	November	December		
1	08:46		09:25 (7)	08:18	07:24	07:12	06:06	05:20	05:17	05:54	06:45	07:35	07:30	08:22		
	16:32	24	09:49 (9)	17:20	18:13	20:08	21:00	21:47	22:01	21:28	20:25	19:15	17:07	16:26		
2	08:46		09:25 (7)	08:16	07:21	07:10	06:04	05:19	05:17	05:55	06:46	07:37	07:32	08:23		
	16:33	23	09:48 (9)	17:22	18:15	20:10	21:02	21:48	22:01	21:27	20:23	19:12	17:05	16:25		
3	08:45		09:27 (7)	08:15	07:19	07:07	06:02	05:18	05:18	05:57	06:48	07:38	07:33	08:25		
	16:34	21	09:48 (9)	17:24	18:17	20:12	21:03	21:49	22:00	21:25	20:21	19:10	17:04	16:25		
4	08:45		09:29 (7)	08:13	07:17	07:05	06:00	05:17	05:19	05:59	06:50	07:40	07:35	08:26		
	16:35	19	09:48 (9)	17:26	18:18	20:13	21:05	21:50	22:00	21:23	20:18	19:08	17:02	16:24		
5	08:45		09:35 (9)	08:11	07:15	07:03	05:58	05:17	05:20	06:00	06:51	07:42	07:37	08:27		09:23 (9)
	16:36	12	09:47 (9)	17:28	18:20	20:15	21:07	21:51	21:59	21:21	20:16	19:05	17:00	16:24	7	09:30 (9)
6	08:45		09:36 (9)	08:10	07:12	07:00	05:56	05:16	05:20	06:02	06:53	07:43	07:39	08:29		09:23 (9)
	16:37	11	09:47 (9)	17:30	18:22	20:17	21:09	21:52	21:59	21:20	20:14	19:03	16:58	16:23	10	09:33 (9)
7	08:44		09:38 (9)	08:08	07:10	06:58	05:55	05:15	05:21	06:03	06:55	07:45	07:41	08:30		09:22 (9)
	16:39	7	09:45 (9)	17:32	18:24	20:19	21:10	21:53	21:58	21:18	20:11	19:01	16:57	16:23	12	09:34 (9)
8	08:44			08:06	07:08	06:56	05:53	05:15	05:22	06:05	06:56	07:47	07:43	08:31		09:16 (7)
	16:40			17:34	18:26	20:20	21:12	21:54	21:58	21:16	20:09	18:58	16:55	16:22	19	09:35 (9)
9	08:43			08:04	07:06	06:53	05:51	05:14	05:23	06:07	06:58	07:49	07:44	08:32		09:16 (7)
	16:41			17:35	18:28	20:22	21:14	21:55	21:57	21:14	20:07	18:56	16:53	16:22	21	09:37 (9)
10	08:43			08:03	07:03	06:51	05:49	05:14	05:24	06:08	07:00	07:50	07:46	08:33		09:15 (7)
	16:43			17:37	18:29	20:24	21:15	21:56	21:56	21:12	20:04	18:54	16:51	16:22	23	09:38 (9)
11	08:42			08:01	07:01	06:49	05:48	05:13	05:25	06:10	07:01	07:52	07:48	08:35		09:15 (7)
	16:44			17:39	18:31	20:25	21:17	21:56	21:55	21:10	20:02	18:52	16:50	16:22	24	09:39 (9)
12	08:41			07:59	06:59	06:47	05:46	05:13	05:26	06:12	07:03	07:54	07:50	08:36		09:15 (7)
	16:46			17:41	18:33	20:27	21:18	21:57	21:54	21:08	20:00	18:49	16:48	16:22	24	09:39 (9)
13	08:41			07:57	06:56	06:44	05:44	05:13	05:28	06:13	07:05	07:56	07:52	08:37		09:15 (7)
	16:47			17:43	18:35	20:29	21:20	21:58	21:54	21:06	19:57	18:47	16:47	16:22	25	09:40 (9)
14	08:40			07:55	06:54	06:42	05:43	05:13	05:29	06:15	07:06	07:57	07:53	08:38		09:15 (7)
	16:49			17:45	18:36	20:31	21:22	21:58	21:53	21:04	19:55	18:45	16:45	16:22	26	09:41 (9)
15	08:39			07:53	06:52	06:40	05:41	05:12	05:30	06:17	07:08	07:59	07:55	08:38		09:15 (7)
	16:50			17:47	18:38	20:32	21:23	21:59	21:52	21:02	19:52	18:43	16:44	16:22	27	09:42 (9)
16	08:38			07:51	06:49	06:38	05:39	05:12	05:31	06:18	07:10	08:01	07:57	08:39		09:16 (7)
	16:52			17:49	18:40	20:34	21:25	22:00	21:51	21:00	19:50	18:40	16:42	16:22	26	09:42 (9)
17	08:37			07:49	06:47	06:35	05:38	05:12	05:32	06:20	07:11	08:03	07:59	08:40		09:16 (7)
	16:54			17:51	18:42	20:36	21:26	22:00	21:49	20:58	19:48	18:38	16:41	16:22	27	09:43 (9)
18	08:36			07:47	06:45	06:33	05:36	05:12	05:34	06:22	07:13	08:04	08:00	08:41		09:16 (7)
	16:55			17:53	18:44	20:38	21:28	22:00	21:48	20:56	19:45	18:36	16:40	16:22	27	09:43 (9)
19	08:35			07:45	06:42	06:31	05:35	05:12	05:35	06:23	07:15	08:06	08:02	08:42		09:16 (7)
	16:57			17:54	18:45	20:39	21:29	22:01	21:47	20:54	19:43	18:34	16:38	16:22	28	09:44 (9)
20	08:34			07:43	06:40	06:29	05:34	05:12	05:36	06:25	07:16	08:08	08:04	08:42		09:17 (7)
	16:59			17:56	18:47	20:41	21:31	22:01	21:46	20:52	19:41	18:32	16:37	16:23	28	09:45 (9)
21	08:33			07:41	06:38	06:27	05:32	05:12	05:38	06:26	07:18	08:10	08:06	08:43		09:17 (7)
	17:00			17:58	18:49	20:43	21:32	22:01	21:45	20:50	19:38	18:30	16:36	16:23	28	09:45 (9)
22	08:32			07:39	06:35	06:24	05:31	05:13	05:39	06:28	07:20	08:12	08:07	08:43		09:18 (7)
	17:02			18:00	18:51	20:45	21:34	22:02	21:43	20:47	19:36	18:27	16:35	16:24	28	09:46 (9)
23	08:31			07:37	06:33	06:22	05:30	05:13	05:40	06:30	07:21	08:13	08:09	08:44		09:18 (7)
	17:04			18:02	18:52	20:46	21:35	22:02	21:42	20:45	19:33	18:25	16:33	16:24	28	09:46 (9)
24	08:29			07:34	06:31	06:20	05:28	05:13	05:42	06:31	07:23	08:15	08:11	08:44		09:18 (7)
	17:06			18:04	18:54	20:48	21:37	22:02	21:41	20:43	19:31	18:23	16:32	16:25	28	09:46 (9)
25	08:28			07:32	06:28	06:18	05:27	05:13	05:43	06:33	07:25	07:17	08:12	08:45		09:20 (7)
	17:07			18:06	18:56	20:50	21:38	22:02	21:39	20:41	19:29	17:21	16:31	16:25	27	09:47 (9)
26	08:27			07:30	06:26	06:16	05:26	05:14	05:45	06:35	07:26	07:19	08:14	08:45		09:20 (7)
	17:09			18:07	18:58	20:51	21:39	22:02	21:38	20:39	19:26	17:19	16:30	16:26	27	09:47 (9)
27	08:25			07:28	06:24	06:14	05:25	05:14	05:46	06:36	07:28	07:21	08:16	08:45		09:20 (7)
	17:11			18:09	18:59	20:53	21:41	22:02	21:36	20:36	19:24	17:17	16:29	16:27	27	09:47 (9)
28	08:24			07:26	06:21	06:12	05:24	05:15	05:48	06:38	07:30	07:22	08:17	08:45		09:21 (7)
	17:13			18:11	19:01	20:55	21:42	22:02	21:35	20:34	19:22	17:15	16:28	16:28	26	09:47 (9)
29	08:23				07:19	06:10	05:23	05:15	05:49	06:40	07:31	07:24	08:19	08:46		09:22 (7)
	17:15				20:03	20:57	21:43	22:01	21:33	20:32	19:19	17:13	16:28	16:28	26	09:48 (9)
30	08:21				07:17	06:08	05:22	05:16	05:51	06:41	07:33	07:26	08:20	08:46		09:23 (7)
	17:17				20:05	20:58	21:44	22:01	21:32	20:30	19:17	17:11	16:27	16:29	25	09:48 (9)
31	08:20				07:14		05:21		05:52	06:43		07:28		08:46		09:23 (7)
	17:18				20:06		21:46		21:30	20:27		17:09		16:30	25	09:48 (9)
Potential sun hours	257			277	367	417	487	502	504	455	381	331	264	241		
Total, worst case		117													649	
Sun reduction		0.22													0.22	
Oper. time red.		1.00													1.00	
Wind dir. red.		0.67													0.67	
Total reduction		0.14													0.15	
Total, real		17													94	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
Jennings O'Donovan
Finisklin Business Park
F91 RHH9 Sligo
+353719161416
Kathlyn Feeney / kfeeney@jodireland.com
Calculated:
09/06/2025 13:54/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Worst Case - V150 **Shadow receptor:** AP - 42

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January		February	March	April	May	June	July	August	September	October	November		December	
1	08:46		09:18 (7)	08:18	07:24	07:12	06:06	05:20	05:17	05:54	06:45	07:35	07:30	08:22	08:57 (7)
	16:32	18	09:36 (9)	17:20	18:13	20:08	21:00	21:47	22:01	21:28	20:25	19:15	17:07	16:26	22 09:19 (9)
2	08:46		09:17 (7)	08:16	07:21	07:10	06:04	05:19	05:17	05:56	06:46	07:37	07:32	08:23	08:57 (7)
	16:33	18	09:35 (9)	17:22	18:15	20:10	21:02	21:48	22:01	21:27	20:23	19:12	17:06	16:25	24 09:21 (9)
3	08:45		09:17 (7)	08:15	07:19	07:07	06:02	05:18	05:18	05:57	06:48	07:38	07:33	08:25	08:57 (7)
	16:34	19	09:36 (9)	17:24	18:17	20:12	21:03	21:49	22:00	21:25	20:21	19:10	17:04	16:25	24 09:21 (9)
4	08:45		09:17 (7)	08:13	07:17	07:05	06:00	05:17	05:19	05:59	06:50	07:40	07:35	08:26	08:59 (7)
	16:35	20	09:37 (9)	17:26	18:18	20:13	21:05	21:50	22:00	21:23	20:18	19:08	17:02	16:24	23 09:22 (9)
5	08:45		09:16 (7)	08:11	07:15	07:03	05:58	05:17	05:20	06:00	06:51	07:42	07:37	08:27	09:00 (7)
	16:36	21	09:37 (9)	17:28	18:20	20:15	21:07	21:51	21:59	21:21	20:16	19:05	17:00	16:24	22 09:22 (9)
6	08:45		09:16 (7)	08:10	07:12	07:00	05:56	05:16	05:20	06:02	06:53	07:43	07:39	08:29	09:02 (7)
	16:37	21	09:37 (9)	17:30	18:22	20:17	21:09	21:52	21:59	21:20	20:14	19:03	16:58	16:23	21 09:23 (9)
7	08:44		09:15 (7)	08:08	07:10	06:58	05:55	05:15	05:21	06:03	06:55	07:45	07:41	08:30	09:03 (7)
	16:39	22	09:37 (9)	17:32	18:24	20:19	21:10	21:53	21:58	21:18	20:11	19:01	16:57	16:23	21 09:24 (9)
8	08:44		09:15 (7)	08:06	07:08	06:56	05:53	05:15	05:22	06:05	06:56	07:47	07:43	08:31	09:04 (7)
	16:40	23	09:38 (9)	17:34	18:26	20:20	21:12	21:54	21:58	21:16	20:09	18:58	16:55	16:22	20 09:24 (9)
9	08:43		09:14 (7)	08:04	07:06	06:53	05:51	05:14	05:23	06:07	06:58	07:49	07:44	08:32	09:06 (7)
	16:41	24	09:38 (9)	17:35	18:28	20:22	21:14	21:55	21:57	21:14	20:07	18:56	16:53	16:22	19 09:25 (9)
10	08:43		09:14 (7)	08:03	07:03	06:51	05:49	05:14	05:24	06:08	07:00	07:50	07:46	08:33	09:07 (7)
	16:43	24	09:38 (9)	17:37	18:29	20:24	21:15	21:56	21:56	21:12	20:04	18:54	16:51	16:22	19 09:26 (9)
11	08:42		09:14 (7)	08:01	07:01	06:49	05:48	05:13	05:25	06:10	07:01	07:52	07:48	08:35	09:08 (7)
	16:44	23	09:37 (9)	17:39	18:31	20:25	21:17	21:56	21:55	21:10	20:02	18:52	16:50	16:22	18 09:26 (9)
12	08:41		09:16 (7)	07:59	06:59	06:47	05:46	05:13	05:26	06:12	07:03	07:54	07:50	08:36	09:09 (7)
	16:46	22	09:38 (9)	17:41	18:33	20:27	21:18	21:57	21:54	21:08	20:00	18:49	16:48	16:22	17 09:26 (9)
13	08:41		09:18 (7)	07:57	06:56	06:44	05:44	05:13	05:28	06:13	07:05	07:56	07:52	08:37	09:10 (7)
	16:47	20	09:38 (9)	17:43	18:35	20:29	21:20	21:58	21:54	21:06	19:57	18:47	16:47	16:22	17 09:27 (9)
14	08:40		09:20 (7)	07:55	06:54	06:42	05:43	05:13	05:29	06:15	07:06	07:57	07:53	08:38	09:11 (7)
	16:49	17	09:37 (9)	17:45	18:36	20:31	21:22	21:58	21:53	21:04	19:55	18:45	16:45	16:22	16 09:27 (9)
15	08:39		09:21 (9)	07:53	06:52	06:40	05:41	05:12	05:30	06:17	07:08	07:59	07:55	08:38	09:12 (7)
	16:50	16	09:37 (9)	17:47	18:38	20:32	21:23	21:59	21:52	21:02	19:52	18:43	16:44	16:22	16 09:28 (9)
16	08:38		09:23 (9)	07:51	06:49	06:38	05:39	05:12	05:31	06:18	07:10	08:01	07:57	08:39	09:13 (7)
	16:52	13	09:36 (9)	17:49	18:40	20:34	21:25	22:00	21:51	21:00	19:50	18:40	16:42	16:22	15 09:28 (9)
17	08:37		09:24 (9)	07:49	06:47	06:35	05:38	05:12	05:32	06:20	07:11	08:03	07:59	08:40	09:14 (7)
	16:54	10	09:34 (9)	17:51	18:42	20:36	21:26	22:00	21:49	20:58	19:48	18:38	16:41	16:22	15 09:29 (9)
18	08:36		09:27 (9)	07:47	06:45	06:33	05:36	05:12	05:34	06:22	07:13	08:04	08:00	08:41	09:14 (7)
	16:55	5	09:32 (9)	17:53	18:44	20:38	21:28	22:00	21:48	20:56	19:45	18:36	16:40	16:22	15 09:29 (9)
19	08:35			07:45	06:42	06:31	05:35	05:12	05:35	06:23	07:15	08:06	08:02	08:42	09:15 (7)
	16:57			17:54	18:45	20:39	21:29	22:01	21:47	20:54	19:43	18:34	16:38	16:22	15 09:30 (9)
20	08:34			07:43	06:40	06:29	05:34	05:12	05:36	06:25	07:16	08:08	08:04	08:42	09:16 (7)
	16:59			17:56	18:47	20:41	21:31	22:01	21:46	20:52	19:41	18:32	16:37	16:23	14 09:30 (9)
21	08:33			07:41	06:38	06:27	05:32	05:12	05:38	06:26	07:18	08:10	08:06	08:43	09:16 (7)
	17:00			17:58	18:49	20:43	21:32	22:01	21:45	20:50	19:38	18:30	16:36	16:23	14 09:30 (9)
22	08:32			07:39	06:35	06:25	05:31	05:13	05:39	06:28	07:20	08:12	08:07	08:43	09:17 (7)
	17:02			18:00	18:51	20:45	21:34	22:02	21:43	20:47	19:36	18:27	16:35	16:24	14 09:31 (9)
23	08:31			07:37	06:33	06:22	05:30	05:13	05:40	06:30	07:21	08:13	08:09	08:44	09:17 (7)
	17:04			18:02	18:52	20:46	21:35	22:02	21:42	20:45	19:33	18:25	16:33	16:24	14 09:31 (9)
24	08:29			07:34	06:31	06:20	05:28	05:13	05:42	06:31	07:23	08:15	08:11	09:05 (9)	08:44 09:17 (7)
	17:06			18:04	18:54	20:48	21:37	22:02	21:41	20:43	19:31	18:23	16:32	5 09:10 (9)	16:25 14 09:31 (9)
25	08:28			07:32	06:28	06:18	05:27	05:13	05:43	06:33	07:25	07:17	08:12	09:02 (9)	08:45 09:18 (7)
	17:07			18:06	18:56	20:50	21:38	22:02	21:39	20:41	19:29	17:21	16:31	10 09:12 (9)	16:25 15 09:33 (9)
26	08:27			07:30	06:26	06:16	05:26	05:14	05:45	06:35	07:26	07:19	08:14	09:01 (9)	08:45 09:18 (7)
	17:09			18:07	18:58	20:51	21:39	22:02	21:38	20:39	19:26	17:19	16:30	13 09:14 (9)	16:26 15 09:33 (9)
27	08:25			07:28	06:24	06:14	05:25	05:14	05:46	06:36	07:28	07:21	08:16	09:00 (9)	08:45 09:18 (7)
	17:11			18:09	18:59	20:53	21:41	22:02	21:36	20:36	19:24	17:17	16:29	16 09:16 (9)	16:27 15 09:33 (9)
28	08:24			07:26	06:21	06:12	05:24	05:15	05:48	06:38	07:30	07:22	08:17	08:59 (7)	08:45 09:18 (7)
	17:13			18:11	19:01	20:55	21:42	22:02	21:35	20:34	19:22	17:15	16:28	17 09:16 (9)	16:28 16 09:34 (9)
29	08:23				07:19	06:10	05:23	05:15	05:49	06:40	07:31	07:24	08:19	08:58 (7)	08:46 09:18 (7)
	17:15				20:03	20:57	21:43	22:01	21:33	20:32	19:19	17:13	16:28	20 09:18 (9)	16:28 16 09:34 (9)
30	08:21				07:17	06:08	05:22	05:16	05:51	06:41	07:33	07:26	08:20	08:58 (7)	08:46 09:18 (7)
	17:17				20:05	20:58	21:45	22:01	21:32	20:30	19:17	17:11	16:27	21 09:19 (9)	16:29 17 09:35 (9)
31	08:20				07:14		05:21		05:52	06:43		07:28			08:46 09:18 (7)
	17:18				20:06		21:46		21:30	20:27		17:09			16:30 17 09:35 (9)
Potential sun hours	257		277	367	417	487	502	504	455	381	331	264		241	
Total, worst case		336											102		540
Sun reduction		0.22											0.26		0.22
Oper. time red.		1.00											1.00		1.00
Wind dir. red.		0.66											0.66		0.66
Total reduction		0.14											0.17		0.15
Total, real		48											18		78

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
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F91 RHH9 Sligo
+353719161416
Kathlyn Feeney / kfeeney@jodireland.com

Calculated:
09/06/2025 13:54/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Worst Case - V150 **Shadow receptor:** AQ - 46

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January			February	March	April	May	June	July	August	September	October	November	December		
1	08:46		09:40 (9)	08:18	07:24	07:12	06:06	05:20	05:17	05:54	06:45	07:35	07:30	08:22		
	16:32	8	09:48 (9)	17:20	18:13	20:08	21:00	21:47	22:01	21:28	20:25	19:15	17:07	16:26		
2	08:46		09:41 (9)	08:16	07:21	07:10	06:04	05:19	05:17	05:55	06:46	07:37	07:32	08:23		
	16:33	5	09:46 (9)	17:22	18:15	20:10	21:02	21:48	22:01	21:27	20:23	19:12	17:05	16:25		
3	08:45			08:15	07:19	07:07	06:02	05:18	05:18	05:57	06:48	07:38	07:33	08:25		
	16:34			17:24	18:17	20:12	21:03	21:49	22:00	21:25	20:21	19:10	17:04	16:25		
4	08:45			08:13	07:17	07:05	06:00	05:17	05:19	05:59	06:50	07:40	07:35	08:26		
	16:35			17:26	18:18	20:13	21:05	21:50	22:00	21:23	20:18	19:08	17:02	16:24		
5	08:45			08:11	07:15	07:03	05:58	05:17	05:20	06:00	06:51	07:42	07:37	08:27		
	16:36			17:28	18:20	20:15	21:07	21:51	21:59	21:21	20:16	19:05	17:00	16:24		
6	08:45			08:10	07:12	07:00	05:56	05:16	05:20	06:02	06:53	07:43	07:39	08:29		
	16:37			17:30	18:22	20:17	21:09	21:52	21:59	21:20	20:14	19:03	16:58	16:23		
7	08:44			08:08	07:10	06:58	05:55	05:15	05:21	06:03	06:55	07:45	07:41	08:30		
	16:39			17:32	18:24	20:19	21:10	21:53	21:58	21:18	20:11	19:01	16:57	16:23		
8	08:44			08:06	07:08	06:56	05:53	05:15	05:22	06:05	06:56	07:47	07:43	08:31		
	16:40			17:34	18:26	20:20	21:12	21:54	21:58	21:16	20:09	18:58	16:55	16:22		
9	08:43			08:04	07:06	06:53	05:51	05:14	05:23	06:07	06:58	07:49	07:44	08:32		
	16:41			17:35	18:28	20:22	21:14	21:55	21:57	21:14	20:07	18:56	16:53	16:22		
10	08:43			08:03	07:03	06:51	05:49	05:14	05:24	06:08	07:00	07:50	07:46	08:33		09:31 (9)
	16:43			17:37	18:29	20:24	21:15	21:56	21:56	21:12	20:04	18:54	16:51	16:22	5	09:36 (9)
11	08:42			08:01	07:01	06:49	05:48	05:13	05:25	06:10	07:01	07:52	07:48	08:35		09:30 (9)
	16:44			17:39	18:31	20:25	21:17	21:56	21:55	21:10	20:02	18:52	16:50	16:22	8	09:38 (9)
12	08:41			07:59	06:59	06:47	05:46	05:13	05:26	06:12	07:03	07:54	07:50	08:36		09:30 (9)
	16:46			17:41	18:33	20:27	21:18	21:57	21:54	21:08	20:00	18:49	16:48	16:22	9	09:39 (9)
13	08:41			07:57	06:56	06:44	05:44	05:13	05:28	06:13	07:05	07:56	07:52	08:37		09:24 (7)
	16:47			17:43	18:35	20:29	21:20	21:58	21:54	21:06	19:57	18:47	16:47	16:22	13	09:40 (9)
14	08:40			07:55	06:54	06:42	05:43	05:13	05:29	06:15	07:06	07:57	07:53	08:38		09:23 (7)
	16:49			17:45	18:36	20:31	21:22	21:58	21:53	21:04	19:55	18:45	16:45	16:22	17	09:41 (9)
15	08:39			07:53	06:52	06:40	05:41	05:12	05:30	06:17	07:08	07:59	07:55	08:38		09:23 (7)
	16:50			17:47	18:38	20:32	21:23	21:59	21:52	21:02	19:52	18:43	16:44	16:22	19	09:42 (9)
16	08:38			07:51	06:49	06:38	05:39	05:12	05:31	06:18	07:10	08:01	07:57	08:39		09:23 (7)
	16:52			17:49	18:40	20:34	21:25	22:00	21:51	21:00	19:50	18:40	16:42	16:22	20	09:43 (9)
17	08:37			07:49	06:47	06:35	05:38	05:12	05:32	06:20	07:11	08:03	07:59	08:40		09:23 (7)
	16:54			17:51	18:42	20:36	21:26	22:00	21:49	20:58	19:48	18:38	16:41	16:22	21	09:44 (9)
18	08:36			07:47	06:45	06:33	05:36	05:12	05:34	06:22	07:13	08:04	08:00	08:41		09:22 (7)
	16:55			17:52	18:44	20:38	21:28	22:00	21:48	20:56	19:45	18:36	16:40	16:22	22	09:44 (9)
19	08:35			07:45	06:42	06:31	05:35	05:12	05:35	06:23	07:15	08:06	08:02	08:42		09:23 (7)
	16:57			17:54	18:45	20:39	21:29	22:01	21:47	20:54	19:43	18:34	16:38	16:22	22	09:45 (9)
20	08:34			07:43	06:40	06:29	05:34	05:12	05:36	06:25	07:16	08:08	08:04	08:42		09:24 (7)
	16:59			17:56	18:47	20:41	21:31	22:01	21:46	20:52	19:41	18:32	16:37	16:23	22	09:46 (9)
21	08:33			07:41	06:38	06:27	05:32	05:12	05:38	06:26	07:18	08:10	08:06	08:43		09:23 (7)
	17:00			17:58	18:49	20:43	21:32	22:01	21:45	20:50	19:38	18:30	16:36	16:23	23	09:46 (9)
22	08:32			07:39	06:35	06:24	05:31	05:13	05:39	06:28	07:20	08:12	08:07	08:43		09:24 (7)
	17:02			18:00	18:51	20:45	21:34	22:02	21:43	20:47	19:36	18:27	16:35	16:24	23	09:47 (9)
23	08:31			07:37	06:33	06:22	05:30	05:13	05:40	06:30	07:21	08:13	08:09	08:44		09:25 (7)
	17:04			18:02	18:52	20:46	21:35	22:02	21:42	20:45	19:33	18:25	16:33	16:24	22	09:47 (9)
24	08:29			07:34	06:31	06:20	05:28	05:13	05:42	06:31	07:23	08:15	08:11	08:44		09:25 (7)
	17:06			18:04	18:54	20:48	21:37	22:02	21:41	20:43	19:31	18:23	16:32	16:25	22	09:47 (9)
25	08:28			07:32	06:28	06:18	05:27	05:13	05:43	06:33	07:25	07:17	08:12	08:45		09:26 (7)
	17:07			18:06	18:56	20:50	21:38	22:02	21:39	20:41	19:29	17:21	16:31	16:25	22	09:48 (9)
26	08:27			07:30	06:26	06:16	05:26	05:14	05:45	06:35	07:26	07:19	08:14	08:45		09:27 (7)
	17:09			18:07	18:58	20:51	21:39	22:02	21:38	20:39	19:26	17:19	16:30	16:26	21	09:48 (9)
27	08:25			07:28	06:24	06:14	05:25	05:14	05:46	06:36	07:28	07:21	08:16	08:45		09:27 (7)
	17:11			18:09	18:59	20:53	21:41	22:02	21:36	20:36	19:24	17:17	16:29	16:27	21	09:48 (9)
28	08:24			07:26	06:21	06:12	05:24	05:15	05:48	06:38	07:30	07:22	08:17	08:45		09:28 (7)
	17:13			18:11	19:01	20:55	21:42	22:02	21:35	20:34	19:22	17:15	16:28	16:28	20	09:48 (9)
29	08:23				07:19	06:10	05:23	05:15	05:49	06:40	07:31	07:24	08:19	08:46		09:29 (7)
	17:15				20:03	20:57	21:43	22:01	21:33	20:32	19:19	17:13	16:28	16:28	18	09:48 (9)
30	08:21				07:17	06:08	05:22	05:16	05:51	06:41	07:33	07:26	08:20	08:46		09:31 (7)
	17:17				20:05	20:58	21:44	22:01	21:32	20:30	19:17	17:11	16:27	16:29	15	09:48 (9)
31	08:20				07:14		05:21		05:52	06:43		07:28		08:46		09:38 (9)
	17:18				20:06		21:46		21:30	20:27		17:09		16:30	10	09:48 (9)
Potential sun hours	257			277	367	417	487	502	504	455	381	331	264	241		
Total, worst case		13													395	
Sun reduction		0.22													0.22	
Oper. time red.		1.00													1.00	
Wind dir. red.		0.67													0.67	
Total reduction		0.14													0.15	
Total, real		2													57	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
Jennings O'Donovan
Finisklin Business Park
F91 RHH9 Sligo
+353719161416
Kathlyn Feeney / kfeeney@jodireland.com

Calculated:
09/06/2025 13:54/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Worst Case - V150 **Shadow receptor:** AR - 47

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January	February	March	April	May	June	July	August	September	October	November	December		
1	08:46	08:18	07:24	07:12	06:06	05:20	05:17	05:54	06:45	07:35	07:30	08:22		
	16:32	17:20	18:13	20:08	21:00	21:47	22:01	21:28	20:25	19:15	17:07	16:26		
2	08:46	08:16	07:21	07:10	06:04	05:19	05:17	05:55	06:46	07:37	07:32	08:23		
	16:33	17:22	18:15	20:10	21:02	21:48	22:01	21:27	20:23	19:12	17:05	16:25		
3	08:45	08:15	07:19	07:07	06:02	05:18	05:18	05:57	06:48	07:38	07:33	08:25		
	16:34	17:24	18:17	20:12	21:03	21:49	22:00	21:25	20:21	19:10	17:04	16:25		
4	08:45	08:13	07:17	07:05	06:00	05:17	05:19	05:59	06:50	07:40	07:35	08:26		
	16:35	17:26	18:18	20:13	21:05	21:50	22:00	21:23	20:18	19:08	17:02	16:24		
5	08:45	08:11	07:15	07:03	05:58	05:17	05:20	06:00	06:51	07:42	07:37	08:27		
	16:36	17:28	18:20	20:15	21:07	21:51	21:59	21:21	20:16	19:05	17:00	16:24		
6	08:45	08:10	07:12	07:00	05:56	05:16	05:20	06:02	06:53	07:43	07:39	08:29		
	16:37	17:30	18:22	20:17	21:09	21:52	21:59	21:20	20:14	19:03	16:58	16:23		
7	08:44	08:08	07:10	06:58	05:55	05:15	05:21	06:03	06:55	07:45	07:41	08:30		
	16:39	17:32	18:24	20:19	21:10	21:53	21:58	21:18	20:11	19:01	16:57	16:23		
8	08:44	08:06	07:08	06:56	05:53	05:15	05:22	06:05	06:56	07:47	07:43	08:31		
	16:40	17:34	18:26	20:20	21:12	21:54	21:58	21:16	20:09	18:58	16:55	16:22		
9	08:43	08:04	07:06	06:53	05:51	05:14	05:23	06:07	06:58	07:49	07:44	08:32		
	16:41	17:35	18:28	20:22	21:14	21:55	21:57	21:14	20:07	18:56	16:53	16:22		
10	08:43	08:03	07:03	06:51	05:49	05:14	05:24	06:08	07:00	07:50	07:46	08:33		
	16:43	17:37	18:29	20:24	21:15	21:56	21:56	21:12	20:04	18:54	16:51	16:22		
11	08:42	08:01	07:01	06:49	05:48	05:13	05:25	06:10	07:01	07:52	07:48	08:35		
	16:44	17:39	18:31	20:25	21:17	21:56	21:55	21:10	20:02	18:52	16:50	16:22		
12	08:41	07:59	06:59	06:47	05:46	05:13	05:26	06:12	07:03	07:54	07:50	08:36		
	16:46	17:41	18:33	20:27	21:18	21:57	21:54	21:08	20:00	18:49	16:48	16:22		
13	08:41	07:57	06:56	06:44	05:44	05:13	05:28	06:13	07:05	07:56	07:52	08:37		
	16:47	17:43	18:35	20:29	21:20	21:58	21:54	21:06	19:57	18:47	16:47	16:22		
14	08:40	07:55	06:54	06:42	05:43	05:13	05:29	06:15	07:06	07:57	07:53	08:38		
	16:49	17:45	18:36	20:31	21:22	21:58	21:53	21:04	19:55	18:45	16:45	16:21		
15	08:39	07:53	06:52	06:40	05:41	05:12	05:30	06:17	07:08	07:59	07:55	08:38		
	16:50	17:47	18:38	20:32	21:23	21:59	21:52	21:02	19:52	18:43	16:44	16:22		
16	08:38	07:51	06:49	06:38	05:39	05:12	05:31	06:18	07:10	08:01	07:57	08:39		09:39 (9)
	16:52	17:49	18:40	20:34	21:25	22:00	21:51	21:00	19:50	18:40	16:42	16:22	4	09:43 (9)
17	08:37	07:49	06:47	06:35	05:38	05:12	05:32	06:20	07:11	08:03	07:59	08:40		09:38 (9)
	16:54	17:51	18:42	20:36	21:26	22:00	21:49	20:58	19:48	18:38	16:41	16:22	7	09:45 (9)
18	08:36	07:47	06:45	06:33	05:36	05:12	05:34	06:22	07:13	08:04	08:00	08:41		09:38 (9)
	16:55	17:52	18:44	20:38	21:28	22:00	21:48	20:56	19:45	18:36	16:40	16:22	7	09:45 (9)
19	08:35	07:45	06:42	06:31	05:35	05:12	05:35	06:23	07:15	08:06	08:02	08:42		09:38 (9)
	16:57	17:54	18:45	20:39	21:29	22:01	21:47	20:54	19:43	18:34	16:38	16:22	8	09:46 (9)
20	08:34	07:43	06:40	06:29	05:34	05:12	05:36	06:25	07:16	08:08	08:04	08:42		09:39 (9)
	16:59	17:56	18:47	20:41	21:31	22:01	21:46	20:52	19:41	18:32	16:37	16:23	8	09:47 (9)
21	08:33	07:41	06:38	06:27	05:32	05:12	05:38	06:26	07:18	08:10	08:06	08:43		09:38 (9)
	17:00	17:58	18:49	20:43	21:32	22:01	21:45	20:50	19:38	18:30	16:36	16:23	9	09:47 (9)
22	08:32	07:39	06:35	06:24	05:31	05:13	05:39	06:28	07:20	08:12	08:07	08:43		09:39 (9)
	17:02	18:00	18:51	20:45	21:34	22:02	21:43	20:47	19:36	18:27	16:35	16:24	9	09:48 (9)
23	08:31	07:37	06:33	06:22	05:30	05:13	05:40	06:30	07:21	08:13	08:09	08:44		09:40 (9)
	17:04	18:02	18:52	20:46	21:35	22:02	21:42	20:45	19:33	18:25	16:33	16:24	8	09:48 (9)
24	08:29	07:34	06:31	06:20	05:28	05:13	05:42	06:31	07:23	08:15	08:11	08:44		09:40 (9)
	17:06	18:04	18:54	20:48	21:37	22:02	21:41	20:43	19:31	18:23	16:32	16:25	8	09:48 (9)
25	08:28	07:32	06:28	06:18	05:27	05:13	05:43	06:33	07:25	07:17	08:12	08:45		09:41 (9)
	17:07	18:06	18:56	20:50	21:38	22:02	21:39	20:41	19:29	17:21	16:31	16:25	8	09:49 (9)
26	08:27	07:30	06:26	06:16	05:26	05:14	05:45	06:35	07:26	07:19	08:14	08:45		09:42 (9)
	17:09	18:07	18:58	20:51	21:39	22:02	21:38	20:39	19:26	17:19	16:30	16:26	7	09:49 (9)
27	08:25	07:28	06:24	06:14	05:25	05:14	05:46	06:36	07:28	07:21	08:16	08:45		09:43 (9)
	17:11	18:09	18:59	20:53	21:41	22:02	21:36	20:36	19:24	17:17	16:29	16:27	5	09:48 (9)
28	08:24	07:26	06:21	06:12	05:24	05:15	05:48	06:38	07:30	07:22	08:17	08:45		09:45 (9)
	17:13	18:11	19:01	20:55	21:42	22:02	21:35	20:34	19:22	17:15	16:28	16:28	2	09:47 (9)
29	08:23		07:19	06:10	05:23	05:15	05:49	06:40	07:31	07:24	08:19	08:46		
	17:15		20:03	20:57	21:43	22:01	21:33	20:32	19:19	17:13	16:28	16:28		
30	08:21		07:17	06:08	05:22	05:16	05:51	06:41	07:33	07:26	08:20	08:46		
	17:17		20:05	20:58	21:44	22:01	21:32	20:30	19:17	17:11	16:27	16:29		
31	08:20		07:14		05:21		05:52	06:43		07:28		08:46		
	17:18		20:06		21:46		21:30	20:27		17:09		16:30		
Potential sun hours	257	277	367	417	487	502	504	455	381	331	264	241		
Total, worst case													90	
Sun reduction													0.22	
Oper. time red.													1.00	
Wind dir. red.													0.67	
Total reduction													0.15	
Total, real													13	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

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SHADOW - Calendar

Calculation: 6839 Garrane WF Worst Case - V150 **Shadow receptor:** AS - 48

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:46	08:18	07:24	07:12	06:06	05:20	05:17	05:54	06:45	07:35	07:30	08:22
	16:32	17:20	18:13	20:08	21:00	21:47	22:01	21:28	20:25	19:15	17:07	16:26
2	08:46	08:16	07:21	07:10	06:04	05:19	05:17	05:55	06:46	07:37	07:32	08:23
	16:33	17:22	18:15	20:10	21:02	21:48	22:01	21:27	20:23	19:12	17:05	16:25
3	08:45	08:15	07:19	07:07	06:02	05:18	05:18	05:57	06:48	07:38	07:33	08:25
	16:34	17:24	18:17	20:12	21:03	21:49	22:00	21:25	20:21	19:10	17:04	16:25
4	08:45	08:13	07:17	07:05	06:00	05:17	05:19	05:59	06:50	07:40	07:35	08:26
	16:35	17:26	18:18	20:13	21:05	21:50	22:00	21:23	20:18	19:08	17:02	16:24
5	08:45	08:11	07:15	07:03	05:58	05:17	05:20	06:00	06:51	07:42	07:37	08:27
	16:36	17:28	18:20	20:15	21:07	21:51	21:59	21:21	20:16	19:05	17:00	16:24
6	08:45	08:10	07:12	07:00	05:56	05:16	05:20	06:02	06:53	07:43	07:39	08:29
	16:37	17:30	18:22	20:17	21:09	21:52	21:59	21:20	20:14	19:03	16:58	16:23
7	08:44	08:08	07:10	06:58	05:55	05:15	05:21	06:03	06:55	07:45	07:41	08:30
	16:39	17:32	18:24	20:19	21:10	21:53	21:58	21:18	20:11	19:01	16:57	16:23
8	08:44	08:06	07:08	06:56	05:53	05:15	05:22	06:05	06:56	07:47	07:43	08:31
	16:40	17:34	18:26	20:20	21:12	21:54	21:58	21:16	20:09	18:58	16:55	16:22
9	08:43	08:04	07:06	06:53	05:51	05:14	05:23	06:07	06:58	07:49	07:44	08:32
	16:41	17:35	18:28	20:22	21:14	21:55	21:57	21:14	20:07	18:56	16:53	16:22
10	08:43	08:03	07:03	06:51	05:49	05:14	05:24	06:08	07:00	07:50	07:46	08:33
	16:43	17:37	18:29	20:24	21:15	21:56	21:56	21:12	20:04	18:54	16:51	16:22
11	08:42	08:01	07:01	06:49	05:48	05:13	05:25	06:10	07:01	07:52	07:48	08:35
	16:44	17:39	18:31	20:25	21:17	21:56	21:55	21:10	20:02	18:52	16:50	16:22
12	08:41	07:59	06:59	06:47	05:46	05:13	05:26	06:12	07:03	07:54	07:50	08:36
	16:46	17:41	18:33	20:27	21:18	21:57	21:54	21:08	20:00	18:49	16:48	16:22
13	08:41	07:57	06:56	06:44	05:44	05:13	05:28	06:13	07:05	07:56	07:52	08:37
	16:47	17:43	18:35	20:29	21:20	21:58	21:54	21:06	19:57	18:47	16:47	16:22
14	08:40	07:55	06:54	06:42	05:43	05:13	05:29	06:15	07:06	07:57	07:53	08:38
	16:49	17:45	18:36	20:31	21:22	21:58	21:53	21:04	19:55	18:45	16:45	16:21
15	08:39	07:53	06:52	06:40	05:41	05:12	05:30	06:17	07:08	07:59	07:55	08:38
	16:50	17:47	18:38	20:32	21:23	21:59	21:52	21:02	19:52	18:43	16:44	16:22
16	08:38	07:51	06:49	06:38	05:39	05:12	05:31	06:18	07:10	08:01	07:57	08:39
	16:52	17:49	18:40	20:34	21:25	22:00	21:51	21:00	19:50	18:40	16:42	16:22
17	08:37	07:49	06:47	06:35	05:38	05:12	05:32	06:20	07:11	08:03	07:59	08:40
	16:54	17:51	18:42	20:36	21:26	22:00	21:49	20:58	19:48	18:38	16:41	16:22
18	08:36	07:47	06:45	06:33	05:36	05:12	05:34	06:22	07:13	08:04	08:00	08:41
	16:55	17:52	18:44	20:38	21:28	22:00	21:48	20:56	19:45	18:36	16:40	16:22
19	08:35	07:45	06:42	06:31	05:35	05:12	05:35	06:23	07:15	08:06	08:02	08:42
	16:57	17:54	18:45	20:39	21:29	22:01	21:47	20:54	19:43	18:34	16:38	16:22
20	08:34	07:43	06:40	06:29	05:34	05:12	05:36	06:25	07:16	08:08	08:04	08:42
	16:59	17:56	18:47	20:41	21:31	22:01	21:46	20:52	19:41	18:32	16:37	16:23
21	08:33	07:41	06:38	06:27	05:32	05:12	05:38	06:26	07:18	08:10	08:06	08:43
	17:00	17:58	18:49	20:43	21:32	22:01	21:45	20:50	19:38	18:30	16:36	16:23
22	08:32	07:39	06:35	06:24	05:31	05:13	05:39	06:28	07:20	08:12	08:07	08:43
	17:02	18:00	18:51	20:45	21:34	22:02	21:43	20:47	19:36	18:27	16:35	16:24
23	08:31	07:37	06:33	06:22	05:30	05:13	05:40	06:30	07:21	08:13	08:09	08:44
	17:04	18:02	18:52	20:46	21:35	22:02	21:42	20:45	19:33	18:25	16:33	16:24
24	08:29	07:34	06:31	06:20	05:28	05:13	05:42	06:31	07:23	08:15	08:11	08:44
	17:06	18:04	18:54	20:48	21:37	22:02	21:41	20:43	19:31	18:23	16:32	16:25
25	08:28	07:32	06:28	06:18	05:27	05:13	05:43	06:33	07:25	07:17	08:12	08:45
	17:07	18:06	18:56	20:50	21:38	22:02	21:39	20:41	19:29	17:21	16:31	16:25
26	08:27	07:30	06:26	06:16	05:26	05:14	05:45	06:35	07:26	07:19	08:14	08:45
	17:09	18:07	18:58	20:51	21:39	22:02	21:38	20:39	19:26	17:19	16:30	16:26
27	08:25	07:28	06:24	06:14	05:25	05:14	05:46	06:36	07:28	07:21	08:16	08:45
	17:11	18:09	18:59	20:53	21:41	22:02	21:36	20:36	19:24	17:17	16:29	16:27
28	08:24	07:26	06:21	06:12	05:24	05:15	05:48	06:38	07:30	07:22	08:17	08:45
	17:13	18:11	19:01	20:55	21:42	22:02	21:35	20:34	19:22	17:15	16:28	16:28
29	08:23		07:19	06:10	05:23	05:15	05:49	06:40	07:31	07:24	08:19	08:46
	17:15		20:03	20:57	21:43	22:01	21:33	20:32	19:19	17:13	16:28	16:28
30	08:21		07:17	06:08	05:22	05:16	05:51	06:41	07:33	07:26	08:20	08:46
	17:17		20:05	20:58	21:44	22:01	21:32	20:30	19:17	17:11	16:27	16:29
31	08:20		07:14		05:21		05:52	06:43		07:28		08:46
	17:18		20:06		21:46		21:30	20:27		17:09		16:30
Potential sun hours	257	277	367	417	487	502	504	455	381	331	264	241
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
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+353719161416
Kathlyn Feeney / kfeeney@jodireland.com

Calculated:
09/06/2025 13:54/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Worst Case - V150 **Shadow receptor:** AT - 49

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:46	08:18	07:24	07:12	06:06	05:20	05:17	05:54	06:45	07:35	07:30	08:22
	16:32	17:20	18:13	20:08	21:00	21:47	22:01	21:28	20:25	19:15	17:07	16:26
2	08:46	08:16	07:21	07:10	06:04	05:19	05:17	05:55	06:46	07:37	07:32	08:23
	16:33	17:22	18:15	20:10	21:02	21:48	22:01	21:27	20:23	19:12	17:05	16:25
3	08:45	08:15	07:19	07:07	06:02	05:18	05:18	05:57	06:48	07:38	07:33	08:25
	16:34	17:24	18:17	20:12	21:03	21:49	22:00	21:25	20:21	19:10	17:04	16:25
4	08:45	08:13	07:17	07:05	06:00	05:17	05:19	05:59	06:50	07:40	07:35	08:26
	16:35	17:26	18:18	20:13	21:05	21:50	22:00	21:23	20:18	19:08	17:02	16:24
5	08:45	08:11	07:15	07:03	05:58	05:17	05:20	06:00	06:51	07:42	07:37	08:27
	16:36	17:28	18:20	20:15	21:07	21:51	21:59	21:21	20:16	19:05	17:00	16:24
6	08:45	08:10	07:12	07:00	05:56	05:16	05:20	06:02	06:53	07:43	07:39	08:29
	16:37	17:30	18:22	20:17	21:09	21:52	21:59	21:20	20:14	19:03	16:58	16:23
7	08:44	08:08	07:10	06:58	05:55	05:15	05:21	06:03	06:55	07:45	07:41	08:30
	16:39	17:32	18:24	20:19	21:10	21:53	21:58	21:18	20:11	19:01	16:56	16:23
8	08:44	08:06	07:08	06:56	05:53	05:15	05:22	06:05	06:56	07:47	07:43	08:31
	16:40	17:34	18:26	20:20	21:12	21:54	21:58	21:16	20:09	18:58	16:55	16:22
9	08:43	08:04	07:06	06:53	05:51	05:14	05:23	06:07	06:58	07:49	07:44	08:32
	16:41	17:35	18:28	20:22	21:14	21:55	21:57	21:14	20:07	18:56	16:53	16:22
10	08:43	08:03	07:03	06:51	05:49	05:14	05:24	06:08	07:00	07:50	07:46	08:33
	16:43	17:37	18:29	20:24	21:15	21:56	21:56	21:12	20:04	18:54	16:51	16:22
11	08:42	08:01	07:01	06:49	05:48	05:13	05:25	06:10	07:01	07:52	07:48	08:35
	16:44	17:39	18:31	20:25	21:17	21:56	21:55	21:10	20:02	18:52	16:50	16:22
12	08:41	07:59	06:59	06:47	05:46	05:13	05:26	06:12	07:03	07:54	07:50	08:36
	16:46	17:41	18:33	20:27	21:18	21:57	21:54	21:08	20:00	18:49	16:48	16:22
13	08:41	07:57	06:56	06:44	05:44	05:13	05:28	06:13	07:05	07:56	07:52	08:37
	16:47	17:43	18:35	20:29	21:20	21:58	21:54	21:06	19:57	18:47	16:47	16:21
14	08:40	07:55	06:54	06:42	05:43	05:13	05:29	06:15	07:06	07:57	07:53	08:38
	16:49	17:45	18:36	20:31	21:22	21:58	21:53	21:04	19:55	18:45	16:45	16:21
15	08:39	07:53	06:52	06:40	05:41	05:12	05:30	06:17	07:08	07:59	07:55	08:38
	16:50	17:47	18:38	20:32	21:23	21:59	21:52	21:02	19:52	18:43	16:44	16:22
16	08:38	07:51	06:49	06:38	05:39	05:12	05:31	06:18	07:10	08:01	07:57	08:39
	16:52	17:49	18:40	20:34	21:25	22:00	21:51	21:00	19:50	18:40	16:42	16:22
17	08:37	07:49	06:47	06:35	05:38	05:12	05:32	06:20	07:11	08:03	07:59	08:40
	16:54	17:51	18:42	20:36	21:26	22:00	21:49	20:58	19:48	18:38	16:41	16:22
18	08:36	07:47	06:45	06:33	05:36	05:12	05:34	06:21	07:13	08:04	08:00	08:41
	16:55	17:52	18:44	20:38	21:28	22:00	21:48	20:56	19:45	18:36	16:40	16:22
19	08:35	07:45	06:42	06:31	05:35	05:12	05:35	06:23	07:15	08:06	08:02	08:42
	16:57	17:54	18:45	20:39	21:29	22:01	21:47	20:54	19:43	18:34	16:38	16:22
20	08:34	07:43	06:40	06:29	05:34	05:12	05:36	06:25	07:16	08:08	08:04	08:42
	16:59	17:56	18:47	20:41	21:31	22:01	21:46	20:52	19:41	18:32	16:37	16:23
21	08:33	07:41	06:38	06:27	05:32	05:12	05:38	06:26	07:18	08:10	08:06	08:43
	17:00	17:58	18:49	20:43	21:32	22:01	21:45	20:50	19:38	18:30	16:36	16:23
22	08:32	07:39	06:35	06:24	05:31	05:13	05:39	06:28	07:20	08:12	08:07	08:43
	17:02	18:00	18:51	20:45	21:34	22:02	21:43	20:47	19:36	18:27	16:35	16:24
23	08:31	07:37	06:33	06:22	05:30	05:13	05:40	06:30	07:21	08:13	08:09	08:44
	17:04	18:02	18:52	20:46	21:35	22:02	21:42	20:45	19:33	18:25	16:33	16:24
24	08:29	07:34	06:31	06:20	05:28	05:13	05:42	06:31	07:23	08:15	08:11	08:44
	17:06	18:04	18:54	20:48	21:37	22:02	21:41	20:43	19:31	18:23	16:32	16:25
25	08:28	07:32	06:28	06:18	05:27	05:13	05:43	06:33	07:25	07:17	08:12	08:45
	17:07	18:06	18:56	20:50	21:38	22:02	21:39	20:41	19:29	17:21	16:31	16:25
26	08:27	07:30	06:26	06:16	05:26	05:14	05:45	06:35	07:26	07:19	08:14	08:45
	17:09	18:07	18:58	20:51	21:39	22:02	21:38	20:39	19:26	17:19	16:30	16:26
27	08:25	07:28	06:24	06:14	05:25	05:14	05:46	06:36	07:28	07:21	08:16	08:45
	17:11	18:09	18:59	20:53	21:41	22:02	21:36	20:36	19:24	17:17	16:29	16:27
28	08:24	07:26	06:21	06:12	05:24	05:15	05:48	06:38	07:30	07:22	08:17	08:45
	17:13	18:11	19:01	20:55	21:42	22:02	21:35	20:34	19:22	17:15	16:28	16:28
29	08:23		07:19	06:10	05:23	05:15	05:49	06:40	07:31	07:24	08:19	08:46
	17:15		20:03	20:57	21:43	22:01	21:33	20:32	19:19	17:13	16:28	16:28
30	08:21		07:17	06:08	05:22	05:16	05:51	06:41	07:33	07:26	08:20	08:46
	17:17		20:05	20:58	21:44	22:01	21:32	20:30	19:17	17:11	16:27	16:29
31	08:20		07:14		05:21		05:52	06:43		07:28		08:46
	17:18		20:06		21:46		21:30	20:27		17:09		16:30
Potential sun hours	257	277	367	417	487	502	504	455	381	331	264	241
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

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Kathlyn Feeney / kfeeney@jodireland.com

Calculated:
09/06/2025 13:54/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Worst Case - V150 **Shadow receptor:** AU - 50

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:46	08:18	07:24	07:12	06:06	05:20	05:17	05:54	06:45	07:35	07:30	08:22
	16:32	17:20	18:13	20:08	21:00	21:47	22:01	21:28	20:25	19:15	17:07	16:26
2	08:46	08:16	07:21	07:10	06:04	05:19	05:17	05:55	06:46	07:37	07:32	08:23
	16:33	17:22	18:15	20:10	21:02	21:48	22:01	21:27	20:23	19:12	17:05	16:25
3	08:45	08:15	07:19	07:07	06:02	05:18	05:18	05:57	06:48	07:38	07:33	08:25
	16:34	17:24	18:17	20:12	21:03	21:49	22:00	21:25	20:21	19:10	17:04	16:25
4	08:45	08:13	07:17	07:05	06:00	05:17	05:19	05:59	06:50	07:40	07:35	08:26
	16:35	17:26	18:18	20:13	21:05	21:50	22:00	21:23	20:18	19:08	17:02	16:24
5	08:45	08:11	07:15	07:03	05:58	05:17	05:20	06:00	06:51	07:42	07:37	08:27
	16:36	17:28	18:20	20:15	21:07	21:51	21:59	21:21	20:16	19:05	17:00	16:24
6	08:45	08:10	07:12	07:00	05:56	05:16	05:20	06:02	06:53	07:43	07:39	08:29
	16:37	17:30	18:22	20:17	21:09	21:52	21:59	21:20	20:14	19:03	16:58	16:23
7	08:44	08:08	07:10	06:58	05:55	05:15	05:21	06:03	06:55	07:45	07:41	08:30
	16:39	17:32	18:24	20:18	21:10	21:53	21:58	21:18	20:11	19:01	16:56	16:23
8	08:44	08:06	07:08	06:56	05:53	05:15	05:22	06:05	06:56	07:47	07:43	08:31
	16:40	17:34	18:26	20:20	21:12	21:54	21:58	21:16	20:09	18:58	16:55	16:22
9	08:43	08:04	07:06	06:53	05:51	05:14	05:23	06:07	06:58	07:49	07:44	08:32
	16:41	17:35	18:28	20:22	21:14	21:55	21:57	21:14	20:07	18:56	16:53	16:22
10	08:43	08:03	07:03	06:51	05:49	05:14	05:24	06:08	07:00	07:50	07:46	08:33
	16:43	17:37	18:29	20:24	21:15	21:56	21:56	21:12	20:04	18:54	16:51	16:22
11	08:42	08:01	07:01	06:49	05:48	05:13	05:25	06:10	07:01	07:52	07:48	08:35
	16:44	17:39	18:31	20:25	21:17	21:56	21:55	21:10	20:02	18:51	16:50	16:22
12	08:41	07:59	06:59	06:47	05:46	05:13	05:26	06:12	07:03	07:54	07:50	08:36
	16:46	17:41	18:33	20:27	21:18	21:57	21:54	21:08	20:00	18:49	16:48	16:22
13	08:41	07:57	06:56	06:44	05:44	05:13	05:28	06:13	07:05	07:56	07:52	08:37
	16:47	17:43	18:35	20:29	21:20	21:58	21:54	21:06	19:57	18:47	16:47	16:21
14	08:40	07:55	06:54	06:42	05:43	05:13	05:29	06:15	07:06	07:57	07:53	08:38
	16:49	17:45	18:36	20:31	21:22	21:58	21:53	21:04	19:55	18:45	16:45	16:21
15	08:39	07:53	06:52	06:40	05:41	05:12	05:30	06:17	07:08	07:59	07:55	08:38
	16:50	17:47	18:38	20:32	21:23	21:59	21:52	21:02	19:52	18:43	16:44	16:22
16	08:38	07:51	06:49	06:38	05:39	05:12	05:31	06:18	07:10	08:01	07:57	08:39
	16:52	17:49	18:40	20:34	21:25	22:00	21:51	21:00	19:50	18:40	16:42	16:22
17	08:37	07:49	06:47	06:35	05:38	05:12	05:32	06:20	07:11	08:03	07:59	08:40
	16:54	17:51	18:42	20:36	21:26	22:00	21:49	20:58	19:48	18:38	16:41	16:22
18	08:36	07:47	06:45	06:33	05:36	05:12	05:34	06:21	07:13	08:04	08:00	08:41
	16:55	17:52	18:44	20:38	21:28	22:00	21:48	20:56	19:45	18:36	16:40	16:22
19	08:35	07:45	06:42	06:31	05:35	05:12	05:35	06:23	07:15	08:06	08:02	08:42
	16:57	17:54	18:45	20:39	21:29	22:01	21:47	20:54	19:43	18:34	16:38	16:22
20	08:34	07:43	06:40	06:29	05:34	05:12	05:36	06:25	07:16	08:08	08:04	08:42
	16:59	17:56	18:47	20:41	21:31	22:01	21:46	20:52	19:41	18:32	16:37	16:23
21	08:33	07:41	06:38	06:27	05:32	05:12	05:38	06:26	07:18	08:10	08:06	08:43
	17:00	17:58	18:49	20:43	21:32	22:01	21:45	20:50	19:38	18:30	16:36	16:23
22	08:32	07:39	06:35	06:24	05:31	05:13	05:39	06:28	07:20	08:11	08:07	08:43
	17:02	18:00	18:51	20:45	21:34	22:02	21:43	20:47	19:36	18:27	16:35	16:24
23	08:31	07:37	06:33	06:22	05:30	05:13	05:40	06:30	07:21	08:13	08:09	08:44
	17:04	18:02	18:52	20:46	21:35	22:02	21:42	20:45	19:33	18:25	16:33	16:24
24	08:29	07:34	06:31	06:20	05:28	05:13	05:42	06:31	07:23	08:15	08:11	08:44
	17:06	18:04	18:54	20:48	21:37	22:02	21:41	20:43	19:31	18:23	16:32	16:25
25	08:28	07:32	06:28	06:18	05:27	05:13	05:43	06:33	07:25	07:17	08:12	08:45
	17:07	18:06	18:56	20:50	21:38	22:02	21:39	20:41	19:29	17:21	16:31	16:25
26	08:27	07:30	06:26	06:16	05:26	05:14	05:45	06:35	07:26	07:19	08:14	08:45
	17:09	18:07	18:58	20:51	21:39	22:02	21:38	20:39	19:26	17:19	16:30	16:26
27	08:25	07:28	06:24	06:14	05:25	05:14	05:46	06:36	07:28	07:21	08:16	08:45
	17:11	18:09	18:59	20:53	21:41	22:02	21:36	20:36	19:24	17:17	16:29	16:27
28	08:24	07:26	06:21	06:12	05:24	05:15	05:48	06:38	07:30	07:22	08:17	08:45
	17:13	18:11	19:01	20:55	21:42	22:02	21:35	20:34	19:22	17:15	16:28	16:28
29	08:23		07:19	06:10	05:23	05:15	05:49	06:40	07:31	07:24	08:19	08:46
	17:15		20:03	20:57	21:43	22:01	21:33	20:32	19:19	17:13	16:28	16:28
30	08:21		07:17	06:08	05:22	05:16	05:51	06:41	07:33	07:26	08:20	08:46
	17:17		20:05	20:58	21:44	22:01	21:32	20:30	19:17	17:11	16:27	16:29
31	08:20		07:14		05:21		05:52	06:43		07:28		08:46
	17:18		20:06		21:46		21:30	20:27		17:09		16:30
Potential sun hours	257	277	367	417	487	502	504	455	381	331	264	241
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

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Kathlyn Feeney / kfeeney@jodireland.com

Calculated:
09/06/2025 13:54/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Worst Case - V150 **Shadow receptor:** AV - 51

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:46	08:18	07:24	07:12	06:06	05:20	05:17	05:54	06:45	07:35	07:30	08:22
	16:32	17:20	18:13	20:08	21:00	21:47	22:01	21:28	20:25	19:15	17:07	16:26
2	08:46	08:16	07:21	07:10	06:04	05:19	05:17	05:55	06:46	07:37	07:32	08:23
	16:33	17:22	18:15	20:10	21:02	21:48	22:01	21:27	20:23	19:12	17:05	16:25
3	08:45	08:15	07:19	07:07	06:02	05:18	05:18	05:57	06:48	07:38	07:33	08:25
	16:34	17:24	18:17	20:12	21:03	21:49	22:00	21:25	20:21	19:10	17:04	16:25
4	08:45	08:13	07:17	07:05	06:00	05:17	05:19	05:59	06:50	07:40	07:35	08:26
	16:35	17:26	18:18	20:13	21:05	21:50	22:00	21:23	20:18	19:08	17:02	16:24
5	08:45	08:11	07:15	07:03	05:58	05:17	05:20	06:00	06:51	07:42	07:37	08:27
	16:36	17:28	18:20	20:15	21:07	21:51	21:59	21:21	20:16	19:05	17:00	16:24
6	08:45	08:10	07:12	07:00	05:56	05:16	05:20	06:02	06:53	07:43	07:39	08:29
	16:37	17:30	18:22	20:17	21:09	21:52	21:59	21:20	20:14	19:03	16:58	16:23
7	08:44	08:08	07:10	06:58	05:55	05:15	05:21	06:03	06:55	07:45	07:41	08:30
	16:39	17:32	18:24	20:18	21:10	21:53	21:58	21:18	20:11	19:01	16:56	16:23
8	08:44	08:06	07:08	06:56	05:53	05:15	05:22	06:05	06:56	07:47	07:43	08:31
	16:40	17:34	18:26	20:20	21:12	21:54	21:58	21:16	20:09	18:58	16:55	16:22
9	08:43	08:04	07:06	06:53	05:51	05:14	05:23	06:07	06:58	07:49	07:44	08:32
	16:41	17:35	18:28	20:22	21:14	21:55	21:57	21:14	20:07	18:56	16:53	16:22
10	08:43	08:03	07:03	06:51	05:49	05:14	05:24	06:08	07:00	07:50	07:46	08:33
	16:43	17:37	18:29	20:24	21:15	21:56	21:56	21:12	20:04	18:54	16:51	16:22
11	08:42	08:01	07:01	06:49	05:48	05:13	05:25	06:10	07:01	07:52	07:48	08:35
	16:44	17:39	18:31	20:25	21:17	21:56	21:55	21:10	20:02	18:51	16:50	16:22
12	08:41	07:59	06:59	06:47	05:46	05:13	05:26	06:12	07:03	07:54	07:50	08:36
	16:46	17:41	18:33	20:27	21:18	21:57	21:54	21:08	19:59	18:49	16:48	16:22
13	08:41	07:57	06:56	06:44	05:44	05:13	05:28	06:13	07:05	07:56	07:52	08:37
	16:47	17:43	18:35	20:29	21:20	21:58	21:54	21:06	19:57	18:47	16:47	16:21
14	08:40	07:55	06:54	06:42	05:43	05:13	05:29	06:15	07:06	07:57	07:53	08:38
	16:49	17:45	18:36	20:31	21:22	21:58	21:53	21:04	19:55	18:45	16:45	16:21
15	08:39	07:53	06:52	06:40	05:41	05:12	05:30	06:17	07:08	07:59	07:55	08:38
	16:50	17:47	18:38	20:32	21:23	21:59	21:52	21:02	19:52	18:43	16:44	16:22
16	08:38	07:51	06:49	06:38	05:39	05:12	05:31	06:18	07:10	08:01	07:57	08:39
	16:52	17:49	18:40	20:34	21:25	22:00	21:51	21:00	19:50	18:40	16:42	16:22
17	08:37	07:49	06:47	06:35	05:38	05:12	05:32	06:20	07:11	08:03	07:59	08:40
	16:54	17:51	18:42	20:36	21:26	22:00	21:49	20:58	19:48	18:38	16:41	16:22
18	08:36	07:47	06:45	06:33	05:36	05:12	05:34	06:21	07:13	08:04	08:00	08:41
	16:55	17:52	18:44	20:38	21:28	22:00	21:48	20:56	19:45	18:36	16:40	16:22
19	08:35	07:45	06:42	06:31	05:35	05:12	05:35	06:23	07:15	08:06	08:02	08:42
	16:57	17:54	18:45	20:39	21:29	22:01	21:47	20:54	19:43	18:34	16:38	16:22
20	08:34	07:43	06:40	06:29	05:34	05:12	05:36	06:25	07:16	08:08	08:04	08:42
	16:59	17:56	18:47	20:41	21:31	22:01	21:46	20:52	19:41	18:32	16:37	16:23
21	08:33	07:41	06:38	06:27	05:32	05:12	05:38	06:26	07:18	08:10	08:06	08:43
	17:00	17:58	18:49	20:43	21:32	22:01	21:45	20:50	19:38	18:30	16:36	16:23
22	08:32	07:39	06:35	06:24	05:31	05:13	05:39	06:28	07:20	08:11	08:07	08:43
	17:02	18:00	18:51	20:45	21:34	22:02	21:43	20:47	19:36	18:27	16:35	16:24
23	08:31	07:37	06:33	06:22	05:30	05:13	05:40	06:30	07:21	08:13	08:09	08:44
	17:04	18:02	18:52	20:46	21:35	22:02	21:42	20:45	19:33	18:25	16:33	16:24
24	08:29	07:34	06:31	06:20	05:28	05:13	05:42	06:31	07:23	08:15	08:11	08:44
	17:06	18:04	18:54	20:48	21:37	22:02	21:41	20:43	19:31	18:23	16:32	16:25
25	08:28	07:32	06:28	06:18	05:27	05:13	05:43	06:33	07:25	07:17	08:12	08:45
	17:07	18:06	18:56	20:50	21:38	22:02	21:39	20:41	19:29	17:21	16:31	16:25
26	08:27	07:30	06:26	06:16	05:26	05:14	05:45	06:35	07:26	07:19	08:14	08:45
	17:09	18:07	18:58	20:51	21:39	22:02	21:38	20:39	19:26	17:19	16:30	16:26
27	08:25	07:28	06:24	06:14	05:25	05:14	05:46	06:36	07:28	07:21	08:16	08:45
	17:11	18:09	18:59	20:53	21:41	22:02	21:36	20:36	19:24	17:17	16:29	16:27
28	08:24	07:26	06:21	06:12	05:24	05:15	05:48	06:38	07:30	07:22	08:17	08:45
	17:13	18:11	19:01	20:55	21:42	22:02	21:35	20:34	19:22	17:15	16:28	16:28
29	08:23		07:19	06:10	05:23	05:15	05:49	06:40	07:31	07:24	08:19	08:46
	17:15		20:03	20:57	21:43	22:01	21:33	20:32	19:19	17:13	16:28	16:28
30	08:21		07:17	06:08	05:22	05:16	05:51	06:41	07:33	07:26	08:20	08:46
	17:17		20:05	20:58	21:44	22:01	21:32	20:30	19:17	17:11	16:27	16:29
31	08:20		07:14		05:21		05:52	06:43		07:28		08:46
	17:18		20:06		21:46		21:30	20:27		17:09		16:30
Potential sun hours	257	277	367	417	487	502	504	455	381	331	264	241
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

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Kathlyn Feeney / kfeeney@jodireland.com

Calculated:
09/06/2025 13:54/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Worst Case - V150 **Shadow receptor:** AW - 62

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:46	08:18	07:23	07:12	06:06	05:20	05:16	05:54	06:45	07:35	07:30	08:22
	16:32	17:20	18:13	20:08	21:00	21:47	22:01	21:28	20:25	19:14	17:07	16:26
2	08:46	08:16	07:21	07:09	06:04	05:19	05:17	05:55	06:46	07:36	07:31	08:23
	16:33	17:22	18:15	20:10	21:02	21:48	22:01	21:26	20:23	19:12	17:05	16:25
3	08:45	08:15	07:19	07:07	06:02	05:18	05:18	05:57	06:48	07:38	07:33	08:24
	16:34	17:24	18:17	20:11	21:03	21:49	22:00	21:25	20:20	19:10	17:04	16:25
4	08:45	08:13	07:17	07:05	06:00	05:17	05:19	05:59	06:50	07:40	07:35	08:26
	16:35	17:26	18:18	20:13	21:05	21:50	22:00	21:23	20:18	19:07	17:02	16:24
5	08:45	08:11	07:15	07:02	05:58	05:17	05:20	06:00	06:51	07:42	07:37	08:27
	16:36	17:28	18:20	20:15	21:07	21:51	21:59	21:21	20:16	19:05	17:00	16:24
6	08:45	08:10	07:12	07:00	05:56	05:16	05:20	06:02	06:53	07:43	07:39	08:28
	16:37	17:30	18:22	20:17	21:08	21:52	21:59	21:19	20:13	19:03	16:58	16:23
7	08:44	08:08	07:10	06:58	05:55	05:15	05:21	06:03	06:55	07:45	07:41	08:30
	16:39	17:32	18:24	20:18	21:10	21:53	21:58	21:18	20:11	19:01	16:56	16:23
8	08:44	08:06	07:08	06:56	05:53	05:15	05:22	06:05	06:56	07:47	07:42	08:31
	16:40	17:33	18:26	20:20	21:12	21:54	21:57	21:16	20:09	18:58	16:55	16:22
9	08:43	08:04	07:05	06:53	05:51	05:14	05:23	06:07	06:58	07:48	07:44	08:32
	16:41	17:35	18:27	20:22	21:13	21:55	21:57	21:14	20:06	18:56	16:53	16:22
10	08:43	08:02	07:03	06:51	05:49	05:14	05:24	06:08	07:00	07:50	07:46	08:33
	16:43	17:37	18:29	20:24	21:15	21:56	21:56	21:12	20:04	18:54	16:51	16:22
11	08:42	08:01	07:01	06:49	05:47	05:13	05:25	06:10	07:01	07:52	07:48	08:34
	16:44	17:39	18:31	20:25	21:17	21:56	21:55	21:10	20:02	18:51	16:50	16:22
12	08:41	07:59	06:59	06:46	05:46	05:13	05:26	06:12	07:03	07:54	07:50	08:35
	16:46	17:41	18:33	20:27	21:18	21:57	21:54	21:08	19:59	18:49	16:48	16:21
13	08:41	07:57	06:56	06:44	05:44	05:13	05:28	06:13	07:05	07:55	07:52	08:36
	16:47	17:43	18:35	20:29	21:20	21:58	21:53	21:06	19:57	18:47	16:47	16:21
14	08:40	07:55	06:54	06:42	05:43	05:12	05:29	06:15	07:06	07:57	07:53	08:37
	16:49	17:45	18:36	20:31	21:22	21:58	21:52	21:04	19:55	18:45	16:45	16:21
15	08:39	07:53	06:52	06:40	05:41	05:12	05:30	06:16	07:08	07:59	07:55	08:38
	16:50	17:47	18:38	20:32	21:23	21:59	21:51	21:02	19:52	18:42	16:44	16:21
16	08:38	07:51	06:49	06:37	05:39	05:12	05:31	06:18	07:10	08:01	07:57	08:39
	16:52	17:49	18:40	20:34	21:25	21:59	21:50	21:00	19:50	18:40	16:42	16:22
17	08:37	07:49	06:47	06:35	05:38	05:12	05:32	06:20	07:11	08:02	07:59	08:40
	16:54	17:51	18:42	20:36	21:26	22:00	21:49	20:58	19:48	18:38	16:41	16:22
18	08:36	07:47	06:45	06:33	05:36	05:12	05:34	06:21	07:13	08:04	08:00	08:41
	16:55	17:52	18:43	20:38	21:28	22:00	21:48	20:56	19:45	18:36	16:39	16:22
19	08:35	07:45	06:42	06:31	05:35	05:12	05:35	06:23	07:15	08:06	08:02	08:42
	16:57	17:54	18:45	20:39	21:29	22:01	21:47	20:54	19:43	18:34	16:38	16:22
20	08:34	07:43	06:40	06:29	05:33	05:12	05:36	06:25	07:16	08:08	08:04	08:42
	16:59	17:56	18:47	20:41	21:31	22:01	21:46	20:52	19:40	18:32	16:37	16:23
21	08:33	07:41	06:38	06:27	05:32	05:12	05:38	06:26	07:18	08:10	08:06	08:43
	17:00	17:58	18:49	20:43	21:32	22:01	21:45	20:49	19:38	18:29	16:36	16:23
22	08:32	07:39	06:35	06:24	05:31	05:12	05:39	06:28	07:20	08:11	08:07	08:43
	17:02	18:00	18:50	20:44	21:34	22:01	21:43	20:47	19:36	18:27	16:34	16:23
23	08:31	07:36	06:33	06:22	05:29	05:13	05:40	06:30	07:21	08:13	08:09	08:44
	17:04	18:02	18:52	20:46	21:35	22:02	21:42	20:45	19:33	18:25	16:33	16:24
24	08:29	07:34	06:31	06:20	05:28	05:13	05:42	06:31	07:23	08:15	08:11	08:44
	17:06	18:04	18:54	20:48	21:37	22:02	21:41	20:43	19:31	18:23	16:32	16:25
25	08:28	07:32	06:28	06:18	05:27	05:13	05:43	06:33	07:25	07:17	08:12	08:45
	17:07	18:05	18:56	20:50	21:38	22:02	21:39	20:41	19:29	17:21	16:31	16:25
26	08:27	07:30	06:26	06:16	05:26	05:14	05:45	06:35	07:26	07:19	08:14	08:45
	17:09	18:07	18:57	20:51	21:39	22:02	21:38	20:39	19:26	17:19	16:30	16:26
27	08:25	07:28	06:23	06:14	05:25	05:14	05:46	06:36	07:28	07:20	08:15	08:45
	17:11	18:09	18:59	20:53	21:41	22:02	21:36	20:36	19:24	17:17	16:29	16:27
28	08:24	07:26	06:21	06:12	05:24	05:15	05:48	06:38	07:30	07:22	08:17	08:45
	17:13	18:11	19:01	20:55	21:42	22:02	21:35	20:34	19:22	17:15	16:28	16:27
29	08:22		07:19	06:10	05:23	05:15	05:49	06:40	07:31	07:24	08:19	08:46
	17:15		20:03	20:57	21:43	22:01	21:33	20:32	19:19	17:13	16:28	16:28
30	08:21		07:16	06:08	05:22	05:16	05:51	06:41	07:33	07:26	08:20	08:46
	17:16		20:04	20:58	21:44	22:01	21:31	20:30	19:17	17:11	16:27	16:29
31	08:19		07:14		05:21		05:52	06:43		07:28		08:46
	17:18		20:06		21:46		21:30	20:27		17:09		16:30
Potential sun hours	257	277	367	417	487	502	504	455	381	331	264	241
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
Jennings O'Donovan
Finisklin Business Park
F91 RHH9 Sligo
+353719161416
Kathlyn Feeney / kfeeney@jodireland.com

Calculated:
09/06/2025 13:54/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Worst Case - V150 **Shadow receptor:** AX - 63

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:46	08:18	07:23	07:12	06:06	05:20	05:16	05:54	06:45	07:35	07:30	08:22
	16:32	17:20	18:13	20:08	21:00	21:47	22:01	21:28	20:25	19:14	17:07	16:26
2	08:46	08:16	07:21	07:09	06:04	05:19	05:17	05:55	06:46	07:36	07:31	08:23
	16:33	17:22	18:15	20:10	21:02	21:48	22:01	21:26	20:23	19:12	17:05	16:25
3	08:45	08:15	07:19	07:07	06:02	05:18	05:18	05:57	06:48	07:38	07:33	08:24
	16:34	17:24	18:17	20:11	21:03	21:49	22:00	21:25	20:20	19:10	17:04	16:25
4	08:45	08:13	07:17	07:05	06:00	05:17	05:19	05:59	06:50	07:40	07:35	08:26
	16:35	17:26	18:18	20:13	21:05	21:50	22:00	21:23	20:18	19:07	17:02	16:24
5	08:45	08:11	07:15	07:02	05:58	05:17	05:20	06:00	06:51	07:42	07:37	08:27
	16:36	17:28	18:20	20:15	21:07	21:51	21:59	21:21	20:16	19:05	17:00	16:24
6	08:45	08:10	07:12	07:00	05:56	05:16	05:20	06:02	06:53	07:43	07:39	08:28
	16:37	17:30	18:22	20:17	21:08	21:52	21:59	21:19	20:13	19:03	16:58	16:23
7	08:44	08:08	07:10	06:58	05:55	05:15	05:21	06:03	06:55	07:45	07:41	08:30
	16:39	17:32	18:24	20:18	21:10	21:53	21:58	21:18	20:11	19:01	16:56	16:23
8	08:44	08:06	07:08	06:56	05:53	05:15	05:22	06:05	06:56	07:47	07:42	08:31
	16:40	17:33	18:26	20:20	21:12	21:54	21:57	21:16	20:09	18:58	16:55	16:22
9	08:43	08:04	07:05	06:53	05:51	05:14	05:23	06:07	06:58	07:48	07:44	08:32
	16:41	17:35	18:27	20:22	21:13	21:55	21:57	21:14	20:06	18:56	16:53	16:22
10	08:43	08:02	07:03	06:51	05:49	05:14	05:24	06:08	07:00	07:50	07:46	08:33
	16:43	17:37	18:29	20:24	21:15	21:56	21:56	21:12	20:04	18:54	16:51	16:22
11	08:42	08:01	07:01	06:49	05:47	05:13	05:25	06:10	07:01	07:52	07:48	08:34
	16:44	17:39	18:31	20:25	21:17	21:56	21:55	21:10	20:02	18:51	16:50	16:22
12	08:41	07:59	06:59	06:46	05:46	05:13	05:26	06:12	07:03	07:54	07:50	08:35
	16:46	17:41	18:33	20:27	21:18	21:57	21:54	21:08	19:59	18:49	16:48	16:21
13	08:41	07:57	06:56	06:44	05:44	05:13	05:28	06:13	07:05	07:55	07:52	08:36
	16:47	17:43	18:35	20:29	21:20	21:58	21:53	21:06	19:57	18:47	16:47	16:21
14	08:40	07:55	06:54	06:42	05:43	05:12	05:29	06:15	07:06	07:57	07:53	08:37
	16:49	17:45	18:36	20:31	21:22	21:58	21:52	21:04	19:55	18:45	16:45	16:21
15	08:39	07:53	06:52	06:40	05:41	05:12	05:30	06:16	07:08	07:59	07:55	08:38
	16:50	17:47	18:38	20:32	21:23	21:59	21:51	21:02	19:52	18:42	16:44	16:21
16	08:38	07:51	06:49	06:37	05:39	05:12	05:31	06:18	07:10	08:01	07:57	08:39
	16:52	17:49	18:40	20:34	21:25	21:59	21:50	21:00	19:50	18:40	16:42	16:22
17	08:37	07:49	06:47	06:35	05:38	05:12	05:32	06:20	07:11	08:02	07:59	08:40
	16:54	17:51	18:42	20:36	21:26	22:00	21:49	20:58	19:48	18:38	16:41	16:22
18	08:36	07:47	06:45	06:33	05:36	05:12	05:34	06:21	07:13	08:04	08:00	08:41
	16:55	17:52	18:43	20:38	21:28	22:00	21:48	20:56	19:45	18:36	16:39	16:22
19	08:35	07:45	06:42	06:31	05:35	05:12	05:35	06:23	07:15	08:06	08:02	08:42
	16:57	17:54	18:45	20:39	21:29	22:01	21:47	20:54	19:43	18:34	16:38	16:22
20	08:34	07:43	06:40	06:29	05:33	05:12	05:36	06:25	07:16	08:08	08:04	08:42
	16:59	17:56	18:47	20:41	21:31	22:01	21:46	20:52	19:40	18:32	16:37	16:23
21	08:33	07:41	06:38	06:27	05:32	05:12	05:38	06:26	07:18	08:10	08:06	08:43
	17:00	17:58	18:49	20:43	21:32	22:01	21:45	20:49	19:38	18:29	16:36	16:23
22	08:32	07:39	06:35	06:24	05:31	05:12	05:39	06:28	07:20	08:11	08:07	08:43
	17:02	18:00	18:50	20:44	21:34	22:01	21:43	20:47	19:36	18:27	16:34	16:23
23	08:31	07:36	06:33	06:22	05:29	05:13	05:40	06:30	07:21	08:13	08:09	08:44
	17:04	18:02	18:52	20:46	21:35	22:02	21:42	20:45	19:33	18:25	16:33	16:24
24	08:29	07:34	06:31	06:20	05:28	05:13	05:42	06:31	07:23	08:15	08:11	08:44
	17:06	18:04	18:54	20:48	21:37	22:02	21:41	20:43	19:31	18:23	16:32	16:25
25	08:28	07:32	06:28	06:18	05:27	05:13	05:43	06:33	07:25	07:17	08:12	08:45
	17:07	18:05	18:56	20:50	21:38	22:02	21:39	20:41	19:29	17:21	16:31	16:25
26	08:27	07:30	06:26	06:16	05:26	05:14	05:45	06:35	07:26	07:19	08:14	08:45
	17:09	18:07	18:57	20:51	21:39	22:02	21:38	20:39	19:26	17:19	16:30	16:26
27	08:25	07:28	06:23	06:14	05:25	05:14	05:46	06:36	07:28	07:20	08:15	08:45
	17:11	18:09	18:59	20:53	21:41	22:02	21:36	20:36	19:24	17:17	16:29	16:27
28	08:24	07:26	06:21	06:12	05:24	05:15	05:48	06:38	07:30	07:22	08:17	08:45
	17:13	18:11	19:01	20:55	21:42	22:02	21:35	20:34	19:22	17:15	16:28	16:27
29	08:22		07:19	06:10	05:23	05:15	05:49	06:40	07:31	07:24	08:19	08:46
	17:15		20:03	20:57	21:43	22:01	21:33	20:32	19:19	17:13	16:28	16:28
30	08:21		07:16	06:08	05:22	05:16	05:51	06:41	07:33	07:26	08:20	08:46
	17:16		20:04	20:58	21:44	22:01	21:31	20:30	19:17	17:11	16:27	16:29
31	08:19		07:14		05:21		05:52	06:43		07:28		08:46
	17:18		20:06		21:46		21:30	20:27		17:09		16:30
Potential sun hours	257	277	367	417	487	502	504	455	381	331	264	241
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
Jennings O'Donovan
Finisklin Business Park
F91 RHH9 Sligo
+353719161416
Kathlyn Feeney / kfeeney@jodireland.com

Calculated:
09/06/2025 13:54/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Worst Case - V150 **Shadow receptor:** AY - 64

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:46	08:18	07:23	07:12	06:06	05:20	05:16	05:54	06:45	07:35	07:30	08:22
	16:32	17:20	18:13	20:08	21:00	21:47	22:01	21:28	20:25	19:14	17:07	16:26
2	08:46	08:16	07:21	07:09	06:04	05:19	05:17	05:55	06:46	07:36	07:31	08:23
	16:33	17:22	18:15	20:10	21:02	21:48	22:01	21:26	20:23	19:12	17:05	16:25
3	08:45	08:15	07:19	07:07	06:02	05:18	05:18	05:57	06:48	07:38	07:33	08:24
	16:34	17:24	18:17	20:11	21:03	21:49	22:00	21:25	20:20	19:10	17:04	16:25
4	08:45	08:13	07:17	07:05	06:00	05:17	05:19	05:59	06:50	07:40	07:35	08:26
	16:35	17:26	18:18	20:13	21:05	21:50	22:00	21:23	20:18	19:07	17:02	16:24
5	08:45	08:11	07:15	07:02	05:58	05:17	05:20	06:00	06:51	07:42	07:37	08:27
	16:36	17:28	18:20	20:15	21:07	21:51	21:59	21:21	20:16	19:05	17:00	16:24
6	08:45	08:10	07:12	07:00	05:56	05:16	05:20	06:02	06:53	07:43	07:39	08:28
	16:37	17:30	18:22	20:17	21:08	21:52	21:59	21:19	20:13	19:03	16:58	16:23
7	08:44	08:08	07:10	06:58	05:55	05:15	05:21	06:03	06:55	07:45	07:41	08:30
	16:39	17:32	18:24	20:18	21:10	21:53	21:58	21:18	20:11	19:01	16:56	16:23
8	08:44	08:06	07:08	06:56	05:53	05:15	05:22	06:05	06:56	07:47	07:42	08:31
	16:40	17:33	18:26	20:20	21:12	21:54	21:57	21:16	20:09	18:58	16:55	16:22
9	08:43	08:04	07:05	06:53	05:51	05:14	05:23	06:07	06:58	07:48	07:44	08:32
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29	08:22		07:19	06:10	05:23	05:15	05:49	06:40	07:31	07:24	08:19	08:46
	17:15		20:03	20:57	21:43	22:01	21:33	20:32	19:19	17:13	16:28	16:28
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31	08:19		07:14		05:21		05:52	06:43		07:28		08:46
	17:18		20:06		21:46		21:30	20:27		17:09		16:30
Potential sun hours	257	277	367	417	487	502	504	455	381	331	264	241
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

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SHADOW - Calendar

Calculation: 6839 Garrane WF Worst Case - V150 **Shadow receptor:** AZ - 65

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:46	08:18	07:23	07:12	06:06	05:20	05:16	05:54	06:45	07:35	07:30	08:22
	16:32	17:20	18:13	20:08	21:00	21:47	22:01	21:28	20:25	19:14	17:07	16:26
2	08:46	08:16	07:21	07:09	06:04	05:19	05:17	05:55	06:46	07:36	07:31	08:23
	16:33	17:22	18:15	20:10	21:02	21:48	22:01	21:26	20:23	19:12	17:05	16:25
3	08:45	08:15	07:19	07:07	06:02	05:18	05:18	05:57	06:48	07:38	07:33	08:24
	16:34	17:24	18:17	20:11	21:03	21:49	22:00	21:25	20:20	19:10	17:04	16:25
4	08:45	08:13	07:17	07:05	06:00	05:17	05:19	05:59	06:50	07:40	07:35	08:26
	16:35	17:26	18:18	20:13	21:05	21:50	22:00	21:23	20:18	19:07	17:02	16:24
5	08:45	08:11	07:15	07:02	05:58	05:17	05:20	06:00	06:51	07:42	07:37	08:27
	16:36	17:28	18:20	20:15	21:07	21:51	21:59	21:21	20:16	19:05	17:00	16:24
6	08:45	08:10	07:12	07:00	05:56	05:16	05:20	06:02	06:53	07:43	07:39	08:28
	16:37	17:30	18:22	20:17	21:08	21:52	21:59	21:19	20:13	19:03	16:58	16:23
7	08:44	08:08	07:10	06:58	05:55	05:15	05:21	06:03	06:55	07:45	07:41	08:30
	16:39	17:32	18:24	20:18	21:10	21:53	21:58	21:18	20:11	19:01	16:56	16:23
8	08:44	08:06	07:08	06:56	05:53	05:15	05:22	06:05	06:56	07:47	07:42	08:31
	16:40	17:33	18:26	20:20	21:12	21:54	21:57	21:16	20:09	18:58	16:55	16:22
9	08:43	08:04	07:05	06:53	05:51	05:14	05:23	06:07	06:58	07:48	07:44	08:32
	16:41	17:35	18:27	20:22	21:13	21:55	21:57	21:14	20:06	18:56	16:53	16:22
10	08:43	08:02	07:03	06:51	05:49	05:14	05:24	06:08	07:00	07:50	07:46	08:33
	16:43	17:37	18:29	20:24	21:15	21:56	21:56	21:12	20:04	18:54	16:51	16:22
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12	08:41	07:59	06:59	06:46	05:46	05:13	05:26	06:12	07:03	07:54	07:50	08:35
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15	08:39	07:53	06:52	06:40	05:41	05:12	05:30	06:16	07:08	07:59	07:55	08:38
	16:50	17:47	18:38	20:32	21:23	21:59	21:51	21:02	19:52	18:42	16:44	16:21
16	08:38	07:51	06:49	06:37	05:39	05:12	05:31	06:18	07:10	08:01	07:57	08:39
	16:52	17:49	18:40	20:34	21:25	21:59	21:50	21:00	19:50	18:40	16:42	16:22
17	08:37	07:49	06:47	06:35	05:38	05:12	05:32	06:20	07:11	08:02	07:59	08:40
	16:54	17:51	18:42	20:36	21:26	22:00	21:49	20:58	19:48	18:38	16:41	16:22
18	08:36	07:47	06:45	06:33	05:36	05:12	05:34	06:21	07:13	08:04	08:00	08:41
	16:55	17:52	18:43	20:38	21:28	22:00	21:48	20:56	19:45	18:36	16:39	16:22
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	16:57	17:54	18:45	20:39	21:29	22:01	21:47	20:54	19:43	18:34	16:38	16:22
20	08:34	07:43	06:40	06:29	05:33	05:12	05:36	06:25	07:16	08:08	08:04	08:42
	16:59	17:56	18:47	20:41	21:31	22:01	21:46	20:52	19:40	18:32	16:37	16:23
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	17:00	17:58	18:49	20:43	21:32	22:01	21:45	20:49	19:38	18:29	16:36	16:23
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	17:02	18:00	18:50	20:44	21:34	22:01	21:43	20:47	19:36	18:27	16:34	16:23
23	08:31	07:36	06:33	06:22	05:29	05:13	05:40	06:30	07:21	08:13	08:09	08:44
	17:04	18:02	18:52	20:46	21:35	22:02	21:42	20:45	19:33	18:25	16:33	16:24
24	08:29	07:34	06:31	06:20	05:28	05:13	05:42	06:31	07:23	08:15	08:11	08:44
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25	08:28	07:32	06:28	06:18	05:27	05:13	05:43	06:33	07:25	07:17	08:12	08:45
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26	08:27	07:30	06:26	06:16	05:26	05:14	05:45	06:35	07:26	07:19	08:14	08:45
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	17:13	18:11	19:01	20:55	21:42	22:02	21:35	20:34	19:22	17:15	16:28	16:28
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	17:15		20:03	20:57	21:43	22:01	21:33	20:32	19:19	17:13	16:28	16:28
30	08:21		07:16	06:08	05:22	05:16	05:51	06:41	07:33	07:26	08:20	08:46
	17:16		20:04	20:58	21:44	22:01	21:31	20:30	19:17	17:11	16:27	16:29
31	08:19		07:14		05:21		05:52	06:43		07:28		08:46
	17:18		20:06		21:46		21:30	20:27		17:09		16:30
Potential sun hours	257	277	367	417	487	502	504	455	381	331	264	241
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
Jennings O'Donovan
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+353719161416
Kathlyn Feeney / kfeeney@jodireland.com

Calculated:
09/06/2025 13:54/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Worst Case - V150 **Shadow receptor:** BA - 66

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:46	08:18	07:23	07:12	06:06	05:20	05:16	05:54	06:45	07:35	07:30	08:22
	16:32	17:20	18:13	20:08	21:00	21:47	22:01	21:28	20:25	19:14	17:07	16:26
2	08:46	08:16	07:21	07:09	06:04	05:19	05:17	05:55	06:46	07:36	07:31	08:23
	16:33	17:22	18:15	20:10	21:02	21:48	22:01	21:26	20:23	19:12	17:05	16:25
3	08:45	08:15	07:19	07:07	06:02	05:18	05:18	05:57	06:48	07:38	07:33	08:24
	16:34	17:24	18:17	20:11	21:03	21:49	22:00	21:25	20:20	19:10	17:04	16:25
4	08:45	08:13	07:17	07:05	06:00	05:17	05:19	05:59	06:50	07:40	07:35	08:26
	16:35	17:26	18:18	20:13	21:05	21:50	22:00	21:23	20:18	19:07	17:02	16:24
5	08:45	08:11	07:15	07:02	05:58	05:17	05:20	06:00	06:51	07:42	07:37	08:27
	16:36	17:28	18:20	20:15	21:07	21:51	21:59	21:21	20:16	19:05	17:00	16:24
6	08:45	08:10	07:12	07:00	05:56	05:16	05:20	06:02	06:53	07:43	07:39	08:28
	16:37	17:30	18:22	20:17	21:08	21:52	21:59	21:19	20:13	19:03	16:58	16:23
7	08:44	08:08	07:10	06:58	05:55	05:15	05:21	06:03	06:55	07:45	07:41	08:30
	16:39	17:32	18:24	20:18	21:10	21:53	21:58	21:18	20:11	19:01	16:56	16:23
8	08:44	08:06	07:08	06:56	05:53	05:15	05:22	06:05	06:56	07:47	07:42	08:31
	16:40	17:33	18:26	20:20	21:12	21:54	21:57	21:16	20:09	18:58	16:55	16:22
9	08:43	08:04	07:05	06:53	05:51	05:14	05:23	06:07	06:58	07:48	07:44	08:32
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10	08:43	08:02	07:03	06:51	05:49	05:14	05:24	06:08	07:00	07:50	07:46	08:33
	16:43	17:37	18:29	20:24	21:15	21:56	21:56	21:12	20:04	18:54	16:51	16:22
11	08:42	08:01	07:01	06:49	05:47	05:13	05:25	06:10	07:01	07:52	07:48	08:34
	16:44	17:39	18:31	20:25	21:17	21:56	21:55	21:10	20:02	18:51	16:50	16:22
12	08:41	07:59	06:59	06:46	05:46	05:13	05:26	06:12	07:03	07:54	07:50	08:35
	16:46	17:41	18:33	20:27	21:18	21:57	21:54	21:08	19:59	18:49	16:48	16:21
13	08:41	07:57	06:56	06:44	05:44	05:13	05:28	06:13	07:05	07:55	07:52	08:36
	16:47	17:43	18:35	20:29	21:20	21:58	21:53	21:06	19:57	18:47	16:47	16:21
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	16:50	17:47	18:38	20:32	21:23	21:59	21:51	21:02	19:52	18:42	16:44	16:21
16	08:38	07:51	06:49	06:37	05:39	05:12	05:31	06:18	07:10	08:01	07:57	08:39
	16:52	17:49	18:40	20:34	21:25	21:59	21:50	21:00	19:50	18:40	16:42	16:22
17	08:37	07:49	06:47	06:35	05:38	05:12	05:32	06:20	07:11	08:02	07:59	08:40
	16:54	17:51	18:42	20:36	21:26	22:00	21:49	20:58	19:48	18:38	16:41	16:22
18	08:36	07:47	06:45	06:33	05:36	05:12	05:34	06:21	07:13	08:04	08:00	08:41
	16:55	17:52	18:43	20:38	21:28	22:00	21:48	20:56	19:45	18:36	16:39	16:22
19	08:35	07:45	06:42	06:31	05:35	05:12	05:35	06:23	07:15	08:06	08:02	08:42
	16:57	17:54	18:45	20:39	21:29	22:01	21:47	20:54	19:43	18:34	16:38	16:22
20	08:34	07:43	06:40	06:29	05:33	05:12	05:36	06:25	07:16	08:08	08:04	08:42
	16:59	17:56	18:47	20:41	21:31	22:01	21:46	20:52	19:40	18:32	16:37	16:23
21	08:33	07:41	06:38	06:27	05:32	05:12	05:38	06:26	07:18	08:10	08:06	08:43
	17:00	17:58	18:49	20:43	21:32	22:01	21:45	20:49	19:38	18:29	16:36	16:23
22	08:32	07:39	06:35	06:24	05:31	05:12	05:39	06:28	07:20	08:11	08:07	08:43
	17:02	18:00	18:50	20:44	21:34	22:01	21:43	20:47	19:36	18:27	16:34	16:23
23	08:31	07:36	06:33	06:22	05:29	05:13	05:40	06:30	07:21	08:13	08:09	08:44
	17:04	18:02	18:52	20:46	21:35	22:02	21:42	20:45	19:33	18:25	16:33	16:24
24	08:29	07:34	06:31	06:20	05:28	05:13	05:42	06:31	07:23	08:15	08:11	08:44
	17:06	18:04	18:54	20:48	21:37	22:02	21:41	20:43	19:31	18:23	16:32	16:25
25	08:28	07:32	06:28	06:18	05:27	05:13	05:43	06:33	07:25	07:17	08:12	08:45
	17:07	18:05	18:56	20:50	21:38	22:02	21:39	20:41	19:29	17:21	16:31	16:25
26	08:27	07:30	06:26	06:16	05:26	05:14	05:45	06:35	07:26	07:19	08:14	08:45
	17:09	18:07	18:57	20:51	21:39	22:02	21:38	20:39	19:26	17:19	16:30	16:26
27	08:25	07:28	06:23	06:14	05:25	05:14	05:46	06:36	07:28	07:20	08:15	08:45
	17:11	18:09	18:59	20:53	21:41	22:02	21:36	20:36	19:24	17:17	16:29	16:27
28	08:24	07:26	06:21	06:12	05:24	05:15	05:48	06:38	07:30	07:22	08:17	08:45
	17:13	18:11	19:01	20:55	21:42	22:02	21:35	20:34	19:22	17:15	16:28	16:28
29	08:22		07:19	06:10	05:23	05:15	05:49	06:40	07:31	07:24	08:19	08:46
	17:15		20:03	20:57	21:43	22:01	21:33	20:32	19:19	17:13	16:28	16:28
30	08:21		07:16	06:08	05:22	05:16	05:51	06:41	07:33	07:26	08:20	08:46
	17:16		20:04	20:58	21:44	22:01	21:31	20:30	19:17	17:11	16:27	16:29
31	08:19		07:14		05:21		05:52	06:43		07:28		08:46
	17:18		20:06		21:46		21:30	20:27		17:09		16:30
Potential sun hours	257	277	367	417	487	502	504	455	381	331	264	241
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
Jennings O'Donovan
Finisklin Business Park
F91 RHH9 Sligo
+353719161416
Kathlyn Feeney / kfeeney@jodireland.com

Calculated:
09/06/2025 13:54/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Worst Case - V150 **Shadow receptor:** BB - 67

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:46	08:18	07:23	07:12	06:06	05:20	05:16	05:54	06:45	07:35	07:30	08:22
	16:32	17:20	18:13	20:08	21:00	21:47	22:01	21:28	20:25	19:14	17:07	16:26
2	08:46	08:16	07:21	07:09	06:04	05:19	05:17	05:55	06:46	07:36	07:31	08:23
	16:33	17:22	18:15	20:10	21:02	21:48	22:01	21:26	20:23	19:12	17:05	16:25
3	08:45	08:15	07:19	07:07	06:02	05:18	05:18	05:57	06:48	07:38	07:33	08:24
	16:34	17:24	18:17	20:11	21:03	21:49	22:00	21:25	20:20	19:10	17:04	16:25
4	08:45	08:13	07:17	07:05	06:00	05:17	05:19	05:59	06:50	07:40	07:35	08:26
	16:35	17:26	18:18	20:13	21:05	21:50	22:00	21:23	20:18	19:07	17:02	16:24
5	08:45	08:11	07:15	07:02	05:58	05:17	05:20	06:00	06:51	07:42	07:37	08:27
	16:36	17:28	18:20	20:15	21:07	21:51	21:59	21:21	20:16	19:05	17:00	16:24
6	08:45	08:10	07:12	07:00	05:56	05:16	05:20	06:02	06:53	07:43	07:39	08:28
	16:37	17:30	18:22	20:17	21:08	21:52	21:59	21:19	20:13	19:03	16:58	16:23
7	08:44	08:08	07:10	06:58	05:55	05:15	05:21	06:03	06:55	07:45	07:41	08:30
	16:39	17:32	18:24	20:18	21:10	21:53	21:58	21:18	20:11	19:01	16:56	16:23
8	08:44	08:06	07:08	06:56	05:53	05:15	05:22	06:05	06:56	07:47	07:42	08:31
	16:40	17:33	18:26	20:20	21:12	21:54	21:57	21:16	20:09	18:58	16:55	16:22
9	08:43	08:04	07:05	06:53	05:51	05:14	05:23	06:07	06:58	07:48	07:44	08:32
	16:41	17:35	18:27	20:22	21:13	21:55	21:57	21:14	20:06	18:56	16:53	16:22
10	08:43	08:02	07:03	06:51	05:49	05:14	05:24	06:08	07:00	07:50	07:46	08:33
	16:43	17:37	18:29	20:24	21:15	21:56	21:56	21:12	20:04	18:54	16:51	16:22
11	08:42	08:01	07:01	06:49	05:47	05:13	05:25	06:10	07:01	07:52	07:48	08:34
	16:44	17:39	18:31	20:25	21:17	21:56	21:55	21:10	20:02	18:51	16:50	16:22
12	08:41	07:59	06:59	06:46	05:46	05:13	05:26	06:12	07:03	07:54	07:50	08:35
	16:46	17:41	18:33	20:27	21:18	21:57	21:54	21:08	19:59	18:49	16:48	16:21
13	08:41	07:57	06:56	06:44	05:44	05:13	05:28	06:13	07:05	07:55	07:52	08:36
	16:47	17:43	18:35	20:29	21:20	21:58	21:53	21:06	19:57	18:47	16:47	16:21
14	08:40	07:55	06:54	06:42	05:43	05:12	05:29	06:15	07:06	07:57	07:53	08:37
	16:49	17:45	18:36	20:31	21:22	21:58	21:52	21:04	19:55	18:45	16:45	16:21
15	08:39	07:53	06:52	06:40	05:41	05:12	05:30	06:16	07:08	07:59	07:55	08:38
	16:50	17:47	18:38	20:32	21:23	21:59	21:51	21:02	19:52	18:42	16:44	16:21
16	08:38	07:51	06:49	06:37	05:39	05:12	05:31	06:18	07:10	08:01	07:57	08:39
	16:52	17:49	18:40	20:34	21:25	21:59	21:50	21:00	19:50	18:40	16:42	16:22
17	08:37	07:49	06:47	06:35	05:38	05:12	05:32	06:20	07:11	08:02	07:59	08:40
	16:54	17:51	18:42	20:36	21:26	22:00	21:49	20:58	19:48	18:38	16:41	16:22
18	08:36	07:47	06:45	06:33	05:36	05:12	05:34	06:21	07:13	08:04	08:00	08:41
	16:55	17:52	18:43	20:38	21:28	22:00	21:48	20:56	19:45	18:36	16:39	16:22
19	08:35	07:45	06:42	06:31	05:35	05:12	05:35	06:23	07:15	08:06	08:02	08:42
	16:57	17:54	18:45	20:39	21:29	22:01	21:47	20:54	19:43	18:34	16:38	16:22
20	08:34	07:43	06:40	06:29	05:33	05:12	05:36	06:25	07:16	08:08	08:04	08:42
	16:59	17:56	18:47	20:41	21:31	22:01	21:46	20:52	19:40	18:32	16:37	16:23
21	08:33	07:41	06:38	06:27	05:32	05:12	05:38	06:26	07:18	08:10	08:06	08:43
	17:00	17:58	18:49	20:43	21:32	22:01	21:45	20:49	19:38	18:29	16:36	16:23
22	08:32	07:39	06:35	06:24	05:31	05:12	05:39	06:28	07:20	08:11	08:07	08:43
	17:02	18:00	18:50	20:44	21:34	22:01	21:43	20:47	19:36	18:27	16:34	16:23
23	08:31	07:36	06:33	06:22	05:29	05:13	05:40	06:30	07:21	08:13	08:09	08:44
	17:04	18:02	18:52	20:46	21:35	22:02	21:42	20:45	19:33	18:25	16:33	16:24
24	08:29	07:34	06:31	06:20	05:28	05:13	05:42	06:31	07:23	08:15	08:11	08:44
	17:06	18:04	18:54	20:48	21:37	22:02	21:41	20:43	19:31	18:23	16:32	16:25
25	08:28	07:32	06:28	06:18	05:27	05:13	05:43	06:33	07:25	07:17	08:12	08:45
	17:07	18:05	18:56	20:50	21:38	22:02	21:39	20:41	19:29	17:21	16:31	16:25
26	08:27	07:30	06:26	06:16	05:26	05:14	05:45	06:35	07:26	07:19	08:14	08:45
	17:09	18:07	18:57	20:51	21:39	22:02	21:38	20:39	19:26	17:19	16:30	16:26
27	08:25	07:28	06:23	06:14	05:25	05:14	05:46	06:36	07:28	07:20	08:15	08:45
	17:11	18:09	18:59	20:53	21:41	22:02	21:36	20:36	19:24	17:17	16:29	16:27
28	08:24	07:26	06:21	06:12	05:24	05:15	05:48	06:38	07:30	07:22	08:17	08:45
	17:13	18:11	19:01	20:55	21:42	22:02	21:35	20:34	19:22	17:15	16:28	16:28
29	08:22		07:19	06:10	05:23	05:15	05:49	06:40	07:31	07:24	08:19	08:46
	17:15		20:03	20:57	21:43	22:01	21:33	20:32	19:19	17:13	16:28	16:28
30	08:21		07:16	06:08	05:22	05:16	05:51	06:41	07:33	07:26	08:20	08:46
	17:17		20:04	20:58	21:44	22:01	21:31	20:30	19:17	17:11	16:27	16:29
31	08:19		07:14		05:21		05:52	06:43		07:28		08:46
	17:18		20:06		21:46		21:30	20:27		17:09		16:30
Potential sun hours	257	277	367	417	487	502	504	455	381	331	264	241
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
Jennings O'Donovan
Finisklin Business Park
F91 RHH9 Sligo
+353719161416
Kathlyn Feeney / kfeeney@jodireland.com

Calculated:
09/06/2025 13:54/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Worst Case - V150 **Shadow receptor:** BC - 68

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January	February	March	April	May	June	July	August	September	October	November	December		
1	08:46	08:18	07:23	07:12	06:06	05:20	05:16	05:54	06:45	07:35	07:30	08:22		
	16:32	17:20	18:13	20:08	21:00	21:47	22:01	21:28	20:25	19:14	17:07	16:26		
2	08:46	08:16	07:21	07:09	06:04	05:19	05:17	05:55	06:46	07:36	07:31	08:23		
	16:33	17:22	18:15	20:10	21:02	21:48	22:01	21:26	20:23	19:12	17:05	16:25		
3	08:45	08:15	07:19	07:07	06:02	05:18	05:18	05:57	06:48	07:38	07:33	08:24		
	16:34	17:24	18:17	20:11	21:03	21:49	22:00	21:25	20:20	19:10	17:04	16:25		
4	08:45	08:13	07:17	07:05	06:00	05:17	05:19	05:59	06:50	07:40	07:35	08:26		
	16:35	17:26	18:18	20:13	21:05	21:50	22:00	21:23	20:18	19:07	17:02	16:24		
5	08:45	08:11	07:15	07:02	05:58	05:17	05:20	06:00	06:51	07:42	07:37	08:27		
	16:36	17:28	18:20	20:15	21:07	21:51	21:59	21:21	20:16	19:05	17:00	16:24		
6	08:45	08:10	07:12	07:00	05:56	05:16	05:20	06:02	06:53	07:43	07:39	08:28		
	16:37	17:30	18:22	20:17	21:08	21:52	21:59	21:19	20:13	19:03	16:58	16:23		
7	08:44	08:08	07:10	06:58	05:55	05:15	05:21	06:03	06:55	07:45	07:41	08:30		
	16:39	17:32	18:24	20:18	21:10	21:53	21:58	21:18	20:11	19:01	16:56	16:23		
8	08:44	08:06	07:08	06:56	05:53	05:15	05:22	06:05	06:56	07:47	07:42	08:31		
	16:40	17:33	18:26	20:20	21:12	21:54	21:57	21:16	20:09	18:58	16:55	16:22		
9	08:43	08:04	07:05	06:53	05:51	05:14	05:23	06:07	06:58	07:48	07:44	08:32		
	16:41	17:35	18:27	20:22	21:13	21:55	21:57	21:14	20:06	18:56	16:53	16:22		
10	08:43	08:02	07:03	06:51	05:49	05:14	05:24	06:08	07:00	07:50	07:46	08:33		
	16:43	17:37	18:29	20:24	21:15	21:56	21:56	21:12	20:04	18:54	16:51	16:22		
11	08:42	08:01	07:01	06:49	05:47	05:13	05:25	06:10	07:01	07:52	07:48	08:34		
	16:44	17:39	18:31	20:25	21:17	21:56	21:55	21:10	20:02	18:51	16:50	16:22		
12	08:41	07:59	06:59	06:46	05:46	05:13	05:26	06:12	07:03	07:54	07:50	08:35		
	16:46	17:41	18:33	20:27	21:18	21:57	21:54	21:08	19:59	18:49	16:48	16:21		
13	08:41	07:57	06:56	06:44	05:44	05:13	05:28	06:13	07:05	07:55	07:52	08:36		
	16:47	17:43	18:35	20:29	21:20	21:58	21:53	21:06	19:57	18:47	16:47	16:21		
14	08:40	07:55	06:54	06:42	05:43	05:12	05:29	06:15	07:06	07:57	07:53	08:37		15:12 (9)
	16:49	17:45	18:36	20:31	21:22	21:58	21:52	21:04	19:55	18:45	16:45	16:21	2	15:14 (9)
15	08:39	07:53	06:52	06:40	05:41	05:12	05:30	06:16	07:08	07:59	07:55	08:38		15:11 (9)
	16:50	17:47	18:38	20:32	21:23	21:59	21:51	21:02	19:52	18:42	16:44	16:21	6	15:17 (9)
16	08:38	07:51	06:49	06:37	05:39	05:12	05:31	06:18	07:10	08:01	07:57	08:39		15:11 (9)
	16:52	17:49	18:40	20:34	21:25	21:59	21:50	21:00	19:50	18:40	16:42	16:22	7	15:18 (9)
17	08:37	07:49	06:47	06:35	05:38	05:12	05:32	06:20	07:11	08:02	07:59	08:40		15:11 (9)
	16:54	17:51	18:42	20:36	21:26	22:00	21:49	20:58	19:48	18:38	16:41	16:22	8	15:19 (9)
18	08:36	07:47	06:45	06:33	05:36	05:12	05:34	06:21	07:13	08:04	08:00	08:41		15:10 (9)
	16:55	17:52	18:43	20:38	21:28	22:00	21:48	20:56	19:45	18:36	16:39	16:22	10	15:20 (9)
19	08:35	07:45	06:42	06:31	05:35	05:12	05:35	06:23	07:15	08:06	08:02	08:42		15:11 (9)
	16:57	17:54	18:45	20:39	21:29	22:01	21:47	20:54	19:43	18:34	16:38	16:22	10	15:21 (9)
20	08:34	07:43	06:40	06:29	05:33	05:12	05:36	06:25	07:16	08:08	08:04	08:42		15:11 (9)
	16:59	17:56	18:47	20:41	21:31	22:01	21:46	20:52	19:40	18:32	16:37	16:23	11	15:22 (9)
21	08:33	07:41	06:38	06:27	05:32	05:12	05:38	06:26	07:18	08:10	08:06	08:43		15:11 (9)
	17:00	17:58	18:49	20:43	21:32	22:01	21:45	20:49	19:38	18:29	16:36	16:23	11	15:22 (9)
22	08:32	07:39	06:35	06:24	05:31	05:12	05:39	06:28	07:20	08:11	08:07	08:43		15:12 (9)
	17:02	18:00	18:50	20:44	21:34	22:01	21:43	20:47	19:36	18:27	16:34	16:23	11	15:23 (9)
23	08:31	07:36	06:33	06:22	05:29	05:13	05:40	06:30	07:21	08:13	08:09	08:44		15:12 (9)
	17:04	18:02	18:52	20:46	21:35	22:02	21:42	20:45	19:33	18:25	16:33	16:24	11	15:23 (9)
24	08:29	07:34	06:31	06:20	05:28	05:13	05:42	06:31	07:23	08:15	08:11	08:44		15:12 (9)
	17:06	18:04	18:54	20:48	21:37	22:02	21:41	20:43	19:31	18:23	16:32	16:25	11	15:23 (9)
25	08:28	07:32	06:28	06:18	05:27	05:13	05:43	06:33	07:25	07:17	08:12	08:45		15:14 (9)
	17:07	18:05	18:56	20:50	21:38	22:02	21:39	20:41	19:29	17:21	16:31	16:25	10	15:24 (9)
26	08:27	07:30	06:26	06:16	05:26	05:14	05:45	06:35	07:26	07:19	08:14	08:45		15:15 (9)
	17:09	18:07	18:57	20:51	21:39	22:02	21:38	20:39	19:26	17:19	16:30	16:26	8	15:23 (9)
27	08:25	07:28	06:23	06:14	05:25	05:14	05:46	06:36	07:28	07:20	08:15	08:45		15:15 (9)
	17:11	18:09	18:59	20:53	21:41	22:02	21:36	20:36	19:24	17:17	16:29	16:27	8	15:23 (9)
28	08:24	07:26	06:21	06:12	05:24	05:15	05:48	06:38	07:30	07:22	08:17	08:45		15:16 (9)
	17:13	18:11	19:01	20:55	21:42	22:02	21:35	20:34	19:22	17:15	16:28	16:28	7	15:23 (9)
29	08:22		07:19	06:10	05:23	05:15	05:49	06:40	07:31	07:24	08:19	08:46		15:18 (9)
	17:15		20:03	20:57	21:43	22:01	21:33	20:32	19:19	17:13	16:28	16:28	4	15:22 (9)
30	08:21		07:16	06:08	05:22	05:16	05:51	06:41	07:33	07:26	08:20	08:46		
	17:16		20:04	20:58	21:44	22:01	21:31	20:30	19:17	17:11	16:27	16:29		
31	08:19		07:14		05:21		05:52	06:43		07:28		08:46		
	17:18		20:06		21:46		21:30	20:27		17:09		16:30		
Potential sun hours	257	277	367	417	487	502	504	455	381	331	264	241		
Total, worst case													135	
Sun reduction													0.22	
Oper. time red.													1.00	
Wind dir. red.													0.62	
Total reduction													0.13	
Total, real													18	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
Jennings O'Donovan
Finisklin Business Park
F91 RHH9 Sligo
+353719161416
Kathlyn Feeney / kfeeney@jodireland.com

Calculated:
09/06/2025 13:54/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Worst Case - V150 **Shadow receptor:** BD - 69

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January	February	March	April	May	June	July	August	September	October	November	December		
1	08:46	08:18	07:23	07:12	06:06	05:20	05:16	05:54	06:45	07:35	07:30	08:22		
	16:32	17:20	18:13	20:08	21:00	21:47	22:01	21:28	20:25	19:14	17:07	16:26		
2	08:46	08:16	07:21	07:09	06:04	05:19	05:17	05:55	06:46	07:36	07:31	08:23		
	16:33	17:22	18:15	20:10	21:02	21:48	22:01	21:26	20:23	19:12	17:05	16:25		
3	08:45	08:15	07:19	07:07	06:02	05:18	05:18	05:57	06:48	07:38	07:33	08:24		
	16:34	17:24	18:17	20:11	21:03	21:49	22:00	21:25	20:20	19:10	17:04	16:25		
4	08:45	08:13	07:17	07:05	06:00	05:17	05:19	05:59	06:50	07:40	07:35	08:26		
	16:35	17:26	18:18	20:13	21:05	21:50	22:00	21:23	20:18	19:07	17:02	16:24		
5	08:45	08:11	07:15	07:02	05:58	05:17	05:20	06:00	06:51	07:42	07:37	08:27		
	16:36	17:28	18:20	20:15	21:07	21:51	21:59	21:21	20:16	19:05	17:00	16:24		
6	08:45	08:10	07:12	07:00	05:56	05:16	05:20	06:02	06:53	07:43	07:39	08:28		
	16:37	17:30	18:22	20:17	21:08	21:52	21:59	21:19	20:13	19:03	16:58	16:23		
7	08:44	08:08	07:10	06:58	05:55	05:15	05:21	06:03	06:55	07:45	07:41	08:30		
	16:39	17:32	18:24	20:18	21:10	21:53	21:58	21:18	20:11	19:01	16:56	16:23		
8	08:44	08:06	07:08	06:56	05:53	05:15	05:22	06:05	06:56	07:47	07:42	08:31		
	16:40	17:33	18:26	20:20	21:12	21:54	21:57	21:16	20:09	18:58	16:55	16:22		
9	08:43	08:04	07:05	06:53	05:51	05:14	05:23	06:07	06:58	07:48	07:44	08:32		
	16:41	17:35	18:27	20:22	21:13	21:55	21:57	21:14	20:06	18:56	16:53	16:22		
10	08:43	08:02	07:03	06:51	05:49	05:14	05:24	06:08	07:00	07:50	07:46	08:33		
	16:43	17:37	18:29	20:24	21:15	21:56	21:56	21:12	20:04	18:54	16:51	16:22		
11	08:42	08:01	07:01	06:49	05:47	05:13	05:25	06:10	07:01	07:52	07:48	08:34		
	16:44	17:39	18:31	20:25	21:17	21:56	21:55	21:10	20:02	18:51	16:50	16:22		
12	08:41	07:59	06:59	06:46	05:46	05:13	05:26	06:12	07:03	07:54	07:50	08:35		15:12 (9)
	16:46	17:41	18:33	20:27	21:18	21:57	21:54	21:08	19:59	18:49	16:48	16:21	3	15:15 (9)
13	08:41	07:57	06:56	06:44	05:44	05:13	05:28	06:13	07:05	07:55	07:52	08:36		15:11 (9)
	16:47	17:43	18:35	20:29	21:20	21:58	21:53	21:06	19:57	18:47	16:47	16:21	6	15:17 (9)
14	08:40	07:55	06:54	06:42	05:43	05:12	05:29	06:15	07:06	07:57	07:53	08:37		15:10 (9)
	16:49	17:45	18:36	20:31	21:22	21:58	21:52	21:04	19:55	18:45	16:45	16:21	9	15:19 (9)
15	08:39	07:53	06:52	06:40	05:41	05:12	05:30	06:16	07:08	07:59	07:55	08:38		15:10 (9)
	16:50	17:47	18:38	20:32	21:23	21:59	21:51	21:02	19:52	18:42	16:44	16:21	10	15:20 (9)
16	08:38	07:51	06:49	06:37	05:39	05:12	05:31	06:18	07:10	08:01	07:57	08:39		15:10 (9)
	16:52	17:49	18:40	20:34	21:25	21:59	21:50	21:00	19:50	18:40	16:42	16:22	11	15:21 (9)
17	08:37	07:49	06:47	06:35	05:38	05:12	05:32	06:20	07:11	08:02	07:59	08:40		15:10 (9)
	16:54	17:51	18:42	20:36	21:26	22:00	21:49	20:58	19:48	18:38	16:41	16:22	12	15:22 (9)
18	08:36	07:47	06:45	06:33	05:36	05:12	05:34	06:21	07:13	08:04	08:00	08:41		15:10 (9)
	16:55	17:52	18:43	20:38	21:28	22:00	21:48	20:56	19:45	18:36	16:39	16:22	12	15:22 (9)
19	08:35	07:45	06:42	06:31	05:35	05:12	05:35	06:23	07:15	08:06	08:02	08:42		15:10 (9)
	16:57	17:54	18:45	20:39	21:29	22:01	21:47	20:54	19:43	18:34	16:38	16:22	13	15:23 (9)
20	08:34	07:43	06:40	06:29	05:33	05:12	05:36	06:25	07:16	08:08	08:04	08:42		15:11 (9)
	16:59	17:56	18:47	20:41	21:31	22:01	21:46	20:52	19:40	18:32	16:37	16:23	13	15:24 (9)
21	08:33	07:41	06:38	06:27	05:32	05:12	05:38	06:26	07:18	08:10	08:06	08:43		15:11 (9)
	17:00	17:58	18:49	20:43	21:32	22:01	21:45	20:49	19:38	18:29	16:36	16:23	13	15:24 (9)
22	08:32	07:39	06:35	06:24	05:31	05:12	05:39	06:28	07:20	08:11	08:07	08:43		15:12 (9)
	17:02	18:00	18:50	20:44	21:34	22:01	21:43	20:47	19:36	18:27	16:34	16:23	13	15:25 (9)
23	08:31	07:36	06:33	06:22	05:29	05:13	05:40	06:30	07:21	08:13	08:09	08:44		15:12 (9)
	17:04	18:02	18:52	20:46	21:35	22:02	21:42	20:45	19:33	18:25	16:33	16:24	13	15:25 (9)
24	08:29	07:34	06:31	06:20	05:28	05:13	05:42	06:31	07:23	08:15	08:11	08:44		15:12 (9)
	17:06	18:04	18:54	20:48	21:37	22:02	21:41	20:43	19:31	18:23	16:32	16:25	13	15:25 (9)
25	08:28	07:32	06:28	06:18	05:27	05:13	05:43	06:33	07:25	07:17	08:12	08:45		15:14 (9)
	17:07	18:05	18:56	20:50	21:38	22:02	21:39	20:41	19:29	17:21	16:31	16:25	12	15:26 (9)
26	08:27	07:30	06:26	06:16	05:26	05:14	05:45	06:35	07:26	07:19	08:14	08:45		15:14 (9)
	17:09	18:07	18:57	20:51	21:39	22:02	21:38	20:39	19:26	17:19	16:30	16:26	12	15:26 (9)
27	08:25	07:28	06:23	06:14	05:25	05:14	05:46	06:36	07:28	07:20	08:15	08:45		15:15 (9)
	17:11	18:09	18:59	20:53	21:41	22:02	21:36	20:36	19:24	17:17	16:29	16:27	11	15:26 (9)
28	08:24	07:26	06:21	06:12	05:24	05:15	05:48	06:38	07:30	07:22	08:17	08:45		15:16 (9)
	17:13	18:11	19:01	20:55	21:42	22:02	21:35	20:34	19:22	17:15	16:28	16:28	10	15:26 (9)
29	08:22		07:19	06:10	05:23	05:15	05:49	06:40	07:31	07:24	08:19	08:46		15:17 (9)
	17:15		20:03	20:57	21:43	22:01	21:33	20:32	19:19	17:13	16:28	16:28	9	15:26 (9)
30	08:21		07:16	06:08	05:22	05:16	05:51	06:41	07:33	07:26	08:20	08:46		15:18 (9)
	17:16		20:04	20:58	21:44	22:01	21:31	20:30	19:17	17:11	16:27	16:29	7	15:25 (9)
31	08:19		07:14		05:21		05:52	06:43		07:28		08:46		15:20 (9)
	17:18		20:06		21:46		21:30	20:27		17:09		16:30	4	15:24 (9)
Potential sun hours	257	277	367	417	487	502	504	455	381	331	264	241		
Total, worst case													206	
Sun reduction													0.22	
Oper. time red.													1.00	
Wind dir. red.													0.62	
Total reduction													0.13	
Total, real													28	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
Jennings O'Donovan
Finisklin Business Park
F91 RHH9 Sligo
+353719161416
Kathlyn Feeney / kfeeney@jodireland.com
Calculated:
09/06/2025 13:54/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Worst Case - V150 **Shadow receptor:** BE - 70

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January			February	March	April	May	June	July	August	September	October	November	December		
1	08:46		15:20 (9)	08:18	07:23	07:12	06:06	05:20	05:16	05:54	06:45	07:35	07:30	08:22		
	16:32	15	15:35 (9)	17:20	18:13	20:08	21:00	21:47	22:01	21:28	20:25	19:14	17:07	16:26		
2	08:46		15:20 (9)	08:16	07:21	07:09	06:04	05:19	05:17	05:55	06:46	07:36	07:31	08:23		
	16:33	14	15:34 (9)	17:22	18:15	20:10	21:02	21:48	22:01	21:26	20:23	19:12	17:05	16:25		
3	08:45		15:21 (9)	08:15	07:19	07:07	06:02	05:18	05:18	05:57	06:48	07:38	07:33	08:24		
	16:34	13	15:34 (9)	17:24	18:17	20:11	21:03	21:49	22:00	21:25	20:20	19:10	17:04	16:25		
4	08:45		15:23 (9)	08:13	07:17	07:05	06:00	05:17	05:19	05:59	06:50	07:40	07:35	08:26		
	16:35	11	15:34 (9)	17:26	18:18	20:13	21:05	21:50	22:00	21:23	20:18	19:07	17:02	16:24		
5	08:45		15:24 (9)	08:11	07:15	07:02	05:58	05:17	05:20	06:00	06:51	07:42	07:37	08:27		
	16:36	9	15:33 (9)	17:28	18:20	20:15	21:07	21:51	21:59	21:21	20:16	19:05	17:00	16:24		
6	08:45		15:28 (9)	08:10	07:12	07:00	05:56	05:16	05:20	06:02	06:53	07:43	07:39	08:28		15:14 (9)
	16:37	3	15:31 (9)	17:30	18:22	20:17	21:08	21:52	21:59	21:19	20:13	19:03	16:58	16:23	3	15:17 (9)
7	08:44			08:08	07:10	06:58	05:55	05:15	05:21	06:03	06:55	07:45	07:41	08:30		15:12 (9)
	16:39			17:32	18:24	20:18	21:10	21:53	21:58	21:18	20:11	19:01	16:56	16:23	8	15:20 (9)
8	08:44			08:06	07:08	06:56	05:53	05:15	05:22	06:05	06:56	07:47	07:42	08:31		15:10 (9)
	16:40			17:33	18:26	20:20	21:12	21:54	21:57	21:16	20:09	18:58	16:55	16:22	11	15:21 (9)
9	08:43			08:04	07:05	06:53	05:51	05:14	05:23	06:07	06:58	07:48	07:44	08:32		15:11 (9)
	16:41			17:35	18:27	20:22	21:13	21:55	21:57	21:14	20:06	18:56	16:53	16:22	12	15:23 (9)
10	08:43			08:02	07:03	06:51	05:49	05:14	05:24	06:08	07:00	07:50	07:46	08:33		15:10 (9)
	16:43			17:37	18:29	20:24	21:15	21:56	21:56	21:12	20:04	18:54	16:51	16:22	14	15:24 (9)
11	08:42			08:01	07:01	06:49	05:47	05:13	05:25	06:10	07:01	07:52	07:48	08:34		15:10 (9)
	16:44			17:39	18:31	20:25	21:17	21:56	21:55	21:10	20:02	18:51	16:50	16:22	15	15:25 (9)
12	08:41			07:59	06:59	06:46	05:46	05:13	05:26	06:12	07:03	07:54	07:50	08:35		15:10 (9)
	16:46			17:41	18:33	20:27	21:18	21:57	21:54	21:08	19:59	18:49	16:48	16:21	16	15:26 (9)
13	08:41			07:57	06:56	06:44	05:44	05:13	05:28	06:13	07:05	07:55	07:51	08:36		15:09 (9)
	16:47			17:43	18:35	20:29	21:20	21:58	21:53	21:06	19:57	18:47	16:47	16:21	18	15:27 (9)
14	08:40			07:55	06:54	06:42	05:43	05:12	05:29	06:15	07:06	07:57	07:53	08:37		15:10 (9)
	16:49			17:45	18:36	20:31	21:22	21:58	21:52	21:04	19:55	18:45	16:45	16:21	18	15:28 (9)
15	08:39			07:53	06:52	06:40	05:41	05:12	05:30	06:16	07:08	07:59	07:55	08:38		15:10 (9)
	16:50			17:47	18:38	20:32	21:23	21:59	21:51	21:02	19:52	18:42	16:44	16:21	18	15:28 (9)
16	08:38			07:51	06:49	06:37	05:39	05:12	05:31	06:18	07:10	08:01	07:57	08:39		15:10 (9)
	16:52			17:49	18:40	20:34	21:25	21:59	21:50	21:00	19:50	18:40	16:42	16:22	19	15:29 (9)
17	08:37			07:49	06:47	06:35	05:38	05:12	05:32	06:20	07:11	08:02	07:59	08:40		15:11 (9)
	16:54			17:51	18:42	20:36	21:26	22:00	21:49	20:58	19:48	18:38	16:41	16:22	19	15:30 (9)
18	08:36			07:47	06:45	06:33	05:36	05:12	05:34	06:21	07:13	08:04	08:00	08:41		15:10 (9)
	16:55			17:52	18:43	20:38	21:28	22:00	21:48	20:56	19:45	18:36	16:39	16:22	20	15:30 (9)
19	08:35			07:45	06:42	06:31	05:35	05:12	05:35	06:23	07:15	08:06	08:02	08:42		15:11 (9)
	16:57			17:54	18:45	20:39	21:29	22:01	21:47	20:54	19:43	18:34	16:38	16:22	20	15:31 (9)
20	08:34			07:43	06:40	06:29	05:33	05:12	05:36	06:25	07:16	08:08	08:04	08:42		15:12 (9)
	16:59			17:56	18:47	20:41	21:31	22:01	21:46	20:52	19:40	18:32	16:37	16:23	20	15:32 (9)
21	08:33			07:41	06:38	06:27	05:32	05:12	05:38	06:26	07:18	08:10	08:06	08:43		15:12 (9)
	17:00			17:58	18:49	20:43	21:32	22:01	21:45	20:49	19:38	18:29	16:36	16:23	20	15:32 (9)
22	08:32			07:39	06:35	06:24	05:31	05:12	05:39	06:28	07:20	08:11	08:07	08:43		15:12 (9)
	17:02			18:00	18:50	20:44	21:34	22:01	21:43	20:47	19:36	18:27	16:34	16:23	21	15:33 (9)
23	08:31			07:36	06:33	06:22	05:29	05:13	05:40	06:30	07:21	08:13	08:09	08:44		15:13 (9)
	17:04			18:02	18:52	20:46	21:35	22:02	21:42	20:45	19:33	18:25	16:33	16:24	20	15:33 (9)
24	08:29			07:34	06:31	06:20	05:28	05:13	05:42	06:31	07:23	08:15	08:11	08:44		15:13 (9)
	17:06			18:04	18:54	20:48	21:37	22:02	21:41	20:43	19:31	18:23	16:32	16:25	20	15:33 (9)
25	08:28			07:32	06:28	06:18	05:27	05:13	05:43	06:33	07:25	07:17	08:12	08:45		15:14 (9)
	17:07			18:05	18:56	20:50	21:38	22:02	21:39	20:41	19:29	17:21	16:31	16:25	20	15:34 (9)
26	08:27			07:30	06:26	06:16	05:26	05:14	05:45	06:35	07:26	07:19	08:14	08:45		15:14 (9)
	17:09			18:07	18:57	20:51	21:39	22:02	21:38	20:39	19:26	17:19	16:30	16:26	20	15:34 (9)
27	08:25			07:28	06:23	06:14	05:25	05:14	05:46	06:36	07:28	07:20	08:15	08:45		15:15 (9)
	17:11			18:09	18:59	20:53	21:41	22:02	21:36	20:36	19:24	17:17	16:29	16:27	19	15:34 (9)
28	08:24			07:26	06:21	06:12	05:24	05:15	05:48	06:38	07:30	07:22	08:17	08:45		15:16 (9)
	17:13			18:11	19:01	20:55	21:42	22:02	21:35	20:34	19:22	17:15	16:28	16:28	18	15:34 (9)
29	08:22				07:19	06:10	05:23	05:15	05:49	06:40	07:31	07:24	08:19	08:46		15:16 (9)
	17:15				20:03	20:57	21:43	22:01	21:33	20:32	19:19	17:13	16:28	16:28	19	15:35 (9)
30	08:21				07:16	06:08	05:22	05:16	05:51	06:41	07:33	07:26	08:20	08:46		15:17 (9)
	17:17				20:04	20:58	21:44	22:01	21:31	20:30	19:17	17:11	16:27	16:29	18	15:35 (9)
31	08:19				07:14		05:21		05:52	06:43		07:28		08:46		15:18 (9)
	17:18				20:06		21:46		21:30	20:27		17:09		16:30	17	15:35 (9)
Potential sun hours	257			277	367	417	487	502	504	455	381	331	264	241		
Total, worst case		65													443	
Sun reduction		0.22													0.22	
Oper. time red.		1.00													1.00	
Wind dir. red.		0.62													0.62	
Total reduction		0.13													0.13	
Total, real		9													60	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

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Jennings O'Donovan
Finisklin Business Park
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+353719161416
Kathlyn Feeney / kfeeney@jodireland.com

Calculated:
09/06/2025 13:54/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Worst Case - V150 **Shadow receptor:** BF - 71

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January			February	March	April	May	June	July	August	September	October	November	December		
1	08:46		15:20 (9)	08:18	07:23	07:12	06:06	05:20	05:16	05:54	06:45	07:35	07:30	08:22		
	16:32	17	15:37 (9)	17:20	18:13	20:08	21:00	21:47	22:01	21:28	20:25	19:14	17:07	16:26		
2	08:46		15:20 (9)	08:16	07:21	07:09	06:04	05:19	05:17	05:55	06:46	07:36	07:31	08:23		
	16:33	16	15:36 (9)	17:22	18:15	20:10	21:02	21:48	22:01	21:26	20:23	19:12	17:05	16:25		
3	08:45		15:21 (9)	08:15	07:19	07:07	06:02	05:18	05:18	05:57	06:48	07:38	07:33	08:24		
	16:34	15	15:36 (9)	17:24	18:17	20:11	21:03	21:49	22:00	21:25	20:20	19:10	17:04	16:25		
4	08:45		15:23 (9)	08:13	07:17	07:05	06:00	05:17	05:19	05:59	06:50	07:40	07:35	08:26		
	16:35	13	15:36 (9)	17:26	18:18	20:13	21:05	21:50	22:00	21:23	20:18	19:07	17:02	16:24		
5	08:45		15:24 (9)	08:11	07:15	07:02	05:58	05:17	05:20	06:00	06:51	07:42	07:37	08:27		15:14 (9)
	16:36	11	15:35 (9)	17:28	18:20	20:15	21:07	21:51	21:59	21:21	20:16	19:05	17:00	16:24	3	15:17 (9)
6	08:45		15:26 (9)	08:10	07:12	07:00	05:56	05:16	05:20	06:02	06:53	07:43	07:39	08:28		15:12 (9)
	16:37	9	15:35 (9)	17:30	18:22	20:17	21:08	21:52	21:59	21:19	20:13	19:03	16:58	16:23	9	15:21 (9)
7	08:44		15:29 (9)	08:08	07:10	06:58	05:55	05:15	05:21	06:03	06:55	07:45	07:41	08:30		15:11 (9)
	16:39	3	15:32 (9)	17:32	18:24	20:18	21:10	21:53	21:58	21:18	20:11	19:01	16:56	16:23	11	15:22 (9)
8	08:44			08:06	07:08	06:56	05:53	05:15	05:22	06:05	06:56	07:47	07:42	08:31		15:10 (9)
	16:40			17:33	18:26	20:20	21:12	21:54	21:57	21:16	20:09	18:58	16:55	16:22	13	15:23 (9)
9	08:43			08:04	07:05	06:53	05:51	05:14	05:23	06:07	06:58	07:48	07:44	08:32		15:10 (9)
	16:41			17:35	18:27	20:22	21:13	21:55	21:57	21:14	20:06	18:56	16:53	16:22	15	15:25 (9)
10	08:43			08:02	07:03	06:51	05:49	05:14	05:24	06:08	07:00	07:50	07:46	08:33		15:10 (9)
	16:43			17:37	18:29	20:24	21:15	21:56	21:56	21:12	20:04	18:54	16:51	16:22	16	15:26 (9)
11	08:42			08:01	07:01	06:49	05:47	05:13	05:25	06:10	07:01	07:52	07:48	08:34		15:10 (9)
	16:44			17:39	18:31	20:25	21:17	21:56	21:55	21:10	20:02	18:51	16:50	16:22	17	15:27 (9)
12	08:41			07:59	06:59	06:46	05:46	05:13	05:26	06:12	07:03	07:54	07:50	08:35		15:10 (9)
	16:46			17:41	18:33	20:27	21:18	21:57	21:54	21:08	19:59	18:49	16:48	16:21	18	15:28 (9)
13	08:41			07:57	06:56	06:44	05:44	05:13	05:28	06:13	07:05	07:55	07:51	08:36		15:10 (9)
	16:47			17:43	18:35	20:29	21:20	21:58	21:53	21:06	19:57	18:47	16:47	16:21	18	15:28 (9)
14	08:40			07:55	06:54	06:42	05:43	05:12	05:29	06:15	07:06	07:57	07:53	08:37		15:10 (9)
	16:49			17:45	18:36	20:31	21:22	21:58	21:52	21:04	19:55	18:45	16:45	16:21	19	15:29 (9)
15	08:39			07:53	06:52	06:40	05:41	05:12	05:30	06:16	07:08	07:59	07:55	08:38		15:10 (9)
	16:50			17:47	18:38	20:32	21:23	21:59	21:51	21:02	19:52	18:42	16:44	16:21	20	15:30 (9)
16	08:38			07:51	06:49	06:37	05:39	05:12	05:31	06:18	07:10	08:01	07:57	08:39		15:10 (9)
	16:52			17:49	18:40	20:34	21:25	21:59	21:50	21:00	19:50	18:40	16:42	16:22	21	15:31 (9)
17	08:37			07:49	06:47	06:35	05:38	05:12	05:32	06:20	07:11	08:02	07:59	08:40		15:11 (9)
	16:54			17:51	18:42	20:36	21:26	22:00	21:49	20:58	19:48	18:38	16:41	16:22	21	15:32 (9)
18	08:36			07:47	06:45	06:33	05:36	05:12	05:34	06:21	07:13	08:04	08:00	08:41		15:11 (9)
	16:55			17:52	18:43	20:38	21:28	22:00	21:48	20:56	19:45	18:36	16:39	16:22	21	15:32 (9)
19	08:35			07:45	06:42	06:31	05:35	05:12	05:35	06:23	07:15	08:06	08:02	08:42		15:11 (9)
	16:57			17:54	18:45	20:39	21:29	22:01	21:47	20:54	19:43	18:34	16:38	16:22	21	15:32 (9)
20	08:34			07:43	06:40	06:29	05:33	05:12	05:36	06:25	07:16	08:08	08:04	08:42		15:12 (9)
	16:59			17:56	18:47	20:41	21:31	22:01	21:46	20:52	19:40	18:32	16:37	16:23	21	15:33 (9)
21	08:33			07:41	06:38	06:27	05:32	05:12	05:38	06:26	07:18	08:10	08:06	08:43		15:12 (9)
	17:00			17:58	18:49	20:43	21:32	22:01	21:45	20:49	19:38	18:29	16:36	16:23	21	15:33 (9)
22	08:32			07:39	06:35	06:24	05:31	05:12	05:39	06:28	07:20	08:11	08:07	08:43		15:13 (9)
	17:02			18:00	18:50	20:44	21:34	22:01	21:43	20:47	19:36	18:27	16:34	16:23	21	15:34 (9)
23	08:31			07:36	06:33	06:22	05:29	05:13	05:40	06:30	07:21	08:13	08:09	08:44		15:13 (9)
	17:04			18:02	18:52	20:46	21:35	22:02	21:42	20:45	19:33	18:25	16:33	16:24	21	15:34 (9)
24	08:29			07:34	06:31	06:20	05:28	05:13	05:42	06:31	07:23	08:15	08:11	08:44		15:13 (9)
	17:06			18:04	18:54	20:48	21:37	22:02	21:41	20:43	19:31	18:23	16:32	16:25	21	15:34 (9)
25	08:28			07:32	06:28	06:18	05:27	05:13	05:43	06:33	07:25	07:17	08:12	08:45		15:14 (9)
	17:07			18:05	18:56	20:50	21:38	22:02	21:39	20:41	19:29	17:21	16:31	16:25	21	15:35 (9)
26	08:27			07:30	06:26	06:16	05:26	05:14	05:45	06:35	07:26	07:19	08:14	08:45		15:15 (9)
	17:09			18:07	18:57	20:51	21:39	22:02	21:38	20:39	19:26	17:19	16:30	16:26	21	15:36 (9)
27	08:25			07:28	06:23	06:14	05:25	05:14	05:46	06:36	07:28	07:20	08:15	08:45		15:15 (9)
	17:11			18:09	18:59	20:53	21:41	22:02	21:36	20:36	19:24	17:17	16:29	16:27	21	15:36 (9)
28	08:24			07:26	06:21	06:12	05:24	05:15	05:48	06:38	07:30	07:22	08:17	08:45		15:16 (9)
	17:13			18:11	19:01	20:55	21:42	22:02	21:35	20:34	19:22	17:15	16:28	16:28	20	15:36 (9)
29	08:22				07:19	06:10	05:23	05:15	05:49	06:40	07:31	07:24	08:19	08:46		15:17 (9)
	17:15				20:03	20:57	21:43	22:01	21:33	20:32	19:19	17:13	16:28	16:28	19	15:36 (9)
30	08:21				07:16	06:08	05:22	05:16	05:51	06:41	07:33	07:26	08:20	08:46		15:17 (9)
	17:17				20:04	20:58	21:44	22:01	21:31	20:30	19:17	17:11	16:27	16:29	19	15:36 (9)
31	08:19				07:14		05:21		05:52	06:43		07:28		08:46		15:18 (9)
	17:18				20:06		21:46		21:30	20:27		17:09		16:30	19	15:37 (9)
Potential sun hours	257			277	367	417	487	502	504	455	381	331	264	241		
Total, worst case		84													488	
Sun reduction		0.22													0.22	
Oper. time red.		1.00													1.00	
Wind dir. red.		0.62													0.62	
Total reduction		0.13													0.14	
Total, real		11													66	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
Jennings O'Donovan
Finisklin Business Park
F91 RHH9 Sligo
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Kathlyn Feeney / kfeeney@jodireland.com
Calculated:
09/06/2025 13:54/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Worst Case - V150 **Shadow receptor:** BG - 72

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January			February	March	April	May	June	July	August	September	October	November	December		
1	08:46		15:17 (9)	08:18	07:23	07:12	06:06	05:20	05:16	05:54	06:45	07:35	07:30	08:22		
	16:32	15	15:32 (9)	17:20	18:13	20:08	21:00	21:47	22:01	21:28	20:25	19:14	17:07	16:26		
2	08:46		15:17 (9)	08:16	07:21	07:09	06:04	05:19	05:17	05:55	06:46	07:36	07:31	08:23		
	16:33	15	15:32 (9)	17:22	18:15	20:10	21:02	21:48	22:01	21:26	20:23	19:12	17:05	16:25		
3	08:45		15:18 (9)	08:15	07:19	07:07	06:02	05:18	05:18	05:57	06:48	07:38	07:33	08:24		
	16:34	14	15:32 (9)	17:24	18:17	20:11	21:03	21:49	22:00	21:25	20:20	19:10	17:04	16:25		
4	08:45		15:20 (9)	08:13	07:17	07:05	06:00	05:17	05:19	05:59	06:50	07:40	07:35	08:26		
	16:35	11	15:31 (9)	17:26	18:18	20:13	21:05	21:50	22:00	21:23	20:18	19:07	17:02	16:24		
5	08:45		15:22 (9)	08:11	07:15	07:02	05:58	05:17	05:20	06:00	06:51	07:42	07:37	08:27		
	16:36	8	15:30 (9)	17:28	18:20	20:15	21:07	21:51	21:59	21:21	20:16	19:05	17:00	16:24		
6	08:45		15:25 (9)	08:10	07:12	07:00	05:56	05:16	05:20	06:02	06:53	07:43	07:39	08:28		15:11 (9)
	16:37	4	15:29 (9)	17:30	18:22	20:17	21:08	21:52	21:59	21:19	20:13	19:03	16:58	16:23	3	15:14 (9)
7	08:44			08:08	07:10	06:58	05:55	05:15	05:21	06:03	06:55	07:45	07:41	08:30		15:09 (9)
	16:39			17:32	18:24	20:18	21:10	21:53	21:58	21:18	20:11	19:01	16:56	16:23	8	15:17 (9)
8	08:44			08:06	07:08	06:56	05:53	05:15	05:22	06:05	06:56	07:47	07:42	08:31		15:08 (9)
	16:40			17:33	18:26	20:20	21:12	21:54	21:57	21:16	20:09	18:58	16:55	16:22	10	15:18 (9)
9	08:43			08:04	07:05	06:53	05:51	05:14	05:23	06:07	06:58	07:48	07:44	08:32		15:08 (9)
	16:41			17:35	18:27	20:22	21:13	21:55	21:57	21:14	20:06	18:56	16:53	16:22	13	15:21 (9)
10	08:43			08:02	07:03	06:51	05:49	05:14	05:24	06:08	07:00	07:50	07:46	08:33		15:07 (9)
	16:43			17:37	18:29	20:24	21:15	21:56	21:56	21:12	20:04	18:54	16:51	16:22	15	15:22 (9)
11	08:42			08:01	07:01	06:49	05:47	05:13	05:25	06:10	07:01	07:52	07:48	08:34		15:07 (9)
	16:44			17:39	18:31	20:25	21:17	21:56	21:55	21:10	20:02	18:51	16:50	16:22	16	15:23 (9)
12	08:41			07:59	06:59	06:46	05:46	05:13	05:26	06:12	07:03	07:54	07:50	08:35		15:06 (9)
	16:46			17:41	18:33	20:27	21:18	21:57	21:54	21:08	19:59	18:49	16:48	16:21	17	15:23 (9)
13	08:41			07:57	06:56	06:44	05:44	05:13	05:28	06:13	07:05	07:55	07:52	08:36		15:06 (9)
	16:47			17:43	18:35	20:29	21:20	21:58	21:53	21:06	19:57	18:47	16:47	16:21	18	15:24 (9)
14	08:40			07:55	06:54	06:42	05:43	05:12	05:29	06:15	07:06	07:57	07:53	08:37		15:07 (9)
	16:49			17:45	18:36	20:31	21:22	21:58	21:52	21:04	19:55	18:45	16:45	16:21	18	15:25 (9)
15	08:39			07:53	06:52	06:40	05:41	05:12	05:30	06:16	07:08	07:59	07:55	08:38		15:07 (9)
	16:50			17:47	18:38	20:32	21:23	21:59	21:51	21:02	19:52	18:42	16:44	16:21	19	15:26 (9)
16	08:38			07:51	06:49	06:37	05:39	05:12	05:31	06:18	07:10	08:01	07:57	08:39		15:07 (9)
	16:52			17:49	18:40	20:34	21:25	21:59	21:50	21:00	19:50	18:40	16:42	16:22	20	15:27 (9)
17	08:37			07:49	06:47	06:35	05:38	05:12	05:32	06:20	07:11	08:02	07:59	08:40		15:08 (9)
	16:54			17:51	18:42	20:36	21:26	22:00	21:49	20:58	19:48	18:38	16:41	16:22	20	15:28 (9)
18	08:36			07:47	06:45	06:33	05:36	05:12	05:34	06:21	07:13	08:04	08:00	08:41		15:07 (9)
	16:55			17:52	18:43	20:38	21:28	22:00	21:48	20:56	19:45	18:36	16:39	16:22	20	15:27 (9)
19	08:35			07:45	06:42	06:31	05:35	05:12	05:35	06:23	07:15	08:06	08:02	08:42		15:08 (9)
	16:57			17:54	18:45	20:39	21:29	22:01	21:47	20:54	19:43	18:34	16:38	16:22	20	15:28 (9)
20	08:34			07:43	06:40	06:29	05:33	05:12	05:36	06:25	07:16	08:08	08:04	08:42		15:09 (9)
	16:59			17:56	18:47	20:41	21:31	22:01	21:46	20:52	19:40	18:32	16:37	16:23	20	15:29 (9)
21	08:33			07:41	06:38	06:27	05:32	05:12	05:38	06:26	07:18	08:10	08:06	08:43		15:08 (9)
	17:00			17:58	18:49	20:43	21:32	22:01	21:45	20:49	19:38	18:29	16:36	16:23	21	15:29 (9)
22	08:32			07:39	06:35	06:24	05:31	05:12	05:39	06:28	07:20	08:11	08:07	08:43		15:09 (9)
	17:02			18:00	18:50	20:44	21:34	22:01	21:43	20:47	19:36	18:27	16:34	16:24	21	15:30 (9)
23	08:31			07:36	06:33	06:22	05:29	05:13	05:40	06:30	07:21	08:13	08:09	08:44		15:10 (9)
	17:04			18:02	18:52	20:46	21:35	22:02	21:42	20:45	19:33	18:25	16:33	16:24	20	15:30 (9)
24	08:29			07:34	06:31	06:20	05:28	05:13	05:42	06:31	07:23	08:15	08:11	08:44		15:10 (9)
	17:06			18:04	18:54	20:48	21:37	22:02	21:41	20:43	19:31	18:23	16:32	16:25	20	15:30 (9)
25	08:28			07:32	06:28	06:18	05:27	05:13	05:43	06:33	07:25	07:17	08:12	08:45		15:11 (9)
	17:07			18:05	18:56	20:50	21:38	22:02	21:39	20:41	19:29	17:21	16:31	16:25	20	15:31 (9)
26	08:27			07:30	06:26	06:16	05:26	05:14	05:45	06:35	07:26	07:19	08:14	08:45		15:11 (9)
	17:09			18:07	18:57	20:51	21:39	22:02	21:38	20:39	19:26	17:19	16:30	16:26	21	15:32 (9)
27	08:25			07:28	06:23	06:14	05:25	05:14	05:46	06:36	07:28	07:20	08:15	08:45		15:12 (9)
	17:11			18:09	18:59	20:53	21:41	22:02	21:36	20:36	19:24	17:17	16:29	16:27	20	15:32 (9)
28	08:24			07:26	06:21	06:12	05:24	05:15	05:48	06:38	07:30	07:22	08:17	08:45		15:12 (9)
	17:13			18:11	19:01	20:55	21:42	22:02	21:35	20:34	19:22	17:15	16:28	16:28	20	15:32 (9)
29	08:22				07:19	06:10	05:23	05:15	05:49	06:40	07:31	07:24	08:19	08:46		15:13 (9)
	17:15				20:03	20:57	21:43	22:01	21:33	20:32	19:19	17:13	16:28	16:28	19	15:32 (9)
30	08:21				07:16	06:08	05:22	05:16	05:51	06:41	07:33	07:26	08:20	08:46		15:14 (9)
	17:17				20:04	20:58	21:44	22:01	21:31	20:30	19:17	17:11	16:27	16:29	18	15:32 (9)
31	08:19				07:14		05:21		05:52	06:43		07:28		08:46		15:15 (9)
	17:18				20:06		21:46		21:30	20:27		17:09		16:30	17	15:32 (9)
Potential sun hours	257			277	367	417	487	502	504	455	381	331	264	241		
Total, worst case		67													454	
Sun reduction		0.22													0.22	
Oper. time red.		1.00													1.00	
Wind dir. red.		0.62													0.62	
Total reduction		0.13													0.13	
Total, real		9													61	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
Jennings O'Donovan
Finisklin Business Park
F91 RHH9 Sligo
+353719161416
Kathlyn Feeney / kfeeney@jodireland.com

Calculated:
09/06/2025 13:54/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Worst Case - V150 **Shadow receptor:** BH - 73

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January			February	March	April	May	June	July	August	September	October	November	December		
1	08:46		15:17 (9)	08:18	07:23	07:12	06:06	05:20	05:16	05:54	06:45	07:35	07:30	08:22		
	16:32	23	15:40 (9)	17:20	18:13	20:08	21:00	21:47	22:01	21:28	20:25	19:14	17:07	16:26		
2	08:46		15:17 (9)	08:16	07:21	07:09	06:04	05:19	05:17	05:55	06:46	07:36	07:31	08:23		15:11 (9)
	16:33	22	15:39 (9)	17:22	18:15	20:10	21:02	21:48	22:01	21:26	20:23	19:12	17:05	16:25	8	15:19 (9)
3	08:45		15:18 (9)	08:15	07:19	07:07	06:02	05:18	05:18	05:57	06:48	07:38	07:33	08:24		15:09 (9)
	16:34	22	15:40 (9)	17:24	18:17	20:11	21:03	21:49	22:00	21:25	20:20	19:10	17:04	16:25	12	15:21 (9)
4	08:45		15:20 (9)	08:13	07:17	07:05	06:00	05:17	05:19	05:59	06:50	07:40	07:35	08:26		15:09 (9)
	16:35	20	15:40 (9)	17:26	18:18	20:13	21:05	21:50	22:00	21:23	20:18	19:07	17:02	16:24	14	15:23 (9)
5	08:45		15:20 (9)	08:11	07:15	07:02	05:58	05:17	05:20	06:00	06:51	07:42	07:37	08:27		15:08 (9)
	16:36	20	15:40 (9)	17:28	18:20	20:15	21:07	21:51	21:59	21:21	20:16	19:05	17:00	16:24	16	15:24 (9)
6	08:45		15:22 (9)	08:10	07:12	07:00	05:56	05:16	05:20	06:02	06:53	07:43	07:39	08:28		15:08 (9)
	16:37	18	15:40 (9)	17:30	18:22	20:17	21:08	21:52	21:59	21:19	20:13	19:03	16:58	16:23	18	15:26 (9)
7	08:44		15:23 (9)	08:08	07:10	06:58	05:55	05:15	05:21	06:03	06:55	07:45	07:41	08:30		15:07 (9)
	16:39	16	15:39 (9)	17:32	18:24	20:18	21:10	21:53	21:58	21:18	20:11	19:01	16:56	16:23	20	15:27 (9)
8	08:44		15:25 (9)	08:06	07:08	06:56	05:53	05:15	05:22	06:05	06:56	07:47	07:42	08:31		15:07 (9)
	16:40	14	15:39 (9)	17:33	18:26	20:20	21:12	21:54	21:57	21:16	20:09	18:58	16:55	16:22	20	15:27 (9)
9	08:43		15:26 (9)	08:04	07:05	06:53	05:51	05:14	05:23	06:07	06:58	07:48	07:44	08:32		15:08 (9)
	16:41	12	15:38 (9)	17:35	18:27	20:22	21:13	21:55	21:57	21:14	20:06	18:56	16:53	16:22	21	15:29 (9)
10	08:43		15:28 (9)	08:02	07:03	06:51	05:49	05:14	05:24	06:08	07:00	07:50	07:46	08:33		15:07 (9)
	16:43	8	15:36 (9)	17:37	18:29	20:24	21:15	21:56	21:56	21:12	20:04	18:54	16:51	16:22	22	15:29 (9)
11	08:42			08:01	07:01	06:49	05:48	05:13	05:25	06:10	07:01	07:52	07:48	08:34		15:07 (9)
	16:44			17:39	18:31	20:25	21:17	21:56	21:55	21:10	20:02	18:51	16:50	16:22	23	15:30 (9)
12	08:41			07:59	06:59	06:46	05:46	05:13	05:26	06:12	07:03	07:54	07:50	08:35		15:07 (9)
	16:46			17:41	18:33	20:27	21:18	21:57	21:54	21:08	19:59	18:49	16:48	16:21	24	15:31 (9)
13	08:41			07:57	06:56	06:44	05:44	05:13	05:28	06:13	07:05	07:55	07:51	08:36		15:08 (9)
	16:47			17:43	18:35	20:29	21:20	21:58	21:53	21:06	19:57	18:47	16:47	16:21	23	15:31 (9)
14	08:40			07:55	06:54	06:42	05:43	05:12	05:29	06:15	07:06	07:57	07:53	08:37		15:08 (9)
	16:49			17:45	18:36	20:31	21:22	21:58	21:52	21:04	19:55	18:45	16:45	16:21	24	15:32 (9)
15	08:39			07:53	06:52	06:40	05:41	05:12	05:30	06:16	07:08	07:59	07:55	08:38		15:08 (9)
	16:50			17:47	18:38	20:32	21:23	21:59	21:51	21:02	19:52	18:42	16:44	16:21	25	15:33 (9)
16	08:38			07:51	06:49	06:37	05:39	05:12	05:31	06:18	07:10	08:01	07:57	08:39		15:09 (9)
	16:52			17:49	18:40	20:34	21:25	21:59	21:50	21:00	19:50	18:40	16:42	16:22	25	15:34 (9)
17	08:37			07:49	06:47	06:35	05:38	05:12	05:32	06:20	07:11	08:02	07:59	08:40		15:09 (9)
	16:54			17:51	18:42	20:36	21:26	22:00	21:49	20:58	19:48	18:38	16:41	16:22	25	15:34 (9)
18	08:36			07:47	06:45	06:33	05:36	05:12	05:34	06:21	07:13	08:04	08:00	08:41		15:09 (9)
	16:55			17:52	18:43	20:38	21:28	22:00	21:48	20:56	19:45	18:36	16:39	16:22	25	15:34 (9)
19	08:35			07:45	06:42	06:31	05:35	05:12	05:35	06:23	07:15	08:06	08:02	08:42		15:09 (9)
	16:57			17:54	18:45	20:39	21:29	22:01	21:47	20:54	19:43	18:34	16:38	16:22	26	15:35 (9)
20	08:34			07:43	06:40	06:29	05:33	05:12	05:36	06:25	07:16	08:08	08:04	08:42		15:10 (9)
	16:59			17:56	18:47	20:41	21:31	22:01	21:46	20:52	19:40	18:32	16:37	16:23	26	15:36 (9)
21	08:33			07:41	06:38	06:27	05:32	05:12	05:38	06:26	07:18	08:10	08:06	08:43		15:10 (9)
	17:00			17:58	18:49	20:43	21:32	22:01	21:45	20:49	19:38	18:29	16:36	16:23	26	15:36 (9)
22	08:32			07:39	06:35	06:24	05:31	05:12	05:39	06:28	07:20	08:11	08:07	08:43		15:11 (9)
	17:02			18:00	18:50	20:44	21:34	22:01	21:43	20:47	19:36	18:27	16:35	16:24	26	15:37 (9)
23	08:31			07:36	06:33	06:22	05:29	05:13	05:40	06:30	07:21	08:13	08:09	08:44		15:11 (9)
	17:04			18:02	18:52	20:46	21:35	22:02	21:42	20:45	19:33	18:25	16:33	16:24	26	15:37 (9)
24	08:29			07:34	06:31	06:20	05:28	05:13	05:42	06:31	07:23	08:15	08:11	08:44		15:11 (9)
	17:06			18:04	18:54	20:48	21:37	22:02	21:41	20:43	19:31	18:23	16:32	16:25	26	15:37 (9)
25	08:28			07:32	06:28	06:18	05:27	05:13	05:43	06:33	07:25	07:17	08:12	08:45		15:13 (9)
	17:07			18:05	18:56	20:50	21:38	22:02	21:39	20:41	19:29	17:21	16:31	16:25	25	15:38 (9)
26	08:27			07:30	06:26	06:16	05:26	05:14	05:45	06:35	07:26	07:19	08:14	08:45		15:13 (9)
	17:09			18:07	18:57	20:51	21:39	22:02	21:38	20:39	19:26	17:19	16:30	16:26	25	15:38 (9)
27	08:25			07:28	06:23	06:14	05:25	05:14	05:46	06:36	07:28	07:20	08:15	08:45		15:13 (9)
	17:11			18:09	18:59	20:53	21:41	22:02	21:36	20:36	19:24	17:17	16:29	16:27	25	15:38 (9)
28	08:24			07:26	06:21	06:12	05:24	05:15	05:48	06:38	07:30	07:22	08:17	08:45		15:14 (9)
	17:13			18:11	19:01	20:55	21:42	22:02	21:35	20:34	19:22	17:15	16:28	16:28	25	15:39 (9)
29	08:22				07:19	06:10	05:23	05:15	05:49	06:40	07:31	07:24	08:19	08:46		15:14 (9)
	17:15				20:03	20:57	21:43	22:01	21:33	20:32	19:19	17:13	16:28	16:28	25	15:39 (9)
30	08:21				07:16	06:08	05:22	05:16	05:51	06:41	07:33	07:26	08:20	08:46		15:15 (9)
	17:17				20:04	20:58	21:44	22:01	21:31	20:30	19:17	17:11	16:27	16:29	24	15:39 (9)
31	08:19				07:14		05:21		05:52	06:43		07:28		08:46		15:16 (9)
	17:18				20:06		21:46		21:30	20:27		17:09		16:30	24	15:40 (9)
Potential sun hours	257			277	367	417	487	502	504	455	381	331	264	241		
Total, worst case		175													674	
Sun reduction		0.22													0.22	
Oper. time red.		1.00													1.00	
Wind dir. red.		0.62													0.62	
Total reduction		0.13													0.14	
Total, real		24													91	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
Jennings O'Donovan
Finisklin Business Park
F91 RHH9 Sligo
+353719161416
Kathlyn Feeney / kfeeney@jodireland.com
Calculated:
09/06/2025 13:54/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Worst Case - V150 **Shadow receptor:** BI - 74

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January			February	March	April	May	June	July	August	September	October	November			December		
1	08:46		15:23 (9)	08:18	07:23	07:12	06:06	05:20	05:16	05:54	06:45	07:35	07:30			08:22		15:12 (9)
	16:32	28	15:51 (9)	17:20	18:13	20:08	21:00	21:47	22:01	21:28	20:25	19:14	17:07			16:26	21	15:33 (9)
2	08:46		15:23 (9)	08:16	07:21	07:09	06:04	05:19	05:17	05:55	06:46	07:36	07:31			08:23		15:12 (9)
	16:33	28	15:51 (9)	17:22	18:15	20:10	21:02	21:48	22:01	21:26	20:23	19:12	17:05			16:25	23	15:35 (9)
3	08:45		15:24 (9)	08:15	07:19	07:07	06:02	05:18	05:18	05:57	06:48	07:38	07:33			08:24		15:12 (9)
	16:34	27	15:51 (9)	17:24	18:17	20:11	21:03	21:49	22:00	21:25	20:20	19:10	17:04			16:25	23	15:35 (9)
4	08:45		15:25 (9)	08:13	07:17	07:05	06:00	05:17	05:19	05:59	06:50	07:40	07:35			08:26		15:12 (9)
	16:35	27	15:52 (9)	17:26	18:18	20:13	21:05	21:50	22:00	21:23	20:18	19:07	17:02			16:24	24	15:36 (9)
5	08:45		15:25 (9)	08:11	07:15	07:02	05:58	05:17	05:20	06:00	06:51	07:42	07:37			08:27		15:11 (9)
	16:36	26	15:51 (9)	17:28	18:20	20:15	21:07	21:51	21:59	21:21	20:16	19:05	17:00			16:24	26	15:37 (9)
6	08:45		15:26 (9)	08:10	07:12	07:00	05:56	05:16	05:20	06:02	06:53	07:43	07:39			08:28		15:12 (9)
	16:37	26	15:52 (9)	17:30	18:22	20:17	21:08	21:52	21:59	21:19	20:13	19:03	16:58			16:23	26	15:38 (9)
7	08:44		15:26 (9)	08:08	07:10	06:58	05:55	05:15	05:21	06:03	06:55	07:45	07:41			08:30		15:12 (9)
	16:39	26	15:52 (9)	17:32	18:24	20:18	21:10	21:53	21:58	21:18	20:11	19:01	16:56			16:23	26	15:38 (9)
8	08:44		15:28 (9)	08:06	07:08	06:56	05:53	05:15	05:22	06:05	06:56	07:47	07:42			08:31		15:12 (9)
	16:40	24	15:52 (9)	17:33	18:26	20:20	21:12	21:54	21:57	21:16	20:09	18:58	16:55			16:22	27	15:39 (9)
9	08:43		15:28 (9)	08:04	07:05	06:53	05:51	05:14	05:23	06:07	06:58	07:48	07:44			08:32		15:13 (9)
	16:41	24	15:52 (9)	17:35	18:27	20:22	21:13	21:55	21:57	21:14	20:06	18:56	16:53			16:22	27	15:40 (9)
10	08:43		15:29 (9)	08:02	07:03	06:51	05:49	05:14	05:24	06:08	07:00	07:50	07:46			08:33		15:13 (9)
	16:43	23	15:52 (9)	17:37	18:29	20:24	21:15	21:56	21:56	21:12	20:04	18:54	16:51			16:22	28	15:41 (9)
11	08:42		15:30 (9)	08:01	07:01	06:49	05:48	05:13	05:25	06:10	07:01	07:52	07:48			08:34		15:13 (9)
	16:44	21	15:51 (9)	17:39	18:31	20:25	21:17	21:56	21:55	21:10	20:02	18:51	16:50			16:22	28	15:41 (9)
12	08:41		15:31 (9)	07:59	06:59	06:46	05:46	05:13	05:26	06:12	07:03	07:54	07:50			08:35		15:13 (9)
	16:46	20	15:51 (9)	17:41	18:33	20:27	21:18	21:57	21:54	21:08	19:59	18:49	16:48			16:21	29	15:42 (9)
13	08:41		15:33 (9)	07:57	06:56	06:44	05:44	05:13	05:28	06:13	07:05	07:55	07:51			08:36		15:13 (9)
	16:47	18	15:51 (9)	17:43	18:35	20:29	21:20	21:58	21:53	21:06	19:57	18:47	16:47			16:21	29	15:42 (9)
14	08:40		15:35 (9)	07:55	06:54	06:42	05:43	05:12	05:29	06:15	07:06	07:57	07:53			08:37		15:14 (9)
	16:49	15	15:50 (9)	17:45	18:36	20:31	21:22	21:58	21:52	21:04	19:55	18:45	16:45			16:21	29	15:43 (9)
15	08:39		15:37 (9)	07:53	06:52	06:40	05:41	05:12	05:30	06:16	07:08	07:59	07:55			08:38		15:14 (9)
	16:50	12	15:49 (9)	17:47	18:38	20:32	21:23	21:59	21:51	21:02	19:52	18:42	16:44			16:21	29	15:43 (9)
16	08:38		15:38 (9)	07:51	06:49	06:37	05:39	05:12	05:31	06:18	07:10	08:01	07:57			08:39		15:15 (9)
	16:52	8	15:46 (9)	17:49	18:40	20:34	21:25	21:59	21:50	21:00	19:50	18:40	16:42			16:22	29	15:44 (9)
17	08:37			07:49	06:47	06:35	05:38	05:12	05:32	06:20	07:11	08:02	07:59			08:40		15:14 (9)
	16:54			17:51	18:42	20:36	21:26	22:00	21:49	20:58	19:48	18:38	16:41			16:22	30	15:44 (9)
18	08:36			07:47	06:45	06:33	05:36	05:12	05:34	06:21	07:13	08:04	08:00			08:41		15:15 (9)
	16:55			17:52	18:43	20:38	21:28	22:00	21:48	20:56	19:45	18:36	16:39			16:22	29	15:44 (9)
19	08:35			07:45	06:42	06:31	05:35	05:12	05:35	06:23	07:15	08:06	08:02			08:42		15:16 (9)
	16:57			17:54	18:45	20:39	21:29	22:01	21:47	20:54	19:43	18:34	16:38			16:22	29	15:45 (9)
20	08:34			07:43	06:40	06:29	05:33	05:12	05:36	06:25	07:16	08:08	08:04			08:42		15:17 (9)
	16:59			17:56	18:47	20:41	21:31	22:01	21:46	20:52	19:40	18:32	16:37			16:23	29	15:46 (9)
21	08:33			07:41	06:38	06:27	05:32	05:12	05:38	06:26	07:18	08:10	08:06			08:43		15:16 (9)
	17:00			17:58	18:49	20:43	21:32	22:01	21:45	20:49	19:38	18:29	16:36			16:23	30	15:46 (9)
22	08:32			07:39	06:35	06:24	05:31	05:12	05:39	06:28	07:20	08:11	08:07			08:43		15:17 (9)
	17:02			18:00	18:50	20:44	21:34	22:01	21:43	20:47	19:36	18:27	16:35			16:24	30	15:47 (9)
23	08:31			07:36	06:33	06:22	05:29	05:13	05:40	06:30	07:21	08:13	08:09			08:44		15:18 (9)
	17:04			18:02	18:52	20:46	21:35	22:02	21:42	20:45	19:33	18:25	16:33			16:24	29	15:47 (9)
24	08:29			07:34	06:31	06:20	05:28	05:13	05:42	06:31	07:23	08:15	08:11			08:44		15:18 (9)
	17:06			18:04	18:54	20:48	21:37	22:02	21:41	20:43	19:31	18:23	16:32			16:25	29	15:47 (9)
25	08:28			07:32	06:28	06:18	05:27	05:13	05:43	06:33	07:25	07:17	08:12			08:45		15:19 (9)
	17:07			18:05	18:56	20:50	21:38	22:02	21:39	20:41	19:29	17:21	16:31			16:25	29	15:48 (9)
26	08:27			07:30	06:26	06:16	05:26	05:14	05:45	06:35	07:26	07:19	08:14		15:18 (9)	08:45		15:19 (9)
	17:09			18:07	18:57	20:51	21:39	22:02	21:38	20:39	19:26	17:19	16:30	7	15:25 (9)	16:26	30	15:49 (9)
27	08:25			07:28	06:23	06:14	05:25	05:14	05:46	06:36	07:28	07:20	08:15		15:16 (9)	08:45		15:20 (9)
	17:11			18:09	18:59	20:53	21:41	22:02	21:36	20:36	19:24	17:17	16:29	12	15:28 (9)	16:27	29	15:49 (9)
28	08:24			07:26	06:21	06:12	05:24	05:15	05:48	06:38	07:30	07:22	08:17		15:14 (9)	08:45		15:20 (9)
	17:13			18:11	19:01	20:55	21:42	22:02	21:35	20:34	19:22	17:15	16:28	15	15:29 (9)	16:28	29	15:49 (9)
29	08:22				07:19	06:10	05:23	05:15	05:49	06:40	07:31	07:24	08:19		15:13 (9)	08:46		15:20 (9)
	17:15				20:03	20:57	21:43	22:01	21:33	20:32	19:19	17:13	16:28	18	15:31 (9)	16:28	30	15:50 (9)
30	08:21				07:16	06:08	05:22	05:16	05:51	06:41	07:33	07:26	08:20		15:13 (9)	08:46		15:21 (9)
	17:17				20:04	20:58	21:44	22:01	21:31	20:30	19:17	17:11	16:27	20	15:33 (9)	16:29	29	15:50 (9)
31	08:19				07:14		05:21		05:52	06:43		07:28				08:46		15:22 (9)
	17:18				20:06		21:46		21:30	20:27		17:09				16:30	28	15:50 (9)
Potential sun hours	257			277	367	417	487	502	504	455	381	331	264			241		
Total, worst case		353												72			863	
Sun reduction		0.22												0.26			0.22	
Oper. time red.		1.00												1.00			1.00	
Wind dir. red.		0.62												0.62			0.62	
Total reduction		0.13												0.16			0.14	
Total, real		47												12			117	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
Jennings O'Donovan
Finisklin Business Park
F91 RHH9 Sligo
+353719161416
Kathlyn Feeney / kfeeney@jodireland.com
Calculated:
09/06/2025 13:54/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Worst Case - V150 **Shadow receptor:** BJ - 75

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January		February	March	April	May	June	July	August	September	October	November			December		
1	08:46		15:26 (9)	08:18	07:23	07:12	06:06	05:20	05:17	05:54	06:45	07:35	07:30			08:22		15:14 (9)
	16:32	30	15:56 (9)	17:20	18:13	20:08	21:00	21:47	22:01	21:28	20:25	19:14	17:07			16:26	28	15:42 (9)
2	08:46		15:26 (9)	08:16	07:21	07:09	06:04	05:19	05:17	05:55	06:46	07:36	07:31			08:23		15:14 (9)
	16:33	31	15:57 (9)	17:22	18:15	20:10	21:02	21:48	22:01	21:26	20:23	19:12	17:05			16:25	29	15:43 (9)
3	08:45		15:27 (9)	08:15	07:19	07:07	06:02	05:18	05:18	05:57	06:48	07:38	07:33			08:24		15:14 (9)
	16:34	31	15:58 (9)	17:24	18:17	20:11	21:03	21:49	22:00	21:25	20:20	19:10	17:04			16:25	29	15:43 (9)
4	08:45		15:28 (9)	08:13	07:17	07:05	06:00	05:17	05:19	05:59	06:50	07:40	07:35			08:26		15:14 (9)
	16:35	31	15:59 (9)	17:26	18:18	20:13	21:05	21:50	22:00	21:23	20:18	19:07	17:02			16:24	30	15:44 (9)
5	08:45		15:28 (9)	08:11	07:15	07:02	05:58	05:17	05:20	06:00	06:51	07:42	07:37			08:27		15:14 (9)
	16:36	31	15:59 (9)	17:28	18:20	20:15	21:07	21:51	21:59	21:21	20:16	19:05	17:00			16:24	30	15:44 (9)
6	08:45		15:29 (9)	08:10	07:12	07:00	05:56	05:16	05:20	06:02	06:53	07:43	07:39			08:28		15:15 (9)
	16:37	30	15:59 (9)	17:30	18:22	20:17	21:08	21:52	21:59	21:19	20:13	19:03	16:58			16:23	30	15:45 (9)
7	08:44		15:29 (9)	08:08	07:10	06:58	05:55	05:15	05:21	06:03	06:55	07:45	07:41			08:30		15:15 (9)
	16:39	30	15:59 (9)	17:32	18:24	20:18	21:10	21:53	21:58	21:18	20:11	19:01	16:56			16:23	31	15:46 (9)
8	08:44		15:29 (9)	08:06	07:08	06:56	05:53	05:15	05:22	06:05	06:56	07:47	07:42			08:31		15:15 (9)
	16:40	30	15:59 (9)	17:33	18:26	20:20	21:12	21:54	21:57	21:16	20:09	18:58	16:55			16:22	31	15:46 (9)
9	08:43		15:31 (9)	08:04	07:05	06:53	05:51	05:14	05:23	06:07	06:58	07:48	07:44			08:32		15:16 (9)
	16:41	29	16:00 (9)	17:35	18:27	20:22	21:13	21:55	21:57	21:14	20:06	18:56	16:53			16:22	31	15:47 (9)
10	08:43		15:31 (9)	08:02	07:03	06:51	05:49	05:14	05:24	06:08	07:00	07:50	07:46			08:33		15:16 (9)
	16:43	29	16:00 (9)	17:37	18:29	20:24	21:15	21:56	21:56	21:12	20:04	18:54	16:51			16:22	31	15:47 (9)
11	08:42		15:32 (9)	08:01	07:01	06:49	05:48	05:13	05:25	06:10	07:01	07:52	07:48			08:34		15:16 (9)
	16:44	28	16:00 (9)	17:39	18:31	20:25	21:17	21:56	21:55	21:10	20:02	18:51	16:50			16:22	31	15:47 (9)
12	08:41		15:32 (9)	07:59	06:59	06:46	05:46	05:13	05:26	06:12	07:03	07:54	07:50			08:35		15:17 (9)
	16:46	27	15:59 (9)	17:41	18:33	20:27	21:18	21:57	21:54	21:08	19:59	18:49	16:48			16:21	29	15:46 (9)
13	08:41		15:33 (9)	07:57	06:56	06:44	05:44	05:13	05:28	06:13	07:05	07:55	07:51			08:36		15:17 (9)
	16:47	26	15:59 (9)	17:43	18:35	20:29	21:20	21:58	21:53	21:06	19:57	18:47	16:47			16:21	29	15:46 (9)
14	08:40		15:35 (9)	07:55	06:54	06:42	05:43	05:12	05:29	06:15	07:06	07:57	07:53			08:37		15:18 (9)
	16:49	25	16:00 (9)	17:45	18:36	20:31	21:22	21:58	21:52	21:04	19:55	18:45	16:45			16:21	28	15:46 (9)
15	08:39		15:36 (9)	07:53	06:52	06:40	05:41	05:12	05:30	06:16	07:08	07:59	07:55			08:38		15:18 (9)
	16:50	24	16:00 (9)	17:47	18:38	20:32	21:23	21:59	21:51	21:02	19:52	18:42	16:44			16:21	28	15:46 (9)
16	08:38		15:36 (9)	07:51	06:49	06:37	05:39	05:12	05:31	06:18	07:10	08:01	07:57			08:39		15:19 (9)
	16:52	23	15:59 (9)	17:49	18:40	20:34	21:25	21:59	21:50	21:00	19:50	18:40	16:42			16:22	27	15:46 (9)
17	08:37		15:38 (9)	07:49	06:47	06:35	05:38	05:12	05:32	06:20	07:11	08:02	07:59			08:40		15:18 (9)
	16:54	20	15:58 (9)	17:51	18:42	20:36	21:26	22:00	21:49	20:58	19:48	18:38	16:41			16:22	28	15:46 (9)
18	08:36		15:39 (9)	07:47	06:45	06:33	05:36	05:12	05:34	06:21	07:13	08:04	08:00			08:41		15:19 (9)
	16:55	19	15:58 (9)	17:52	18:43	20:38	21:28	22:00	21:48	20:56	19:45	18:36	16:39			16:22	27	15:46 (9)
19	08:35		15:41 (9)	07:45	06:42	06:31	05:35	05:12	05:35	06:23	07:15	08:06	08:02			08:42		15:20 (9)
	16:57	16	15:57 (9)	17:54	18:45	20:39	21:29	22:01	21:47	20:54	19:43	18:34	16:38			16:22	27	15:47 (9)
20	08:34		15:44 (9)	07:43	06:40	06:29	05:33	05:12	05:36	06:25	07:16	08:08	08:04			08:42		15:21 (9)
	16:59	11	15:55 (9)	17:56	18:47	20:41	21:31	22:01	21:46	20:52	19:40	18:32	16:37			16:23	26	15:47 (9)
21	08:33		15:47 (9)	07:41	06:38	06:27	05:32	05:12	05:38	06:26	07:18	08:10	08:06		15:23 (9)	08:43		15:21 (9)
	17:00	5	15:52 (9)	17:58	18:49	20:43	21:32	22:01	21:45	20:49	19:38	18:29	16:36	5	15:28 (9)	16:23	26	15:47 (9)
22	08:32			07:39	06:35	06:24	05:31	05:12	05:39	06:28	07:20	08:11	08:07		15:20 (9)	08:43		15:22 (9)
	17:02			18:00	18:50	20:44	21:34	22:01	21:43	20:47	19:36	18:27	16:35	11	15:31 (9)	16:24	26	15:48 (9)
23	08:31			07:36	06:33	06:22	05:29	05:13	05:40	06:30	07:21	08:13	08:09		15:18 (9)	08:44		15:22 (9)
	17:04			18:02	18:52	20:46	21:35	22:02	21:42	20:45	19:33	18:25	16:33	16	15:34 (9)	16:24	26	15:48 (9)
24	08:29			07:34	06:31	06:20	05:28	05:13	05:42	06:31	07:23	08:15	08:11		15:16 (9)	08:44		15:22 (9)
	17:06			18:04	18:54	20:48	21:37	22:02	21:41	20:43	19:31	18:23	16:32	19	15:35 (9)	16:25	26	15:48 (9)
25	08:28			07:32	06:28	06:18	05:27	05:13	05:43	06:33	07:25	07:17	08:12		15:16 (9)	08:45		15:23 (9)
	17:07			18:05	18:56	20:50	21:38	22:02	21:39	20:41	19:29	17:21	16:31	20	15:36 (9)	16:25	27	15:50 (9)
26	08:27			07:30	06:26	06:16	05:26	05:14	05:45	06:35	07:26	07:19	08:14		15:15 (9)	08:45		15:23 (9)
	17:09			18:07	18:57	20:51	21:39	22:02	21:38	20:39	19:26	17:19	16:30	23	15:38 (9)	16:26	27	15:50 (9)
27	08:25			07:28	06:23	06:14	05:25	05:14	05:46	06:36	07:28	07:20	08:15		15:15 (9)	08:45		15:23 (9)
	17:11			18:09	18:59	20:53	21:41	22:02	21:36	20:36	19:24	17:17	16:29	24	15:39 (9)	16:27	28	15:51 (9)
28	08:24			07:26	06:21	06:12	05:24	05:15	05:48	06:38	07:30	07:22	08:17		15:14 (9)	08:45		15:24 (9)
	17:13			18:11	19:01	20:55	21:42	22:02	21:35	20:34	19:22	17:15	16:28	25	15:39 (9)	16:28	28	15:52 (9)
29	08:22				07:19	06:10	05:23	05:15	05:49	06:40	07:31	07:24	08:19		15:14 (9)	08:46		15:24 (9)
	17:15				20:03	20:57	21:43	22:01	21:33	20:32	19:19	17:13	16:28	26	15:40 (9)	16:28	29	15:53 (9)
30	08:21				07:16	06:08	05:22	05:16	05:51	06:41	07:33	07:26	08:20		15:14 (9)	08:46		15:25 (9)
	17:17				20:04	20:58	21:44	22:01	21:31	20:30	19:17	17:11	16:27	28	15:42 (9)	16:29	29	15:54 (9)
31	08:19				07:14		05:21		05:52	06:43		07:28				08:46		15:25 (9)
	17:18				20:06		21:46		21:30	20:27		17:09				16:30	30	15:55 (9)
Potential sun hours	257		277	367	417	487	502	504	455	381	331	264			241			
Total, worst case		526												197			882	
Sun reduction		0.22												0.26			0.22	
Oper. time red.		1.00												1.00			1.00	
Wind dir. red.		0.62												0.62			0.62	
Total reduction		0.13												0.16			0.14	
Total, real		71												32			119	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
Jennings O'Donovan
Finisklin Business Park
F91 RHH9 Sligo
+353719161416
Kathlyn Feeney / kfeeney@jodireland.com
Calculated:
09/06/2025 13:54/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Worst Case - V150 **Shadow receptor:** BK - 76

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January			February	March	April	May	June	July	August	September	October	November			December		
1	08:46		15:31 (9)	08:18	07:23	07:12	06:06	05:20	05:17	05:54	06:45	07:35	07:30			08:22		15:17 (9)
	16:32	25	15:56 (9)	17:20	18:13	20:08	21:00	21:47	22:01	21:28	20:25	19:14	17:07			16:26	31	15:48 (9)
2	08:46		15:31 (9)	08:16	07:21	07:09	06:04	05:19	05:17	05:55	06:46	07:36	07:31			08:23		15:18 (9)
	16:33	26	15:57 (9)	17:22	18:15	20:10	21:02	21:48	22:01	21:26	20:23	19:12	17:05			16:25	31	15:49 (9)
3	08:45		15:31 (9)	08:15	07:19	07:07	06:02	05:18	05:18	05:57	06:48	07:38	07:33			08:24		15:18 (9)
	16:34	27	15:58 (9)	17:24	18:17	20:11	21:03	21:49	22:00	21:25	20:20	19:10	17:04			16:25	31	15:49 (9)
4	08:45		15:32 (9)	08:13	07:17	07:05	06:00	05:17	05:19	05:59	06:50	07:40	07:35			08:26		15:18 (9)
	16:35	28	16:00 (9)	17:26	18:18	20:13	21:05	21:50	22:00	21:23	20:18	19:07	17:02			16:24	32	15:50 (9)
5	08:45		15:32 (9)	08:11	07:15	07:02	05:58	05:17	05:20	06:00	06:51	07:42	07:37			08:27		15:18 (9)
	16:36	29	16:01 (9)	17:28	18:20	20:15	21:07	21:51	21:59	21:21	20:16	19:05	17:00			16:24	31	15:49 (9)
6	08:45		15:33 (9)	08:10	07:12	07:00	05:56	05:16	05:20	06:02	06:53	07:43	07:39			08:28		15:19 (9)
	16:37	30	16:03 (9)	17:30	18:22	20:17	21:08	21:52	21:59	21:19	20:13	19:03	16:58			16:23	30	15:49 (9)
7	08:44		15:33 (9)	08:08	07:10	06:58	05:55	05:15	05:21	06:03	06:55	07:45	07:41			08:30		15:19 (9)
	16:39	31	16:04 (9)	17:32	18:24	20:18	21:10	21:53	21:58	21:18	20:11	19:01	16:56			16:23	29	15:48 (9)
8	08:44		15:33 (9)	08:06	07:08	06:56	05:53	05:15	05:22	06:05	06:56	07:47	07:42			08:31		15:19 (9)
	16:40	32	16:05 (9)	17:33	18:26	20:20	21:12	21:54	21:57	21:16	20:09	18:58	16:55			16:22	28	15:47 (9)
9	08:43		15:34 (9)	08:04	07:05	06:53	05:51	05:14	05:23	06:07	06:58	07:48	07:44			08:32		15:20 (9)
	16:41	32	16:06 (9)	17:35	18:27	20:22	21:13	21:55	21:57	21:14	20:06	18:56	16:53			16:22	27	15:47 (9)
10	08:43		15:35 (9)	08:02	07:03	06:51	05:49	05:14	05:24	06:08	07:00	07:50	07:46			08:33		15:21 (9)
	16:43	31	16:06 (9)	17:37	18:29	20:24	21:15	21:56	21:56	21:12	20:04	18:54	16:51			16:22	26	15:47 (9)
11	08:42		15:35 (9)	08:01	07:01	06:49	05:48	05:13	05:25	06:10	07:01	07:52	07:48			08:34		15:21 (9)
	16:44	31	16:06 (9)	17:39	18:31	20:25	21:17	21:56	21:55	21:10	20:02	18:51	16:50			16:22	26	15:47 (9)
12	08:41		15:36 (9)	07:59	06:59	06:46	05:46	05:13	05:26	06:12	07:03	07:54	07:50			08:35		15:21 (9)
	16:46	30	16:06 (9)	17:41	18:33	20:27	21:18	21:57	21:54	21:08	19:59	18:49	16:48			16:21	25	15:46 (9)
13	08:41		15:36 (9)	07:57	06:56	06:44	05:44	05:13	05:28	06:13	07:05	07:55	07:51			08:36		15:22 (9)
	16:47	30	16:06 (9)	17:43	18:35	20:29	21:20	21:58	21:53	21:06	19:57	18:47	16:47			16:21	24	15:46 (9)
14	08:40		15:38 (9)	07:55	06:54	06:42	05:43	05:12	05:29	06:15	07:06	07:57	07:53			08:37		15:22 (9)
	16:49	29	16:07 (9)	17:45	18:36	20:31	21:22	21:58	21:52	21:04	19:55	18:45	16:45			16:21	24	15:46 (9)
15	08:39		15:39 (9)	07:53	06:52	06:40	05:41	05:12	05:30	06:16	07:08	07:59	07:55			08:38		15:23 (9)
	16:50	28	16:07 (9)	17:47	18:38	20:32	21:23	21:59	21:51	21:02	19:52	18:42	16:44			16:21	23	15:46 (9)
16	08:38		15:38 (9)	07:51	06:49	06:37	05:39	05:12	05:31	06:18	07:10	08:01	07:57			08:39		15:23 (9)
	16:52	28	16:06 (9)	17:49	18:40	20:34	21:25	21:59	21:50	21:00	19:50	18:40	16:42			16:22	23	15:46 (9)
17	08:37		15:39 (9)	07:49	06:47	06:35	05:38	05:12	05:32	06:20	07:11	08:02	07:59			08:40		15:23 (9)
	16:54	27	16:06 (9)	17:51	18:42	20:36	21:26	22:00	21:49	20:58	19:48	18:38	16:41			16:22	23	15:46 (9)
18	08:36		15:40 (9)	07:47	06:45	06:33	05:36	05:12	05:34	06:21	07:13	08:04	08:00		15:25 (9)	08:41		15:24 (9)
	16:55	26	16:06 (9)	17:52	18:43	20:38	21:28	22:00	21:48	20:56	19:45	18:36	16:39	9	15:34 (9)	16:22	22	15:46 (9)
19	08:35		15:42 (9)	07:45	06:42	06:31	05:35	05:12	05:35	06:23	07:15	08:06	08:02		15:22 (9)	08:41		15:25 (9)
	16:57	24	16:06 (9)	17:54	18:45	20:39	21:29	22:01	21:47	20:54	19:43	18:34	16:38	14	15:36 (9)	16:22	22	15:47 (9)
20	08:34		15:43 (9)	07:43	06:40	06:29	05:33	05:12	05:36	06:25	07:16	08:08	08:04		15:21 (9)	08:42		15:26 (9)
	16:59	23	16:06 (9)	17:56	18:47	20:41	21:31	22:01	21:46	20:52	19:40	18:32	16:37	17	15:38 (9)	16:23	21	15:47 (9)
21	08:33		15:44 (9)	07:41	06:38	06:27	05:32	05:12	05:38	06:26	07:18	08:10	08:06		15:20 (9)	08:43		15:26 (9)
	17:00	20	16:04 (9)	17:58	18:49	20:43	21:32	22:01	21:45	20:49	19:38	18:29	16:36	20	15:40 (9)	16:23	21	15:47 (9)
22	08:32		15:46 (9)	07:39	06:35	06:24	05:31	05:13	05:39	06:28	07:20	08:11	08:07		15:19 (9)	08:43		15:26 (9)
	17:02	17	16:03 (9)	18:00	18:50	20:44	21:34	22:01	21:43	20:47	19:36	18:27	16:35	23	15:42 (9)	16:24	22	15:48 (9)
23	08:31		15:48 (9)	07:36	06:33	06:22	05:29	05:13	05:40	06:30	07:21	08:13	08:09		15:19 (9)	08:44		15:27 (9)
	17:04	14	16:02 (9)	18:02	18:52	20:46	21:35	22:02	21:42	20:45	19:33	18:25	16:33	24	15:43 (9)	16:24	21	15:48 (9)
24	08:29		15:51 (9)	07:34	06:31	06:20	05:28	05:13	05:42	06:31	07:23	08:15	08:11		15:18 (9)	08:44		15:27 (9)
	17:06	9	16:00 (9)	18:04	18:54	20:48	21:37	22:02	21:41	20:43	19:31	18:23	16:32	25	15:43 (9)	16:25	21	15:48 (9)
25	08:28			07:32	06:28	06:18	05:27	05:13	05:43	06:33	07:25	07:17	08:12		15:17 (9)	08:45		15:28 (9)
	17:07			18:05	18:56	20:50	21:38	22:02	21:39	20:41	19:29	17:21	16:31	27	15:44 (9)	16:25	22	15:50 (9)
26	08:27			07:30	06:26	06:16	05:26	05:14	05:45	06:35	07:26	07:19	08:14		15:17 (9)	08:45		15:28 (9)
	17:09			18:07	18:57	20:51	21:39	22:02	21:38	20:39	19:26	17:19	16:30	28	15:45 (9)	16:26	22	15:50 (9)
27	08:25			07:28	06:23	06:14	05:25	05:14	05:46	06:36	07:28	07:20	08:15		15:18 (9)	08:45		15:28 (9)
	17:11			18:09	18:59	20:53	21:41	22:02	21:36	20:36	19:24	17:17	16:29	28	15:46 (9)	16:27	23	15:51 (9)
28	08:24			07:26	06:21	06:12	05:24	05:15	05:48	06:38	07:30	07:22	08:17		15:17 (9)	08:45		15:29 (9)
	17:13			18:11	19:01	20:55	21:42	22:02	21:35	20:34	19:22	17:15	16:28	29	15:46 (9)	16:28	23	15:52 (9)
29	08:22				07:19	06:10	05:23	05:15	05:49	06:40	07:31	07:24	08:19		15:17 (9)	08:46		15:29 (9)
	17:15				20:03	20:57	21:43	22:01	21:33	20:32	19:19	17:13	16:28	30	15:47 (9)	16:28	24	15:53 (9)
30	08:21				07:16	06:08	05:22	05:16	05:51	06:41	07:33	07:26	08:20		15:18 (9)	08:46		15:30 (9)
	17:17				20:04	20:58	21:44	22:01	21:31	20:30	19:17	17:11	16:27	30	15:48 (9)	16:29	24	15:54 (9)
31	08:19				07:14		05:21		05:52	06:43		07:28				08:46		15:30 (9)
	17:18				20:06		21:46		21:30	20:27		17:09				16:30	25	15:55 (9)
Potential sun hours	257			277	367	417	487	502	504	455	381	331	264			241		
Total, worst case		627												304			777	
Sun reduction		0.22												0.26			0.22	
Oper. time red.		1.00												1.00			1.00	
Wind dir. red.		0.62												0.62			0.62	
Total reduction		0.13												0.16			0.14	
Total, real		84												49			105	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
Jennings O'Donovan
Finisklin Business Park
F91 RHH9 Sligo
+353719161416
Kathlyn Feeney / kfeeney@jodireland.com
Calculated:
09/06/2025 13:54/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Worst Case - V150 **Shadow receptor:** BL - 77

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January			February	March	April	May	June	July	August	September	October	November			December		
1	08:46		15:43 (9)	08:18	07:23	07:12	06:06	05:20	05:17	05:54	06:45	07:35	07:30			08:22		15:27 (9)
	16:32	13	15:56 (9)	17:20	18:13	20:08	21:00	21:47	22:01	21:28	20:25	19:14	17:07			16:26	25	15:52 (9)
2	08:46		15:42 (9)	08:16	07:21	07:09	06:04	05:19	05:17	05:55	06:46	07:36	07:31			08:23		15:28 (9)
	16:33	15	15:57 (9)	17:22	18:15	20:10	21:02	21:48	22:01	21:26	20:23	19:12	17:05			16:25	23	15:51 (9)
3	08:45		15:43 (9)	08:15	07:19	07:07	06:02	05:18	05:18	05:57	06:48	07:38	07:33			08:24		15:28 (9)
	16:34	15	15:58 (9)	17:24	18:17	20:11	21:03	21:49	22:00	21:25	20:20	19:10	17:04			16:25	22	15:50 (9)
4	08:45		15:44 (9)	08:13	07:17	07:05	06:00	05:17	05:19	05:59	06:50	07:40	07:35			08:26		15:29 (9)
	16:35	16	16:00 (9)	17:26	18:18	20:13	21:05	21:50	22:00	21:23	20:18	19:07	17:02			16:24	21	15:50 (9)
5	08:45		15:43 (9)	08:11	07:15	07:02	05:58	05:17	05:20	06:00	06:51	07:42	07:37			08:27		15:29 (9)
	16:36	18	16:01 (9)	17:28	18:20	20:15	21:07	21:51	21:59	21:21	20:16	19:05	17:00			16:24	20	15:49 (9)
6	08:44		15:44 (9)	08:10	07:12	07:00	05:56	05:16	05:20	06:02	06:53	07:43	07:39			08:28		15:30 (9)
	16:37	19	16:03 (9)	17:30	18:22	20:17	21:08	21:52	21:59	21:19	20:13	19:03	16:58			16:23	19	15:49 (9)
7	08:44		15:44 (9)	08:08	07:10	06:58	05:55	05:15	05:21	06:03	06:55	07:45	07:41			08:30		15:30 (9)
	16:39	20	16:04 (9)	17:32	18:24	20:18	21:10	21:53	21:58	21:18	20:11	19:01	16:56			16:23	18	15:48 (9)
8	08:44		15:44 (9)	08:06	07:08	06:56	05:53	05:15	05:22	06:05	06:56	07:47	07:42			08:31		15:31 (9)
	16:40	21	16:05 (9)	17:33	18:26	20:20	21:12	21:54	21:57	21:16	20:09	18:58	16:55			16:22	16	15:47 (9)
9	08:43		15:45 (9)	08:04	07:05	06:53	05:51	05:14	05:23	06:07	06:58	07:48	07:44			08:32		15:31 (9)
	16:41	22	16:07 (9)	17:35	18:27	20:22	21:13	21:55	21:57	21:14	20:06	18:56	16:53			16:22	15	15:46 (9)
10	08:43		15:45 (9)	08:02	07:03	06:51	05:49	05:14	05:24	06:08	07:00	07:50	07:46			08:33		15:32 (9)
	16:43	23	16:08 (9)	17:37	18:29	20:24	21:15	21:56	21:56	21:12	20:04	18:54	16:51			16:22	15	15:47 (9)
11	08:42		15:45 (9)	08:01	07:01	06:49	05:47	05:13	05:25	06:10	07:01	07:52	07:48			08:34		15:33 (9)
	16:44	25	16:10 (9)	17:39	18:31	20:25	21:17	21:56	21:55	21:10	20:02	18:51	16:50			16:22	14	15:47 (9)
12	08:41		15:46 (9)	07:59	06:59	06:46	05:46	05:13	05:26	06:12	07:03	07:54	07:50			08:35		15:33 (9)
	16:46	25	16:11 (9)	17:41	18:33	20:27	21:18	21:57	21:54	21:08	19:59	18:49	16:48			16:21	13	15:46 (9)
13	08:41		15:46 (9)	07:57	06:56	06:44	05:44	05:13	05:28	06:13	07:05	07:55	07:51			08:36		15:34 (9)
	16:47	27	16:13 (9)	17:43	18:35	20:29	21:20	21:58	21:53	21:06	19:57	18:47	16:47			16:21	12	15:46 (9)
14	08:40		15:47 (9)	07:55	06:54	06:42	05:43	05:12	05:29	06:15	07:06	07:57	07:53		15:37 (9)	08:37		15:34 (9)
	16:49	28	16:15 (9)	17:45	18:36	20:31	21:22	21:58	21:52	21:04	19:55	18:45	16:45	4	15:41 (9)	16:21	12	15:46 (9)
15	08:39		15:48 (9)	07:53	06:52	06:40	05:41	05:12	05:30	06:16	07:08	07:59	07:55		15:32 (9)	08:38		15:35 (9)
	16:50	29	16:17 (9)	17:47	18:38	20:32	21:23	21:59	21:51	21:02	19:52	18:42	16:44	12	15:44 (9)	16:21	11	15:46 (9)
16	08:38		15:47 (9)	07:51	06:49	06:37	05:39	05:12	05:31	06:18	07:10	08:01	07:57		15:31 (9)	08:39		15:36 (9)
	16:52	30	16:17 (9)	17:49	18:40	20:34	21:25	21:59	21:50	21:00	19:50	18:40	16:42	16	15:47 (9)	16:22	10	15:46 (9)
17	08:37		15:48 (9)	07:49	06:47	06:35	05:38	05:12	05:32	06:20	07:11	08:02	07:59		15:29 (9)	08:40		15:35 (9)
	16:54	29	16:17 (9)	17:51	18:42	20:36	21:26	22:00	21:49	20:58	19:48	18:38	16:41	19	15:48 (9)	16:22	11	15:46 (9)
18	08:36		15:49 (9)	07:47	06:45	06:33	05:36	05:12	05:34	06:21	07:13	08:04	08:00		15:28 (9)	08:41		15:36 (9)
	16:55	29	16:18 (9)	17:52	18:43	20:38	21:28	22:00	21:48	20:56	19:45	18:36	16:39	22	15:50 (9)	16:22	10	15:46 (9)
19	08:35		15:50 (9)	07:45	06:42	06:31	05:35	05:12	05:35	06:23	07:15	08:06	08:02		15:28 (9)	08:41		15:37 (9)
	16:57	28	16:18 (9)	17:54	18:45	20:39	21:29	22:01	21:47	20:54	19:43	18:34	16:38	23	15:51 (9)	16:22	10	15:47 (9)
20	08:34		15:51 (9)	07:43	06:40	06:29	05:33	05:12	05:36	06:25	07:16	08:08	08:04		15:27 (9)	08:42		15:37 (9)
	16:59	27	16:18 (9)	17:56	18:47	20:41	21:31	22:01	21:46	20:52	19:40	18:32	16:37	25	15:52 (9)	16:23	9	15:46 (9)
21	08:33		15:51 (9)	07:41	06:38	06:27	05:32	05:12	05:38	06:26	07:18	08:10	08:06		15:27 (9)	08:43		15:38 (9)
	17:00	26	16:17 (9)	17:58	18:49	20:43	21:32	22:01	21:45	20:49	19:38	18:29	16:36	26	15:53 (9)	16:23	9	15:47 (9)
22	08:32		15:52 (9)	07:39	06:35	06:24	05:31	05:12	05:39	06:28	07:20	08:11	08:07		15:27 (9)	08:43		15:39 (9)
	17:02	25	16:17 (9)	18:00	18:50	20:44	21:34	22:01	21:43	20:47	19:36	18:27	16:34	27	15:54 (9)	16:24	9	15:48 (9)
23	08:31		15:54 (9)	07:36	06:33	06:22	05:29	05:13	05:40	06:30	07:21	08:13	08:09		15:27 (9)	08:44		15:39 (9)
	17:04	23	16:17 (9)	18:02	18:52	20:46	21:35	22:02	21:42	20:45	19:33	18:25	16:33	28	15:55 (9)	16:24	9	15:48 (9)
24	08:29		15:54 (9)	07:34	06:31	06:20	05:28	05:13	05:42	06:31	07:23	08:15	08:11		15:26 (9)	08:44		15:39 (9)
	17:06	22	16:16 (9)	18:04	18:54	20:48	21:37	22:02	21:41	20:43	19:31	18:23	16:32	29	15:55 (9)	16:25	9	15:48 (9)
25	08:28		15:56 (9)	07:32	06:28	06:18	05:27	05:13	05:43	06:33	07:25	07:17	08:12		15:26 (9)	08:45		15:40 (9)
	17:07	19	16:15 (9)	18:05	18:56	20:50	21:38	22:02	21:39	20:41	19:29	17:21	16:31	29	15:55 (9)	16:25	10	15:50 (9)
26	08:27		15:58 (9)	07:30	06:26	06:16	05:26	05:14	05:45	06:35	07:26	07:19	08:14		15:26 (9)	08:45		15:40 (9)
	17:09	16	16:14 (9)	18:07	18:57	20:51	21:39	22:02	21:38	20:39	19:26	17:19	16:30	30	15:56 (9)	16:26	10	15:50 (9)
27	08:25		16:01 (9)	07:28	06:23	06:14	05:25	05:14	05:46	06:36	07:28	07:20	08:15		15:27 (9)	08:45		15:41 (9)
	17:11	11	16:12 (9)	18:09	18:59	20:53	21:41	22:02	21:36	20:36	19:24	17:17	16:29	29	15:56 (9)	16:27	10	15:51 (9)
28	08:24		16:05 (9)	07:26	06:21	06:12	05:24	05:15	05:48	06:38	07:30	07:22	08:17		15:26 (9)	08:45		15:41 (9)
	17:13	3	16:08 (9)	18:11	19:01	20:55	21:42	22:02	21:35	20:34	19:22	17:15	16:28	28	15:54 (9)	16:28	11	15:52 (9)
29	08:22				07:19	06:10	05:23	05:15	05:49	06:40	07:31	07:24	08:19		15:27 (9)	08:46		15:41 (9)
	17:15				20:03	20:57	21:43	22:01	21:33	20:32	19:19	17:13	16:28	27	15:54 (9)	16:28	12	15:53 (9)
30	08:21				07:16	06:08	05:22	05:16	05:51	06:41	07:33	07:26	08:20		15:28 (9)	08:46		15:42 (9)
	17:17				20:04	20:58	21:44	22:01	21:31	20:30	19:17	17:11	16:27	25	15:53 (9)	16:29	12	15:54 (9)
31	08:19				07:14		05:21		05:52	06:43		07:28				08:46		15:42 (9)
	17:18				20:06		21:46		21:30	20:27		17:09				16:30	13	15:55 (9)
Potential sun hours	257			277	367	417	487	502	504	455	381	331	264			241		
Total, worst case		604												399			420	
Sun reduction		0.22												0.26			0.22	
Oper. time red.		1.00												1.00			1.00	
Wind dir. red.		0.62												0.62			0.62	
Total reduction		0.13												0.16			0.13	
Total, real		81												64			57	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
Jennings O'Donovan
Finisklin Business Park
F91 RHH9 Sligo
+353719161416
Kathlyn Feeney / kfeeney@jodireland.com
Calculated:
09/06/2025 13:54/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Worst Case - V150 **Shadow receptor:** BM - 78

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January			February	March	April	May	June	July	August	September	October	November			December		
1	08:46		15:46 (9)	08:18	07:23	07:12	06:06	05:20	05:17	05:54	06:45	07:35	07:30			08:22		15:30 (9)
	16:32	10	15:56 (9)	17:20	18:13	20:08	21:00	21:47	22:01	21:28	20:25	19:14	17:07			16:26	22	15:52 (9)
2	08:46		15:46 (9)	08:16	07:21	07:09	06:04	05:19	05:17	05:55	06:46	07:36	07:31			08:23		15:31 (9)
	16:33	11	15:57 (9)	17:22	18:15	20:10	21:02	21:48	22:01	21:26	20:23	19:12	17:05			16:25	20	15:51 (9)
3	08:45		15:46 (9)	08:15	07:19	07:07	06:02	05:18	05:18	05:57	06:48	07:38	07:33			08:24		15:31 (9)
	16:34	12	15:58 (9)	17:24	18:17	20:11	21:03	21:49	22:00	21:25	20:20	19:10	17:04			16:25	19	15:50 (9)
4	08:45		15:47 (9)	08:13	07:17	07:05	06:00	05:17	05:19	05:59	06:50	07:40	07:35			08:26		15:32 (9)
	16:35	13	16:00 (9)	17:26	18:18	20:13	21:05	21:50	22:00	21:23	20:18	19:07	17:02			16:24	18	15:50 (9)
5	08:45		15:46 (9)	08:11	07:15	07:02	05:58	05:17	05:20	06:00	06:51	07:42	07:37			08:27		15:32 (9)
	16:36	15	16:01 (9)	17:28	18:20	20:15	21:07	21:51	21:59	21:21	20:16	19:05	17:00			16:24	17	15:49 (9)
6	08:44		15:47 (9)	08:10	07:12	07:00	05:56	05:16	05:20	06:02	06:53	07:43	07:39			08:28		15:33 (9)
	16:37	16	16:03 (9)	17:30	18:22	20:17	21:08	21:52	21:59	21:19	20:13	19:03	16:58			16:23	16	15:49 (9)
7	08:44		15:47 (9)	08:08	07:10	06:58	05:55	05:15	05:21	06:03	06:55	07:45	07:41			08:30		15:34 (9)
	16:39	17	16:04 (9)	17:32	18:24	20:18	21:10	21:53	21:58	21:18	20:11	19:01	16:56			16:23	14	15:48 (9)
8	08:44		15:47 (9)	08:06	07:08	06:56	05:53	05:15	05:22	06:05	06:56	07:47	07:42			08:31		15:34 (9)
	16:40	18	16:05 (9)	17:33	18:26	20:20	21:12	21:54	21:57	21:16	20:09	18:58	16:55			16:22	13	15:47 (9)
9	08:43		15:48 (9)	08:04	07:05	06:53	05:51	05:14	05:23	06:07	06:58	07:48	07:44			08:32		15:34 (9)
	16:41	19	16:07 (9)	17:35	18:27	20:22	21:13	21:55	21:57	21:14	20:06	18:56	16:53			16:22	12	15:46 (9)
10	08:43		15:48 (9)	08:02	07:03	06:51	05:49	05:14	05:24	06:08	07:00	07:50	07:46			08:33		15:36 (9)
	16:43	20	16:08 (9)	17:37	18:29	20:24	21:15	21:56	21:56	21:12	20:04	18:54	16:51			16:22	11	15:47 (9)
11	08:42		15:48 (9)	08:01	07:01	06:49	05:48	05:13	05:25	06:10	07:01	07:52	07:48			08:34		15:36 (9)
	16:44	22	16:10 (9)	17:39	18:31	20:25	21:17	21:56	21:55	21:10	20:02	18:51	16:50			16:22	11	15:47 (9)
12	08:41		15:48 (9)	07:59	06:59	06:46	05:46	05:13	05:26	06:12	07:03	07:54	07:50		15:39 (9)	08:35		15:37 (9)
	16:46	23	16:11 (9)	17:41	18:33	20:27	21:18	21:57	21:54	21:08	19:59	18:49	16:48	5	15:44 (9)	16:21	9	15:46 (9)
13	08:41		15:48 (9)	07:57	06:56	06:44	05:44	05:13	05:28	06:13	07:05	07:55	07:51		15:35 (9)	08:36		15:37 (9)
	16:47	25	16:13 (9)	17:43	18:35	20:29	21:20	21:58	21:53	21:06	19:57	18:47	16:47	13	15:48 (9)	16:21	9	15:46 (9)
14	08:40		15:50 (9)	07:55	06:54	06:42	05:43	05:12	05:29	06:15	07:06	07:57	07:53		15:33 (9)	08:37		15:38 (9)
	16:49	25	16:15 (9)	17:45	18:36	20:31	21:22	21:58	21:52	21:04	19:55	18:45	16:45	17	15:50 (9)	16:21	8	15:46 (9)
15	08:39		15:50 (9)	07:53	06:52	06:40	05:41	05:12	05:30	06:16	07:08	07:59	07:55		15:31 (9)	08:38		15:39 (9)
	16:50	27	16:17 (9)	17:47	18:38	20:32	21:23	21:59	21:51	21:02	19:52	18:42	16:44	20	15:51 (9)	16:21	7	15:46 (9)
16	08:38		15:49 (9)	07:51	06:49	06:37	05:39	05:12	05:31	06:18	07:10	08:01	07:57		15:30 (9)	08:39		15:39 (9)
	16:52	29	16:18 (9)	17:49	18:40	20:34	21:25	21:59	21:50	21:00	19:50	18:40	16:42	22	15:52 (9)	16:22	7	15:46 (9)
17	08:37		15:50 (9)	07:49	06:47	06:35	05:38	05:12	05:32	06:20	07:11	08:02	07:59		15:29 (9)	08:40		15:39 (9)
	16:54	30	16:20 (9)	17:51	18:42	20:36	21:26	22:00	21:49	20:58	19:48	18:38	16:41	25	15:54 (9)	16:22	7	15:46 (9)
18	08:36		15:51 (9)	07:47	06:45	06:33	05:36	05:12	05:34	06:21	07:13	08:04	08:00		15:29 (9)	08:41		15:40 (9)
	16:55	30	16:21 (9)	17:52	18:43	20:38	21:28	22:00	21:48	20:56	19:45	18:36	16:39	26	15:55 (9)	16:22	6	15:46 (9)
19	08:35		15:51 (9)	07:45	06:42	06:31	05:35	05:12	05:35	06:23	07:15	08:06	08:02		15:29 (9)	08:41		15:41 (9)
	16:57	31	16:22 (9)	17:54	18:45	20:39	21:29	22:01	21:47	20:54	19:43	18:34	16:38	27	15:56 (9)	16:22	6	15:47 (9)
20	08:34		15:52 (9)	07:43	06:40	06:29	05:33	05:12	05:36	06:25	07:16	08:08	08:04		15:28 (9)	08:42		15:41 (9)
	16:59	30	16:22 (9)	17:56	18:47	20:41	21:31	22:01	21:46	20:52	19:40	18:32	16:37	28	15:56 (9)	16:23	5	15:46 (9)
21	08:33		15:52 (9)	07:41	06:38	06:27	05:32	05:12	05:38	06:26	07:18	08:10	08:06		15:28 (9)	08:43		15:42 (9)
	17:00	29	16:21 (9)	17:58	18:49	20:43	21:32	22:01	21:45	20:49	19:38	18:29	16:36	29	15:57 (9)	16:23	5	15:47 (9)
22	08:32		15:53 (9)	07:39	06:35	06:24	05:31	05:12	05:39	06:28	07:20	08:11	08:07		15:28 (9)	08:43		15:43 (9)
	17:02	28	16:21 (9)	18:00	18:50	20:44	21:34	22:01	21:43	20:47	19:36	18:27	16:35	30	15:58 (9)	16:24	5	15:48 (9)
23	08:31		15:55 (9)	07:36	06:33	06:22	05:29	05:13	05:40	06:30	07:21	08:13	08:09		15:29 (9)	08:44		15:43 (9)
	17:04	27	16:22 (9)	18:02	18:52	20:46	21:35	22:02	21:42	20:45	19:33	18:25	16:33	30	15:59 (9)	16:24	5	15:48 (9)
24	08:29		15:55 (9)	07:34	06:31	06:20	05:28	05:13	05:42	06:31	07:23	08:15	08:11		15:28 (9)	08:44		15:43 (9)
	17:06	26	16:21 (9)	18:04	18:54	20:48	21:37	22:02	21:41	20:43	19:31	18:23	16:32	30	15:58 (9)	16:25	5	15:48 (9)
25	08:28		15:56 (9)	07:32	06:28	06:18	05:27	05:13	05:43	06:33	07:25	07:17	08:12		15:28 (9)	08:45		15:44 (9)
	17:07	25	16:21 (9)	18:05	18:56	20:50	21:38	22:02	21:39	20:41	19:29	17:21	16:31	30	15:58 (9)	16:25	6	15:50 (9)
26	08:27		15:57 (9)	07:30	06:26	06:16	05:26	05:14	05:45	06:35	07:26	07:19	08:14		15:29 (9)	08:45		15:44 (9)
	17:09	22	16:19 (9)	18:07	18:57	20:51	21:39	22:02	21:38	20:39	19:26	17:19	16:30	28	15:57 (9)	16:26	6	15:50 (9)
27	08:25		15:59 (9)	07:28	06:23	06:14	05:25	05:14	05:46	06:36	07:28	07:20	08:15		15:29 (9)	08:45		15:44 (9)
	17:11	20	16:19 (9)	18:09	18:59	20:53	21:41	22:02	21:36	20:36	19:24	17:17	16:29	27	15:56 (9)	16:27	7	15:51 (9)
28	08:24		16:01 (9)	07:26	06:21	06:12	05:24	05:15	05:48	06:38	07:30	07:22	08:17		15:29 (9)	08:45		15:44 (9)
	17:13	16	16:17 (9)	18:11	19:01	20:55	21:42	22:02	21:35	20:34	19:22	17:15	16:28	25	15:54 (9)	16:28	8	15:52 (9)
29	08:22		16:04 (9)		07:19	06:10	05:23	05:15	05:49	06:40	07:31	07:24	08:19		15:29 (9)	08:46		15:45 (9)
	17:15	12	16:16 (9)		20:03	20:57	21:43	22:01	21:33	20:32	19:19	17:13	16:28	25	15:54 (9)	16:28	8	15:53 (9)
30	08:21		16:07 (9)		07:16	06:08	05:22	05:16	05:51	06:41	07:33	07:26	08:20		15:30 (9)	08:46		15:45 (9)
	17:17	5	16:12 (9)		20:04	20:58	21:44	22:01	21:31	20:30	19:17	17:11	16:27	23	15:53 (9)	16:29	9	15:54 (9)
31	08:19				07:14		05:21		05:52	06:43		07:28				08:46		15:45 (9)
	17:18				20:06		21:46		21:30	20:27		17:09				16:30	10	15:55 (9)
Potential sun hours	257			277	367	417	487	502	504	455	381	331	264			241		
Total, worst case		633												460			311	
Sun reduction		0.22												0.26			0.22	
Oper. time red.		1.00												1.00			1.00	
Wind dir. red.		0.62												0.62			0.62	
Total reduction		0.13												0.16			0.13	
Total, real		85												74			42	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
Jennings O'Donovan
Finisklin Business Park
F91 RHH9 Sligo
+353719161416
Kathlyn Feeney / kfeeney@jodireland.com
Calculated:
09/06/2025 13:54/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Worst Case - V150 **Shadow receptor:** BN - 79

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January		February		March	April	May	June	July	August	September	October	November		December	
1	08:46	15:50 (8)	08:18	16:10 (9)	07:23	07:12	06:06	05:20	05:17	05:54	06:45	07:35	07:30		08:22	15:35 (9)
	16:32 6	15:56 (9)	17:20 9	16:19 (9)	18:13	20:08	21:00	21:47	22:01	21:28	20:25	19:14	17:07		16:26 17	15:52 (9)
2	08:46	15:50 (8)	08:16		07:21	07:09	06:04	05:19	05:17	05:55	06:46	07:36	07:31		08:23	15:36 (9)
	16:33 7	15:57 (9)	17:22		18:15	20:10	21:02	21:48	22:01	21:26	20:23	19:12	17:05		16:25 15	15:51 (9)
3	08:45	15:51 (8)	08:15		07:19	07:07	06:02	05:18	05:18	05:57	06:48	07:38	07:33		08:24	15:36 (9)
	16:34 7	15:58 (9)	17:24		18:17	20:11	21:03	21:49	22:00	21:25	20:20	19:10	17:04		16:25 14	15:50 (9)
4	08:45	15:51 (8)	08:13		07:17	07:05	06:00	05:17	05:19	05:59	06:50	07:40	07:35		08:26	15:37 (9)
	16:35 9	16:00 (9)	17:26		18:18	20:13	21:05	21:50	22:00	21:23	20:18	19:07	17:02		16:24 13	15:50 (9)
5	08:45	15:51 (8)	08:11		07:15	07:02	05:58	05:17	05:20	06:00	06:51	07:42	07:37		08:27	15:37 (9)
	16:36 10	16:01 (9)	17:28		18:20	20:15	21:07	21:51	21:59	21:21	20:16	19:05	17:00		16:24 12	15:49 (9)
6	08:44	15:52 (9)	08:10		07:12	07:00	05:56	05:16	05:20	06:02	06:53	07:43	07:39		08:28	15:38 (9)
	16:37 11	16:03 (9)	17:30		18:22	20:17	21:08	21:52	21:59	21:19	20:13	19:03	16:58		16:23 11	15:49 (9)
7	08:44	15:52 (9)	08:08		07:10	06:58	05:55	05:15	05:21	06:03	06:55	07:45	07:41		08:30	15:38 (8)
	16:39 12	16:04 (9)	17:32		18:24	20:18	21:10	21:53	21:58	21:18	20:11	19:01	16:56		16:23 10	15:48 (9)
8	08:44	15:52 (9)	08:06		07:08	06:56	05:53	05:15	05:22	06:05	06:56	07:47	07:42		08:31	15:38 (8)
	16:40 13	16:05 (9)	17:33		18:26	20:20	21:12	21:54	21:57	21:16	20:09	18:58	16:55		16:22 9	15:47 (9)
9	08:43	15:53 (9)	08:04		07:05	06:53	05:51	05:14	05:23	06:07	06:58	07:48	07:44		08:32	15:39 (8)
	16:41 14	16:07 (9)	17:35		18:27	20:22	21:13	21:55	21:57	21:14	20:06	18:56	16:53		16:22 7	15:46 (9)
10	08:43	15:52 (9)	08:02		07:03	06:51	05:49	05:14	05:24	06:08	07:00	07:50	07:46	15:40 (9)	08:33	15:40 (8)
	16:43 16	16:08 (9)	17:37		18:29	20:24	21:15	21:56	21:56	21:12	20:04	18:54	16:51 10	15:50 (9)	16:22 7	15:47 (9)
11	08:42	15:52 (9)	08:01		07:01	06:49	05:48	05:13	05:25	06:10	07:01	07:52	07:48	15:38 (9)	08:34	15:40 (8)
	16:44 18	16:10 (9)	17:39		18:31	20:25	21:17	21:56	21:55	21:10	20:02	18:51	16:50 15	15:53 (9)	16:22 7	15:47 (9)
12	08:41	15:52 (9)	07:59		06:59	06:46	05:46	05:13	05:26	06:12	07:03	07:54	07:50	15:36 (9)	08:35	15:41 (8)
	16:46 19	16:11 (9)	17:41		18:33	20:27	21:18	21:57	21:54	21:08	19:59	18:49	16:48 19	15:55 (9)	16:21 5	15:46 (9)
13	08:41	15:53 (9)	07:57		06:56	06:44	05:44	05:13	05:28	06:13	07:05	07:55	07:51	15:35 (9)	08:36	15:41 (8)
	16:47 20	16:13 (9)	17:43		18:35	20:29	21:20	21:58	21:53	21:06	19:57	18:47	16:47 22	15:57 (9)	16:21 5	15:46 (9)
14	08:40	15:54 (9)	07:55		06:54	06:42	05:43	05:12	05:29	06:15	07:06	07:57	07:53	15:34 (9)	08:37	15:42 (8)
	16:49 21	16:15 (9)	17:45		18:36	20:31	21:22	21:58	21:52	21:04	19:55	18:45	16:45 24	15:58 (9)	16:21 4	15:46 (9)
15	08:39	15:54 (9)	07:53		06:52	06:40	05:41	05:12	05:30	06:16	07:08	07:59	07:55	15:32 (9)	08:38	15:43 (8)
	16:50 23	16:17 (9)	17:47		18:38	20:32	21:23	21:59	21:51	21:02	19:52	18:42	16:44 26	15:58 (9)	16:21 3	15:46 (9)
16	08:38	15:53 (9)	07:51		06:49	06:37	05:39	05:12	05:31	06:18	07:10	08:01	07:57	15:32 (9)	08:39	15:43 (8)
	16:52 25	16:18 (9)	17:49		18:40	20:34	21:25	21:59	21:50	21:00	19:50	18:40	16:42 27	15:59 (9)	16:22 3	15:46 (9)
17	08:37	15:54 (9)	07:49		06:47	06:35	05:38	05:12	05:32	06:20	07:11	08:02	07:59	15:31 (9)	08:40	15:43 (8)
	16:54 26	16:20 (9)	17:51		18:42	20:36	21:26	22:00	21:49	20:58	19:48	18:38	16:41 29	16:00 (9)	16:22 3	15:46 (9)
18	08:36	15:54 (9)	07:47		06:45	06:33	05:36	05:12	05:34	06:21	07:13	08:04	08:00	15:31 (9)	08:41	15:44 (8)
	16:55 28	16:22 (9)	17:52		18:43	20:38	21:28	22:00	21:48	20:56	19:45	18:36	16:39 29	16:00 (9)	16:22 2	15:46 (8)
19	08:35	15:55 (9)	07:45		06:42	06:31	05:35	05:12	05:35	06:23	07:15	08:06	08:02	15:31 (9)	08:41	15:45 (8)
	16:57 29	16:24 (9)	17:54		18:45	20:39	21:29	22:01	21:47	20:54	19:43	18:34	16:38 30	16:01 (9)	16:22 2	15:47 (8)
20	08:34	15:56 (9)	07:43		06:40	06:29	05:33	05:12	05:36	06:25	07:16	08:08	08:04	15:31 (9)	08:42	15:45 (8)
	16:59 30	16:26 (9)	17:56		18:47	20:41	21:31	22:01	21:46	20:52	19:40	18:32	16:37 31	16:02 (9)	16:23 1	15:46 (8)
21	08:33	15:55 (9)	07:41		06:38	06:27	05:32	05:12	05:38	06:26	07:18	08:10	08:06	15:31 (9)	08:43	15:46 (8)
	17:00 31	16:26 (9)	17:58		18:49	20:43	21:32	22:01	21:45	20:49	19:38	18:29	16:36 31	16:02 (9)	16:23 1	15:47 (8)
22	08:32	15:56 (9)	07:39		06:35	06:24	05:31	05:13	05:39	06:28	07:20	08:11	08:07	15:32 (9)	08:43	15:46 (8)
	17:02 31	16:27 (9)	18:00		18:50	20:44	21:34	22:01	21:43	20:47	19:36	18:27	16:35 30	16:02 (9)	16:24 2	15:48 (8)
23	08:31	15:57 (9)	07:36		06:33	06:22	05:29	05:13	05:40	06:30	07:21	08:13	08:09	15:32 (9)	08:44	15:47 (8)
	17:04 30	16:27 (9)	18:02		18:52	20:46	21:35	22:02	21:42	20:45	19:33	18:25	16:33 29	16:01 (9)	16:24 1	15:48 (8)
24	08:29	15:57 (9)	07:34		06:31	06:20	05:28	05:13	05:42	06:31	07:23	08:15	08:11	15:31 (9)	08:44	15:47 (8)
	17:06 29	16:26 (9)	18:04		18:54	20:48	21:37	22:02	21:41	20:43	19:31	18:23	16:32 28	15:59 (9)	16:25 1	15:48 (8)
25	08:28	15:59 (9)	07:32		06:28	06:18	05:27	05:13	05:43	06:33	07:25	07:17	08:12	15:32 (9)	08:45	15:48 (8)
	17:07 28	16:27 (9)	18:05		18:56	20:50	21:38	22:02	21:39	20:41	19:29	17:21	16:31 26	15:58 (9)	16:25 2	15:50 (8)
26	08:27	15:59 (9)	07:30		06:26	06:16	05:26	05:14	05:45	06:35	07:26	07:19	08:14	15:32 (9)	08:45	15:48 (8)
	17:09 27	16:26 (9)	18:07		18:57	20:51	21:39	22:02	21:38	20:39	19:26	17:19	16:30 25	15:57 (9)	16:26 2	15:50 (8)
27	08:25	16:00 (9)	07:28		06:23	06:14	05:25	05:14	05:46	06:36	07:28	07:20	08:15	15:33 (9)	08:45	15:48 (8)
	17:11 26	16:26 (9)	18:09		18:59	20:53	21:41	22:02	21:36	20:36	19:24	17:17	16:29 23	15:56 (9)	16:27 3	15:51 (9)
28	08:24	16:01 (9)	07:26		06:21	06:12	05:24	05:15	05:48	06:38	07:30	07:22	08:17	15:33 (9)	08:45	15:48 (8)
	17:13 24	16:25 (9)	18:11		19:01	20:55	21:42	22:02	21:35	20:34	19:22	17:15	16:28 21	15:54 (9)	16:28 4	15:52 (9)
29	08:22	16:03 (9)			07:19	06:10	05:23	05:15	05:49	06:40	07:31	07:24	08:19	15:34 (9)	08:46	15:49 (8)
	17:15 22	16:25 (9)			20:03	20:57	21:43	22:01	21:33	20:32	19:19	17:13	16:28 20	15:54 (9)	16:28 4	15:53 (9)
30	08:21	16:04 (9)			07:16	06:08	05:22	05:16	05:51	06:41	07:33	07:26	08:20	15:35 (9)	08:46	15:49 (8)
	17:17 19	16:23 (9)			20:04	20:58	21:44	22:01	21:31	20:30	19:17	17:11	16:27 18	15:53 (9)	16:29 5	15:54 (9)
31	08:19	16:06 (9)			07:14		05:21		05:52	06:43		07:28			08:46	15:50 (8)
	17:18 15	16:21 (9)			20:06		21:46		21:30	20:27		17:09			16:30 5	15:55 (9)
Potential sun hours	257		277		367	417	487	502	504	455	381	331	264		241	
Total, worst case	626		9										513		180	
Sun reduction	0.22		0.24										0.26		0.22	
Oper. time red.	1.00		1.00										1.00		1.00	
Wind dir. red.	0.61		0.61										0.61		0.61	
Total reduction	0.13		0.15										0.16		0.13	
Total, real	84		1										82		24	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
Jennings O'Donovan
Finisklin Business Park
F91 RHH9 Sligo
+353719161416
Kathlyn Feeney / kfeeney@jodireland.com
Calculated:
09/06/2025 13:54/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Worst Case - V150 **Shadow receptor:** BO - 80

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January			February	March	April	May	June	July	August	September	October	November			December		
1	08:46		15:41 (9)	08:18	07:23	07:12	06:06	05:20	05:17	05:54	06:45	07:35	07:30			08:22		15:25 (9)
	16:32	15	15:56 (9)	17:20	18:13	20:08	21:00	21:47	22:01	21:28	20:25	19:14	17:07			16:26	27	15:52 (9)
2	08:46		15:41 (9)	08:16	07:21	07:09	06:04	05:19	05:17	05:55	06:46	07:36	07:31			08:23		15:26 (9)
	16:33	16	15:57 (9)	17:22	18:15	20:10	21:02	21:48	22:01	21:26	20:23	19:12	17:05			16:25	25	15:51 (9)
3	08:45		15:41 (9)	08:15	07:19	07:07	06:02	05:18	05:18	05:57	06:48	07:38	07:33			08:24		15:26 (9)
	16:34	17	15:58 (9)	17:24	18:17	20:11	21:03	21:49	22:00	21:25	20:20	19:10	17:04			16:25	24	15:50 (9)
4	08:45		15:42 (9)	08:13	07:17	07:05	06:00	05:17	05:19	05:59	06:50	07:40	07:35			08:26		15:27 (9)
	16:35	18	16:00 (9)	17:26	18:18	20:13	21:05	21:50	22:00	21:23	20:18	19:07	17:02			16:24	23	15:50 (9)
5	08:45		15:42 (9)	08:11	07:15	07:02	05:58	05:17	05:20	06:00	06:51	07:42	07:37			08:27		15:27 (9)
	16:36	19	16:01 (9)	17:28	18:20	20:15	21:07	21:51	21:59	21:21	20:16	19:05	17:00			16:24	22	15:49 (9)
6	08:44		15:42 (9)	08:10	07:12	07:00	05:56	05:16	05:20	06:02	06:53	07:43	07:39			08:28		15:28 (9)
	16:37	21	16:03 (9)	17:30	18:22	20:17	21:08	21:52	21:59	21:19	20:13	19:03	16:58			16:23	21	15:49 (9)
7	08:44		15:42 (9)	08:08	07:10	06:58	05:55	05:15	05:21	06:03	06:55	07:45	07:41			08:30		15:29 (9)
	16:39	22	16:04 (9)	17:32	18:24	20:18	21:10	21:53	21:58	21:18	20:11	19:01	16:56			16:23	19	15:48 (9)
8	08:44		15:42 (9)	08:06	07:08	06:56	05:53	05:15	05:22	06:05	06:56	07:47	07:42			08:31		15:29 (9)
	16:40	23	16:05 (9)	17:33	18:26	20:20	21:12	21:54	21:57	21:16	20:09	18:58	16:55			16:22	18	15:47 (9)
9	08:43		15:43 (9)	08:04	07:05	06:53	05:51	05:14	05:23	06:07	06:58	07:48	07:44			08:32		15:29 (9)
	16:41	24	16:07 (9)	17:35	18:27	20:22	21:13	21:55	21:57	21:14	20:06	18:56	16:53			16:22	17	15:46 (9)
10	08:43		15:43 (9)	08:02	07:03	06:51	05:49	05:14	05:24	06:08	07:00	07:50	07:46			08:33		15:31 (9)
	16:43	25	16:08 (9)	17:37	18:29	20:24	21:15	21:56	21:56	21:12	20:04	18:54	16:51			16:22	16	15:47 (9)
11	08:42		15:43 (9)	08:01	07:01	06:49	05:48	05:13	05:25	06:10	07:01	07:52	07:48			08:34		15:31 (9)
	16:44	27	16:10 (9)	17:39	18:31	20:25	21:17	21:56	21:55	21:10	20:02	18:51	16:50			16:22	16	15:47 (9)
12	08:41		15:43 (9)	07:59	06:59	06:46	05:46	05:13	05:26	06:12	07:03	07:54	07:50		15:32 (9)	08:35		15:32 (9)
	16:46	28	16:11 (9)	17:41	18:33	20:27	21:18	21:57	21:54	21:08	19:59	18:49	16:48	12	15:44 (9)	16:21	14	15:46 (9)
13	08:41		15:44 (9)	07:57	06:56	06:44	05:44	05:13	05:28	06:13	07:05	07:55	07:51		15:30 (9)	08:36		15:32 (9)
	16:47	29	16:13 (9)	17:43	18:35	20:29	21:20	21:58	21:53	21:06	19:57	18:47	16:47	17	15:47 (9)	16:21	14	15:46 (9)
14	08:40		15:45 (9)	07:55	06:54	06:42	05:43	05:12	05:29	06:15	07:06	07:57	07:53		15:28 (9)	08:37		15:33 (9)
	16:49	30	16:15 (9)	17:45	18:36	20:31	21:22	21:58	21:52	21:04	19:55	18:45	16:45	20	15:48 (9)	16:21	13	15:46 (9)
15	08:39		15:45 (9)	07:53	06:52	06:40	05:41	05:12	05:30	06:16	07:08	07:59	07:55		15:26 (9)	08:38		15:33 (9)
	16:50	32	16:17 (9)	17:47	18:38	20:32	21:23	21:59	21:51	21:02	19:52	18:42	16:44	23	15:49 (9)	16:21	13	15:46 (9)
16	08:38		15:45 (9)	07:51	06:49	06:37	05:39	05:12	05:31	06:18	07:10	08:01	07:57		15:25 (9)	08:39		15:34 (9)
	16:52	33	16:18 (9)	17:49	18:40	20:34	21:25	21:59	21:50	21:00	19:50	18:40	16:42	25	15:50 (9)	16:22	12	15:46 (9)
17	08:37		15:45 (9)	07:49	06:47	06:35	05:38	05:12	05:32	06:20	07:11	08:02	07:59		15:25 (9)	08:40		15:34 (9)
	16:54	34	16:19 (9)	17:51	18:42	20:36	21:26	22:00	21:49	20:58	19:48	18:38	16:41	26	15:51 (9)	16:22	12	15:46 (9)
18	08:36		15:46 (9)	07:47	06:45	06:33	05:36	05:12	05:34	06:21	07:13	08:04	08:00		15:24 (9)	08:41		15:35 (9)
	16:55	33	16:19 (9)	17:52	18:43	20:38	21:28	22:00	21:48	20:56	19:45	18:36	16:39	28	15:52 (9)	16:22	11	15:46 (9)
19	08:35		15:47 (9)	07:45	06:42	06:31	05:35	05:12	05:35	06:23	07:15	08:06	08:02		15:24 (9)	08:41		15:36 (9)
	16:57	32	16:19 (9)	17:54	18:45	20:39	21:29	22:01	21:47	20:54	19:43	18:34	16:38	29	15:53 (9)	16:22	11	15:47 (9)
20	08:34		15:48 (9)	07:43	06:40	06:29	05:33	05:12	05:36	06:25	07:16	08:08	08:04		15:24 (9)	08:42		15:36 (9)
	16:59	32	16:20 (9)	17:56	18:47	20:41	21:31	22:01	21:46	20:52	19:40	18:32	16:37	30	15:54 (9)	16:23	10	15:46 (9)
21	08:33		15:48 (9)	07:41	06:38	06:27	05:32	05:12	05:38	06:26	07:18	08:10	08:06		15:24 (9)	08:43		15:36 (9)
	17:00	31	16:19 (9)	17:58	18:49	20:43	21:32	22:01	21:45	20:49	19:38	18:29	16:36	31	15:55 (9)	16:23	11	15:47 (9)
22	08:32		15:49 (9)	07:39	06:35	06:24	05:31	05:13	05:39	06:28	07:20	08:11	08:07		15:24 (9)	08:43		15:37 (9)
	17:02	30	16:19 (9)	18:00	18:50	20:44	21:34	22:01	21:43	20:47	19:36	18:27	16:35	32	15:56 (9)	16:24	11	15:48 (9)
23	08:31		15:50 (9)	07:36	06:33	06:22	05:29	05:13	05:40	06:30	07:21	08:13	08:09		15:24 (9)	08:44		15:37 (9)
	17:04	29	16:19 (9)	18:02	18:52	20:46	21:35	22:02	21:42	20:45	19:33	18:25	16:33	32	15:56 (9)	16:24	11	15:48 (9)
24	08:29		15:50 (9)	07:34	06:31	06:20	05:28	05:13	05:42	06:31	07:23	08:15	08:11		15:23 (9)	08:44		15:38 (9)
	17:06	28	16:18 (9)	18:04	18:54	20:48	21:37	22:02	21:41	20:43	19:31	18:23	16:32	33	15:56 (9)	16:25	10	15:48 (9)
25	08:28		15:52 (9)	07:32	06:28	06:18	05:27	05:13	05:43	06:33	07:25	07:17	08:12		15:24 (9)	08:45		15:39 (9)
	17:07	26	16:18 (9)	18:05	18:56	20:50	21:38	22:02	21:39	20:41	19:29	17:21	16:31	33	15:57 (9)	16:25	11	15:50 (9)
26	08:27		15:52 (9)	07:30	06:26	06:16	05:26	05:14	05:45	06:35	07:26	07:19	08:14		15:24 (9)	08:45		15:39 (9)
	17:09	25	16:17 (9)	18:07	18:57	20:51	21:39	22:02	21:38	20:39	19:26	17:19	16:30	33	15:57 (9)	16:26	11	15:50 (9)
27	08:25		15:54 (9)	07:28	06:23	06:14	05:25	05:14	05:46	06:36	07:28	07:20	08:15		15:24 (9)	08:45		15:39 (9)
	17:11	23	16:17 (9)	18:09	18:59	20:53	21:41	22:02	21:36	20:36	19:24	17:17	16:29	32	15:56 (9)	16:27	12	15:51 (9)
28	08:24		15:56 (9)	07:26	06:21	06:12	05:24	05:15	05:48	06:38	07:30	07:22	08:17		15:24 (9)	08:45		15:39 (9)
	17:13	19	16:15 (9)	18:11	19:01	20:55	21:42	22:02	21:35	20:34	19:22	17:15	16:28	30	15:54 (9)	16:28	13	15:52 (9)
29	08:22		15:58 (9)		07:19	06:10	05:23	05:15	05:49	06:40	07:31	07:24	08:19		15:25 (9)	08:46		15:40 (9)
	17:15	17	16:15 (9)		20:03	20:57	21:43	22:01	21:33	20:32	19:19	17:13	16:28	29	15:54 (9)	16:28	13	15:53 (9)
30	08:21		16:01 (9)		07:16	06:08	05:22	05:16	05:51	06:41	07:33	07:26	08:20		15:25 (9)	08:46		15:40 (9)
	17:17	11	16:12 (9)		20:04	20:58	21:44	22:01	21:31	20:30	19:17	17:11	16:27	28	15:53 (9)	16:29	14	15:54 (9)
31	08:19				07:14		05:21		05:52	06:43		07:28				08:46		15:40 (9)
	17:18				20:06		21:46		21:30	20:27		17:09				16:30	15	15:55 (9)
Potential sun hours	257			277	367	417	487	502	504	455	381	331	264			241		
Total, worst case		749												523			470	
Sun reduction		0.22												0.26			0.22	
Oper. time red.		1.00												1.00			1.00	
Wind dir. red.		0.62												0.62			0.62	
Total reduction		0.13												0.16			0.13	
Total, real		100												84			63	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
Jennings O'Donovan
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Kathlyn Feeney / kfeeney@jodireland.com

SHADOW - Calendar

Calculation: 6839 Garrane WF Worst Case - V150 **Shadow receptor:** BP - 81

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January		February		March	April	May	June	July	August	September	October	November		December	
1	08:46	15:54 (8)	08:18	16:09 (9)	07:23	07:12	06:06	05:20	05:17	05:54	06:45	07:35	07:30		08:22	15:39 (8)
	16:32	2 15:56 (8)	17:20	20 16:29 (9)	18:13	20:08	21:00	21:47	22:01	21:28	20:25	19:14	17:07		16:26	13 15:52 (9)
2	08:46	15:54 (8)	08:16	16:11 (9)	07:21	07:09	06:04	05:19	05:17	05:55	06:46	07:36	07:31		08:23	15:39 (8)
	16:33	3 15:57 (8)	17:22	16 16:27 (9)	18:15	20:10	21:02	21:48	22:01	21:26	20:23	19:12	17:05		16:25	12 15:51 (9)
3	08:45	15:54 (8)	08:15	16:13 (9)	07:19	07:07	06:02	05:18	05:18	05:57	06:48	07:38	07:33		08:24	15:39 (8)
	16:34	4 15:58 (8)	17:24	11 16:24 (9)	18:17	20:11	21:03	21:49	22:00	21:25	20:20	19:10	17:04		16:25	11 15:50 (9)
4	08:45	15:55 (8)	08:13		07:17	07:05	06:00	05:17	05:19	05:59	06:50	07:40	07:35		08:26	15:40 (8)
	16:35	5 16:00 (9)	17:26		18:18	20:13	21:05	21:50	22:00	21:23	20:18	19:07	17:02		16:24	10 15:50 (9)
5	08:45	15:55 (8)	08:11		07:15	07:02	05:58	05:17	05:20	06:00	06:51	07:42	07:37		08:27	15:40 (8)
	16:36	6 16:01 (9)	17:28		18:20	20:15	21:07	21:51	21:59	21:21	20:16	19:05	17:00		16:24	9 15:49 (9)
6	08:44	15:55 (8)	08:10		07:12	07:00	05:56	05:16	05:20	06:02	06:53	07:43	07:39		08:28	15:42 (8)
	16:37	8 16:03 (9)	17:30		18:22	20:17	21:08	21:52	21:59	21:19	20:13	19:03	16:58		16:23	7 15:49 (9)
7	08:44	15:55 (8)	08:08		07:10	06:58	05:55	05:15	05:21	06:03	06:55	07:45	07:41		08:30	15:42 (8)
	16:39	9 16:04 (9)	17:32		18:24	20:18	21:10	21:53	21:58	21:18	20:11	19:01	16:56		16:23	6 15:48 (9)
8	08:44	15:55 (8)	08:06		07:08	06:56	05:53	05:15	05:22	06:05	06:56	07:47	07:42	15:43 (9)	08:31	15:42 (8)
	16:40	10 16:05 (9)	17:33		18:26	20:20	21:12	21:54	21:57	21:16	20:09	18:58	16:55	12 15:55 (9)	16:22	5 15:47 (9)
9	08:43	15:56 (8)	08:04		07:05	06:53	05:51	05:14	05:23	06:07	06:58	07:48	07:44	15:41 (9)	08:32	15:42 (8)
	16:41	11 16:07 (9)	17:35		18:27	20:22	21:13	21:55	21:57	21:14	20:06	18:56	16:53	17 15:58 (9)	16:22	4 15:46 (8)
10	08:43	15:56 (8)	08:02		07:03	06:51	05:49	05:14	05:24	06:08	07:00	07:50	07:46	15:40 (9)	08:33	15:44 (8)
	16:43	12 16:08 (9)	17:37		18:29	20:24	21:15	21:56	21:56	21:12	20:04	18:54	16:51	20 16:00 (9)	16:22	3 15:47 (8)
11	08:42	15:56 (8)	08:01		07:01	06:49	05:48	05:13	05:25	06:10	07:01	07:52	07:48	15:38 (9)	08:34	15:44 (8)
	16:44	14 16:10 (9)	17:39		18:31	20:25	21:17	21:56	21:55	21:10	20:02	18:51	16:50	23 16:01 (9)	16:22	3 15:47 (8)
12	08:41	15:57 (8)	07:59		06:59	06:46	05:46	05:13	05:26	06:12	07:03	07:54	07:50	15:37 (9)	08:35	15:45 (8)
	16:46	14 16:11 (9)	17:41		18:33	20:27	21:18	21:57	21:54	21:08	19:59	18:49	16:48	25 16:02 (9)	16:21	1 15:46 (8)
13	08:41	15:57 (8)	07:57		06:56	06:44	05:44	05:13	05:28	06:13	07:05	07:55	07:51	15:37 (9)	08:36	15:45 (8)
	16:47	16 16:13 (9)	17:43		18:35	20:29	21:20	21:58	21:53	21:06	19:57	18:47	16:47	26 16:03 (9)	16:21	1 15:46 (8)
14	08:40	15:58 (8)	07:55		06:54	06:42	05:43	05:12	05:29	06:15	07:06	07:57	07:53	15:36 (9)	08:37	
	16:49	17 16:15 (9)	17:45		18:36	20:31	21:22	21:58	21:52	21:04	19:55	18:45	16:45	28 16:04 (9)	16:21	
15	08:39	15:59 (9)	07:53		06:52	06:40	05:41	05:12	05:30	06:16	07:08	07:59	07:55	15:35 (9)	08:38	
	16:50	18 16:17 (9)	17:47		18:38	20:32	21:23	21:59	21:51	21:02	19:52	18:42	16:44	29 16:04 (9)	16:21	
16	08:38	15:58 (9)	07:51		06:49	06:37	05:39	05:12	05:31	06:18	07:10	08:01	07:57	15:35 (9)	08:39	
	16:52	20 16:18 (9)	17:49		18:40	20:34	21:25	21:59	21:50	21:00	19:50	18:40	16:42	30 16:05 (9)	16:22	
17	08:37	15:58 (9)	07:49		06:47	06:35	05:38	05:12	05:32	06:20	07:11	08:02	07:59	15:34 (9)	08:40	
	16:54	22 16:20 (9)	17:51		18:42	20:36	21:26	22:00	21:49	20:58	19:48	18:38	16:41	31 16:05 (9)	16:22	
18	08:36	15:59 (9)	07:47		06:45	06:33	05:36	05:12	05:34	06:21	07:13	08:04	08:00	15:35 (9)	08:41	
	16:55	23 16:22 (9)	17:52		18:43	20:38	21:28	22:00	21:48	20:56	19:45	18:36	16:39	31 16:06 (9)	16:22	
19	08:35	15:59 (9)	07:45		06:42	06:31	05:35	05:12	05:35	06:23	07:15	08:06	08:02	15:35 (9)	08:41	
	16:57	25 16:24 (9)	17:54		18:45	20:39	21:29	22:01	21:47	20:54	19:43	18:34	16:38	31 16:06 (9)	16:22	
20	08:34	16:00 (9)	07:43		06:40	06:29	05:33	05:12	05:36	06:25	07:16	08:08	08:04	15:35 (9)	08:42	
	16:59	26 16:26 (9)	17:56		18:47	20:41	21:31	22:01	21:46	20:52	19:40	18:32	16:37	29 16:04 (9)	16:23	
21	08:33	15:59 (9)	07:41		06:38	06:27	05:32	05:12	05:38	06:26	07:18	08:10	08:06	15:35 (9)	08:43	
	17:00	28 16:27 (9)	17:58		18:49	20:43	21:32	22:01	21:45	20:49	19:38	18:29	16:36	28 16:03 (9)	16:23	
22	08:32	16:00 (9)	07:39		06:35	06:24	05:31	05:13	05:39	06:28	07:20	08:11	08:07	15:36 (9)	08:43	
	17:02	29 16:29 (9)	18:00		18:50	20:44	21:34	22:01	21:43	20:47	19:36	18:27	16:35	26 16:02 (9)	16:24	
23	08:31	16:01 (9)	07:36		06:33	06:22	05:29	05:13	05:40	06:30	07:21	08:13	08:09	15:36 (9)	08:44	
	17:04	31 16:32 (9)	18:02		18:52	20:46	21:35	22:02	21:42	20:45	19:33	18:25	16:33	25 16:01 (9)	16:24	
24	08:29	16:01 (9)	07:34		06:31	06:20	05:28	05:13	05:42	06:31	07:23	08:15	08:11	15:36 (9)	08:44	
	17:06	31 16:32 (9)	18:04		18:54	20:48	21:37	22:02	21:40	20:43	19:31	18:23	16:32	23 15:59 (9)	16:25	
25	08:28	16:02 (9)	07:32		06:28	06:18	05:27	05:13	05:43	06:33	07:25	07:17	08:12	15:36 (9)	08:45	
	17:07	30 16:32 (9)	18:05		18:56	20:50	21:38	22:02	21:39	20:41	19:29	17:21	16:31	22 15:58 (9)	16:25	
26	08:27	16:02 (9)	07:30		06:26	06:16	05:26	05:14	05:45	06:35	07:26	07:19	08:14	15:37 (9)	08:45	
	17:09	30 16:32 (9)	18:07		18:57	20:51	21:39	22:02	21:38	20:39	19:26	17:19	16:30	20 15:57 (9)	16:26	
27	08:25	16:03 (9)	07:28		06:23	06:14	05:25	05:14	05:46	06:36	07:28	07:20	08:15	15:38 (9)	08:45	
	17:11	29 16:32 (9)	18:09		18:59	20:53	21:41	22:02	21:36	20:36	19:24	17:17	16:29	18 15:56 (9)	16:27	
28	08:24	16:03 (9)	07:26		06:21	06:12	05:24	05:15	05:48	06:38	07:30	07:22	08:17	15:38 (9)	08:45	
	17:13	28 16:31 (9)	18:11		19:01	20:55	21:42	22:02	21:35	20:34	19:22	17:15	16:28	16 15:54 (9)	16:28	
29	08:22	16:05 (9)			07:19	06:10	05:23	05:15	05:49	06:40	07:31	07:24	08:19	15:38 (8)	08:46	
	17:15	26 16:31 (9)			20:03	20:57	21:43	22:01	21:33	20:32	19:19	17:13	16:28	16 15:54 (9)	16:28	
30	08:21	16:06 (9)			07:16	06:08	05:22	05:16	05:51	06:41	07:33	07:26	08:20	15:39 (8)	08:46	15:53 (8)
	17:17	24 16:30 (9)			20:04	20:58	21:44	22:01	21:31	20:30	19:17	17:11	16:27	14 15:53 (9)	16:29	1 15:54 (8)
31	08:19	16:07 (9)			07:14		05:21		05:52	06:43		07:28			08:46	15:54 (8)
	17:18	22 16:29 (9)			20:06		21:46		21:30	20:27		17:09			16:30	1 15:55 (8)
Potential sun hours	257		277		367	417	487	502	504	455	381	331	264		241	
Total, worst case	573		47										540		87	
Sun reduction	0.22		0.24										0.26		0.22	
Oper. time red.	1.00		1.00										1.00		1.00	
Wind dir. red.	0.61		0.61										0.61		0.61	
Total reduction	0.13		0.15										0.16		0.13	
Total, real	76		7										86		12	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
Jennings O'Donovan
Finisklin Business Park
F91 RHH9 Sligo
+353719161416
Kathlyn Feeney / kfeeney@jodireland.com

Calculated:
09/06/2025 13:54/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Worst Case - V150 **Shadow receptor:** BQ - 82

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January		February		March	April	May	June	July	August	September	October	November		December	
1	08:46		08:18	16:10 (9)	07:23	07:12	06:06	05:20	05:17	05:54	06:45	07:35	07:30		08:22	15:43 (8)
	16:32		17:20	27 16:37 (9)	18:13	20:08	21:00	21:47	22:01	21:28	20:25	19:14	17:07		16:26	9 15:52 (9)
2	08:46		08:16	16:11 (9)	07:21	07:09	06:04	05:19	05:17	05:55	06:46	07:36	07:31		08:23	15:44 (8)
	16:33		17:22	25 16:36 (9)	18:15	20:10	21:02	21:48	22:01	21:26	20:23	19:12	17:05		16:25	7 15:51 (9)
3	08:45		08:15	16:12 (9)	07:19	07:07	06:02	05:18	05:18	05:57	06:48	07:38	07:33		08:24	15:44 (8)
	16:34		17:24	23 16:35 (9)	18:17	20:11	21:03	21:49	22:00	21:25	20:20	19:10	17:04		16:25	6 15:50 (9)
4	08:45		08:13	16:14 (9)	07:17	07:05	06:00	05:17	05:19	05:59	06:50	07:40	07:35		08:26	15:45 (8)
	16:35		17:26	20 16:34 (9)	18:18	20:13	21:05	21:50	22:00	21:23	20:18	19:07	17:02		16:24	5 15:50 (8)
5	08:45	16:00 (8)	08:11	16:16 (9)	07:15	07:02	05:58	05:17	05:20	06:00	06:51	07:42	07:37	15:48 (9)	08:27	15:45 (8)
	16:36	1 16:01 (8)	17:28	16 16:32 (9)	18:20	20:15	21:07	21:51	21:59	21:21	20:16	19:05	17:00	12 16:00 (9)	16:24	4 15:49 (8)
6	08:44	16:00 (8)	08:10	16:19 (9)	07:12	07:00	05:56	05:16	05:20	06:02	06:53	07:43	07:39	15:46 (9)	08:28	15:46 (8)
	16:37	3 16:03 (8)	17:30	11 16:30 (9)	18:22	20:17	21:08	21:52	21:59	21:19	20:13	19:03	16:58	17 16:03 (9)	16:23	3 15:49 (8)
7	08:44	16:00 (8)	08:08		07:10	06:58	05:55	05:15	05:21	06:03	06:55	07:45	07:41	15:44 (9)	08:30	15:47 (8)
	16:39	4 16:04 (8)	17:32		18:24	20:18	21:10	21:53	21:58	21:18	20:11	19:01	16:56	21 16:05 (9)	16:23	1 15:48 (8)
8	08:44	16:00 (8)	08:06		07:08	06:56	05:53	05:15	05:22	06:05	06:56	07:47	07:42	15:43 (9)	08:31	
	16:40	5 16:05 (8)	17:33		18:26	20:20	21:12	21:54	21:57	21:16	20:09	18:58	16:55	23 16:06 (9)	16:22	
9	08:43	16:01 (8)	08:04		07:05	06:53	05:51	05:14	05:23	06:07	06:58	07:48	07:44	15:42 (9)	08:32	
	16:41	6 16:07 (9)	17:35		18:27	20:22	21:13	21:55	21:57	21:14	20:06	18:56	16:53	25 16:07 (9)	16:22	
10	08:43	16:01 (8)	08:02		07:03	06:51	05:49	05:14	05:24	06:08	07:00	07:50	07:46	15:41 (9)	08:33	
	16:43	7 16:08 (9)	17:37		18:29	20:24	21:15	21:56	21:56	21:12	20:04	18:54	16:51	27 16:08 (9)	16:22	
11	08:42	16:01 (8)	08:01		07:01	06:49	05:48	05:13	05:25	06:10	07:01	07:52	07:48	15:41 (9)	08:34	
	16:44	9 16:10 (9)	17:39		18:31	20:25	21:17	21:56	21:55	21:10	20:02	18:51	16:50	28 16:09 (9)	16:22	
12	08:41	16:01 (8)	07:59		06:59	06:46	05:46	05:13	05:26	06:12	07:03	07:54	07:50	15:40 (9)	08:35	
	16:46	10 16:11 (9)	17:41		18:33	20:27	21:18	21:57	21:54	21:08	19:59	18:49	16:48	30 16:10 (9)	16:21	
13	08:41	16:01 (8)	07:57		06:56	06:44	05:44	05:13	05:28	06:13	07:05	07:55	07:51	15:40 (9)	08:36	
	16:47	12 16:13 (9)	17:43		18:35	20:29	21:20	21:58	21:53	21:06	19:57	18:47	16:47	30 16:10 (9)	16:21	
14	08:40	16:02 (8)	07:55		06:54	06:42	05:43	05:12	05:29	06:15	07:06	07:57	07:53	15:40 (9)	08:37	
	16:49	13 16:15 (9)	17:45		18:36	20:31	21:22	21:58	21:52	21:04	19:55	18:45	16:45	31 16:11 (9)	16:21	
15	08:39	16:03 (8)	07:53		06:52	06:40	05:41	05:12	05:30	06:16	07:08	07:59	07:55	15:39 (9)	08:38	
	16:50	14 16:17 (9)	17:47		18:38	20:32	21:23	21:59	21:51	21:02	19:52	18:42	16:44	31 16:10 (9)	16:21	
16	08:38	16:02 (8)	07:51		06:49	06:37	05:39	05:12	05:31	06:18	07:10	08:01	07:57	15:39 (9)	08:39	
	16:52	16 16:18 (9)	17:49		18:40	20:34	21:25	21:59	21:50	21:00	19:50	18:40	16:42	31 16:10 (9)	16:22	
17	08:37	16:03 (8)	07:49		06:47	06:35	05:38	05:12	05:32	06:20	07:11	08:02	07:59	15:39 (9)	08:40	
	16:54	17 16:20 (9)	17:51		18:42	20:36	21:26	22:00	21:49	20:58	19:48	18:38	16:41	30 16:09 (9)	16:22	
18	08:36	16:03 (8)	07:47		06:45	06:33	05:36	05:12	05:34	06:21	07:13	08:04	08:00	15:39 (9)	08:41	
	16:55	19 16:22 (9)	17:52		18:43	20:38	21:28	22:00	21:48	20:56	19:45	18:36	16:39	28 16:07 (9)	16:22	
19	08:35	16:04 (8)	07:45		06:42	06:31	05:35	05:12	05:35	06:23	07:15	08:06	08:02	15:39 (9)	08:41	
	16:57	20 16:24 (9)	17:54		18:45	20:39	21:29	22:01	21:47	20:54	19:43	18:34	16:38	27 16:06 (9)	16:22	
20	08:34	16:05 (9)	07:43		06:40	06:29	05:33	05:12	05:36	06:25	07:16	08:08	08:04	15:40 (9)	08:42	
	16:59	21 16:26 (9)	17:56		18:47	20:41	21:31	22:01	21:46	20:52	19:40	18:32	16:37	24 16:04 (9)	16:23	
21	08:33	16:04 (9)	07:41		06:38	06:27	05:32	05:12	05:38	06:26	07:18	08:10	08:06	15:40 (9)	08:43	
	17:00	23 16:27 (9)	17:58		18:49	20:43	21:32	22:01	21:45	20:49	19:38	18:29	16:36	23 16:03 (9)	16:23	
22	08:32	16:05 (9)	07:39		06:35	06:24	05:31	05:13	05:39	06:28	07:20	08:11	08:07	15:41 (9)	08:43	
	17:02	24 16:29 (9)	18:00		18:50	20:44	21:34	22:01	21:43	20:47	19:36	18:27	16:35	21 16:02 (9)	16:24	
23	08:31	16:05 (9)	07:36		06:33	06:22	05:29	05:13	05:40	06:30	07:21	08:13	08:09	15:41 (8)	08:44	
	17:04	27 16:32 (9)	18:02		18:52	20:46	21:35	22:02	21:42	20:45	19:33	18:25	16:33	20 16:01 (9)	16:24	
24	08:29	16:05 (9)	07:34		06:31	06:20	05:28	05:13	05:42	06:31	07:23	08:15	08:11	15:40 (8)	08:44	
	17:06	28 16:33 (9)	18:04		18:54	20:48	21:37	22:02	21:40	20:43	19:31	18:23	16:32	19 15:59 (9)	16:25	
25	08:28	16:06 (9)	07:32		06:28	06:18	05:27	05:13	05:43	06:33	07:25	07:17	08:12	15:41 (8)	08:45	
	17:07	30 16:36 (9)	18:05		18:56	20:50	21:38	22:02	21:39	20:41	19:29	17:21	16:31	17 15:58 (9)	16:25	
26	08:27	16:06 (9)	07:30		06:26	06:16	05:26	05:14	05:45	06:35	07:26	07:19	08:14	15:41 (8)	08:45	
	17:09	31 16:37 (9)	18:07		18:57	20:51	21:39	22:02	21:38	20:39	19:26	17:19	16:30	16 15:57 (9)	16:26	
27	08:25	16:07 (9)	07:28		06:23	06:14	05:25	05:14	05:46	06:36	07:28	07:20	08:15	15:42 (8)	08:45	
	17:11	32 16:39 (9)	18:09		18:59	20:53	21:41	22:02	21:36	20:36	19:24	17:17	16:29	14 15:56 (9)	16:27	
28	08:24	16:07 (9)	07:26		06:21	06:12	05:24	05:15	05:48	06:38	07:30	07:22	08:17	15:41 (8)	08:45	
	17:13	31 16:38 (9)	18:11		19:01	20:55	21:42	22:02	21:35	20:34	19:22	17:15	16:28	13 15:54 (9)	16:28	
29	08:22	16:08 (9)			07:19	06:10	05:23	05:15	05:49	06:40	07:31	07:24	08:19	15:42 (8)	08:46	
	17:15	30 16:38 (9)			20:03	20:57	21:43	22:01	21:33	20:32	19:19	17:13	16:28	12 15:54 (9)	16:28	
30	08:21	16:08 (9)			07:16	06:08	05:22	05:16	05:51	06:41	07:33	07:26	08:20	15:43 (8)	08:46	
	17:17	30 16:38 (9)			20:04	20:58	21:44	22:01	21:31	20:30	19:17	17:11	16:27	10 15:53 (9)	16:29	
31	08:19	16:09 (9)			07:14		05:21		05:52	06:43		07:28			08:46	
	17:18	28 16:37 (9)			20:06		21:46		21:30	20:27		17:09			16:30	
Potential sun hours	257		277		367	417	487	502	504	455	381	331	264		241	
Total, worst case		491		122										580		35
Sun reduction		0.22		0.24										0.26		0.22
Oper. time red.		1.00		1.00										1.00		1.00
Wind dir. red.		0.61		0.61										0.61		0.61
Total reduction		0.13		0.15										0.16		0.13
Total, real		65		18										92		5

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
Jennings O'Donovan
Finisklin Business Park
F91 RHH9 Sligo
+353719161416
Kathlyn Feeney / kfeeney@jodireland.com

Calculated:
09/06/2025 13:54/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Worst Case - V150 **Shadow receptor:** BR - 83

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January		February		March		April		May		June	
1	08:46		15:47 (1)	08:18		07:23		17:37 (3)	07:12		19:24 (5)	06:06		20:27 (7)	05:20
	16:32	9	15:56 (1)	17:20		18:13	9	17:46 (3)	20:08	18	19:42 (5)	21:00	4	20:31 (7)	21:47
2	08:45		15:47 (1)	08:16	16:51 (2)	07:21		17:37 (3)	07:09		19:24 (5)	06:04		20:26 (7)	05:19
	16:33	10	15:57 (1)	17:22	1 16:52 (2)	18:15	11	17:48 (3)	20:10	19	19:43 (5)	21:02	7	20:33 (7)	21:48
3	08:45		15:48 (1)	08:15	16:50 (2)	07:19		17:37 (3)	07:07		19:24 (5)	06:02		20:25 (7)	05:18
	16:34	10	15:58 (1)	17:24	4 16:54 (2)	18:17	13	17:50 (3)	20:11	21	19:45 (5)	21:03	9	20:34 (7)	21:49
4	08:45		15:49 (1)	08:13	16:50 (2)	07:17		17:36 (3)	07:05		19:25 (5)	06:00		20:24 (7)	05:17
	16:35	11	16:00 (1)	17:26	6 16:56 (2)	18:18	16	17:52 (3)	20:13	22	19:47 (6)	21:05	12	20:36 (7)	21:50
5	08:45		15:48 (1)	08:11	16:49 (2)	07:15		17:37 (3)	07:02		19:26 (5)	05:58		20:23 (7)	05:17
	16:36	13	16:01 (1)	17:28	9 16:58 (2)	18:20	17	17:54 (3)	20:15	22	19:48 (6)	21:07	14	20:37 (7)	21:51
6	08:44		15:49 (1)	08:10	16:48 (2)	07:12		17:37 (3)	07:00		19:27 (5)	05:56		20:24 (7)	05:16
	16:37	14	16:03 (1)	17:30	11 16:59 (2)	18:22	19	17:56 (3)	20:17	23	19:50 (6)	21:08	15	20:39 (7)	21:52
7	08:44		15:49 (1)	08:08	16:49 (2)	07:10		17:37 (3)	06:58		19:30 (5)	05:55		20:23 (7)	05:15
	16:39	15	16:04 (1)	17:32	13 17:02 (2)	18:24	20	17:57 (3)	20:18	22	19:52 (6)	21:10	17	20:40 (7)	21:53
8	08:44		15:49 (1)	08:06	16:49 (2)	07:08		17:39 (3)	06:56		19:37 (6)	05:53		20:23 (7)	05:15
	16:40	16	16:05 (1)	17:33	15 17:04 (2)	18:26	20	17:59 (4)	20:20	17	19:54 (6)	21:12	19	20:42 (7)	21:54
9	08:43		15:50 (1)	08:04	16:49 (2)	07:05		17:41 (3)	06:53		19:35 (6)	05:51		20:23 (7)	05:14
	16:41	17	16:07 (1)	17:35	17 17:06 (2)	18:27	21	18:02 (4)	20:22	20	19:55 (6)	21:13	21	20:44 (7)	21:55
10	08:42		15:50 (1)	08:02	16:49 (2)	07:03		17:43 (3)	06:51		19:35 (6)	05:49		20:23 (7)	05:14
	16:43	18	16:08 (1)	17:37	19 17:08 (2)	18:29	20	18:03 (4)	20:24	22	19:57 (6)	21:15	22	20:45 (7)	21:55
11	08:42		15:51 (1)	08:01	16:49 (2)	07:01		17:50 (4)	06:49		19:34 (6)	05:48		20:24 (7)	05:13
	16:44	19	16:10 (1)	17:39	21 17:10 (2)	18:31	15	18:05 (4)	20:25	25	19:59 (6)	21:17	23	20:47 (7)	21:56
12	08:41		15:51 (1)	07:59	16:49 (2)	06:59		17:49 (4)	06:46		19:34 (6)	05:46		20:23 (7)	05:13
	16:46	20	16:11 (1)	17:41	24 17:13 (2)	18:33	18	18:07 (4)	20:27	27	20:01 (6)	21:18	25	20:48 (7)	21:57
13	08:40		15:51 (1)	07:57	16:50 (2)	06:56		17:48 (4)	06:44		19:33 (6)	05:44		20:23 (7)	05:13
	16:47	22	16:13 (1)	17:43	24 17:14 (2)	18:35	20	18:08 (4)	20:29	28	20:01 (6)	21:20	26	20:49 (7)	21:58
14	08:40		15:52 (1)	07:55	16:51 (2)	06:54		17:48 (4)	06:42		19:34 (6)	05:43		20:24 (7)	05:13
	16:49	22	16:14 (1)	17:45	23 17:14 (2)	18:36	22	18:10 (4)	20:31	29	20:03 (6)	21:21	27	20:51 (9)	21:58
15	08:39		15:52 (1)	07:53	16:52 (2)	06:52		17:48 (4)	06:40		19:34 (6)	05:41		20:25 (7)	05:12
	16:50	24	16:16 (1)	17:47	21 17:13 (2)	18:38	25	18:13 (4)	20:32	31	20:05 (6)	21:23	28	20:53 (9)	21:59
16	08:38		15:53 (1)	07:51	16:53 (2)	06:49		17:48 (4)	06:37		19:34 (6)	05:39		20:25 (7)	05:12
	16:52	25	16:18 (1)	17:49	19 17:12 (2)	18:40	26	18:14 (4)	20:34	30	20:04 (6)	21:25	29	20:54 (9)	21:59
17	08:37		15:54 (1)	07:49	16:55 (2)	06:47		17:48 (4)	06:35		19:35 (6)	05:38		20:26 (7)	05:12
	16:54	24	16:18 (1)	17:51	15 17:10 (2)	18:42	28	18:16 (4)	20:36	30	20:09 (8)	21:26	29	20:55 (9)	22:00
18	08:36		15:55 (1)	07:47	16:57 (2)	06:45		17:49 (4)	06:33		19:36 (6)	05:36		20:27 (7)	05:12
	16:55	23	16:18 (1)	17:52	9 17:06 (2)	18:43	27	18:16 (4)	20:37	30	20:10 (8)	21:28	29	20:56 (9)	22:00
19	08:35		15:56 (1)	07:45		06:42		17:49 (4)	06:31		19:37 (6)	05:35		20:28 (7)	05:12
	16:57	22	16:18 (1)	17:54		18:45	25	18:14 (4)	20:39	30	20:12 (8)	21:29	30	20:58 (9)	22:01
20	08:34		15:57 (1)	07:43		06:40		17:50 (4)	06:29		19:37 (6)	05:34		20:29 (7)	05:12
	16:59	21	16:18 (1)	17:56		18:47	23	18:13 (4)	20:41	29	20:13 (8)	21:31	30	20:59 (9)	22:01
21	08:33		15:57 (1)	07:41		06:38		17:52 (4)	06:27		19:39 (6)	05:32		20:31 (7)	05:12
	17:00	20	16:17 (1)	17:58		18:49	20	18:12 (4)	20:43	28	20:15 (8)	21:32	30	21:01 (9)	22:01
22	08:32		15:59 (1)	07:39		06:35		17:53 (4)	06:24		19:41 (6)	05:31		20:32 (7)	05:13
	17:02	17	16:16 (1)	18:00		18:50	16	18:09 (4)	20:44	24	20:16 (8)	21:34	28	21:01 (9)	22:01
23	08:30		16:01 (1)	07:36		06:33		17:56 (4)	06:22		19:47 (6)	05:29		20:44 (9)	05:13
	17:04	15	16:16 (1)	18:02		18:52	10	18:06 (4)	20:46	14	20:18 (8)	21:35	17	21:01 (9)	22:01
24	08:29		16:03 (1)	07:34		06:30			06:20		20:06 (8)	05:28		20:45 (9)	05:13
	17:06	11	16:14 (1)	18:04		18:54			20:48	14	20:20 (8)	21:36	15	21:00 (9)	22:02
25	08:28		16:06 (1)	07:32		06:28			06:18		20:07 (8)	05:27		20:46 (9)	05:13
	17:07	5	16:11 (1)	18:05		18:56			20:50	14	20:21 (8)	21:38	13	20:59 (9)	22:02
26	08:27			07:30		06:26		18:28 (5)	06:16		20:08 (8)	05:26		20:47 (9)	05:14
	17:09			18:07		18:57	4	18:32 (5)	20:51	11	20:19 (8)	21:39	11	20:58 (9)	22:02
27	08:25			07:28	17:39 (3)	06:23		18:26 (5)	06:14		20:11 (8)	05:25		20:49 (9)	05:14
	17:11			18:09	4 17:43 (3)	18:59	7	18:33 (5)	20:53	5	20:16 (8)	21:40	8	20:57 (9)	22:02
28	08:24			07:26	17:39 (3)	06:21		18:26 (5)	06:12			05:24		20:52 (9)	05:15
	17:13			18:11	6 17:45 (3)	19:01	9	18:35 (5)	20:55			21:42	2	20:54 (9)	22:01
29	08:22					07:19		19:25 (5)	06:10			05:23			05:15
	17:15					20:03	12	19:37 (5)	20:56			21:43			22:01
30	08:21					07:16		19:24 (5)	06:08		20:29 (7)	05:22			05:16
	17:17					20:04	14	19:38 (5)	20:58	1	20:30 (7)	21:44			22:01
31	08:19					07:14		19:24 (5)				05:21			
	17:18					20:06	16	19:40 (5)				21:45			
Potential sun hours	257		277		367		417		487		501	
Total, worst case		423		261		503		606		540		
Sun reduction		0.22		0.24		0.28		0.38		0.39		
Oper. time red.		1.00		1.00		1.00		1.00		1.00		
Wind dir. red.		0.62		0.60		0.60		0.61		0.63		
Total reduction		0.13		0.15		0.17		0.23		0.25		
Total, real		57		38		84		140		135		

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
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+353719161416
Kathlyn Feeney / kfeeney@jodireland.com

SHADOW - Calendar

Calculation: 6839 Garrane WF Worst Case - V150 **Shadow receptor:** BR - 83

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	July		August		September		October		November		December		
1	05:17		05:54		20:34 (7)	06:45	19:33 (6)	07:35	18:28 (4)	07:30	16:18 (2)	08:21	15:33 (1)
	22:01		21:28	24	20:58 (7)	20:25 25	19:58 (6)	19:14 19	18:47 (4)	17:07 20	16:38 (2)	16:26 19	15:52 (1)
2	05:17		05:55		20:33 (7)	06:46	19:34 (6)	07:36	18:28 (4)	07:31	16:18 (2)	08:23	15:33 (1)
	22:00		21:26	23	20:56 (7)	20:23 22	19:56 (6)	19:12 17	18:45 (4)	17:05 18	16:36 (2)	16:25 19	15:52 (1)
3	05:18		05:57		20:33 (7)	06:48	19:33 (6)	07:38	18:28 (4)	07:33	16:18 (2)	08:24	15:33 (1)
	22:00		21:25	22	20:55 (7)	20:20 20	19:53 (6)	19:10 14	18:42 (4)	17:04 16	16:34 (2)	16:25 17	15:50 (1)
4	05:19		05:59		20:33 (7)	06:50	19:34 (6)	07:40	18:19 (3)	07:35	16:19 (2)	08:26	15:34 (1)
	22:00		21:23	20	20:53 (7)	20:18 17	19:51 (6)	19:07 21	18:40 (4)	17:02 13	16:32 (2)	16:24 16	15:50 (1)
5	05:20		06:00		20:33 (7)	06:51	19:26 (5)	07:42	18:17 (3)	07:37	16:19 (2)	08:27	15:34 (1)
	21:59		21:21	18	20:51 (7)	20:16 22	19:48 (6)	19:05 20	18:37 (4)	17:00 11	16:30 (2)	16:24 15	15:49 (1)
6	05:20		06:02		20:33 (7)	06:53	19:24 (5)	07:43	18:15 (3)	07:39	16:20 (2)	08:28	15:34 (1)
	21:59		21:19	16	20:49 (7)	20:13 22	19:46 (6)	19:03 20	18:35 (4)	16:58 8	16:28 (2)	16:23 14	15:48 (1)
7	05:21		06:03		20:33 (7)	06:55	19:22 (5)	07:45	18:13 (3)	07:41	16:20 (2)	08:30	15:36 (1)
	21:58		21:17	15	20:48 (7)	20:11 22	19:44 (6)	19:01 19	18:32 (3)	16:56 6	16:26 (2)	16:23 12	15:48 (1)
8	05:22		06:05		20:33 (7)	06:56	19:20 (5)	07:47	18:12 (3)	07:42	16:21 (2)	08:31	15:36 (1)
	21:57		21:16	13	20:46 (7)	20:09 21	19:41 (6)	18:58 18	18:30 (3)	16:55 3	16:24 (2)	16:22 11	15:47 (1)
9	05:23		06:07		20:34 (7)	06:58	19:19 (5)	07:48	18:12 (3)	07:44	16:22 (2)	08:32	15:36 (1)
	21:57		21:14	11	20:45 (7)	20:06 21	19:40 (5)	18:56 16	18:28 (3)	16:53 1	16:23 (2)	16:22 11	15:47 (1)
10	05:24		06:08		20:34 (7)	07:00	19:17 (5)	07:50	18:11 (3)	07:46		08:33	15:37 (1)
	21:56		21:12	8	20:42 (7)	20:04 20	19:37 (5)	18:54 15	18:26 (3)	16:51		16:22 10	15:47 (1)
11	05:25		06:10		20:35 (7)	07:01	19:17 (5)	07:52	18:11 (3)	07:48		08:34	15:38 (1)
	21:55		21:10	6	20:41 (7)	20:02 18	19:35 (5)	18:51 13	18:24 (3)	16:50		16:22 9	15:47 (1)
12	05:26		06:12		20:36 (7)	07:03	19:16 (5)	07:54	18:10 (3)	07:50		08:35	15:38 (1)
	21:54		21:08	3	20:39 (7)	19:59 17	19:33 (5)	18:49 10	18:20 (3)	16:48		16:22 8	15:46 (1)
13	05:28		06:13			07:05	19:15 (5)	07:55	18:11 (3)	07:51		08:36	15:39 (1)
	21:53		21:06			19:57 15	19:30 (5)	18:47 7	18:18 (3)	16:47		16:21 7	15:46 (1)
14	05:29		06:15			07:06	19:16 (5)	07:57	18:11 (3)	07:53		08:37	15:39 (1)
	21:52		21:04			19:55 12	19:28 (5)	18:45 5	18:16 (3)	16:45		16:21 7	15:46 (1)
15	05:30		06:16			07:08	19:15 (5)	07:59	18:12 (3)	07:55		08:38	15:40 (1)
	21:51		21:02			19:52 10	19:25 (5)	18:42 2	18:14 (3)	16:44		16:22 6	15:46 (1)
16	05:31		20:59 (9)	06:18		20:18 (8)	07:10	19:16 (5)	08:01		07:57		08:39	15:41 (1)
	21:50	6	21:05 (9)	21:00	7	20:25 (8)	19:50 7	19:23 (5)	18:40		16:42		16:22 5	15:46 (1)
17	05:32		20:58 (9)	06:20		20:14 (8)	07:11	19:17 (5)	08:02		07:59	15:39 (1)	08:40	15:41 (1)
	21:49	9	21:07 (9)	20:58	12	20:26 (8)	19:48 4	19:21 (5)	18:38		16:41 5	15:44 (1)	16:22 5	15:46 (1)
18	05:34		20:56 (9)	06:21		20:13 (8)	07:13	19:17 (5)	08:04		08:00	15:37 (1)	08:41	15:41 (1)
	21:48	12	21:08 (9)	20:56	15	20:28 (8)	19:45 1	19:18 (5)	18:36		16:40 11	15:48 (1)	16:22 5	15:46 (1)
19	05:35		20:55 (9)	06:23		20:11 (8)	07:15		08:06		08:02	15:35 (1)	08:41	15:42 (1)
	21:47	14	21:09 (9)	20:54	14	20:25 (8)	19:43		18:34		16:38 15	15:50 (1)	16:22 5	15:47 (1)
20	05:36		20:55 (9)	06:25		19:50 (6)	07:16	18:44 (4)	08:08		08:04	15:34 (1)	08:42	15:42 (1)
	21:46	16	21:11 (9)	20:51	18	20:23 (8)	19:40 7	18:51 (4)	18:32		16:37 17	15:51 (1)	16:23 4	15:46 (1)
21	05:38		20:44 (7)	06:26		19:46 (6)	07:18	18:39 (4)	08:10		08:05	15:33 (1)	08:43	15:43 (1)
	21:44	24	21:11 (9)	20:49	25	20:22 (8)	19:38 15	18:54 (4)	18:29		16:36 20	15:53 (1)	16:23 4	15:47 (1)
22	05:39		20:42 (7)	06:28		19:43 (6)	07:20	18:37 (4)	08:11		08:07	15:33 (1)	08:43	15:43 (1)
	21:43	29	21:11 (9)	20:47	29	20:19 (8)	19:36 19	18:56 (4)	18:27		16:35 21	15:54 (1)	16:24 4	15:47 (1)
23	05:40		20:40 (7)	06:30		19:42 (6)	07:21	18:35 (4)	08:13		08:09	15:32 (1)	08:44	15:44 (1)
	21:42	30	21:10 (9)	20:45	28	20:17 (8)	19:33 22	18:57 (4)	18:25		16:33 22	15:54 (1)	16:24 4	15:48 (1)
24	05:42		20:39 (7)	06:31		19:39 (6)	07:23	18:33 (4)	08:15		17:26 (2) 08:10		15:32 (1)	08:44	15:44 (1)
	21:40	30	21:09 (9)	20:43	31	20:15 (8)	19:31 24	18:57 (4)	18:23 12		17:38 (2) 16:32 23		15:55 (1)	16:25 5	15:49 (1)
25	05:43		20:38 (7)	06:33		19:38 (6)	07:25	18:32 (4)	07:17		16:24 (2) 08:12		15:32 (1)	08:44	15:44 (1)
	21:39	30	21:08 (9)	20:41	31	20:13 (8)	19:29 26	18:58 (4)	17:21 16		16:40 (2) 16:31 24		15:56 (1)	16:25 5	15:49 (1)
26	05:45		20:37 (7)	06:35		19:37 (6)	07:26	18:31 (4)	07:19		16:22 (2) 08:14		15:32 (1)	08:45	15:45 (1)
	21:38	29	21:06 (9)	20:38	29	20:10 (8)	19:26 28	18:59 (4)	17:19 19		16:41 (2) 16:30 25		15:57 (1)	16:26 6	15:51 (1)
27	05:46		20:36 (7)	06:36		19:36 (6)	07:28	18:29 (4)	07:20		16:21 (2) 08:15		15:32 (1)	08:45	15:46 (1)
	21:36	29	21:05 (9)	20:36	30	20:06 (6)	19:24 27	18:56 (4)	17:17 21		16:42 (2) 16:29 24		15:56 (1)	16:27 5	15:51 (1)
28	05:48		20:35 (7)	06:38		19:36 (6)	07:30	18:29 (4)	07:22		16:20 (2) 08:17		15:32 (1)	08:45	15:46 (1)
	21:35	28	21:03 (9)	20:34	30	20:06 (6)	19:21 25	18:54 (4)	17:15 23		16:43 (2) 16:28 23		15:55 (1)	16:28 6	15:52 (1)
29	05:49		20:35 (7)	06:40		19:34 (6)	07:31	18:29 (4)	07:24		16:19 (2) 08:18		15:32 (1)	08:45	15:46 (1)
	21:33	28	21:03 (9)	20:32	30	20:04 (6)	19:19 23	18:52 (4)	17:13 25		16:44 (2) 16:28 22		15:54 (1)	16:28 7	15:53 (1)
30	05:51		20:34 (7)	06:41		19:34 (6)	07:33	18:28 (4)	07:26		16:19 (2) 08:20		15:33 (1)	08:45	15:47 (1)
	21:31	27	21:01 (9)	20:29	28	20:02 (6)	19:17 21	18:49 (4)	17:11 23		16:42 (2) 16:27 20		15:53 (1)	16:29 7	15:54 (1)
31	05:52		20:35 (7)	06:43		19:33 (6)			07:28		16:18 (2)			08:46	15:47 (1)
	21:30	25	21:00 (7)	20:27	26	19:59 (6)			17:09 22		16:40 (2)			16:30 8	15:55 (1)
Potential sun hours	504			455			381		331		264			241	
Total, worst case		366			562			533		377		368			266
Sun reduction		0.33			0.35			0.34		0.28		0.26			0.22
Oper. time red.		1.00			1.00			1.00		1.00		1.00			1.00
Wind dir. red.		0.63			0.62			0.60		0.60		0.61			0.62
Total reduction		0.21			0.22			0.20		0.17		0.16			0.13
Total, real		77			122			108		63		59			36

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
Jennings O'Donovan
Finisklin Business Park
F91 RHH9 Sligo
+353719161416
Kathlyn Feeney / kfeeney@jodireland.com

Calculated:
09/06/2025 13:54/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Worst Case - V150 **Shadow receptor:** BS - 84

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January			February			March			April			May			June		
1	08:45			08:18		16:29 (1)	07:23		17:23 (2)	07:12		19:18 (4)	06:06			05:20		
	16:32			17:20	20	16:49 (1)	18:13	12	17:35 (2)	20:08	10	19:28 (4)	21:00			21:47		
2	08:45			08:16		16:30 (1)	07:21		17:28 (2)	07:09			06:04			05:19		
	16:33			17:22	22	16:52 (1)	18:15	2	17:30 (2)	20:10			21:02			21:48		
3	08:45			08:15		16:31 (1)	07:19			07:07		19:43 (5)	06:02			05:18		
	16:34			17:24	22	16:53 (1)	18:17			20:11	2	19:45 (5)	21:03			21:49		
4	08:45			08:13		16:32 (1)	07:17			07:05		19:42 (5)	06:00			05:17		
	16:35			17:26	20	16:52 (1)	18:18			20:13	5	19:47 (5)	21:05			21:50		
5	08:45			08:11		16:33 (1)	07:14			07:02		19:40 (5)	05:58			05:17		
	16:36			17:28	18	16:51 (1)	18:20			20:15	8	19:48 (5)	21:07			21:51		
6	08:44			08:10		16:34 (1)	07:12			07:00		19:40 (5)	05:56		20:38 (7)	05:16		
	16:37			17:30	16	16:50 (1)	18:22			20:17	10	19:50 (5)	21:08	1	20:39 (7)	21:52		
7	08:44			08:08		16:37 (1)	07:10			06:58		19:40 (5)	05:55		20:37 (7)	05:15		
	16:39			17:32	12	16:49 (1)	18:24			20:18	12	19:52 (5)	21:10	3	20:40 (7)	21:53		
8	08:44			08:06		16:40 (1)	07:08			06:56		19:40 (5)	05:53		20:36 (7)	05:15		
	16:40			17:33	6	16:46 (1)	18:26			20:20	14	19:54 (5)	21:12	6	20:42 (7)	21:54		
9	08:43			08:04			07:05		17:59 (3)	06:53		19:40 (5)	05:51		20:36 (7)	05:14		
	16:41			17:35			18:27	3	18:02 (3)	20:22	15	19:55 (5)	21:13	8	20:44 (7)	21:55		
10	08:42			08:02			07:03		17:58 (3)	06:51		19:40 (5)	05:49		20:35 (7)	05:14		
	16:43			17:37			18:29	5	18:03 (3)	20:24	17	19:57 (5)	21:15	10	20:45 (7)	21:55		
11	08:42			08:00			07:01		17:57 (3)	06:49		19:41 (5)	05:48		20:35 (7)	05:13		
	16:44			17:39			18:31	8	18:05 (3)	20:25	18	19:59 (5)	21:17	12	20:47 (7)	21:56		
12	08:41			07:59			06:59		17:57 (3)	06:46		19:43 (5)	05:46		20:35 (7)	05:13		
	16:46			17:41			18:33	10	18:07 (3)	20:27	15	20:01 (6)	21:18	13	20:48 (7)	21:57		
13	08:40			07:57			06:56		17:56 (3)	06:44		19:44 (5)	05:44		20:34 (7)	05:13		
	16:47			17:43			18:35	12	18:08 (3)	20:29	13	20:01 (6)	21:20	15	20:49 (7)	21:58		
14	08:40			07:55			06:54		17:57 (3)	06:42		19:56 (6)	05:43		20:35 (7)	05:13		
	16:49			17:45			18:36	13	18:10 (3)	20:30	7	20:03 (6)	21:21	16	20:51 (7)	21:58		
15	08:39			07:53			06:52		17:58 (3)	06:40		19:56 (6)	05:41		20:36 (7)	05:12		
	16:50			17:47			18:38	15	18:13 (3)	20:32	9	20:05 (6)	21:23	17	20:53 (7)	21:59		
16	08:38			07:51			06:49		17:58 (3)	06:37		19:55 (6)	05:39		20:35 (7)	05:12		
	16:52			17:49			18:40	16	18:14 (3)	20:34	12	20:07 (6)	21:25	19	20:54 (7)	21:59		
17	08:37			07:49		17:21 (2)	06:47		17:59 (3)	06:35		19:54 (6)	05:38		20:36 (7)	05:12		
	16:54			17:51	2	17:23 (2)	18:42	14	18:13 (3)	20:36	15	20:09 (6)	21:26	19	20:55 (7)	22:00		
18	08:36			07:47		17:19 (2)	06:45		18:02 (3)	06:33		19:54 (6)	05:36		20:36 (7)	05:12		
	16:55			17:52	5	17:24 (2)	18:43	9	18:11 (3)	20:37	16	20:10 (6)	21:28	20	20:56 (7)	22:00		
19	08:35			07:45		17:19 (2)	06:42		18:16 (4)	06:31		19:53 (6)	05:35		20:37 (7)	05:12		
	16:57			17:54	7	17:26 (2)	18:45	3	18:19 (4)	20:39	18	20:11 (6)	21:29	21	20:58 (9)	22:01		
20	08:34			07:43		17:18 (2)	06:40		18:15 (4)	06:29		19:53 (6)	05:34		20:38 (7)	05:12		
	16:59			17:56	10	17:28 (2)	18:47	6	18:21 (4)	20:41	20	20:13 (6)	21:31	21	20:59 (9)	22:01		
21	08:33			07:41		17:18 (2)	06:38		18:14 (4)	06:27		19:53 (6)	05:32		20:39 (7)	05:12		
	17:00			17:58	13	17:31 (2)	18:49	9	18:23 (4)	20:43	22	20:15 (6)	21:32	22	21:01 (9)	22:01		
22	08:32			07:39		17:18 (2)	06:35		18:13 (4)	06:24		19:53 (6)	05:31		20:39 (7)	05:13		
	17:02			18:00	15	17:33 (2)	18:50	12	18:25 (4)	20:44	23	20:16 (6)	21:34	23	21:02 (9)	22:01		
23	08:30		16:30 (1)	07:36		17:18 (2)	06:33		18:12 (4)	06:22		19:53 (6)	05:29		20:40 (7)	05:13		
	17:04	2	16:32 (1)	18:02	17	17:35 (2)	18:52	15	18:27 (4)	20:46	25	20:18 (6)	21:35	23	21:03 (9)	22:01		
24	08:29		16:29 (1)	07:34		17:18 (2)	06:30		18:11 (4)	06:20		19:54 (6)	05:28		20:42 (7)	05:13		
	17:06	4	16:33 (1)	18:04	18	17:36 (2)	18:54	17	18:28 (4)	20:48	24	20:18 (6)	21:36	22	21:04 (9)	22:02		
25	08:28		16:29 (1)	07:32		17:18 (2)	06:28		18:11 (4)	06:18		19:55 (6)	05:27		20:44 (7)	05:13		
	17:07	7	16:36 (1)	18:05	20	17:38 (2)	18:56	19	18:30 (4)	20:50	22	20:17 (6)	21:38	21	21:06 (9)	22:02		
26	08:27		16:28 (1)	07:30		17:19 (2)	06:26		18:12 (4)	06:16		19:56 (6)	05:26		20:53 (9)	05:14		
	17:09	9	16:37 (1)	18:07	21	17:40 (2)	18:57	20	18:32 (4)	20:51	19	20:15 (6)	21:39	13	21:06 (9)	22:02		
27	08:25		16:29 (1)	07:28		17:20 (2)	06:23		18:11 (4)	06:14		19:57 (6)	05:25		20:54 (9)	05:14		
	17:11	11	16:40 (1)	18:09	19	17:39 (2)	18:59	22	18:33 (4)	20:53	17	20:14 (6)	21:40	11	21:05 (9)	22:02		
28	08:24		16:28 (1)	07:26		17:21 (2)	06:21		18:12 (4)	06:12		19:59 (6)	05:24		20:55 (9)	05:15		
	17:13	13	16:41 (1)	18:11	16	17:37 (2)	19:01	23	18:35 (4)	20:55	13	20:12 (6)	21:42	9	21:04 (9)	22:01		
29	08:22		16:28 (1)				07:19		19:13 (4)	06:10		20:02 (6)	05:23		20:57 (9)	05:15		
	17:15	15	16:43 (1)				20:03	21	19:34 (4)	20:56	6	20:08 (6)	21:43	5	21:02 (9)	22:01		
30	08:21		16:29 (1)				07:16		19:13 (4)	06:08			05:22			05:16		
	17:17	17	16:46 (1)				20:04	19	19:32 (4)	20:58			21:44			22:01		
31	08:19		16:29 (1)				07:14		19:15 (4)				05:21					
	17:18	18	16:47 (1)				20:06	16	19:31 (4)				21:45					
Potential sun hours	257			277			367			417			487			501		
Total, worst case		96			299			321			407			350				
Sun reduction		0.22			0.24			0.28			0.38			0.39				
Oper. time red.		1.00			1.00			1.00			1.00			1.00				
Wind dir. red.		0.60			0.60			0.60			0.61			0.64				
Total reduction		0.13			0.15			0.17			0.23			0.25				
Total, real		13			44			54			94			88				

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
Jennings O'Donovan
Finisklin Business Park
F91 RHH9 Sligo
+353719161416
Kathlyn Feeney / kfeeney@jodireland.com

Calculated:
09/06/2025 13:54/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Worst Case - V150 **Shadow receptor:** BS - 84

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	July			August			September			October			November			December
1	05:17			05:54		20:45 (7)	06:45		19:40 (5)	07:35		18:36 (3)	07:30			08:21
	22:01			21:28	13	20:58 (7)	20:25	17	19:57 (5)	19:14	11	18:47 (3)	17:07			16:26
2	05:17			05:55		20:45 (7)	06:46		19:39 (5)	07:36		18:36 (3)	07:31			08:23
	22:00			21:26	11	20:56 (7)	20:23	17	19:56 (5)	19:12	9	18:45 (3)	17:05			16:25
3	05:18			05:57		20:46 (7)	06:48		19:38 (5)	07:38		18:35 (3)	07:33		16:09 (1)	08:24
	22:00			21:25	9	20:55 (7)	20:20	15	19:53 (5)	19:10	7	18:42 (3)	17:04	8	16:17 (1)	16:25
4	05:19			05:59		20:45 (7)	06:50		19:37 (5)	07:40		18:36 (3)	07:35		16:06 (1)	08:26
	22:00			21:23	8	20:53 (7)	20:18	14	19:51 (5)	19:07	4	18:40 (3)	17:02	13	16:19 (1)	16:24
5	05:20			06:00		20:46 (7)	06:51		19:36 (5)	07:41			07:37		16:04 (1)	08:27
	21:59			21:21	5	20:51 (7)	20:16	12	19:48 (5)	19:05			17:00	17	16:21 (1)	16:24
6	05:20			06:02		20:46 (7)	06:53		19:36 (5)	07:43			07:39		16:03 (1)	08:28
	21:59			21:19	3	20:49 (7)	20:13	10	19:46 (5)	19:03			16:58	19	16:22 (1)	16:23
7	05:21			06:03		20:47 (7)	06:55		19:37 (5)	07:45			07:41		16:02 (1)	08:30
	21:58			21:17	1	20:48 (7)	20:11	7	19:44 (5)	19:01			16:56	21	16:23 (1)	16:23
8	05:22			06:05			06:56		19:36 (5)	07:47			07:42		16:02 (1)	08:31
	21:57			21:16			20:09	5	19:41 (5)	18:58			16:55	22	16:24 (1)	16:22
9	05:23			06:07			06:58		19:37 (5)	07:48			07:44		16:01 (1)	08:32
	21:57			21:14			20:06	3	19:40 (5)	18:56			16:53	22	16:23 (1)	16:22
10	05:24			06:08			07:00			07:50			07:46		16:01 (1)	08:33
	21:56			21:12			20:04			18:54			16:51	20	16:21 (1)	16:22
11	05:25			06:10			07:01		19:10 (4)	07:52			07:48		16:00 (1)	08:34
	21:55			21:10			20:02	10	19:20 (4)	18:51			16:50	18	16:18 (1)	16:22
12	05:26			06:12			07:03		19:07 (4)	07:54		17:58 (2)	07:50		16:00 (1)	08:35
	21:54			21:08			19:59	16	19:23 (4)	18:49	8	18:06 (2)	16:48	16	16:16 (1)	16:22
13	05:28			06:13			07:05		19:05 (4)	07:55		17:55 (2)	07:51		16:00 (1)	08:36
	21:53			21:06			19:57	18	19:23 (4)	18:47	14	18:09 (2)	16:47	15	16:15 (1)	16:21
14	05:29		21:06 (9)	06:15		20:09 (6)	07:06		19:03 (4)	07:57		17:53 (2)	07:53		16:00 (1)	08:37
	21:52	4	21:10 (9)	21:04	9	20:18 (6)	19:55	22	19:25 (4)	18:45	18	18:11 (2)	16:45	13	16:13 (1)	16:21
15	05:30		21:05 (9)	06:16		20:06 (6)	07:08		19:01 (4)	07:59		17:52 (2)	07:55		16:01 (1)	08:38
	21:51	8	21:13 (9)	21:02	14	20:20 (6)	19:52	24	19:25 (4)	18:42	20	18:12 (2)	16:44	11	16:12 (1)	16:22
16	05:31		21:04 (9)	06:18		20:04 (6)	07:10		19:01 (4)	08:01		17:51 (2)	07:57		16:01 (1)	08:39
	21:50	10	21:14 (9)	21:00	18	20:22 (6)	19:50	22	19:23 (4)	18:40	21	18:12 (2)	16:42	9	16:10 (1)	16:22
17	05:32		21:03 (9)	06:20		20:02 (6)	07:11		19:00 (4)	08:02		17:50 (2)	07:59		16:02 (1)	08:40
	21:49	12	21:15 (9)	20:58	20	20:22 (6)	19:48	21	19:21 (4)	18:38	20	18:10 (2)	16:41	7	16:09 (1)	16:22
18	05:34		20:56 (7)	06:21		20:01 (6)	07:13		18:59 (4)	08:04		17:50 (2)	08:00		16:03 (1)	08:41
	21:48	16	21:16 (9)	20:56	23	20:24 (6)	19:45	19	19:18 (4)	18:36	18	18:08 (2)	16:40	4	16:07 (1)	16:22
19	05:35		20:53 (7)	06:23		19:59 (6)	07:15		18:59 (4)	08:06		17:49 (2)	08:02		16:04 (1)	08:41
	21:47	22	21:15 (9)	20:54	25	20:24 (6)	19:43	17	19:16 (4)	18:34	16	18:05 (2)	16:38	2	16:06 (1)	16:22
20	05:36		20:52 (7)	06:25		19:59 (6)	07:16		18:59 (4)	08:08		17:48 (2)	08:04			08:42
	21:46	22	21:14 (9)	20:51	24	20:23 (6)	19:40	15	19:14 (4)	18:32	14	18:02 (2)	16:37			16:23
21	05:38		20:50 (7)	06:26		19:59 (6)	07:18		18:58 (4)	08:10		17:48 (2)	08:05			08:43
	21:44	23	21:13 (9)	20:49	23	20:22 (6)	19:38	13	19:11 (4)	18:29	12	18:00 (2)	16:36			16:23
22	05:39		20:49 (7)	06:28		19:57 (6)	07:20		18:58 (4)	08:11		17:49 (2)	08:07			08:43
	21:43	22	21:11 (9)	20:47	22	20:19 (6)	19:36	11	19:09 (4)	18:27	9	17:58 (2)	16:35			16:24
23	05:40		20:48 (7)	06:30		19:57 (6)	07:21		18:58 (4)	08:13		17:49 (2)	08:09			08:44
	21:42	22	21:10 (9)	20:45	20	20:17 (6)	19:33	8	19:06 (4)	18:25	7	17:56 (2)	16:33			16:24
24	05:42		20:48 (7)	06:31		19:57 (6)	07:23		18:59 (4)	08:15		17:50 (2)	08:10			08:44
	21:40	21	21:09 (9)	20:43	18	20:15 (6)	19:31	4	19:03 (4)	18:23	4	17:54 (2)	16:32			16:25
25	05:43		20:47 (7)	06:33		19:57 (6)	07:25		18:45 (3)	07:17		16:51 (2)	08:12			08:44
	21:39	21	21:08 (7)	20:41	16	20:13 (6)	19:29	9	19:01 (4)	17:21	1	16:52 (2)	16:31			16:25
26	05:45		20:46 (7)	06:35		19:56 (6)	07:26		18:43 (3)	07:19			08:14			08:45
	21:38	20	21:06 (7)	20:38	14	20:10 (6)	19:26	13	18:56 (3)	17:19			16:30			16:26
27	05:46		20:46 (7)	06:36		19:57 (6)	07:28		18:40 (3)	07:20			08:15			08:45
	21:36	19	21:05 (7)	20:36	12	20:09 (6)	19:24	16	18:56 (3)	17:17			16:29			16:27
28	05:48		20:46 (7)	06:38		19:57 (6)	07:30		18:39 (3)	07:22			08:17			08:45
	21:34	17	21:03 (7)	20:34	10	20:07 (6)	19:21	15	18:54 (3)	17:15			16:28			16:28
29	05:49		20:46 (7)	06:40		19:57 (6)	07:31		18:38 (3)	07:24			08:18			08:45
	21:33	17	21:03 (7)	20:32	7	20:04 (6)	19:19	14	18:52 (3)	17:13			16:28			16:28
30	05:51		20:45 (7)	06:41		19:45 (5)	07:33		18:36 (3)	07:26			08:20			08:45
	21:31	16	21:01 (7)	20:29	13	20:02 (6)	19:17	13	18:49 (3)	17:11			16:27			16:29
31	05:52		20:46 (7)	06:43		19:42 (5)				07:28						08:45
	21:30	14	21:00 (7)	20:27	14	19:56 (5)				17:09						16:30
Potential sun hours	504			455			381			331			264			241
Total, worst case		306			352			400			213			237		
Sun reduction		0.33			0.35			0.34			0.28			0.26		
Oper. time red.		1.00			1.00			1.00			1.00			1.00		
Wind dir. red.		0.64			0.61			0.60			0.60			0.60		
Total reduction		0.21			0.22			0.20			0.17			0.16		
Total, real		65			76			82			36			37		

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

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SHADOW - Calendar

Calculation: 6839 Garrane WF Worst Case - V150 **Shadow receptor:** BT - 85

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:45	08:18	07:23	07:12	06:06	05:20	21:01 (1)	05:17	21:06 (1)	05:54	06:45	07:35	07:29	08:21
	16:32	17:20	18:13	20:08	21:00	21:47	21:14 (1)	22:01	21:27 (1)	21:28	20:25	19:14	17:07	16:26
2	08:45	08:16	07:21	07:09	06:04	05:19	21:01 (1)	05:17	21:07 (1)	05:55	06:46	07:36	07:31	08:23
	16:33	17:22	18:15	20:10	21:02	21:48	21:15 (1)	22:00	21:27 (1)	21:26	20:23	19:12	17:05	16:25
3	08:45	08:15	07:19	07:07	06:02	05:18	21:01 (1)	05:18	21:06 (1)	05:57	06:48	07:38	07:33	08:24
	16:34	17:24	18:17	20:11	21:03	21:49	21:15 (1)	22:00	21:26 (1)	21:25	20:20	19:10	17:04	16:25
4	08:45	08:13	07:17	07:05	06:00	05:17	21:01 (1)	05:19	21:07 (1)	05:59	06:50	07:40	07:35	08:26
	16:35	17:26	18:18	20:13	21:05	21:50	21:17 (1)	21:59	21:26 (1)	21:23	20:18	19:07	17:02	16:24
5	08:45	08:11	07:14	07:02	05:58	05:17	21:01 (1)	05:20	21:07 (1)	06:00	06:51	07:41	07:37	08:27
	16:36	17:28	18:20	20:15	21:07	21:51	21:17 (1)	21:59	21:26 (1)	21:21	20:16	19:05	17:00	16:24
6	08:44	08:09	07:12	07:00	05:56	05:16	21:02 (1)	05:21	21:08 (1)	06:02	06:53	07:43	07:39	08:28
	16:37	17:30	18:22	20:17	21:08	21:52	21:19 (1)	21:58	21:25 (1)	21:19	20:13	19:03	16:58	16:23
7	08:44	08:08	07:10	06:58	05:55	05:15	21:01 (1)	05:21	21:07 (1)	06:03	06:55	07:45	07:40	08:30
	16:39	17:32	18:24	20:18	21:10	21:53	21:19 (1)	21:58	21:24 (1)	21:17	20:11	19:01	16:56	16:23
8	08:43	08:06	07:08	06:56	05:53	05:15	21:02 (1)	05:22	21:08 (1)	06:05	06:56	07:47	07:42	08:31
	16:40	17:34	18:26	20:20	21:12	21:54	21:20 (1)	21:57	21:23 (1)	21:16	20:09	18:58	16:55	16:22
9	08:43	08:04	07:05	06:53	05:51	05:14	21:01 (1)	05:23	21:08 (1)	06:07	06:58	07:48	07:44	08:32
	16:41	17:35	18:27	20:22	21:13	21:55	21:20 (1)	21:57	21:23 (1)	21:14	20:06	18:56	16:53	16:22
10	08:42	08:02	07:03	06:51	05:49	05:14	21:02 (1)	05:24	21:08 (1)	06:08	07:00	07:50	07:46	08:33
	16:43	17:37	18:29	20:24	21:15	21:55	21:22 (1)	21:56	21:22 (1)	21:12	20:04	18:54	16:51	16:22
11	08:42	08:00	07:01	06:49	05:48	05:14	21:02 (1)	05:25	21:09 (1)	06:10	07:01	07:52	07:48	08:34
	16:44	17:39	18:31	20:25	21:17	21:56	21:22 (1)	21:55	21:22 (1)	21:10	20:02	18:51	16:50	16:22
12	08:41	07:59	06:59	06:46	05:46	05:13	21:03 (1)	05:27	21:09 (1)	06:12	07:03	07:54	07:50	08:35
	16:46	17:41	18:33	20:27	21:18	21:57	21:23 (1)	21:54	21:21 (1)	21:08	19:59	18:49	16:48	16:22
13	08:40	07:57	06:56	06:44	05:44	05:13	21:02 (1)	05:28	21:09 (1)	06:13	07:05	07:55	07:51	08:36
	16:47	17:43	18:35	20:29	21:20	21:57	21:23 (1)	21:53	21:20 (1)	21:06	19:57	18:47	16:47	16:22
14	08:40	07:55	06:54	06:42	05:43	05:13	21:02 (1)	05:29	21:10 (1)	06:15	07:06	07:57	07:53	08:37
	16:49	17:45	18:36	20:30	21:21	21:58	21:24 (1)	21:52	21:19 (1)	21:04	19:55	18:45	16:45	16:22
15	08:39	07:53	06:52	06:40	05:41	05:12	21:03 (1)	05:30	21:11 (1)	06:17	07:08	07:59	07:55	08:38
	16:50	17:47	18:38	20:32	21:23	21:59	21:25 (1)	21:51	21:19 (1)	21:02	19:52	18:42	16:44	16:22
16	08:38	07:51	06:49	06:37	05:39	05:12	21:03 (1)	05:31	21:11 (1)	06:18	07:10	08:01	07:57	08:39
	16:52	17:49	18:40	20:34	21:25	21:59	21:25 (1)	21:50	21:18 (1)	21:00	19:50	18:40	16:42	16:22
17	08:37	07:49	06:47	06:35	05:38	05:12	21:03 (1)	05:32	21:12 (1)	06:20	07:11	08:02	07:58	08:40
	16:54	17:51	18:42	20:36	21:26	22:00	21:26 (1)	21:49	21:17 (1)	20:58	19:48	18:38	16:41	16:22
18	08:36	07:47	06:45	06:33	05:36	05:12	21:03 (1)	05:34	21:12 (1)	06:21	07:13	08:04	08:00	08:41
	16:55	17:52	18:43	20:37	21:28	22:00	21:26 (1)	21:48	21:16 (1)	20:56	19:45	18:36	16:40	16:22
19	08:35	07:45	06:42	06:31	05:35	05:12	21:04 (1)	05:35	21:13 (1)	06:23	07:15	08:06	08:02	08:41
	16:57	17:54	18:45	20:39	21:29	22:00	21:26 (1)	21:47	21:14 (1)	20:54	19:43	18:34	16:38	16:22
20	08:34	07:43	06:40	06:29	05:34	05:12	21:04 (1)	05:36		06:25	07:16	08:08	08:04	08:42
	16:59	17:56	18:47	20:41	21:31	22:01	21:26 (1)	21:46		20:51	19:40	18:32	16:37	16:23
21	08:33	07:41	06:38	06:27	05:32	05:12	21:04 (1)	05:38		06:26	07:18	08:10	08:05	08:43
	17:00	17:58	18:49	20:43	21:32	22:01	21:26 (1)	21:44		20:49	19:38	18:29	16:36	16:23
22	08:32	07:39	06:35	06:24	05:31	05:13	21:05 (1)	05:39		06:28	07:20	08:11	08:07	08:43
	17:02	18:00	18:50	20:44	21:34	22:01	21:27 (1)	21:43		20:47	19:36	18:27	16:35	16:24
23	08:30	07:36	06:33	06:22	05:30	05:13	21:05 (1)	05:41		06:30	07:21	08:13	08:09	08:44
	17:04	18:02	18:52	20:46	21:35	22:01	21:27 (1)	21:42		20:45	19:33	18:25	16:33	16:24
24	08:29	07:34	06:30	06:20	05:28	21:03 (1)	05:13	21:05 (1)	05:42	06:31	07:23	08:15	08:10	08:44
	17:06	18:04	18:54	20:48	21:36	1 21:04 (1)	22:01	21:27 (1)	21:40	20:43	19:31	18:23	16:32	16:25
25	08:28	07:32	06:28	06:18	05:27	21:03 (1)	05:14	21:05 (1)	05:43	06:33	07:25	07:17	08:12	08:44
	17:07	18:05	18:56	20:50	21:38	3 21:06 (1)	22:02	21:28 (1)	21:39	20:41	19:29	17:21	16:31	16:25
26	08:27	07:30	06:26	06:16	05:26	21:02 (1)	05:14	21:05 (1)	05:45	06:35	07:26	07:19	08:14	08:45
	17:09	18:07	18:57	20:51	21:39	5 21:07 (1)	22:02	21:27 (1)	21:37	20:38	19:26	17:19	16:30	16:26
27	08:25	07:28	06:23	06:14	05:25	21:02 (1)	05:14	21:06 (1)	05:46	06:36	07:28	07:20	08:15	08:45
	17:11	18:09	18:59	20:53	21:40	6 21:08 (1)	22:01	21:28 (1)	21:36	20:36	19:24	17:17	16:29	16:27
28	08:24	07:26	06:21	06:12	05:24	21:02 (1)	05:15	21:06 (1)	05:48	06:38	07:30	07:22	08:17	08:45
	17:13	18:11	19:01	20:55	21:42	7 21:09 (1)	22:01	21:27 (1)	21:34	20:34	19:21	17:15	16:28	16:28
29	08:22		07:19	06:10	05:23	21:01 (1)	05:15	21:06 (1)	05:49	06:40	07:31	07:24	08:18	08:45
	17:15		20:03	20:56	21:43	9 21:10 (1)	22:01	21:28 (1)	21:33	20:32	19:19	17:13	16:28	16:28
30	08:21		07:16	06:08	05:22	21:01 (1)	05:16	21:06 (1)	05:51	06:41	07:33	07:26	08:20	08:45
	17:17		20:04	20:58	21:44	10 21:11 (1)	22:01	21:27 (1)	21:31	20:29	19:17	17:11	16:27	16:29
31	08:19		07:14		05:21	21:02 (1)			05:52	06:43		07:28		08:45
	17:18		20:06		21:45	11 21:13 (1)			21:30	20:27		17:09		16:30
Potential sun hours	257	277	367	417	487	501	504	455	381	331	265	241
Total, worst case					52	601	247					
Sun reduction					0.39	0.35	0.33					
Oper. time red.					1.00	1.00	1.00					
Wind dir. red.					0.64	0.64	0.64					
Total reduction					0.25	0.22	0.21					
Total, real					13	133	52					

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
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Calculated:
09/06/2025 13:54/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Worst Case - V150 **Shadow receptor:** BU - 86

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:45	08:18	07:23	07:12	06:06	05:20	20:51 (1) 05:17	21:17 (2) 05:54	20:51 (1) 06:45	07:35	07:29	08:21
	16:32	17:20	18:13	20:08	21:00	21:47 8	21:14 (2) 22:01 10	21:27 (2) 21:28 7	20:58 (1) 20:25	19:14	17:07	16:26
2	08:45	08:16	07:21	07:09	06:04	05:19	21:11 (2) 05:17	21:18 (2) 05:55	20:51 (1) 06:46	07:36	07:31	08:23
	16:33	17:22	18:15	20:10	21:02	21:48 4	21:15 (2) 22:00 9	21:27 (2) 21:26 5	20:56 (1) 20:23	19:12	17:05	16:25
3	08:45	08:15	07:19	07:07	06:02	05:18	21:11 (2) 05:18	21:17 (2) 05:57	20:52 (1) 06:48	07:38	07:33	08:24
	16:34	17:24	18:17	20:11	21:03	21:49 4	21:15 (2) 22:00 9	21:26 (2) 21:25 3	20:55 (1) 20:20	19:10	17:04	16:25
4	08:45	08:13	07:17	07:05	06:00	05:17	21:12 (2) 05:19	21:18 (2) 05:59	20:52 (1) 06:50	07:40	07:35	08:26
	16:35	17:26	18:18	20:13	21:05	21:50 5	21:17 (2) 21:59 8	21:26 (2) 21:23 1	20:53 (1) 20:18	19:07	17:02	16:24
5	08:45	08:11	07:14	07:02	05:58	05:17	21:11 (2) 05:20	21:18 (2) 06:00	06:51	07:41	07:37	08:27
	16:36	17:28	18:20	20:15	21:07	21:51 6	21:17 (2) 21:59 8	21:26 (2) 21:21	20:16	19:05	17:00	16:24
6	08:44	08:09	07:12	07:00	05:56	05:16	21:12 (2) 05:21	21:18 (2) 06:02	06:53	07:43	07:39	08:28
	16:37	17:30	18:22	20:17	21:08	21:52 7	21:19 (2) 21:58 7	21:25 (2) 21:19	20:13	19:03	16:58	16:23
7	08:44	08:08	07:10	06:58	05:55	05:15	21:12 (2) 05:21	21:18 (2) 06:03	06:55	07:45	07:40	08:30
	16:39	17:32	18:24	20:18	21:10	21:53 7	21:19 (2) 21:58 6	21:24 (2) 21:17	20:11	19:01	16:56	16:23
8	08:43	08:06	07:08	06:56	05:53	05:15	21:12 (2) 05:22	21:18 (2) 06:05	06:56	07:47	07:42	08:31
	16:40	17:33	18:26	20:20	21:12	21:54 8	21:20 (2) 21:57 5	21:23 (2) 21:16	20:09	18:58	16:55	16:22
9	08:43	08:04	07:05	06:53	05:51	20:42 (1) 05:14	21:12 (2) 05:23	21:18 (2) 06:07	06:58	07:48	07:44	08:32
	16:41	17:35	18:27	20:22	21:13 2	20:44 (1) 21:55 8	21:20 (2) 21:56 5	21:23 (2) 21:14	20:06	18:56	16:53	16:22
10	08:42	08:02	07:03	06:51	05:49	20:41 (1) 05:14	21:13 (2) 05:24	21:19 (2) 06:08	07:00	07:50	07:46	08:33
	16:43	17:37	18:29	20:24	21:15 4	20:45 (1) 21:55 9	21:22 (2) 21:56 3	21:22 (2) 21:12	20:04	18:54	16:51	16:22
11	08:42	08:00	07:01	06:49	05:48	20:41 (1) 05:13	21:13 (2) 05:25	21:00 (1) 06:10	07:01	07:52	07:48	08:34
	16:44	17:39	18:31	20:25	21:17 6	20:47 (1) 21:56 9	21:22 (2) 21:55 6	21:22 (2) 21:10	20:02	18:51	16:50	16:22
12	08:41	07:59	06:59	06:46	05:46	20:40 (1) 05:13	21:14 (2) 05:27	20:57 (1) 06:12	07:03	07:54	07:50	08:35
	16:46	17:41	18:33	20:27	21:18 8	20:48 (1) 21:57 9	21:23 (2) 21:54 11	21:21 (2) 21:08	19:59	18:49	16:48	16:22
13	08:40	07:57	06:56	06:44	05:44	20:40 (1) 05:13	21:13 (2) 05:28	20:56 (1) 06:13	07:05	07:55	07:51	08:36
	16:47	17:43	18:35	20:29	21:20 10	20:50 (1) 21:57 10	21:23 (2) 21:53 12	21:20 (2) 21:06	19:57	18:47	16:47	16:22
14	08:40	07:55	06:54	06:42	05:43	20:40 (1) 05:13	21:13 (2) 05:29	20:55 (1) 06:15	07:06	07:57	07:53	08:37
	16:49	17:45	18:36	20:30	21:21 11	20:51 (1) 21:58 11	21:24 (2) 21:52 14	21:09 (1) 21:04	19:55	18:45	16:45	16:22
15	08:39	07:53	06:52	06:40	05:41	20:40 (1) 05:12	21:14 (2) 05:30	20:55 (1) 06:16	07:08	07:59	07:55	08:38
	16:50	17:47	18:38	20:32	21:23 13	20:53 (1) 21:59 11	21:25 (2) 21:51 15	21:10 (1) 21:02	19:52	18:42	16:44	16:22
16	08:38	07:51	06:49	06:37	05:39	20:39 (1) 05:12	21:14 (2) 05:31	20:54 (1) 06:18	07:10	08:01	07:57	08:39
	16:52	17:49	18:40	20:34	21:25 15	20:54 (1) 21:59 11	21:25 (2) 21:50 17	21:11 (1) 21:00	19:50	18:40	16:42	16:22
17	08:37	07:49	06:47	06:35	05:38	20:40 (1) 05:12	21:14 (2) 05:32	20:53 (1) 06:20	07:11	08:02	07:58	08:40
	16:54	17:51	18:42	20:36	21:26 15	20:55 (1) 22:00 12	21:26 (2) 21:49 19	21:12 (1) 20:58	19:48	18:38	16:41	16:22
18	08:36	07:47	06:45	06:33	05:36	20:39 (1) 05:12	21:15 (2) 05:34	20:52 (1) 06:21	07:13	08:04	08:00	08:41
	16:55	17:52	18:43	20:37	21:28 17	20:56 (1) 22:00 11	21:26 (2) 21:48 20	21:12 (1) 20:56	19:45	18:36	16:40	16:22
19	08:35	07:45	06:42	06:31	05:35	20:40 (1) 05:12	21:15 (2) 05:35	20:52 (1) 06:23	07:15	08:06	08:02	08:41
	16:57	17:54	18:45	20:39	21:29 18	20:58 (1) 22:00 11	21:26 (2) 21:47 21	21:13 (1) 20:54	19:43	18:34	16:38	16:22
20	08:34	07:43	06:40	06:29	05:34	20:40 (1) 05:12	21:15 (2) 05:36	20:52 (1) 06:25	07:16	08:08	08:04	08:42
	16:59	17:56	18:47	20:41	21:31 19	20:59 (1) 22:01 11	21:26 (2) 21:46 22	21:14 (1) 20:51	19:40	18:32	16:37	16:23
21	08:33	07:41	06:38	06:27	05:32	20:41 (1) 05:12	21:15 (2) 05:38	20:51 (1) 06:26	07:18	08:09	08:05	08:43
	17:00	17:58	18:49	20:43	21:32 20	21:01 (1) 22:01 11	21:26 (2) 21:44 22	21:13 (1) 20:49	19:38	18:29	16:36	16:23
22	08:32	07:38	06:35	06:24	05:31	20:41 (1) 05:13	21:16 (2) 05:39	20:51 (1) 06:28	07:20	08:11	08:07	08:43
	17:02	18:00	18:50	20:44	21:34 20	21:01 (1) 22:01 11	21:27 (2) 21:43 20	21:11 (1) 20:47	19:36	18:27	16:35	16:24
23	08:30	07:36	06:33	06:22	05:30	20:41 (1) 05:13	21:16 (2) 05:40	20:50 (1) 06:30	07:21	08:13	08:09	08:44
	17:04	18:02	18:52	20:46	21:35 22	21:03 (1) 22:01 11	21:27 (2) 21:42 20	21:10 (1) 20:45	19:33	18:25	16:33	16:24
24	08:29	07:34	06:30	06:20	05:28	20:42 (1) 05:13	21:16 (2) 05:42	20:51 (1) 06:31	07:23	08:15	08:10	08:44
	17:06	18:04	18:54	20:48	21:36 22	21:04 (1) 22:01 11	21:27 (2) 21:40 18	21:09 (1) 20:43	19:31	18:23	16:32	16:25
25	08:28	07:32	06:28	06:18	05:27	20:43 (1) 05:14	21:16 (2) 05:43	20:50 (1) 06:33	07:25	07:17	08:12	08:44
	17:07	18:05	18:56	20:50	21:38 20	21:03 (1) 22:02 12	21:28 (2) 21:39 18	21:08 (1) 20:41	19:29	17:21	16:31	16:25
26	08:27	07:30	06:26	06:16	05:26	20:43 (1) 05:14	21:16 (2) 05:45	20:51 (1) 06:35	07:26	07:19	08:14	08:45
	17:09	18:07	18:57	20:51	21:39 20	21:03 (1) 22:01 11	21:27 (2) 21:37 16	21:07 (1) 20:38	19:26	17:19	16:30	16:26
27	08:25	07:28	06:23	06:14	05:25	20:44 (1) 05:14	21:17 (2) 05:46	20:50 (1) 06:36	07:28	07:20	08:15	08:45
	17:11	18:09	18:59	20:53	21:40 18	21:02 (1) 22:01 11	21:28 (2) 21:36 15	21:05 (1) 20:36	19:24	17:17	16:29	16:27
28	08:24	07:26	06:21	06:12	05:24	20:45 (1) 05:15	21:17 (2) 05:48	20:50 (1) 06:38	07:30	07:22	08:17	08:45
	17:13	18:11	19:01	20:55	21:42 16	21:01 (1) 22:01 10	21:27 (2) 21:34 13	21:03 (1) 20:34	19:21	17:15	16:28	16:28
29	08:22		07:19	06:10	05:23	20:46 (1) 05:15	21:17 (2) 05:49	20:50 (1) 06:40	07:31	07:24	08:18	08:45
	17:15		20:03	20:56	21:43 15	21:01 (1) 22:01 11	21:28 (2) 21:33 12	21:02 (1) 20:32	19:19	17:13	16:28	16:28
30	08:21		07:16	06:08	05:22	20:47 (1) 05:16	21:17 (2) 05:51	20:50 (1) 06:41	07:33	07:26	08:20	08:45
	17:17		20:04	20:58	21:44 12	20:59 (1) 22:01 10	21:27 (2) 21:31 11	21:01 (1) 20:29	19:17	17:11	16:27	16:29
31	08:19		07:14		05:21	20:49 (1)	05:52	20:51 (1) 06:43		07:28		08:45
	17:18		20:06		21:45 11	21:13 (2)	21:30 9	21:00 (1) 20:27		17:09		16:30
Potential sun hours	257	277	367	417	487	501	504	455	381	331	265	241
Total, worst case					334	281	401	16				
Sun reduction					0.39	0.35	0.33	0.35				
Oper. time red.					1.00	1.00	1.00	1.00				
Wind dir. red.					0.64	0.64	0.64	0.64				
Total reduction					0.25	0.22	0.21	0.23				
Total, real					84	62	85	4				

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

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Kathlyn Feeney / kfeeney@jodireland.com

SHADOW - Calendar

Calculation: 6839 Garrane WF Worst Case - V150 **Shadow receptor:** BV - 87

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:45	08:18	07:23	07:12	06:06	05:20	05:17	05:54	06:45	07:35	07:29	08:21
	16:32	17:20	18:13	20:08	21:00	21:47	22:01	21:28	20:25	19:14	17:07	16:26
2	08:45	08:16	07:21	07:09	06:04	05:19	05:17	05:55	06:46	07:36	07:31	08:23
	16:33	17:22	18:15	20:10	21:02	21:48	22:00	21:26	20:23	19:12	17:05	16:25
3	08:45	08:15	07:19	07:07	06:02	05:18	05:18	05:57	06:48	07:38	07:33	08:24
	16:34	17:24	18:17	20:11	21:03	21:49	22:00	21:25	20:20	19:10	17:04	16:25
4	08:45	08:13	07:17	07:05	06:00	05:17	05:19	05:59	06:50	07:40	07:35	08:26
	16:35	17:26	18:18	20:13	21:05	21:50	22:00	21:23	20:18	19:07	17:02	16:24
5	08:45	08:11	07:15	07:02	05:58	05:17	05:20	06:00	06:51	07:42	07:37	08:27
	16:36	17:28	18:20	20:15	21:07	21:51	21:59	21:21	20:16	19:05	17:00	16:24
6	08:44	08:09	07:12	07:00	05:56	05:16	05:21	06:02	06:53	07:43	07:39	08:28
	16:38	17:30	18:22	20:17	21:08	21:52	21:58	21:19	20:13	19:03	16:58	16:23
7	08:44	08:08	07:10	06:58	05:55	05:15	05:21	06:03	06:55	07:45	07:40	08:30
	16:39	17:32	18:24	20:18	21:10	21:53	21:58	21:17	20:11	19:01	16:56	16:23
8	08:43	08:06	07:08	06:56	05:53	05:15	05:22	06:05	06:56	07:47	07:42	08:31
	16:40	17:34	18:26	20:20	21:12	21:54	21:57	21:16	20:09	18:58	16:55	16:22
9	08:43	08:04	07:05	06:53	05:51	05:14	05:23	06:07	06:58	07:48	07:44	08:32
	16:42	17:35	18:27	20:22	21:13	21:55	21:57	21:14	20:06	18:56	16:53	16:22
10	08:42	08:02	07:03	06:51	05:49	05:14	05:24	06:08	07:00	07:50	07:46	08:33
	16:43	17:37	18:29	20:24	21:15	21:55	21:56	21:12	20:04	18:54	16:51	16:22
11	08:42	08:00	07:01	06:49	05:48	05:14	05:25	06:10	07:01	07:52	07:48	08:34
	16:44	17:39	18:31	20:25	21:17	21:56	21:55	21:10	20:02	18:51	16:50	16:22
12	08:41	07:59	06:59	06:46	05:46	05:13	05:27	06:12	07:03	07:54	07:50	08:35
	16:46	17:41	18:33	20:27	21:18	21:57	21:54	21:08	19:59	18:49	16:48	16:22
13	08:40	07:57	06:56	06:44	05:44	05:13	05:28	06:13	07:05	07:55	07:51	08:36
	16:47	17:43	18:35	20:29	21:20	21:57	21:53	21:06	19:57	18:47	16:47	16:22
14	08:40	07:55	06:54	06:42	05:43	05:13	05:29	06:15	07:06	07:57	07:53	08:37
	16:49	17:45	18:36	20:30	21:21	21:58	21:52	21:04	19:55	18:45	16:45	16:22
15	08:39	07:53	06:52	06:40	05:41	05:12	05:30	06:17	07:08	07:59	07:55	08:38
	16:50	17:47	18:38	20:32	21:23	21:59	21:51	21:02	19:52	18:42	16:44	16:22
16	08:38	07:51	06:49	06:38	05:39	05:12	05:31	06:18	07:10	08:01	07:57	08:39
	16:52	17:49	18:40	20:34	21:25	21:59	21:50	21:00	19:50	18:40	16:42	16:22
17	08:37	07:49	06:47	06:35	05:38	05:12	05:32	06:20	07:11	08:02	07:58	08:40
	16:54	17:51	18:42	20:36	21:26	22:00	21:49	20:58	19:48	18:38	16:41	16:22
18	08:36	07:47	06:45	06:33	05:36	05:12	05:34	06:21	07:13	08:04	08:00	08:41
	16:55	17:52	18:43	20:37	21:28	22:00	21:48	20:56	19:45	18:36	16:40	16:22
19	08:35	07:45	06:42	06:31	05:35	05:12	05:35	06:23	07:15	08:06	08:02	08:41
	16:57	17:54	18:45	20:39	21:29	22:00	21:47	20:54	19:43	18:34	16:38	16:22
20	08:34	07:43	06:40	06:29	05:34	05:12	05:36	06:25	07:16	08:08	08:04	08:42
	16:59	17:56	18:47	20:41	21:31	22:01	21:46	20:51	19:40	18:32	16:37	16:23
21	08:33	07:41	06:38	06:27	05:32	05:12	05:38	06:26	07:18	08:10	08:05	08:43
	17:00	17:58	18:49	20:43	21:32	22:01	21:44	20:49	19:38	18:29	16:36	16:23
22	08:32	07:39	06:35	06:24	05:31	05:13	05:39	06:28	07:20	08:11	08:07	08:43
	17:02	18:00	18:50	20:44	21:34	22:01	21:43	20:47	19:36	18:27	16:35	16:24
23	08:30	07:36	06:33	06:22	05:30	05:13	05:41	06:30	07:21	08:13	08:09	08:44
	17:04	18:02	18:52	20:46	21:35	22:01	21:42	20:45	19:33	18:25	16:33	16:24
24	08:29	07:34	06:31	06:20	05:28	05:13	05:42	06:31	07:23	08:15	08:10	08:44
	17:06	18:04	18:54	20:48	21:36	22:01	21:40	20:43	19:31	18:23	16:32	16:25
25	08:28	07:32	06:28	06:18	05:27	05:14	05:43	06:33	07:25	07:17	08:12	08:44
	17:07	18:06	18:56	20:50	21:38	22:02	21:39	20:41	19:29	17:21	16:31	16:25
26	08:27	07:30	06:26	06:16	05:26	05:14	05:45	06:35	07:26	07:19	08:14	08:45
	17:09	18:07	18:57	20:51	21:39	22:02	21:37	20:38	19:26	17:19	16:30	16:26
27	08:25	07:28	06:23	06:14	05:25	05:14	05:46	06:36	07:28	07:20	08:15	08:45
	17:11	18:09	18:59	20:53	21:40	22:01	21:36	20:36	19:24	17:17	16:29	16:27
28	08:24	07:26	06:21	06:12	05:24	05:15	05:48	06:38	07:30	07:22	08:17	08:45
	17:13	18:11	19:01	20:55	21:42	22:01	21:34	20:34	19:22	17:15	16:29	16:28
29	08:22		07:19	06:10	05:23	05:15	05:49	06:40	07:31	07:24	08:18	08:45
	17:15		20:03	20:56	21:43	22:01	21:33	20:32	19:19	17:13	16:28	16:29
30	08:21		07:16	06:08	05:22	05:16	05:51	06:41	07:33	07:26	08:20	08:45
	17:17		20:04	20:58	21:44	22:01	21:31	20:29	19:17	17:11	16:27	16:29
31	08:19		07:14		05:21		05:52	06:43		07:28		08:45
	17:18		20:06		21:45		21:30	20:27		17:09		16:30
Potential sun hours	257	277	367	417	487	501	504	455	381	331	265	241
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
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Calculated:
09/06/2025 13:54/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Worst Case - V150 **Shadow receptor:** BW - 88

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:45	08:18	07:23	07:12	06:06	05:20	05:17	05:54	06:45	07:35	07:29	08:21
	16:32	17:20	18:13	20:08	21:00	21:47	22:01	21:28	20:25	19:14	17:07	16:26
2	08:45	08:16	07:21	07:09	06:04	05:19	05:17	05:56	06:46	07:36	07:31	08:23
	16:33	17:22	18:15	20:10	21:02	21:48	22:00	21:26	20:23	19:12	17:05	16:25
3	08:45	08:15	07:19	07:07	06:02	05:18	05:18	05:57	06:48	07:38	07:33	08:24
	16:34	17:24	18:17	20:11	21:03	21:49	22:00	21:25	20:20	19:10	17:04	16:25
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	16:35	17:26	18:18	20:13	21:05	21:50	22:00	21:23	20:18	19:07	17:02	16:24
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	16:36	17:28	18:20	20:15	21:07	21:51	21:59	21:21	20:16	19:05	17:00	16:24
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18	08:36	07:47	06:45	06:33	05:36	05:12	05:34	06:21	07:13	08:04	08:00	08:41
	16:55	17:52	18:43	20:37	21:28	22:00	21:48	20:56	19:45	18:36	16:40	16:22
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	16:57	17:54	18:45	20:39	21:29	22:00	21:47	20:54	19:43	18:34	16:38	16:22
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	16:59	17:56	18:47	20:41	21:31	22:01	21:46	20:51	19:40	18:32	16:37	16:23
21	08:33	07:41	06:38	06:27	05:32	05:12	05:38	06:26	07:18	08:10	08:05	08:43
	17:00	17:58	18:49	20:43	21:32	22:01	21:44	20:49	19:38	18:29	16:36	16:23
22	08:32	07:39	06:35	06:24	05:31	05:13	05:39	06:28	07:20	08:11	08:07	08:43
	17:02	18:00	18:50	20:44	21:34	22:01	21:43	20:47	19:36	18:27	16:35	16:24
23	08:30	07:36	06:33	06:22	05:30	05:13	05:41	06:30	07:21	08:13	08:09	08:44
	17:04	18:02	18:52	20:46	21:35	22:01	21:42	20:45	19:33	18:25	16:33	16:24
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25	08:28	07:32	06:28	06:18	05:27	05:14	05:43	06:33	07:25	07:17	08:12	08:44
	17:07	18:06	18:56	20:50	21:38	22:02	21:39	20:41	19:29	17:21	16:31	16:25
26	08:27	07:30	06:26	06:16	05:26	05:14	05:45	06:35	07:26	07:19	08:14	08:45
	17:09	18:07	18:57	20:51	21:39	22:02	21:37	20:38	19:26	17:19	16:30	16:26
27	08:25	07:28	06:23	06:14	05:25	05:14	05:46	06:36	07:28	07:20	08:15	08:45
	17:11	18:09	18:59	20:53	21:40	22:01	21:36	20:36	19:24	17:17	16:29	16:27
28	08:24	07:26	06:21	06:12	05:24	05:15	05:48	06:38	07:30	07:22	08:17	08:45
	17:13	18:11	19:01	20:55	21:42	22:01	21:34	20:34	19:22	17:15	16:29	16:28
29	08:22		07:19	06:10	05:23	05:15	05:49	06:40	07:31	07:24	08:18	08:45
	17:15		20:03	20:56	21:43	22:01	21:33	20:32	19:19	17:13	16:28	16:29
30	08:21		07:16	06:08	05:22	05:16	05:51	06:41	07:33	07:26	08:20	08:45
	17:17		20:04	20:58	21:44	22:01	21:31	20:29	19:17	17:11	16:27	16:29
31	08:19		07:14		05:21		05:52	06:43		07:28		08:45
	17:18		20:06		21:45		21:30	20:27		17:09		16:30
Potential sun hours	257	277	367	417	487	501	504	455	381	331	265	241
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
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+353719161416
Kathlyn Feeney / kfeeney@jodireland.com

Calculated:
09/06/2025 13:54/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Worst Case - V150 **Shadow receptor:** BX - 89

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:45	08:18	07:23	07:12	06:06	05:20	05:17	05:54	06:45	07:35	07:29	08:21
	16:32	17:20	18:13	20:08	21:00	21:47	22:01	21:28	20:25	19:14	17:07	16:26
2	08:45	08:16	07:21	07:09	06:04	05:19	05:17	05:56	06:46	07:36	07:31	08:23
	16:33	17:22	18:15	20:10	21:02	21:48	22:00	21:26	20:23	19:12	17:05	16:25
3	08:45	08:15	07:19	07:07	06:02	05:18	05:18	05:57	06:48	07:38	07:33	08:24
	16:34	17:24	18:17	20:11	21:03	21:49	22:00	21:25	20:20	19:10	17:04	16:25
4	08:45	08:13	07:17	07:05	06:00	05:17	05:19	05:59	06:50	07:40	07:35	08:26
	16:35	17:26	18:18	20:13	21:05	21:50	22:00	21:23	20:18	19:07	17:02	16:24
5	08:45	08:11	07:15	07:02	05:58	05:17	05:20	06:00	06:51	07:42	07:37	08:27
	16:36	17:28	18:20	20:15	21:07	21:51	21:59	21:21	20:16	19:05	17:00	16:24
6	08:44	08:09	07:12	07:00	05:56	05:16	05:21	06:02	06:53	07:43	07:39	08:28
	16:38	17:30	18:22	20:17	21:08	21:52	21:58	21:19	20:13	19:03	16:58	16:23
7	08:44	08:08	07:10	06:58	05:55	05:15	05:21	06:03	06:55	07:45	07:40	08:30
	16:39	17:32	18:24	20:18	21:10	21:53	21:58	21:17	20:11	19:01	16:56	16:23
8	08:43	08:06	07:08	06:56	05:53	05:15	05:22	06:05	06:56	07:47	07:42	08:31
	16:40	17:34	18:26	20:20	21:12	21:54	21:57	21:16	20:09	18:58	16:55	16:22
9	08:43	08:04	07:05	06:53	05:51	05:14	05:23	06:07	06:58	07:48	07:44	08:32
	16:42	17:35	18:27	20:22	21:13	21:55	21:57	21:14	20:06	18:56	16:53	16:22
10	08:42	08:02	07:03	06:51	05:49	05:14	05:24	06:08	07:00	07:50	07:46	08:33
	16:43	17:37	18:29	20:24	21:15	21:55	21:56	21:12	20:04	18:54	16:51	16:22
11	08:42	08:00	07:01	06:49	05:48	05:14	05:25	06:10	07:01	07:52	07:48	08:34
	16:44	17:39	18:31	20:25	21:17	21:56	21:55	21:10	20:02	18:51	16:50	16:22
12	08:41	07:59	06:59	06:46	05:46	05:13	05:27	06:12	07:03	07:54	07:50	08:35
	16:46	17:41	18:33	20:27	21:18	21:57	21:54	21:08	19:59	18:49	16:48	16:22
13	08:40	07:57	06:56	06:44	05:44	05:13	05:28	06:13	07:05	07:55	07:51	08:36
	16:47	17:43	18:35	20:29	21:20	21:57	21:53	21:06	19:57	18:47	16:47	16:22
14	08:40	07:55	06:54	06:42	05:43	05:13	05:29	06:15	07:06	07:57	07:53	08:37
	16:49	17:45	18:36	20:30	21:21	21:58	21:52	21:04	19:55	18:45	16:45	16:22
15	08:39	07:53	06:52	06:40	05:41	05:12	05:30	06:17	07:08	07:59	07:55	08:38
	16:50	17:47	18:38	20:32	21:23	21:59	21:51	21:02	19:52	18:42	16:44	16:22
16	08:38	07:51	06:49	06:38	05:39	05:12	05:31	06:18	07:10	08:01	07:57	08:39
	16:52	17:49	18:40	20:34	21:25	21:59	21:50	21:00	19:50	18:40	16:42	16:22
17	08:37	07:49	06:47	06:35	05:38	05:12	05:32	06:20	07:11	08:02	07:58	08:40
	16:54	17:51	18:42	20:36	21:26	22:00	21:49	20:58	19:48	18:38	16:41	16:22
18	08:36	07:47	06:45	06:33	05:36	05:12	05:34	06:21	07:13	08:04	08:00	08:41
	16:55	17:52	18:43	20:37	21:28	22:00	21:48	20:56	19:45	18:36	16:40	16:22
19	08:35	07:45	06:42	06:31	05:35	05:12	05:35	06:23	07:15	08:06	08:02	08:41
	16:57	17:54	18:45	20:39	21:29	22:00	21:47	20:54	19:43	18:34	16:38	16:22
20	08:34	07:43	06:40	06:29	05:34	05:12	05:36	06:25	07:16	08:08	08:04	08:42
	16:59	17:56	18:47	20:41	21:31	22:01	21:46	20:51	19:40	18:32	16:37	16:23
21	08:33	07:41	06:38	06:27	05:32	05:12	05:38	06:26	07:18	08:10	08:05	08:43
	17:00	17:58	18:49	20:43	21:32	22:01	21:44	20:49	19:38	18:29	16:36	16:23
22	08:32	07:39	06:35	06:24	05:31	05:13	05:39	06:28	07:20	08:11	08:07	08:43
	17:02	18:00	18:50	20:44	21:34	22:01	21:43	20:47	19:36	18:27	16:35	16:24
23	08:30	07:36	06:33	06:22	05:30	05:13	05:41	06:30	07:21	08:13	08:09	08:44
	17:04	18:02	18:52	20:46	21:35	22:01	21:42	20:45	19:33	18:25	16:33	16:24
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	17:06	18:04	18:54	20:48	21:36	22:01	21:40	20:43	19:31	18:23	16:32	16:25
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26	08:27	07:30	06:26	06:16	05:26	05:14	05:45	06:35	07:26	07:19	08:14	08:45
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27	08:25	07:28	06:23	06:14	05:25	05:14	05:46	06:36	07:28	07:20	08:15	08:45
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28	08:24	07:26	06:21	06:12	05:24	05:15	05:48	06:38	07:30	07:22	08:17	08:45
	17:13	18:11	19:01	20:55	21:42	22:01	21:34	20:34	19:22	17:15	16:29	16:28
29	08:22		07:19	06:10	05:23	05:15	05:49	06:40	07:31	07:24	08:18	08:45
	17:15		20:03	20:56	21:43	22:01	21:33	20:32	19:19	17:13	16:28	16:29
30	08:21		07:16	06:08	05:22	05:16	05:51	06:41	07:33	07:26	08:20	08:45
	17:17		20:04	20:58	21:44	22:01	21:31	20:29	19:17	17:11	16:27	16:29
31	08:19		07:14		05:21		05:52	06:43		07:28		08:45
	17:18		20:06		21:45		21:30	20:27		17:09		16:30
Potential sun hours	257	277	367	417	487	501	504	455	381	331	265	241
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
Jennings O'Donovan
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Kathlyn Feeney / kfeeney@jodireland.com

Calculated:
09/06/2025 13:54/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Worst Case - V150 **Shadow receptor:** BY - 90

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:45	08:18	07:23	07:12	06:06	05:20	05:17	05:54	06:45	07:35	07:29	08:21
	16:32	17:20	18:13	20:08	21:00	21:47	22:01	21:28	20:25	19:14	17:07	16:26
2	08:45	08:16	07:21	07:09	06:04	05:19	05:17	05:56	06:46	07:36	07:31	08:23
	16:33	17:22	18:15	20:10	21:02	21:48	22:00	21:26	20:23	19:12	17:05	16:25
3	08:45	08:15	07:19	07:07	06:02	05:18	05:18	05:57	06:48	07:38	07:33	08:24
	16:34	17:24	18:17	20:11	21:03	21:49	22:00	21:25	20:20	19:10	17:04	16:25
4	08:45	08:13	07:17	07:05	06:00	05:17	05:19	05:59	06:50	07:40	07:35	08:26
	16:35	17:26	18:18	20:13	21:05	21:50	22:00	21:23	20:18	19:07	17:02	16:24
5	08:45	08:11	07:15	07:02	05:58	05:17	05:20	06:00	06:51	07:42	07:37	08:27
	16:36	17:28	18:20	20:15	21:07	21:51	21:59	21:21	20:16	19:05	17:00	16:24
6	08:44	08:09	07:12	07:00	05:56	05:16	05:21	06:02	06:53	07:43	07:39	08:28
	16:38	17:30	18:22	20:17	21:08	21:52	21:58	21:19	20:13	19:03	16:58	16:23
7	08:44	08:08	07:10	06:58	05:55	05:15	05:21	06:03	06:55	07:45	07:40	08:30
	16:39	17:32	18:24	20:18	21:10	21:53	21:58	21:17	20:11	19:01	16:56	16:23
8	08:43	08:06	07:08	06:56	05:53	05:15	05:22	06:05	06:56	07:47	07:42	08:31
	16:40	17:34	18:26	20:20	21:12	21:54	21:57	21:16	20:09	18:58	16:55	16:22
9	08:43	08:04	07:05	06:53	05:51	05:14	05:23	06:07	06:58	07:48	07:44	08:32
	16:42	17:35	18:27	20:22	21:13	21:55	21:57	21:14	20:06	18:56	16:53	16:22
10	08:42	08:02	07:03	06:51	05:49	05:14	05:24	06:08	07:00	07:50	07:46	08:33
	16:43	17:37	18:29	20:24	21:15	21:55	21:56	21:12	20:04	18:54	16:51	16:22
11	08:42	08:00	07:01	06:49	05:48	05:14	05:25	06:10	07:01	07:52	07:48	08:34
	16:44	17:39	18:31	20:25	21:17	21:56	21:55	21:10	20:02	18:51	16:50	16:22
12	08:41	07:59	06:59	06:46	05:46	05:13	05:27	06:12	07:03	07:54	07:50	08:35
	16:46	17:41	18:33	20:27	21:18	21:57	21:54	21:08	19:59	18:49	16:48	16:22
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	16:49	17:45	18:36	20:30	21:21	21:58	21:52	21:04	19:55	18:45	16:45	16:22
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	16:50	17:47	18:38	20:32	21:23	21:59	21:51	21:02	19:52	18:42	16:44	16:22
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	17:02	18:00	18:50	20:44	21:34	22:01	21:43	20:47	19:36	18:27	16:35	16:24
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	17:09	18:07	18:57	20:51	21:39	22:02	21:37	20:38	19:26	17:19	16:30	16:26
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	17:13	18:11	19:01	20:55	21:42	22:01	21:34	20:34	19:22	17:15	16:29	16:28
29	08:22		07:19	06:10	05:23	05:15	05:49	06:40	07:31	07:24	08:18	08:45
	17:15		20:03	20:56	21:43	22:01	21:33	20:32	19:19	17:13	16:28	16:29
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	17:17		20:04	20:58	21:44	22:01	21:31	20:29	19:17	17:11	16:27	16:29
31	08:19		07:14		05:21		05:52	06:43		07:28		08:45
	17:18		20:06		21:45		21:30	20:27		17:09		16:30
Potential sun hours	257	277	367	417	487	501	504	455	381	331	265	241
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

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SHADOW - Calendar

Calculation: 6839 Garrane WF Worst Case - V150 **Shadow receptor:** BZ - 91

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:45	08:18	07:23	07:12	06:06	05:20	05:17	05:54	06:45	07:35	07:29	08:21
	16:32	17:20	18:13	20:08	21:00	21:47	22:01	21:28	20:25	19:14	17:07	16:26
2	08:45	08:16	07:21	07:09	06:04	05:19	05:17	05:56	06:46	07:36	07:31	08:23
	16:33	17:22	18:15	20:10	21:02	21:48	22:00	21:26	20:23	19:12	17:05	16:25
3	08:45	08:15	07:19	07:07	06:02	05:18	05:18	05:57	06:48	07:38	07:33	08:24
	16:34	17:24	18:17	20:11	21:03	21:49	22:00	21:25	20:20	19:10	17:04	16:25
4	08:45	08:13	07:17	07:05	06:00	05:17	05:19	05:59	06:50	07:40	07:35	08:26
	16:35	17:26	18:18	20:13	21:05	21:50	21:59	21:23	20:18	19:07	17:02	16:24
5	08:45	08:11	07:15	07:02	05:58	05:17	05:20	06:00	06:51	07:42	07:37	08:27
	16:36	17:28	18:20	20:15	21:07	21:51	21:59	21:21	20:16	19:05	17:00	16:24
6	08:44	08:09	07:12	07:00	05:56	05:16	05:21	06:02	06:53	07:43	07:39	08:28
	16:38	17:30	18:22	20:17	21:08	21:52	21:58	21:19	20:13	19:03	16:58	16:23
7	08:44	08:08	07:10	06:58	05:55	05:15	05:21	06:03	06:55	07:45	07:40	08:30
	16:39	17:32	18:24	20:18	21:10	21:53	21:58	21:17	20:11	19:01	16:57	16:23
8	08:43	08:06	07:08	06:56	05:53	05:15	05:22	06:05	06:56	07:47	07:42	08:31
	16:40	17:34	18:26	20:20	21:12	21:54	21:57	21:16	20:09	18:58	16:55	16:22
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	16:42	17:35	18:27	20:22	21:13	21:55	21:57	21:14	20:06	18:56	16:53	16:22
10	08:42	08:02	07:03	06:51	05:49	05:14	05:24	06:08	07:00	07:50	07:46	08:33
	16:43	17:37	18:29	20:24	21:15	21:55	21:56	21:12	20:04	18:54	16:51	16:22
11	08:42	08:00	07:01	06:49	05:48	05:14	05:25	06:10	07:01	07:52	07:48	08:34
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12	08:41	07:59	06:59	06:46	05:46	05:13	05:27	06:12	07:03	07:54	07:50	08:35
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15	08:39	07:53	06:52	06:40	05:41	05:12	05:30	06:17	07:08	07:59	07:55	08:38
	16:50	17:47	18:38	20:32	21:23	21:59	21:51	21:02	19:52	18:42	16:44	16:22
16	08:38	07:51	06:49	06:38	05:39	05:12	05:31	06:18	07:10	08:01	07:57	08:39
	16:52	17:49	18:40	20:34	21:25	21:59	21:50	21:00	19:50	18:40	16:42	16:22
17	08:37	07:49	06:47	06:35	05:38	05:12	05:33	06:20	07:11	08:02	07:58	08:40
	16:54	17:51	18:42	20:36	21:26	22:00	21:49	20:58	19:48	18:38	16:41	16:22
18	08:36	07:47	06:45	06:33	05:36	05:12	05:34	06:21	07:13	08:04	08:00	08:41
	16:55	17:52	18:43	20:37	21:28	22:00	21:48	20:56	19:45	18:36	16:40	16:22
19	08:35	07:45	06:42	06:31	05:35	05:12	05:35	06:23	07:15	08:06	08:02	08:41
	16:57	17:54	18:45	20:39	21:29	22:00	21:47	20:54	19:43	18:34	16:38	16:22
20	08:34	07:43	06:40	06:29	05:34	05:12	05:36	06:25	07:16	08:08	08:04	08:42
	16:59	17:56	18:47	20:41	21:31	22:01	21:46	20:51	19:40	18:32	16:37	16:23
21	08:33	07:41	06:38	06:27	05:32	05:12	05:38	06:26	07:18	08:10	08:05	08:43
	17:00	17:58	18:49	20:43	21:32	22:01	21:44	20:49	19:38	18:29	16:36	16:23
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	17:02	18:00	18:50	20:44	21:34	22:01	21:43	20:47	19:36	18:27	16:35	16:24
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	17:13	18:11	19:01	20:55	21:42	22:01	21:34	20:34	19:22	17:15	16:29	16:28
29	08:22		07:19	06:10	05:23	05:15	05:49	06:40	07:31	07:24	08:18	08:45
	17:15		20:03	20:56	21:43	22:01	21:33	20:32	19:19	17:13	16:28	16:29
30	08:21		07:16	06:08	05:22	05:16	05:51	06:41	07:33	07:26	08:20	08:45
	17:17		20:04	20:58	21:44	22:01	21:31	20:29	19:17	17:11	16:27	16:29
31	08:19		07:14		05:21		05:52	06:43		07:28		08:45
	17:18		20:06		21:45		21:30	20:27		17:09		16:30
Potential sun hours	257	277	367	417	487	501	504	455	381	331	265	241
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
Jennings O'Donovan
Finisklin Business Park
F91 RHH9 Sligo
+353719161416
Kathlyn Feeney / kfeeney@jodireland.com

Calculated:
09/06/2025 13:54/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Worst Case - V150 **Shadow receptor:** CA - 92

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:45	08:18	07:23	07:12	06:06	05:20	05:17	05:54	06:45	07:35	07:29	08:21
	16:32	17:20	18:13	20:08	21:00	21:47	22:01	21:28	20:25	19:14	17:07	16:26
2	08:45	08:16	07:21	07:09	06:04	05:19	05:17	05:56	06:46	07:36	07:31	08:23
	16:33	17:22	18:15	20:10	21:02	21:48	22:00	21:26	20:23	19:12	17:05	16:25
3	08:45	08:15	07:19	07:07	06:02	05:18	05:18	05:57	06:48	07:38	07:33	08:24
	16:34	17:24	18:17	20:11	21:03	21:49	22:00	21:25	20:20	19:10	17:04	16:25
4	08:45	08:13	07:17	07:05	06:00	05:17	05:19	05:59	06:50	07:40	07:35	08:26
	16:35	17:26	18:18	20:13	21:05	21:50	21:59	21:23	20:18	19:07	17:02	16:24
5	08:45	08:11	07:15	07:02	05:58	05:17	05:20	06:00	06:51	07:42	07:37	08:27
	16:36	17:28	18:20	20:15	21:07	21:51	21:59	21:21	20:16	19:05	17:00	16:24
6	08:44	08:09	07:12	07:00	05:56	05:16	05:21	06:02	06:53	07:43	07:39	08:28
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7	08:44	08:08	07:10	06:58	05:55	05:15	05:21	06:03	06:55	07:45	07:40	08:30
	16:39	17:32	18:24	20:18	21:10	21:53	21:58	21:17	20:11	19:01	16:57	16:23
8	08:43	08:06	07:08	06:56	05:53	05:15	05:22	06:05	06:56	07:47	07:42	08:31
	16:40	17:34	18:26	20:20	21:12	21:54	21:57	21:16	20:09	18:58	16:55	16:22
9	08:43	08:04	07:05	06:53	05:51	05:14	05:23	06:07	06:58	07:48	07:44	08:32
	16:42	17:35	18:27	20:22	21:13	21:55	21:57	21:14	20:06	18:56	16:53	16:22
10	08:42	08:02	07:03	06:51	05:49	05:14	05:24	06:08	07:00	07:50	07:46	08:33
	16:43	17:37	18:29	20:24	21:15	21:55	21:56	21:12	20:04	18:54	16:51	16:22
11	08:42	08:00	07:01	06:49	05:48	05:14	05:25	06:10	07:01	07:52	07:48	08:34
	16:44	17:39	18:31	20:25	21:17	21:56	21:55	21:10	20:02	18:51	16:50	16:22
12	08:41	07:59	06:59	06:46	05:46	05:13	05:27	06:12	07:03	07:54	07:50	08:35
	16:46	17:41	18:33	20:27	21:18	21:57	21:54	21:08	19:59	18:49	16:48	16:22
13	08:40	07:57	06:56	06:44	05:44	05:13	05:28	06:13	07:05	07:55	07:51	08:36
	16:47	17:43	18:35	20:29	21:20	21:57	21:53	21:06	19:57	18:47	16:47	16:22
14	08:40	07:55	06:54	06:42	05:43	05:13	05:29	06:15	07:06	07:57	07:53	08:37
	16:49	17:45	18:36	20:30	21:21	21:58	21:52	21:04	19:55	18:45	16:45	16:22
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	16:50	17:47	18:38	20:32	21:23	21:59	21:51	21:02	19:52	18:42	16:44	16:22
16	08:38	07:51	06:49	06:38	05:39	05:12	05:31	06:18	07:10	08:01	07:57	08:39
	16:52	17:49	18:40	20:34	21:25	21:59	21:50	21:00	19:50	18:40	16:42	16:22
17	08:37	07:49	06:47	06:35	05:38	05:12	05:33	06:20	07:11	08:02	07:58	08:40
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18	08:36	07:47	06:45	06:33	05:36	05:12	05:34	06:21	07:13	08:04	08:00	08:41
	16:55	17:52	18:43	20:37	21:28	22:00	21:48	20:56	19:45	18:36	16:40	16:22
19	08:35	07:45	06:42	06:31	05:35	05:12	05:35	06:23	07:15	08:06	08:02	08:41
	16:57	17:54	18:45	20:39	21:29	22:00	21:47	20:54	19:43	18:34	16:38	16:22
20	08:34	07:43	06:40	06:29	05:34	05:12	05:36	06:25	07:16	08:08	08:04	08:42
	16:59	17:56	18:47	20:41	21:31	22:01	21:46	20:51	19:40	18:32	16:37	16:23
21	08:33	07:41	06:38	06:27	05:32	05:12	05:38	06:26	07:18	08:10	08:05	08:43
	17:00	17:58	18:49	20:43	21:32	22:01	21:44	20:49	19:38	18:29	16:36	16:23
22	08:32	07:39	06:35	06:24	05:31	05:13	05:39	06:28	07:20	08:11	08:07	08:43
	17:02	18:00	18:50	20:44	21:34	22:01	21:43	20:47	19:36	18:27	16:35	16:24
23	08:30	07:36	06:33	06:22	05:30	05:13	05:41	06:30	07:21	08:13	08:09	08:44
	17:04	18:02	18:52	20:46	21:35	22:01	21:42	20:45	19:33	18:25	16:33	16:24
24	08:29	07:34	06:31	06:20	05:28	05:13	05:42	06:31	07:23	08:15	08:10	08:44
	17:06	18:04	18:54	20:48	21:36	22:01	21:40	20:43	19:31	18:23	16:32	16:25
25	08:28	07:32	06:28	06:18	05:27	05:14	05:43	06:33	07:25	07:17	08:12	08:44
	17:07	18:06	18:56	20:50	21:38	22:02	21:39	20:41	19:29	17:21	16:31	16:25
26	08:27	07:30	06:26	06:16	05:26	05:14	05:45	06:35	07:26	07:19	08:14	08:45
	17:09	18:07	18:57	20:51	21:39	22:02	21:37	20:38	19:26	17:19	16:30	16:26
27	08:25	07:28	06:23	06:14	05:25	05:14	05:46	06:36	07:28	07:20	08:15	08:45
	17:11	18:09	18:59	20:53	21:40	22:01	21:36	20:36	19:24	17:17	16:29	16:27
28	08:24	07:26	06:21	06:12	05:24	05:15	05:48	06:38	07:30	07:22	08:17	08:45
	17:13	18:11	19:01	20:55	21:42	22:01	21:34	20:34	19:22	17:15	16:29	16:28
29	08:22		07:19	06:10	05:23	05:15	05:49	06:40	07:31	07:24	08:18	08:45
	17:15		20:03	20:56	21:43	22:01	21:33	20:32	19:19	17:13	16:28	16:29
30	08:21		07:16	06:08	05:22	05:16	05:51	06:41	07:33	07:26	08:20	08:45
	17:17		20:04	20:58	21:44	22:01	21:31	20:29	19:17	17:11	16:27	16:29
31	08:19		07:14		05:21		05:52	06:43		07:28		08:45
	17:18		20:06		21:45		21:30	20:27		17:09		16:30
Potential sun hours	257	277	367	417	487	501	504	455	381	331	265	241
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

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SHADOW - Calendar

Calculation: 6839 Garrane WF Worst Case - V150 **Shadow receptor:** CB - 93

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:45	08:18	07:23	07:12	06:06	05:20	05:17	05:54	06:45	07:35	07:29	08:21
	16:32	17:20	18:13	20:08	21:00	21:47	22:01	21:28	20:25	19:14	17:07	16:26
2	08:45	08:16	07:21	07:09	06:04	05:19	05:17	05:56	06:46	07:36	07:31	08:23
	16:33	17:22	18:15	20:10	21:02	21:48	22:00	21:26	20:23	19:12	17:05	16:25
3	08:45	08:15	07:19	07:07	06:02	05:18	05:18	05:57	06:48	07:38	07:33	08:24
	16:34	17:24	18:17	20:11	21:03	21:49	22:00	21:25	20:20	19:10	17:04	16:25
4	08:45	08:13	07:17	07:05	06:00	05:17	05:19	05:59	06:50	07:40	07:35	08:26
	16:35	17:26	18:18	20:13	21:05	21:50	21:59	21:23	20:18	19:07	17:02	16:24
5	08:45	08:11	07:15	07:02	05:58	05:17	05:20	06:00	06:51	07:42	07:37	08:27
	16:36	17:28	18:20	20:15	21:07	21:51	21:59	21:21	20:16	19:05	17:00	16:24
6	08:44	08:09	07:12	07:00	05:56	05:16	05:21	06:02	06:53	07:43	07:39	08:28
	16:38	17:30	18:22	20:17	21:08	21:52	21:58	21:19	20:13	19:03	16:58	16:23
7	08:44	08:08	07:10	06:58	05:55	05:15	05:21	06:03	06:55	07:45	07:40	08:30
	16:39	17:32	18:24	20:18	21:10	21:53	21:58	21:17	20:11	19:01	16:57	16:23
8	08:43	08:06	07:08	06:56	05:53	05:15	05:22	06:05	06:56	07:47	07:42	08:31
	16:40	17:34	18:26	20:20	21:12	21:54	21:57	21:16	20:09	18:58	16:55	16:22
9	08:43	08:04	07:05	06:53	05:51	05:14	05:23	06:07	06:58	07:48	07:44	08:32
	16:42	17:35	18:27	20:22	21:13	21:55	21:57	21:14	20:06	18:56	16:53	16:22
10	08:42	08:02	07:03	06:51	05:49	05:14	05:24	06:08	07:00	07:50	07:46	08:33
	16:43	17:37	18:29	20:24	21:15	21:55	21:56	21:12	20:04	18:54	16:51	16:22
11	08:42	08:00	07:01	06:49	05:48	05:14	05:25	06:10	07:01	07:52	07:48	08:34
	16:44	17:39	18:31	20:25	21:17	21:56	21:55	21:10	20:02	18:51	16:50	16:22
12	08:41	07:59	06:59	06:46	05:46	05:13	05:27	06:12	07:03	07:54	07:50	08:35
	16:46	17:41	18:33	20:27	21:18	21:57	21:54	21:08	19:59	18:49	16:48	16:22
13	08:40	07:57	06:56	06:44	05:44	05:13	05:28	06:13	07:05	07:55	07:51	08:36
	16:47	17:43	18:35	20:29	21:20	21:57	21:53	21:06	19:57	18:47	16:47	16:22
14	08:40	07:55	06:54	06:42	05:43	05:13	05:29	06:15	07:06	07:57	07:53	08:37
	16:49	17:45	18:36	20:30	21:21	21:58	21:52	21:04	19:55	18:45	16:45	16:22
15	08:39	07:53	06:52	06:40	05:41	05:12	05:30	06:17	07:08	07:59	07:55	08:38
	16:50	17:47	18:38	20:32	21:23	21:59	21:51	21:02	19:52	18:42	16:44	16:22
16	08:38	07:51	06:49	06:38	05:40	05:12	05:31	06:18	07:10	08:01	07:57	08:39
	16:52	17:49	18:40	20:34	21:25	21:59	21:50	21:00	19:50	18:40	16:42	16:22
17	08:37	07:49	06:47	06:35	05:38	05:12	05:33	06:20	07:11	08:02	07:58	08:40
	16:54	17:51	18:42	20:36	21:26	22:00	21:49	20:58	19:48	18:38	16:41	16:22
18	08:36	07:47	06:45	06:33	05:36	05:12	05:34	06:21	07:13	08:04	08:00	08:41
	16:55	17:52	18:43	20:37	21:28	22:00	21:48	20:56	19:45	18:36	16:40	16:22
19	08:35	07:45	06:42	06:31	05:35	05:12	05:35	06:23	07:15	08:06	08:02	08:41
	16:57	17:54	18:45	20:39	21:29	22:00	21:47	20:54	19:43	18:34	16:38	16:22
20	08:34	07:43	06:40	06:29	05:34	05:12	05:36	06:25	07:16	08:08	08:04	08:42
	16:59	17:56	18:47	20:41	21:31	22:01	21:46	20:51	19:40	18:32	16:37	16:23
21	08:33	07:41	06:38	06:27	05:32	05:13	05:38	06:26	07:18	08:10	08:05	08:43
	17:00	17:58	18:49	20:43	21:32	22:01	21:44	20:49	19:38	18:29	16:36	16:23
22	08:32	07:39	06:35	06:24	05:31	05:13	05:39	06:28	07:20	08:11	08:07	08:43
	17:02	18:00	18:50	20:44	21:34	22:01	21:43	20:47	19:36	18:27	16:35	16:24
23	08:30	07:36	06:33	06:22	05:30	05:13	05:41	06:30	07:21	08:13	08:09	08:44
	17:04	18:02	18:52	20:46	21:35	22:01	21:42	20:45	19:33	18:25	16:34	16:24
24	08:29	07:34	06:31	06:20	05:28	05:13	05:42	06:31	07:23	08:15	08:10	08:44
	17:06	18:04	18:54	20:48	21:36	22:01	21:40	20:43	19:31	18:23	16:32	16:25
25	08:28	07:32	06:28	06:18	05:27	05:14	05:43	06:33	07:25	07:17	08:12	08:44
	17:07	18:06	18:56	20:50	21:38	22:02	21:39	20:41	19:29	17:21	16:31	16:25
26	08:27	07:30	06:26	06:16	05:26	05:14	05:45	06:35	07:26	07:19	08:14	08:45
	17:09	18:07	18:57	20:51	21:39	22:02	21:37	20:38	19:26	17:19	16:30	16:26
27	08:25	07:28	06:23	06:14	05:25	05:14	05:46	06:36	07:28	07:20	08:15	08:45
	17:11	18:09	18:59	20:53	21:40	22:01	21:36	20:36	19:24	17:17	16:29	16:27
28	08:24	07:26	06:21	06:12	05:24	05:15	05:48	06:38	07:30	07:22	08:17	08:45
	17:13	18:11	19:01	20:55	21:42	22:01	21:34	20:34	19:22	17:15	16:29	16:28
29	08:22		07:19	06:10	05:23	05:15	05:49	06:40	07:31	07:24	08:18	08:45
	17:15		20:03	20:56	21:43	22:01	21:33	20:32	19:19	17:13	16:28	16:29
30	08:21		07:16	06:08	05:22	05:16	05:51	06:41	07:33	07:26	08:20	08:45
	17:17		20:04	20:58	21:44	22:01	21:31	20:29	19:17	17:11	16:27	16:29
31	08:19		07:14		05:21		05:52	06:43		07:28		08:45
	17:18		20:06		21:45		21:30	20:27		17:09		16:30
Potential sun hours	257	277	367	417	487	501	504	455	381	331	265	241
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
Jennings O'Donovan
Finisklin Business Park
F91 RHH9 Sligo
+353719161416
Kathlyn Feeney / kfeeney@jodireland.com

Calculated:
09/06/2025 13:54/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Worst Case - V150 **Shadow receptor:** CC - 94

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:45	08:18	07:23	07:12	06:06	05:20	05:17	05:54	06:45	07:35	07:29	08:21
	16:32	17:20	18:13	20:08	21:00	21:47	22:01	21:28	20:25	19:14	17:07	16:26
2	08:45	08:16	07:21	07:09	06:04	05:19	05:17	05:56	06:46	07:36	07:31	08:23
	16:33	17:22	18:15	20:10	21:02	21:48	22:00	21:26	20:23	19:12	17:05	16:25
3	08:45	08:15	07:19	07:07	06:02	05:18	05:18	05:57	06:48	07:38	07:33	08:24
	16:34	17:24	18:17	20:11	21:03	21:49	22:00	21:25	20:20	19:10	17:04	16:25
4	08:45	08:13	07:17	07:05	06:00	05:17	05:19	05:59	06:50	07:40	07:35	08:26
	16:35	17:26	18:18	20:13	21:05	21:50	21:59	21:23	20:18	19:07	17:02	16:24
5	08:45	08:11	07:15	07:02	05:58	05:17	05:20	06:00	06:51	07:42	07:37	08:27
	16:36	17:28	18:20	20:15	21:07	21:51	21:59	21:21	20:16	19:05	17:00	16:24
6	08:44	08:09	07:12	07:00	05:56	05:16	05:21	06:02	06:53	07:43	07:39	08:28
	16:38	17:30	18:22	20:17	21:08	21:52	21:58	21:19	20:13	19:03	16:58	16:23
7	08:44	08:08	07:10	06:58	05:55	05:15	05:21	06:03	06:55	07:45	07:40	08:30
	16:39	17:32	18:24	20:18	21:10	21:53	21:58	21:17	20:11	19:01	16:57	16:23
8	08:43	08:06	07:08	06:56	05:53	05:15	05:22	06:05	06:56	07:47	07:42	08:31
	16:40	17:34	18:26	20:20	21:12	21:54	21:57	21:16	20:09	18:58	16:55	16:22
9	08:43	08:04	07:05	06:53	05:51	05:14	05:23	06:07	06:58	07:48	07:44	08:32
	16:42	17:35	18:27	20:22	21:13	21:55	21:57	21:14	20:06	18:56	16:53	16:22
10	08:42	08:02	07:03	06:51	05:49	05:14	05:24	06:08	07:00	07:50	07:46	08:33
	16:43	17:37	18:29	20:24	21:15	21:55	21:56	21:12	20:04	18:54	16:51	16:22
11	08:42	08:00	07:01	06:49	05:48	05:14	05:25	06:10	07:01	07:52	07:48	08:34
	16:44	17:39	18:31	20:25	21:17	21:56	21:55	21:10	20:02	18:51	16:50	16:22
12	08:41	07:59	06:59	06:46	05:46	05:13	05:27	06:12	07:03	07:54	07:50	08:35
	16:46	17:41	18:33	20:27	21:18	21:57	21:54	21:08	19:59	18:49	16:48	16:22
13	08:40	07:57	06:56	06:44	05:44	05:13	05:28	06:13	07:05	07:55	07:51	08:36
	16:47	17:43	18:35	20:29	21:20	21:57	21:53	21:06	19:57	18:47	16:47	16:22
14	08:40	07:55	06:54	06:42	05:43	05:13	05:29	06:15	07:06	07:57	07:53	08:37
	16:49	17:45	18:36	20:30	21:21	21:58	21:52	21:04	19:55	18:45	16:45	16:22
15	08:39	07:53	06:52	06:40	05:41	05:12	05:30	06:17	07:08	07:59	07:55	08:38
	16:50	17:47	18:38	20:32	21:23	21:59	21:51	21:02	19:52	18:42	16:44	16:22
16	08:38	07:51	06:49	06:38	05:40	05:12	05:31	06:18	07:10	08:01	07:57	08:39
	16:52	17:49	18:40	20:34	21:25	21:59	21:50	21:00	19:50	18:40	16:42	16:22
17	08:37	07:49	06:47	06:35	05:38	05:12	05:33	06:20	07:11	08:02	07:58	08:40
	16:54	17:51	18:42	20:36	21:26	22:00	21:49	20:58	19:48	18:38	16:41	16:22
18	08:36	07:47	06:45	06:33	05:36	05:12	05:34	06:21	07:13	08:04	08:00	08:41
	16:55	17:52	18:43	20:37	21:28	22:00	21:48	20:56	19:45	18:36	16:40	16:22
19	08:35	07:45	06:42	06:31	05:35	05:12	05:35	06:23	07:15	08:06	08:02	08:41
	16:57	17:54	18:45	20:39	21:29	22:00	21:47	20:54	19:43	18:34	16:38	16:22
20	08:34	07:43	06:40	06:29	05:34	05:12	05:36	06:25	07:16	08:08	08:04	08:42
	16:59	17:56	18:47	20:41	21:31	22:01	21:46	20:51	19:40	18:32	16:37	16:23
21	08:33	07:41	06:38	06:27	05:32	05:12	05:38	06:26	07:18	08:10	08:05	08:43
	17:00	17:58	18:49	20:43	21:32	22:01	21:44	20:49	19:38	18:29	16:36	16:23
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	17:02	18:00	18:50	20:44	21:34	22:01	21:43	20:47	19:36	18:27	16:35	16:24
23	08:30	07:36	06:33	06:22	05:30	05:13	05:41	06:30	07:21	08:13	08:09	08:44
	17:04	18:02	18:52	20:46	21:35	22:01	21:42	20:45	19:33	18:25	16:33	16:24
24	08:29	07:34	06:31	06:20	05:28	05:13	05:42	06:31	07:23	08:15	08:10	08:44
	17:06	18:04	18:54	20:48	21:36	22:01	21:40	20:43	19:31	18:23	16:32	16:25
25	08:28	07:32	06:28	06:18	05:27	05:14	05:43	06:33	07:25	07:17	08:12	08:44
	17:07	18:06	18:56	20:50	21:38	22:02	21:39	20:41	19:29	17:21	16:31	16:25
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	17:09	18:07	18:57	20:51	21:39	22:02	21:37	20:38	19:26	17:19	16:30	16:26
27	08:25	07:28	06:23	06:14	05:25	05:14	05:46	06:36	07:28	07:20	08:15	08:45
	17:11	18:09	18:59	20:53	21:40	22:01	21:36	20:36	19:24	17:17	16:29	16:27
28	08:24	07:26	06:21	06:12	05:24	05:15	05:48	06:38	07:30	07:22	08:17	08:45
	17:13	18:11	19:01	20:55	21:42	22:01	21:34	20:34	19:22	17:15	16:29	16:28
29	08:22		07:19	06:10	05:23	05:15	05:49	06:40	07:31	07:24	08:18	08:45
	17:15		20:03	20:56	21:43	22:01	21:33	20:32	19:19	17:13	16:28	16:29
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31	08:19		07:14		05:21		05:52	06:43		07:28		08:45
	17:18		20:06		21:45		21:30	20:27		17:09		16:30
Potential sun hours	257	277	367	417	487	501	504	455	381	331	265	241
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

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Finisklin Business Park
F91 RHH9 Sligo
+353719161416
Kathlyn Feeney / kfeeney@jodireland.com

Calculated:
09/06/2025 13:54/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Worst Case - V150 **Shadow receptor:** CD - 95

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:45	08:18	07:23	07:12	06:06	05:20	05:17	05:54	06:45	07:35	07:29	08:21
	16:32	17:20	18:13	20:08	21:00	21:47	22:01	21:28	20:25	19:14	17:07	16:26
2	08:45	08:16	07:21	07:09	06:04	05:19	05:17	05:56	06:46	07:36	07:31	08:23
	16:33	17:22	18:15	20:10	21:02	21:48	22:00	21:26	20:23	19:12	17:05	16:25
3	08:45	08:15	07:19	07:07	06:02	05:18	05:18	05:57	06:48	07:38	07:33	08:24
	16:34	17:24	18:17	20:11	21:03	21:49	22:00	21:25	20:20	19:10	17:04	16:25
4	08:45	08:13	07:17	07:05	06:00	05:17	05:19	05:59	06:50	07:40	07:35	08:26
	16:35	17:26	18:18	20:13	21:05	21:50	21:59	21:23	20:18	19:07	17:02	16:24
5	08:45	08:11	07:15	07:02	05:58	05:17	05:20	06:00	06:51	07:42	07:37	08:27
	16:36	17:28	18:20	20:15	21:07	21:51	21:59	21:21	20:16	19:05	17:00	16:24
6	08:44	08:09	07:12	07:00	05:56	05:16	05:21	06:02	06:53	07:43	07:39	08:28
	16:38	17:30	18:22	20:17	21:08	21:52	21:58	21:19	20:13	19:03	16:58	16:23
7	08:44	08:08	07:10	06:58	05:55	05:15	05:21	06:03	06:55	07:45	07:40	08:30
	16:39	17:32	18:24	20:18	21:10	21:53	21:58	21:17	20:11	19:01	16:57	16:23
8	08:43	08:06	07:08	06:56	05:53	05:15	05:22	06:05	06:56	07:47	07:42	08:31
	16:40	17:34	18:26	20:20	21:12	21:54	21:57	21:16	20:09	18:58	16:55	16:22
9	08:43	08:04	07:05	06:53	05:51	05:14	05:23	06:07	06:58	07:48	07:44	08:32
	16:42	17:35	18:27	20:22	21:13	21:55	21:56	21:14	20:06	18:56	16:53	16:22
10	08:42	08:02	07:03	06:51	05:49	05:14	05:24	06:08	07:00	07:50	07:46	08:33
	16:43	17:37	18:29	20:24	21:15	21:55	21:56	21:12	20:04	18:54	16:51	16:22
11	08:42	08:00	07:01	06:49	05:48	05:14	05:25	06:10	07:01	07:52	07:48	08:34
	16:44	17:39	18:31	20:25	21:17	21:56	21:55	21:10	20:02	18:51	16:50	16:22
12	08:41	07:59	06:59	06:46	05:46	05:13	05:27	06:12	07:03	07:54	07:50	08:35
	16:46	17:41	18:33	20:27	21:18	21:57	21:54	21:08	19:59	18:49	16:48	16:22
13	08:40	07:57	06:56	06:44	05:44	05:13	05:28	06:13	07:05	07:55	07:51	08:36
	16:47	17:43	18:35	20:29	21:20	21:57	21:53	21:06	19:57	18:47	16:47	16:22
14	08:40	07:55	06:54	06:42	05:43	05:13	05:29	06:15	07:06	07:57	07:53	08:37
	16:49	17:45	18:36	20:30	21:21	21:58	21:52	21:04	19:55	18:45	16:45	16:22
15	08:39	07:53	06:52	06:40	05:41	05:12	05:30	06:17	07:08	07:59	07:55	08:38
	16:50	17:47	18:38	20:32	21:23	21:59	21:51	21:02	19:52	18:42	16:44	16:22
16	08:38	07:51	06:49	06:38	05:40	05:12	05:31	06:18	07:10	08:01	07:57	08:39
	16:52	17:49	18:40	20:34	21:25	21:59	21:50	21:00	19:50	18:40	16:42	16:22
17	08:37	07:49	06:47	06:35	05:38	05:12	05:33	06:20	07:11	08:02	07:58	08:40
	16:54	17:51	18:42	20:36	21:26	22:00	21:49	20:58	19:48	18:38	16:41	16:22
18	08:36	07:47	06:45	06:33	05:36	05:12	05:34	06:21	07:13	08:04	08:00	08:41
	16:55	17:52	18:43	20:37	21:28	22:00	21:48	20:56	19:45	18:36	16:40	16:22
19	08:35	07:45	06:42	06:31	05:35	05:12	05:35	06:23	07:15	08:06	08:02	08:41
	16:57	17:54	18:45	20:39	21:29	22:00	21:47	20:54	19:43	18:34	16:38	16:22
20	08:34	07:43	06:40	06:29	05:34	05:12	05:36	06:25	07:16	08:08	08:04	08:42
	16:59	17:56	18:47	20:41	21:31	22:01	21:46	20:51	19:40	18:32	16:37	16:23
21	08:33	07:41	06:38	06:27	05:32	05:13	05:38	06:26	07:18	08:10	08:05	08:43
	17:00	17:58	18:49	20:43	21:32	22:01	21:44	20:49	19:38	18:29	16:36	16:23
22	08:32	07:39	06:35	06:24	05:31	05:13	05:39	06:28	07:20	08:11	08:07	08:43
	17:02	18:00	18:50	20:44	21:34	22:01	21:43	20:47	19:36	18:27	16:35	16:24
23	08:30	07:36	06:33	06:22	05:30	05:13	05:41	06:30	07:21	08:13	08:09	08:44
	17:04	18:02	18:52	20:46	21:35	22:01	21:42	20:45	19:33	18:25	16:33	16:24
24	08:29	07:34	06:31	06:20	05:28	05:13	05:42	06:31	07:23	08:15	08:10	08:44
	17:06	18:04	18:54	20:48	21:36	22:01	21:40	20:43	19:31	18:23	16:32	16:25
25	08:28	07:32	06:28	06:18	05:27	05:14	05:43	06:33	07:25	07:17	08:12	08:44
	17:07	18:06	18:56	20:50	21:38	22:02	21:39	20:41	19:29	17:21	16:31	16:25
26	08:27	07:30	06:26	06:16	05:26	05:14	05:45	06:35	07:26	07:19	08:14	08:45
	17:09	18:07	18:57	20:51	21:39	22:01	21:37	20:38	19:26	17:19	16:30	16:26
27	08:25	07:28	06:23	06:14	05:25	05:14	05:46	06:36	07:28	07:20	08:15	08:45
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28	08:24	07:26	06:21	06:12	05:24	05:15	05:48	06:38	07:30	07:22	08:17	08:45
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29	08:22		07:19	06:10	05:23	05:15	05:49	06:40	07:31	07:24	08:18	08:45
	17:15		20:03	20:56	21:43	22:01	21:33	20:32	19:19	17:13	16:28	16:29
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	17:17		20:04	20:58	21:44	22:01	21:31	20:29	19:17	17:11	16:27	16:29
31	08:19		07:14		05:21		05:52	06:43		07:28		08:45
	17:18		20:06		21:45		21:30	20:27		17:09		16:30
Potential sun hours	257	277	367	417	487	501	504	455	381	331	265	241
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

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SHADOW - Calendar

Calculation: 6839 Garrane WF Worst Case - V150 **Shadow receptor:** CE - 96

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
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	16:33	17:22	18:15	20:10	21:02	21:48	22:00	21:26	20:23	19:12	17:05	16:25
3	08:45	08:15	07:19	07:07	06:02	05:18	05:18	05:57	06:48	07:38	07:33	08:24
	16:34	17:24	18:17	20:11	21:03	21:49	22:00	21:25	20:20	19:10	17:04	16:25
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	16:35	17:26	18:18	20:13	21:05	21:50	21:59	21:23	20:18	19:07	17:02	16:24
5	08:45	08:11	07:15	07:02	05:58	05:17	05:20	06:00	06:51	07:42	07:37	08:27
	16:36	17:28	18:20	20:15	21:07	21:51	21:59	21:21	20:16	19:05	17:00	16:24
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12	08:41	07:59	06:59	06:46	05:46	05:13	05:27	06:12	07:03	07:54	07:50	08:35
	16:46	17:41	18:33	20:27	21:18	21:57	21:54	21:08	19:59	18:49	16:48	16:22
13	08:40	07:57	06:56	06:44	05:44	05:13	05:28	06:13	07:05	07:55	07:51	08:36
	16:47	17:43	18:35	20:29	21:20	21:57	21:53	21:06	19:57	18:47	16:47	16:22
14	08:40	07:55	06:54	06:42	05:43	05:13	05:29	06:15	07:06	07:57	07:53	08:37
	16:49	17:45	18:36	20:30	21:21	21:58	21:52	21:04	19:55	18:45	16:45	16:22
15	08:39	07:53	06:52	06:40	05:41	05:12	05:30	06:17	07:08	07:59	07:55	08:38
	16:50	17:47	18:38	20:32	21:23	21:59	21:51	21:02	19:52	18:42	16:44	16:22
16	08:38	07:51	06:49	06:38	05:40	05:12	05:31	06:18	07:10	08:01	07:57	08:39
	16:52	17:49	18:40	20:34	21:25	21:59	21:50	21:00	19:50	18:40	16:42	16:22
17	08:37	07:49	06:47	06:35	05:38	05:12	05:33	06:20	07:11	08:02	07:58	08:40
	16:54	17:51	18:42	20:36	21:26	22:00	21:49	20:58	19:48	18:38	16:41	16:22
18	08:36	07:47	06:45	06:33	05:36	05:12	05:34	06:21	07:13	08:04	08:00	08:41
	16:55	17:52	18:43	20:37	21:28	22:00	21:48	20:56	19:45	18:36	16:40	16:22
19	08:35	07:45	06:42	06:31	05:35	05:12	05:35	06:23	07:15	08:06	08:02	08:41
	16:57	17:54	18:45	20:39	21:29	22:00	21:47	20:54	19:43	18:34	16:38	16:22
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21	08:33	07:41	06:38	06:27	05:32	05:13	05:38	06:26	07:18	08:10	08:05	08:43
	17:00	17:58	18:49	20:43	21:32	22:01	21:44	20:49	19:38	18:29	16:36	16:23
22	08:32	07:39	06:35	06:24	05:31	05:13	05:39	06:28	07:20	08:11	08:07	08:43
	17:02	18:00	18:50	20:44	21:34	22:01	21:43	20:47	19:36	18:27	16:35	16:24
23	08:30	07:36	06:33	06:22	05:30	05:13	05:41	06:30	07:21	08:13	08:09	08:44
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	17:06	18:04	18:54	20:48	21:36	22:01	21:40	20:43	19:31	18:23	16:32	16:25
25	08:28	07:32	06:28	06:18	05:27	05:14	05:43	06:33	07:25	07:17	08:12	08:44
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26	08:27	07:30	06:26	06:16	05:26	05:14	05:45	06:35	07:26	07:19	08:14	08:45
	17:09	18:07	18:57	20:51	21:39	22:01	21:37	20:38	19:26	17:19	16:30	16:26
27	08:25	07:28	06:23	06:14	05:25	05:14	05:46	06:36	07:28	07:20	08:15	08:45
	17:11	18:09	18:59	20:53	21:40	22:01	21:36	20:36	19:24	17:17	16:29	16:27
28	08:24	07:26	06:21	06:12	05:24	05:15	05:48	06:38	07:30	07:22	08:17	08:45
	17:13	18:11	19:01	20:55	21:42	22:01	21:34	20:34	19:22	17:15	16:29	16:28
29	08:22		07:19	06:10	05:23	05:15	05:49	06:40	07:31	07:24	08:18	08:45
	17:15		20:03	20:56	21:43	22:01	21:33	20:32	19:19	17:13	16:28	16:29
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Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

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Kathlyn Feeney / kfeeney@jodireland.com

SHADOW - Calendar

Calculation: 6839 Garrane WF Worst Case - V150 **Shadow receptor:** CF - 122

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
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	16:32	17:20	18:13	20:08	21:00	21:47	22:01	21:28	20:25	19:15	17:07	16:26
2	08:45	08:16	07:21	07:10	06:04	05:19	05:17	05:56	06:46	07:36	07:31	08:23
	16:33	17:22	18:15	20:10	21:02	21:48	22:00	21:26	20:23	19:12	17:06	16:26
3	08:45	08:15	07:19	07:07	06:02	05:18	05:18	05:57	06:48	07:38	07:33	08:24
	16:34	17:24	18:17	20:11	21:03	21:49	22:00	21:25	20:20	19:10	17:04	16:25
4	08:45	08:13	07:17	07:05	06:00	05:18	05:19	05:59	06:50	07:40	07:35	08:26
	16:35	17:26	18:18	20:13	21:05	21:50	22:00	21:23	20:18	19:08	17:02	16:24
5	08:45	08:11	07:15	07:03	05:58	05:17	05:20	06:00	06:51	07:42	07:37	08:27
	16:36	17:28	18:20	20:15	21:07	21:51	21:59	21:21	20:16	19:05	17:00	16:24
6	08:44	08:10	07:12	07:00	05:57	05:16	05:21	06:02	06:53	07:43	07:39	08:28
	16:38	17:30	18:22	20:17	21:08	21:52	21:59	21:19	20:13	19:03	16:58	16:23
7	08:44	08:08	07:10	06:58	05:55	05:16	05:22	06:04	06:55	07:45	07:41	08:30
	16:39	17:32	18:24	20:18	21:10	21:53	21:58	21:17	20:11	19:01	16:57	16:23
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	16:54	17:51	18:42	20:36	21:26	22:00	21:49	20:58	19:48	18:38	16:41	16:22
18	08:36	07:47	06:45	06:33	05:37	05:12	05:34	06:22	07:13	08:04	08:00	08:41
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	16:59	17:56	18:47	20:41	21:31	22:01	21:46	20:52	19:41	18:32	16:37	16:23
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	17:01	17:58	18:49	20:43	21:32	22:01	21:44	20:49	19:38	18:30	16:36	16:23
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25	08:28	07:32	06:28	06:18	05:27	05:14	05:43	06:33	07:25	07:17	08:12	08:44
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	17:11	18:09	18:59	20:53	21:40	22:02	21:36	20:36	19:24	17:17	16:30	16:27
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	17:13	18:11	19:01	20:55	21:42	22:01	21:35	20:34	19:22	17:15	16:29	16:28
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	17:15		20:03	20:56	21:43	22:01	21:33	20:32	19:19	17:13	16:28	16:29
30	08:21		07:17	06:08	05:22	05:16	05:51	06:41	07:33	07:26	08:20	08:45
	17:17		20:04	20:58	21:44	22:01	21:31	20:30	19:17	17:11	16:27	16:30
31	08:19		07:14		05:21		05:52	06:43		07:28		08:45
	17:19		20:06		21:45		21:30	20:27		17:09		16:30
Potential sun hours	257	277	367	417	487	501	504	455	381	331	265	241
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
Jennings O'Donovan
Finisklin Business Park
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+353719161416
Kathlyn Feeney / kfeeney@jodireland.com

Calculated:
09/06/2025 13:54/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Worst Case - V150 **Shadow receptor:** CG - 123

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:45	08:18	07:23	07:12	06:06	05:20	05:17	05:54	06:45	07:35	07:30	08:21
	16:32	17:20	18:13	20:08	21:00	21:47	22:01	21:28	20:25	19:15	17:07	16:26
2	08:45	08:16	07:21	07:10	06:04	05:19	05:17	05:56	06:46	07:36	07:31	08:23
	16:33	17:22	18:15	20:10	21:02	21:48	22:00	21:26	20:23	19:12	17:06	16:26
3	08:45	08:15	07:19	07:07	06:02	05:18	05:18	05:57	06:48	07:38	07:33	08:24
	16:34	17:24	18:17	20:11	21:03	21:49	22:00	21:25	20:20	19:10	17:04	16:25
4	08:45	08:13	07:17	07:05	06:00	05:18	05:19	05:59	06:50	07:40	07:35	08:26
	16:35	17:26	18:18	20:13	21:05	21:50	22:00	21:23	20:18	19:08	17:02	16:24
5	08:45	08:11	07:15	07:03	05:58	05:17	05:20	06:00	06:51	07:42	07:37	08:27
	16:36	17:28	18:20	20:15	21:07	21:51	21:59	21:21	20:16	19:05	17:00	16:24
6	08:44	08:10	07:12	07:00	05:57	05:16	05:21	06:02	06:53	07:43	07:39	08:28
	16:38	17:30	18:22	20:17	21:08	21:52	21:59	21:19	20:13	19:03	16:58	16:23
7	08:44	08:08	07:10	06:58	05:55	05:16	05:22	06:04	06:55	07:45	07:41	08:30
	16:39	17:32	18:24	20:18	21:10	21:53	21:58	21:17	20:11	19:01	16:57	16:23
8	08:44	08:06	07:08	06:56	05:53	05:15	05:22	06:05	06:56	07:47	07:42	08:31
	16:40	17:34	18:26	20:20	21:12	21:54	21:57	21:16	20:09	18:58	16:55	16:23
9	08:43	08:04	07:05	06:53	05:51	05:14	05:23	06:07	06:58	07:48	07:44	08:32
	16:42	17:36	18:28	20:22	21:13	21:55	21:57	21:14	20:06	18:56	16:53	16:22
10	08:42	08:02	07:03	06:51	05:49	05:14	05:25	06:08	07:00	07:50	07:46	08:33
	16:43	17:37	18:29	20:24	21:15	21:55	21:56	21:12	20:04	18:54	16:52	16:22
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	16:44	17:39	18:31	20:25	21:17	21:56	21:55	21:10	20:02	18:52	16:50	16:22
12	08:41	07:59	06:59	06:47	05:46	05:13	05:27	06:12	07:03	07:54	07:50	08:35
	16:46	17:41	18:33	20:27	21:18	21:57	21:54	21:08	19:59	18:49	16:48	16:22
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15	08:39	07:53	06:52	06:40	05:41	05:13	05:30	06:17	07:08	07:59	07:55	08:38
	16:51	17:47	18:38	20:32	21:23	21:59	21:51	21:02	19:52	18:43	16:44	16:22
16	08:38	07:51	06:49	06:38	05:40	05:12	05:31	06:18	07:10	08:01	07:57	08:39
	16:52	17:49	18:40	20:34	21:25	21:59	21:50	21:00	19:50	18:40	16:42	16:22
17	08:37	07:49	06:47	06:35	05:38	05:12	05:33	06:20	07:11	08:02	07:59	08:40
	16:54	17:51	18:42	20:36	21:26	22:00	21:49	20:58	19:48	18:38	16:41	16:22
18	08:36	07:47	06:45	06:33	05:37	05:12	05:34	06:22	07:13	08:04	08:00	08:41
	16:55	17:53	18:44	20:37	21:28	22:00	21:48	20:56	19:45	18:36	16:40	16:22
19	08:35	07:45	06:42	06:31	05:35	05:12	05:35	06:23	07:15	08:06	08:02	08:41
	16:57	17:54	18:45	20:39	21:29	22:00	21:47	20:54	19:43	18:34	16:38	16:23
20	08:34	07:43	06:40	06:29	05:34	05:12	05:36	06:25	07:16	08:08	08:04	08:42
	16:59	17:56	18:47	20:41	21:31	22:01	21:46	20:52	19:41	18:32	16:37	16:23
21	08:33	07:41	06:38	06:27	05:32	05:13	05:38	06:27	07:18	08:10	08:05	08:43
	17:01	17:58	18:49	20:43	21:32	22:01	21:44	20:49	19:38	18:30	16:36	16:23
22	08:32	07:39	06:35	06:25	05:31	05:13	05:39	06:28	07:20	08:11	08:07	08:43
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	17:04	18:02	18:52	20:46	21:35	22:01	21:42	20:45	19:33	18:25	16:34	16:24
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	17:13	18:11	19:01	20:55	21:42	22:01	21:35	20:34	19:22	17:15	16:29	16:28
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	17:15		20:03	20:56	21:43	22:01	21:33	20:32	19:19	17:13	16:28	16:29
30	08:21		07:17	06:08	05:22	05:16	05:51	06:41	07:33	07:26	08:20	08:45
	17:17		20:04	20:58	21:44	22:01	21:31	20:30	19:17	17:11	16:27	16:30
31	08:19		07:14		05:21		05:52	06:43		07:28		08:45
	17:19		20:06		21:45		21:30	20:27		17:09		16:30
Potential sun hours	257	277	367	417	487	501	504	455	381	331	265	241
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
Jennings O'Donovan
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Kathlyn Feeney / kfeeney@jodireland.com

Calculated:
09/06/2025 13:54/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Worst Case - V150 **Shadow receptor:** CH - 124

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:45	08:18	07:23	07:12	06:06	05:20	05:17	05:54	06:45	07:35	07:30	08:21
	16:32	17:20	18:13	20:08	21:00	21:47	22:01	21:28	20:25	19:15	17:07	16:26
2	08:45	08:16	07:21	07:10	06:04	05:19	05:17	05:56	06:46	07:36	07:31	08:23
	16:33	17:22	18:15	20:10	21:02	21:48	22:00	21:26	20:23	19:12	17:06	16:26
3	08:45	08:15	07:19	07:07	06:02	05:18	05:18	05:57	06:48	07:38	07:33	08:24
	16:34	17:24	18:17	20:11	21:03	21:49	22:00	21:25	20:20	19:10	17:04	16:25
4	08:45	08:13	07:17	07:05	06:00	05:17	05:19	05:59	06:50	07:40	07:35	08:26
	16:35	17:26	18:18	20:13	21:05	21:50	22:00	21:23	20:18	19:08	17:02	16:24
5	08:45	08:11	07:15	07:03	05:58	05:17	05:20	06:00	06:51	07:42	07:37	08:27
	16:36	17:28	18:20	20:15	21:07	21:51	21:59	21:21	20:16	19:05	17:00	16:24
6	08:44	08:10	07:12	07:00	05:57	05:16	05:21	06:02	06:53	07:43	07:39	08:28
	16:38	17:30	18:22	20:17	21:08	21:52	21:59	21:19	20:13	19:03	16:58	16:23
7	08:44	08:08	07:10	06:58	05:55	05:16	05:22	06:04	06:55	07:45	07:41	08:30
	16:39	17:32	18:24	20:18	21:10	21:53	21:58	21:17	20:11	19:01	16:57	16:23
8	08:44	08:06	07:08	06:56	05:53	05:15	05:22	06:05	06:56	07:47	07:42	08:31
	16:40	17:34	18:26	20:20	21:12	21:54	21:57	21:16	20:09	18:58	16:55	16:23
9	08:43	08:04	07:05	06:53	05:51	05:14	05:23	06:07	06:58	07:48	07:44	08:32
	16:42	17:36	18:28	20:22	21:13	21:55	21:57	21:14	20:06	18:56	16:53	16:22
10	08:42	08:02	07:03	06:51	05:49	05:14	05:24	06:08	07:00	07:50	07:46	08:33
	16:43	17:37	18:29	20:24	21:15	21:55	21:56	21:12	20:04	18:54	16:52	16:22
11	08:42	08:01	07:01	06:49	05:48	05:14	05:26	06:10	07:01	07:52	07:48	08:34
	16:44	17:39	18:31	20:25	21:17	21:56	21:55	21:10	20:02	18:52	16:50	16:22
12	08:41	07:59	06:59	06:47	05:46	05:13	05:27	06:12	07:03	07:54	07:50	08:35
	16:46	17:41	18:33	20:27	21:18	21:57	21:54	21:08	19:59	18:49	16:48	16:22
13	08:40	07:57	06:56	06:44	05:44	05:13	05:28	06:13	07:05	07:55	07:51	08:36
	16:47	17:43	18:35	20:29	21:20	21:58	21:53	21:06	19:57	18:47	16:47	16:22
14	08:40	07:55	06:54	06:42	05:43	05:13	05:29	06:15	07:06	07:57	07:53	08:37
	16:49	17:45	18:36	20:31	21:21	21:58	21:52	21:04	19:55	18:45	16:45	16:22
15	08:39	07:53	06:52	06:40	05:41	05:13	05:30	06:17	07:08	07:59	07:55	08:38
	16:51	17:47	18:38	20:32	21:23	21:59	21:51	21:02	19:52	18:43	16:44	16:22
16	08:38	07:51	06:49	06:38	05:40	05:12	05:31	06:18	07:10	08:01	07:57	08:39
	16:52	17:49	18:40	20:34	21:25	21:59	21:50	21:00	19:50	18:40	16:42	16:22
17	08:37	07:49	06:47	06:35	05:38	05:12	05:33	06:20	07:11	08:02	07:59	08:40
	16:54	17:51	18:42	20:36	21:26	22:00	21:49	20:58	19:48	18:38	16:41	16:22
18	08:36	07:47	06:45	06:33	05:37	05:12	05:34	06:22	07:13	08:04	08:00	08:41
	16:55	17:53	18:44	20:37	21:28	22:00	21:48	20:56	19:45	18:36	16:40	16:22
19	08:35	07:45	06:42	06:31	05:35	05:12	05:35	06:23	07:15	08:06	08:02	08:41
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	16:59	17:56	18:47	20:41	21:31	22:01	21:46	20:52	19:41	18:32	16:37	16:23
21	08:33	07:41	06:38	06:27	05:32	05:13	05:38	06:27	07:18	08:10	08:05	08:43
	17:01	17:58	18:49	20:43	21:32	22:01	21:44	20:49	19:38	18:30	16:36	16:23
22	08:32	07:39	06:35	06:25	05:31	05:13	05:39	06:28	07:20	08:11	08:07	08:43
	17:02	18:00	18:51	20:44	21:34	22:01	21:43	20:47	19:36	18:27	16:35	16:24
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25	08:28	07:32	06:28	06:18	05:27	05:14	05:43	06:33	07:25	07:17	08:12	08:44
	17:08	18:06	18:56	20:50	21:38	22:02	21:39	20:41	19:29	17:21	16:31	16:26
26	08:27	07:30	06:26	06:16	05:26	05:14	05:45	06:35	07:26	07:19	08:14	08:45
	17:09	18:07	18:58	20:51	21:39	22:02	21:38	20:38	19:26	17:19	16:30	16:26
27	08:25	07:28	06:24	06:14	05:25	05:14	05:46	06:36	07:28	07:20	08:15	08:45
	17:11	18:09	18:59	20:53	21:40	22:02	21:36	20:36	19:24	17:17	16:30	16:27
28	08:24	07:26	06:21	06:12	05:24	05:15	05:48	06:38	07:30	07:22	08:17	08:45
	17:13	18:11	19:01	20:55	21:42	22:01	21:35	20:34	19:22	17:15	16:29	16:28
29	08:22		07:19	06:10	05:23	05:16	05:49	06:40	07:31	07:24	08:18	08:45
	17:15		20:03	20:56	21:43	22:01	21:33	20:32	19:19	17:13	16:28	16:29
30	08:21		07:17	06:08	05:22	05:16	05:51	06:41	07:33	07:26	08:20	08:45
	17:17		20:04	20:58	21:44	22:01	21:31	20:30	19:17	17:11	16:27	16:30
31	08:19		07:14		05:21		05:52	06:43		07:28		08:45
	17:19		20:06		21:45		21:30	20:27		17:09		16:30
Potential sun hours	257	277	367	417	487	501	504	455	381	331	265	241
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
Jennings O'Donovan
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+353719161416
Kathlyn Feeney / kfeeney@jodireland.com

Calculated:
09/06/2025 13:54/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Worst Case - V150 **Shadow receptor:** CI - 125

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:45	08:18	07:23	07:12	06:06	05:20	05:17	05:54	06:45	07:35	07:30	08:21
	16:32	17:20	18:13	20:08	21:00	21:47	22:01	21:28	20:25	19:15	17:07	16:26
2	08:45	08:16	07:21	07:10	06:04	05:19	05:17	05:56	06:46	07:36	07:31	08:23
	16:33	17:22	18:15	20:10	21:02	21:48	22:00	21:26	20:23	19:12	17:06	16:26
3	08:45	08:15	07:19	07:07	06:02	05:18	05:18	05:57	06:48	07:38	07:33	08:24
	16:34	17:24	18:17	20:11	21:03	21:49	22:00	21:25	20:20	19:10	17:04	16:25
4	08:45	08:13	07:17	07:05	06:00	05:18	05:19	05:59	06:50	07:40	07:35	08:26
	16:35	17:26	18:18	20:13	21:05	21:50	22:00	21:23	20:18	19:08	17:02	16:24
5	08:45	08:11	07:15	07:03	05:58	05:17	05:20	06:00	06:51	07:42	07:37	08:27
	16:36	17:28	18:20	20:15	21:07	21:51	21:59	21:21	20:16	19:05	17:00	16:24
6	08:44	08:10	07:12	07:00	05:57	05:16	05:21	06:02	06:53	07:43	07:39	08:28
	16:38	17:30	18:22	20:17	21:08	21:52	21:59	21:19	20:13	19:03	16:58	16:23
7	08:44	08:08	07:10	06:58	05:55	05:16	05:22	06:04	06:55	07:45	07:41	08:30
	16:39	17:32	18:24	20:18	21:10	21:53	21:58	21:17	20:11	19:01	16:57	16:23
8	08:44	08:06	07:08	06:56	05:53	05:15	05:22	06:05	06:56	07:47	07:42	08:31
	16:40	17:34	18:26	20:20	21:12	21:54	21:57	21:16	20:09	18:58	16:55	16:23
9	08:43	08:04	07:06	06:53	05:51	05:14	05:23	06:07	06:58	07:48	07:44	08:32
	16:42	17:36	18:28	20:22	21:13	21:55	21:57	21:14	20:06	18:56	16:53	16:22
10	08:42	08:02	07:03	06:51	05:49	05:14	05:24	06:08	07:00	07:50	07:46	08:33
	16:43	17:37	18:29	20:24	21:15	21:55	21:56	21:12	20:04	18:54	16:52	16:22
11	08:42	08:01	07:01	06:49	05:48	05:14	05:26	06:10	07:01	07:52	07:48	08:34
	16:44	17:39	18:31	20:25	21:17	21:56	21:55	21:10	20:02	18:52	16:50	16:22
12	08:41	07:59	06:59	06:47	05:46	05:13	05:27	06:12	07:03	07:54	07:50	08:35
	16:46	17:41	18:33	20:27	21:18	21:57	21:54	21:08	19:59	18:49	16:48	16:22
13	08:40	07:57	06:56	06:44	05:44	05:13	05:28	06:13	07:05	07:55	07:51	08:36
	16:47	17:43	18:35	20:29	21:20	21:58	21:53	21:06	19:57	18:47	16:47	16:22
14	08:40	07:55	06:54	06:42	05:43	05:13	05:29	06:15	07:06	07:57	07:53	08:37
	16:49	17:45	18:36	20:31	21:21	21:58	21:52	21:04	19:55	18:45	16:45	16:22
15	08:39	07:53	06:52	06:40	05:41	05:13	05:30	06:17	07:08	07:59	07:55	08:38
	16:51	17:47	18:38	20:32	21:23	21:59	21:51	21:02	19:52	18:43	16:44	16:22
16	08:38	07:51	06:49	06:38	05:40	05:12	05:31	06:18	07:10	08:01	07:57	08:39
	16:52	17:49	18:40	20:34	21:25	21:59	21:50	21:00	19:50	18:40	16:42	16:22
17	08:37	07:49	06:47	06:35	05:38	05:12	05:33	06:20	07:11	08:02	07:59	08:40
	16:54	17:51	18:42	20:36	21:26	22:00	21:49	20:58	19:48	18:38	16:41	16:22
18	08:36	07:47	06:45	06:33	05:37	05:12	05:34	06:22	07:13	08:04	08:00	08:41
	16:55	17:53	18:44	20:38	21:28	22:00	21:48	20:56	19:45	18:36	16:40	16:22
19	08:35	07:45	06:42	06:31	05:35	05:12	05:35	06:23	07:15	08:06	08:02	08:41
	16:57	17:54	18:45	20:39	21:29	22:01	21:47	20:54	19:43	18:34	16:38	16:23
20	08:34	07:43	06:40	06:29	05:34	05:12	05:36	06:25	07:16	08:08	08:04	08:42
	16:59	17:56	18:47	20:41	21:31	22:01	21:46	20:52	19:41	18:32	16:37	16:23
21	08:33	07:41	06:38	06:27	05:32	05:13	05:38	06:27	07:18	08:10	08:05	08:43
	17:01	17:58	18:49	20:43	21:32	22:01	21:44	20:49	19:38	18:30	16:36	16:23
22	08:32	07:39	06:35	06:25	05:31	05:13	05:39	06:28	07:20	08:11	08:07	08:43
	17:02	18:00	18:51	20:44	21:34	22:01	21:43	20:47	19:36	18:27	16:35	16:24
23	08:30	07:36	06:33	06:22	05:30	05:13	05:41	06:30	07:21	08:13	08:09	08:44
	17:04	18:02	18:52	20:46	21:35	22:01	21:42	20:45	19:33	18:25	16:34	16:24
24	08:29	07:34	06:31	06:20	05:28	05:13	05:42	06:32	07:23	08:15	08:10	08:44
	17:06	18:04	18:54	20:48	21:36	22:02	21:40	20:43	19:31	18:23	16:32	16:25
25	08:28	07:32	06:28	06:18	05:27	05:14	05:43	06:33	07:25	07:17	08:12	08:44
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26	08:27	07:30	06:26	06:16	05:26	05:14	05:45	06:35	07:26	07:19	08:14	08:45
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27	08:25	07:28	06:24	06:14	05:25	05:14	05:46	06:36	07:28	07:20	08:15	08:45
	17:11	18:09	18:59	20:53	21:40	22:02	21:36	20:36	19:24	17:17	16:30	16:27
28	08:24	07:26	06:21	06:12	05:24	05:15	05:48	06:38	07:30	07:22	08:17	08:45
	17:13	18:11	19:01	20:55	21:42	22:01	21:35	20:34	19:22	17:15	16:29	16:28
29	08:22		07:19	06:10	05:23	05:16	05:49	06:40	07:31	07:24	08:18	08:45
	17:15		20:03	20:56	21:43	22:01	21:33	20:32	19:19	17:13	16:28	16:29
30	08:21		07:17	06:08	05:22	05:16	05:51	06:41	07:33	07:26	08:20	08:45
	17:17		20:04	20:58	21:44	22:01	21:31	20:30	19:17	17:11	16:27	16:30
31	08:19		07:14		05:21		05:52	06:43		07:28		08:45
	17:19		20:06		21:45		21:30	20:27		17:09		16:30
Potential sun hours	257	277	367	417	487	501	504	455	381	331	265	241
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
Jennings O'Donovan
Finisklin Business Park
F91 RHH9 Sligo
+353719161416
Kathlyn Feeney / kfeeney@jodireland.com

Calculated:
09/06/2025 13:54/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Worst Case - V150 **Shadow receptor:** CJ - 126

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:46	08:18	07:24	07:12	06:06	05:20	05:17	05:54	06:45	07:35	07:30	08:21
	16:32	17:20	18:13	20:08	21:00	21:47	22:01	21:28	20:25	19:15	17:07	16:26
2	08:45	08:16	07:21	07:10	06:04	05:19	05:17	05:56	06:46	07:36	07:31	08:23
	16:33	17:22	18:15	20:10	21:02	21:48	22:00	21:26	20:23	19:12	17:06	16:26
3	08:45	08:15	07:19	07:07	06:02	05:18	05:18	05:57	06:48	07:38	07:33	08:24
	16:34	17:24	18:17	20:11	21:03	21:49	22:00	21:25	20:20	19:10	17:04	16:25
4	08:45	08:13	07:17	07:05	06:00	05:18	05:19	05:59	06:50	07:40	07:35	08:26
	16:35	17:26	18:18	20:13	21:05	21:50	22:00	21:23	20:18	19:08	17:02	16:24
5	08:45	08:11	07:15	07:03	05:58	05:17	05:20	06:00	06:51	07:42	07:37	08:27
	16:36	17:28	18:20	20:15	21:07	21:51	21:59	21:21	20:16	19:05	17:00	16:24
6	08:44	08:10	07:12	07:00	05:57	05:16	05:21	06:02	06:53	07:43	07:39	08:28
	16:38	17:30	18:22	20:17	21:08	21:52	21:59	21:19	20:13	19:03	16:58	16:23
7	08:44	08:08	07:10	06:58	05:55	05:16	05:22	06:04	06:55	07:45	07:41	08:30
	16:39	17:32	18:24	20:18	21:10	21:53	21:58	21:18	20:11	19:01	16:57	16:23
8	08:44	08:06	07:08	06:56	05:53	05:15	05:22	06:05	06:56	07:47	07:42	08:31
	16:40	17:34	18:26	20:20	21:12	21:54	21:57	21:16	20:09	18:58	16:55	16:23
9	08:43	08:04	07:06	06:53	05:51	05:14	05:23	06:07	06:58	07:48	07:44	08:32
	16:42	17:36	18:28	20:22	21:13	21:55	21:57	21:14	20:06	18:56	16:53	16:22
10	08:42	08:02	07:03	06:51	05:49	05:14	05:25	06:08	07:00	07:50	07:46	08:33
	16:43	17:37	18:29	20:24	21:15	21:55	21:56	21:12	20:04	18:54	16:52	16:22
11	08:42	08:01	07:01	06:49	05:48	05:14	05:26	06:10	07:01	07:52	07:48	08:34
	16:44	17:39	18:31	20:25	21:17	21:56	21:55	21:10	20:02	18:52	16:50	16:22
12	08:41	07:59	06:59	06:47	05:46	05:13	05:27	06:12	07:03	07:54	07:50	08:35
	16:46	17:41	18:33	20:27	21:18	21:57	21:54	21:08	19:59	18:49	16:48	16:22
13	08:40	07:57	06:56	06:44	05:44	05:13	05:28	06:13	07:05	07:55	07:51	08:36
	16:47	17:43	18:35	20:29	21:20	21:58	21:53	21:06	19:57	18:47	16:47	16:22
14	08:40	07:55	06:54	06:42	05:43	05:13	05:29	06:15	07:06	07:57	07:53	08:37
	16:49	17:45	18:36	20:31	21:21	21:58	21:52	21:04	19:55	18:45	16:45	16:22
15	08:39	07:53	06:52	06:40	05:41	05:13	05:30	06:17	07:08	07:59	07:55	08:38
	16:51	17:47	18:38	20:32	21:23	21:59	21:51	21:02	19:52	18:43	16:44	16:22
16	08:38	07:51	06:49	06:38	05:40	05:12	05:31	06:18	07:10	08:01	07:57	08:39
	16:52	17:49	18:40	20:34	21:25	21:59	21:50	21:00	19:50	18:40	16:42	16:22
17	08:37	07:49	06:47	06:35	05:38	05:12	05:33	06:20	07:11	08:02	07:59	08:40
	16:54	17:51	18:42	20:36	21:26	22:00	21:49	20:58	19:48	18:38	16:41	16:22
18	08:36	07:47	06:45	06:33	05:37	05:12	05:34	06:22	07:13	08:04	08:00	08:41
	16:55	17:53	18:44	20:38	21:28	22:00	21:48	20:56	19:45	18:36	16:40	16:22
19	08:35	07:45	06:42	06:31	05:35	05:12	05:35	06:23	07:15	08:06	08:02	08:41
	16:57	17:54	18:45	20:39	21:29	22:01	21:47	20:54	19:43	18:34	16:38	16:23
20	08:34	07:43	06:40	06:29	05:34	05:12	05:36	06:25	07:16	08:08	08:04	08:42
	16:59	17:56	18:47	20:41	21:31	22:01	21:46	20:52	19:41	18:32	16:37	16:23
21	08:33	07:41	06:38	06:27	05:32	05:13	05:38	06:27	07:18	08:10	08:05	08:43
	17:01	17:58	18:49	20:43	21:32	22:01	21:44	20:49	19:38	18:30	16:36	16:23
22	08:32	07:39	06:35	06:25	05:31	05:13	05:39	06:28	07:20	08:11	08:07	08:43
	17:02	18:00	18:51	20:44	21:34	22:01	21:43	20:47	19:36	18:27	16:35	16:24
23	08:31	07:36	06:33	06:22	05:30	05:13	05:41	06:30	07:21	08:13	08:09	08:44
	17:04	18:02	18:52	20:46	21:35	22:01	21:42	20:45	19:33	18:25	16:34	16:24
24	08:29	07:34	06:31	06:20	05:28	05:13	05:42	06:32	07:23	08:15	08:10	08:44
	17:06	18:04	18:54	20:48	21:36	22:02	21:40	20:43	19:31	18:23	16:32	16:25
25	08:28	07:32	06:28	06:18	05:27	05:14	05:43	06:33	07:25	07:17	08:12	08:44
	17:08	18:06	18:56	20:50	21:38	22:02	21:39	20:41	19:29	17:21	16:31	16:26
26	08:27	07:30	06:26	06:16	05:26	05:14	05:45	06:35	07:26	07:19	08:14	08:45
	17:09	18:07	18:58	20:51	21:39	22:02	21:38	20:38	19:26	17:19	16:30	16:26
27	08:25	07:28	06:24	06:14	05:25	05:14	05:46	06:37	07:28	07:20	08:15	08:45
	17:11	18:09	18:59	20:53	21:40	22:02	21:36	20:36	19:24	17:17	16:30	16:27
28	08:24	07:26	06:21	06:12	05:24	05:15	05:48	06:38	07:30	07:22	08:17	08:45
	17:13	18:11	19:01	20:55	21:42	22:01	21:35	20:34	19:22	17:15	16:29	16:28
29	08:22		07:19	06:10	05:23	05:16	05:49	06:40	07:31	07:24	08:18	08:45
	17:15		20:03	20:56	21:43	22:01	21:33	20:32	19:19	17:13	16:28	16:29
30	08:21		07:17	06:08	05:22	05:16	05:51	06:41	07:33	07:26	08:20	08:45
	17:17		20:05	20:58	21:44	22:01	21:31	20:30	19:17	17:11	16:27	16:30
31	08:19		07:14		05:21		05:52	06:43		07:28		08:46
	17:19		20:06		21:45		21:30	20:27		17:09		16:30
Potential sun hours	257	277	367	417	487	501	504	455	381	331	265	241
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

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Kathlyn Feeney / kfeeney@jodireland.com

Calculated:
09/06/2025 13:54/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Worst Case - V150 **Shadow receptor:** CK - 127

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:46	08:18	07:24	07:12	06:06	05:20	05:17	05:54	06:45	07:35	07:30	08:21
	16:32	17:20	18:13	20:08	21:00	21:47	22:01	21:28	20:25	19:15	17:07	16:26
2	08:45	08:16	07:21	07:10	06:04	05:19	05:17	05:56	06:46	07:36	07:31	08:23
	16:33	17:22	18:15	20:10	21:02	21:48	22:00	21:26	20:23	19:12	17:06	16:26
3	08:45	08:15	07:19	07:07	06:02	05:18	05:18	05:57	06:48	07:38	07:33	08:24
	16:34	17:24	18:17	20:11	21:03	21:49	22:00	21:25	20:20	19:10	17:04	16:25
4	08:45	08:13	07:17	07:05	06:00	05:17	05:19	05:59	06:50	07:40	07:35	08:26
	16:35	17:26	18:18	20:13	21:05	21:50	22:00	21:23	20:18	19:08	17:02	16:24
5	08:45	08:11	07:15	07:03	05:58	05:17	05:20	06:00	06:51	07:42	07:37	08:27
	16:36	17:28	18:20	20:15	21:07	21:51	21:59	21:21	20:16	19:05	17:00	16:24
6	08:44	08:10	07:12	07:00	05:57	05:16	05:21	06:02	06:53	07:43	07:39	08:28
	16:38	17:30	18:22	20:17	21:08	21:52	21:59	21:19	20:13	19:03	16:58	16:23
7	08:44	08:08	07:10	06:58	05:55	05:16	05:22	06:04	06:55	07:45	07:41	08:30
	16:39	17:32	18:24	20:18	21:10	21:53	21:58	21:18	20:11	19:01	16:57	16:23
8	08:44	08:06	07:08	06:56	05:53	05:15	05:22	06:05	06:56	07:47	07:42	08:31
	16:40	17:34	18:26	20:20	21:12	21:54	21:57	21:16	20:09	18:58	16:55	16:23
9	08:43	08:04	07:06	06:53	05:51	05:14	05:23	06:07	06:58	07:48	07:44	08:32
	16:42	17:36	18:28	20:22	21:13	21:55	21:57	21:14	20:06	18:56	16:53	16:22
10	08:42	08:02	07:03	06:51	05:49	05:14	05:24	06:08	07:00	07:50	07:46	08:33
	16:43	17:37	18:29	20:24	21:15	21:55	21:56	21:12	20:04	18:54	16:52	16:22
11	08:42	08:01	07:01	06:49	05:48	05:14	05:26	06:10	07:01	07:52	07:48	08:34
	16:44	17:39	18:31	20:25	21:17	21:56	21:55	21:10	20:02	18:52	16:50	16:22
12	08:41	07:59	06:59	06:47	05:46	05:13	05:27	06:12	07:03	07:54	07:50	08:35
	16:46	17:41	18:33	20:27	21:18	21:57	21:54	21:08	19:59	18:49	16:48	16:22
13	08:40	07:57	06:56	06:44	05:44	05:13	05:28	06:13	07:05	07:55	07:51	08:36
	16:47	17:43	18:35	20:29	21:20	21:58	21:53	21:06	19:57	18:47	16:47	16:22
14	08:40	07:55	06:54	06:42	05:43	05:13	05:29	06:15	07:06	07:57	07:53	08:37
	16:49	17:45	18:36	20:31	21:21	21:58	21:52	21:04	19:55	18:45	16:45	16:22
15	08:39	07:53	06:52	06:40	05:41	05:13	05:30	06:17	07:08	07:59	07:55	08:38
	16:51	17:47	18:38	20:32	21:23	21:59	21:51	21:02	19:52	18:43	16:44	16:22
16	08:38	07:51	06:49	06:38	05:40	05:12	05:31	06:18	07:10	08:01	07:57	08:39
	16:52	17:49	18:40	20:34	21:25	21:59	21:50	21:00	19:50	18:40	16:42	16:22
17	08:37	07:49	06:47	06:35	05:38	05:12	05:33	06:20	07:11	08:02	07:59	08:40
	16:54	17:51	18:42	20:36	21:26	22:00	21:49	20:58	19:48	18:38	16:41	16:22
18	08:36	07:47	06:45	06:33	05:37	05:12	05:34	06:22	07:13	08:04	08:00	08:41
	16:55	17:53	18:44	20:38	21:28	22:00	21:48	20:56	19:45	18:36	16:40	16:22
19	08:35	07:45	06:42	06:31	05:35	05:12	05:35	06:23	07:15	08:06	08:02	08:41
	16:57	17:54	18:45	20:39	21:29	22:01	21:47	20:54	19:43	18:34	16:38	16:23
20	08:34	07:43	06:40	06:29	05:34	05:12	05:36	06:25	07:16	08:08	08:04	08:42
	16:59	17:56	18:47	20:41	21:31	22:01	21:46	20:52	19:41	18:32	16:37	16:23
21	08:33	07:41	06:38	06:27	05:32	05:13	05:38	06:27	07:18	08:10	08:05	08:43
	17:01	17:58	18:49	20:43	21:32	22:01	21:44	20:49	19:38	18:30	16:36	16:23
22	08:32	07:39	06:35	06:25	05:31	05:13	05:39	06:28	07:20	08:11	08:07	08:43
	17:02	18:00	18:51	20:44	21:34	22:01	21:43	20:47	19:36	18:27	16:35	16:24
23	08:31	07:36	06:33	06:22	05:30	05:13	05:41	06:30	07:21	08:13	08:09	08:44
	17:04	18:02	18:52	20:46	21:35	22:01	21:42	20:45	19:33	18:25	16:34	16:24
24	08:29	07:34	06:31	06:20	05:28	05:13	05:42	06:32	07:23	08:15	08:11	08:44
	17:06	18:04	18:54	20:48	21:36	22:02	21:40	20:43	19:31	18:23	16:32	16:25
25	08:28	07:32	06:28	06:18	05:27	05:14	05:43	06:33	07:25	07:17	08:12	08:44
	17:08	18:06	18:56	20:50	21:38	22:02	21:39	20:41	19:29	17:21	16:31	16:26
26	08:27	07:30	06:26	06:16	05:26	05:14	05:45	06:35	07:26	07:19	08:14	08:45
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27	08:25	07:28	06:24	06:14	05:25	05:14	05:46	06:36	07:28	07:20	08:15	08:45
	17:11	18:09	18:59	20:53	21:40	22:02	21:36	20:36	19:24	17:17	16:30	16:27
28	08:24	07:26	06:21	06:12	05:24	05:15	05:48	06:38	07:30	07:22	08:17	08:45
	17:13	18:11	19:01	20:55	21:42	22:01	21:35	20:34	19:22	17:15	16:29	16:28
29	08:22		07:19	06:10	05:23	05:16	05:49	06:40	07:31	07:24	08:18	08:45
	17:15		20:03	20:56	21:43	22:01	21:33	20:32	19:19	17:13	16:28	16:29
30	08:21		07:17	06:08	05:22	05:16	05:51	06:41	07:33	07:26	08:20	08:45
	17:17		20:05	20:58	21:44	22:01	21:31	20:30	19:17	17:11	16:27	16:30
31	08:19		07:14		05:21		05:52	06:43		07:28		08:46
	17:19		20:06		21:45		21:30	20:27		17:09		16:30
Potential sun hours	257	277	367	417	487	501	504	455	381	331	265	241
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
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Kathlyn Feeney / kfeeney@jodireland.com

Calculated:
09/06/2025 13:54/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Worst Case - V150 **Shadow receptor:** CL - 128

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:46	08:18	07:24	07:12	06:06	05:20	05:17	05:54	06:45	07:35	07:30	08:21
	16:32	17:20	18:13	20:08	21:00	21:47	22:01	21:28	20:25	19:15	17:07	16:26
2	08:45	08:16	07:21	07:10	06:04	05:19	05:17	05:56	06:46	07:36	07:31	08:23
	16:33	17:22	18:15	20:10	21:02	21:48	22:00	21:26	20:23	19:12	17:06	16:26
3	08:45	08:15	07:19	07:07	06:02	05:18	05:18	05:57	06:48	07:38	07:33	08:24
	16:34	17:24	18:17	20:11	21:03	21:49	22:00	21:25	20:20	19:10	17:04	16:25
4	08:45	08:13	07:17	07:05	06:00	05:17	05:19	05:59	06:50	07:40	07:35	08:26
	16:35	17:26	18:18	20:13	21:05	21:50	22:00	21:23	20:18	19:08	17:02	16:24
5	08:45	08:11	07:15	07:03	05:58	05:17	05:20	06:00	06:51	07:42	07:37	08:27
	16:36	17:28	18:20	20:15	21:07	21:51	21:59	21:21	20:16	19:05	17:00	16:24
6	08:44	08:10	07:12	07:00	05:57	05:16	05:21	06:02	06:53	07:43	07:39	08:28
	16:38	17:30	18:22	20:17	21:08	21:52	21:59	21:19	20:14	19:03	16:58	16:23
7	08:44	08:08	07:10	06:58	05:55	05:16	05:22	06:04	06:55	07:45	07:41	08:30
	16:39	17:32	18:24	20:18	21:10	21:53	21:58	21:18	20:11	19:01	16:57	16:23
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	16:40	17:34	18:26	20:20	21:12	21:54	21:57	21:16	20:09	18:58	16:55	16:23
9	08:43	08:04	07:06	06:53	05:51	05:14	05:23	06:07	06:58	07:48	07:44	08:32
	16:42	17:36	18:28	20:22	21:13	21:55	21:57	21:14	20:07	18:56	16:53	16:22
10	08:43	08:02	07:03	06:51	05:49	05:14	05:24	06:08	07:00	07:50	07:46	08:33
	16:43	17:37	18:29	20:24	21:15	21:55	21:56	21:12	20:04	18:54	16:52	16:22
11	08:42	08:01	07:01	06:49	05:48	05:14	05:26	06:10	07:01	07:52	07:48	08:34
	16:44	17:39	18:31	20:25	21:17	21:56	21:55	21:10	20:02	18:52	16:50	16:22
12	08:41	07:59	06:59	06:47	05:46	05:13	05:27	06:12	07:03	07:54	07:50	08:35
	16:46	17:41	18:33	20:27	21:18	21:57	21:54	21:08	19:59	18:49	16:48	16:22
13	08:41	07:57	06:56	06:44	05:44	05:13	05:28	06:13	07:05	07:55	07:51	08:36
	16:47	17:43	18:35	20:29	21:20	21:58	21:53	21:06	19:57	18:47	16:47	16:22
14	08:40	07:55	06:54	06:42	05:43	05:13	05:29	06:15	07:06	07:57	07:53	08:37
	16:49	17:45	18:36	20:31	21:21	21:58	21:52	21:04	19:55	18:45	16:45	16:22
15	08:39	07:53	06:52	06:40	05:41	05:13	05:30	06:17	07:08	07:59	07:55	08:38
	16:51	17:47	18:38	20:32	21:23	21:59	21:51	21:02	19:52	18:43	16:44	16:22
16	08:38	07:51	06:49	06:38	05:40	05:12	05:31	06:18	07:10	08:01	07:57	08:39
	16:52	17:49	18:40	20:34	21:25	21:59	21:50	21:00	19:50	18:40	16:42	16:22
17	08:37	07:49	06:47	06:35	05:38	05:12	05:33	06:20	07:11	08:02	07:59	08:40
	16:54	17:51	18:42	20:36	21:26	22:00	21:49	20:58	19:48	18:38	16:41	16:22
18	08:36	07:47	06:45	06:33	05:37	05:12	05:34	06:22	07:13	08:04	08:00	08:41
	16:55	17:53	18:44	20:38	21:28	22:00	21:48	20:56	19:45	18:36	16:40	16:22
19	08:35	07:45	06:42	06:31	05:35	05:12	05:35	06:23	07:15	08:06	08:02	08:41
	16:57	17:54	18:45	20:39	21:29	22:01	21:47	20:54	19:43	18:34	16:38	16:23
20	08:34	07:43	06:40	06:29	05:34	05:12	05:36	06:25	07:16	08:08	08:04	08:42
	16:59	17:56	18:47	20:41	21:31	22:01	21:46	20:52	19:41	18:32	16:37	16:23
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	17:01	17:58	18:49	20:43	21:32	22:01	21:44	20:49	19:38	18:30	16:36	16:23
22	08:32	07:39	06:35	06:25	05:31	05:13	05:39	06:28	07:20	08:11	08:07	08:43
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25	08:28	07:32	06:28	06:18	05:27	05:14	05:43	06:33	07:25	07:17	08:12	08:45
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26	08:27	07:30	06:26	06:16	05:26	05:14	05:45	06:35	07:26	07:19	08:14	08:45
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27	08:25	07:28	06:24	06:14	05:25	05:14	05:46	06:37	07:28	07:20	08:15	08:45
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29	08:22		07:19	06:10	05:23	05:16	05:49	06:40	07:31	07:24	08:18	08:45
	17:15		20:03	20:57	21:43	22:01	21:33	20:32	19:19	17:13	16:28	16:29
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Potential sun hours	257	277	367	417	487	501	504	455	381	331	265	241
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
Jennings O'Donovan
Finisklin Business Park
F91 RHH9 Sligo
+353719161416
Kathlyn Feeney / kfeeney@jodireland.com
Calculated:
09/06/2025 13:54/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Worst Case - V150 **Shadow receptor:** CM - 129

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:46	08:18	07:24	07:12	06:06	05:20	05:17	05:54	06:45	07:35	07:30	08:21
	16:32	17:20	18:13	20:08	21:00	21:47	22:01	21:28	20:25	19:15	17:07	16:26
2	08:45	08:16	07:21	07:10	06:04	05:19	05:17	05:56	06:46	07:36	07:31	08:23
	16:33	17:22	18:15	20:10	21:02	21:48	22:00	21:26	20:23	19:12	17:06	16:26
3	08:45	08:15	07:19	07:07	06:02	05:18	05:18	05:57	06:48	07:38	07:33	08:24
	16:34	17:24	18:17	20:11	21:03	21:49	22:00	21:25	20:20	19:10	17:04	16:25
4	08:45	08:13	07:17	07:05	06:00	05:17	05:19	05:59	06:50	07:40	07:35	08:26
	16:35	17:26	18:18	20:13	21:05	21:50	22:00	21:23	20:18	19:08	17:02	16:24
5	08:45	08:11	07:15	07:03	05:58	05:17	05:20	06:00	06:51	07:42	07:37	08:27
	16:36	17:28	18:20	20:15	21:07	21:51	21:59	21:21	20:16	19:05	17:00	16:24
6	08:44	08:10	07:12	07:00	05:57	05:16	05:21	06:02	06:53	07:43	07:39	08:28
	16:38	17:30	18:22	20:17	21:08	21:52	21:59	21:19	20:14	19:03	16:58	16:23
7	08:44	08:08	07:10	06:58	05:55	05:16	05:22	06:04	06:55	07:45	07:41	08:30
	16:39	17:32	18:24	20:18	21:10	21:53	21:58	21:18	20:11	19:01	16:57	16:23
8	08:44	08:06	07:08	06:56	05:53	05:15	05:22	06:05	06:56	07:47	07:42	08:31
	16:40	17:34	18:26	20:20	21:12	21:54	21:57	21:16	20:09	18:58	16:55	16:23
9	08:43	08:04	07:06	06:53	05:51	05:14	05:23	06:07	06:58	07:48	07:44	08:32
	16:42	17:36	18:28	20:22	21:13	21:55	21:57	21:14	20:07	18:56	16:53	16:22
10	08:43	08:02	07:03	06:51	05:49	05:14	05:24	06:08	07:00	07:50	07:46	08:33
	16:43	17:37	18:29	20:24	21:15	21:55	21:56	21:12	20:04	18:54	16:52	16:22
11	08:42	08:01	07:01	06:49	05:48	05:14	05:26	06:10	07:01	07:52	07:48	08:34
	16:44	17:39	18:31	20:25	21:17	21:56	21:55	21:10	20:02	18:52	16:50	16:22
12	08:41	07:59	06:59	06:47	05:46	05:13	05:27	06:12	07:03	07:54	07:50	08:35
	16:46	17:41	18:33	20:27	21:18	21:57	21:54	21:08	19:59	18:49	16:48	16:22
13	08:41	07:57	06:56	06:44	05:44	05:13	05:28	06:13	07:05	07:55	07:51	08:36
	16:47	17:43	18:35	20:29	21:20	21:58	21:53	21:06	19:57	18:47	16:47	16:22
14	08:40	07:55	06:54	06:42	05:43	05:13	05:29	06:15	07:06	07:57	07:53	08:37
	16:49	17:45	18:36	20:31	21:21	21:58	21:52	21:04	19:55	18:45	16:45	16:22
15	08:39	07:53	06:52	06:40	05:41	05:13	05:30	06:17	07:08	07:59	07:55	08:38
	16:51	17:47	18:38	20:32	21:23	21:59	21:51	21:02	19:52	18:43	16:44	16:22
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	16:52	17:49	18:40	20:34	21:25	21:59	21:50	21:00	19:50	18:40	16:42	16:22
17	08:37	07:49	06:47	06:35	05:38	05:12	05:33	06:20	07:11	08:02	07:59	08:40
	16:54	17:51	18:42	20:36	21:26	22:00	21:49	20:58	19:48	18:38	16:41	16:22
18	08:36	07:47	06:45	06:33	05:37	05:12	05:34	06:22	07:13	08:04	08:00	08:41
	16:55	17:53	18:44	20:38	21:28	22:00	21:48	20:56	19:45	18:36	16:40	16:22
19	08:35	07:45	06:42	06:31	05:35	05:12	05:35	06:23	07:15	08:06	08:02	08:41
	16:57	17:54	18:45	20:39	21:29	22:01	21:47	20:54	19:43	18:34	16:38	16:23
20	08:34	07:43	06:40	06:29	05:34	05:12	05:36	06:25	07:16	08:08	08:04	08:42
	16:59	17:56	18:47	20:41	21:31	22:01	21:46	20:52	19:41	18:32	16:37	16:23
21	08:33	07:41	06:38	06:27	05:32	05:13	05:38	06:27	07:18	08:10	08:05	08:43
	17:01	17:58	18:49	20:43	21:32	22:01	21:44	20:49	19:38	18:30	16:36	16:23
22	08:32	07:39	06:35	06:25	05:31	05:13	05:39	06:28	07:20	08:11	08:07	08:43
	17:02	18:00	18:51	20:44	21:34	22:01	21:43	20:47	19:36	18:27	16:35	16:24
23	08:31	07:37	06:33	06:22	05:30	05:13	05:41	06:30	07:21	08:13	08:09	08:44
	17:04	18:02	18:52	20:46	21:35	22:01	21:42	20:45	19:33	18:25	16:34	16:24
24	08:29	07:34	06:31	06:20	05:28	05:13	05:42	06:32	07:23	08:15	08:11	08:44
	17:06	18:04	18:54	20:48	21:36	22:02	21:40	20:43	19:31	18:23	16:32	16:25
25	08:28	07:32	06:28	06:18	05:27	05:14	05:43	06:33	07:25	07:17	08:12	08:45
	17:08	18:06	18:56	20:50	21:38	22:02	21:39	20:41	19:29	17:21	16:31	16:26
26	08:27	07:30	06:26	06:16	05:26	05:14	05:45	06:35	07:26	07:19	08:14	08:45
	17:09	18:07	18:58	20:51	21:39	22:02	21:38	20:39	19:26	17:19	16:30	16:26
27	08:25	07:28	06:24	06:14	05:25	05:14	05:46	06:37	07:28	07:20	08:15	08:45
	17:11	18:09	18:59	20:53	21:41	22:02	21:36	20:36	19:24	17:17	16:30	16:27
28	08:24	07:26	06:21	06:12	05:24	05:15	05:48	06:38	07:30	07:22	08:17	08:45
	17:13	18:11	19:01	20:55	21:42	22:01	21:35	20:34	19:22	17:15	16:29	16:28
29	08:22		07:19	06:10	05:23	05:16	05:49	06:40	07:31	07:24	08:18	08:45
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30	08:21		07:17	06:08	05:22	05:16	05:51	06:41	07:33	07:26	08:20	08:46
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31	08:19		07:14		05:21		05:52	06:43		07:28		08:46
	17:19		20:06		21:45		21:30	20:27		17:09		16:30
Potential sun hours	257	277	367	417	487	501	504	455	381	331	265	241
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
Jennings O'Donovan
Finisklin Business Park
F91 RHH9 Sligo
+353719161416
Kathlyn Feeney / kfeeney@jodireland.com

Calculated:
09/06/2025 13:54/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Worst Case - V150 **Shadow receptor:** CN - 130

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:46	08:18	07:24	07:12	06:06	05:20	05:17	05:54	06:45	07:35	07:30	08:21
	16:32	17:20	18:13	20:08	21:00	21:47	22:01	21:28	20:25	19:15	17:07	16:26
2	08:45	08:16	07:21	07:10	06:04	05:19	05:17	05:56	06:46	07:36	07:31	08:23
	16:33	17:22	18:15	20:10	21:02	21:48	22:00	21:26	20:23	19:12	17:06	16:26
3	08:45	08:15	07:19	07:07	06:02	05:18	05:18	05:57	06:48	07:38	07:33	08:24
	16:34	17:24	18:17	20:11	21:03	21:49	22:00	21:25	20:20	19:10	17:04	16:25
4	08:45	08:13	07:17	07:05	06:00	05:17	05:19	05:59	06:50	07:40	07:35	08:26
	16:35	17:26	18:18	20:13	21:05	21:50	22:00	21:23	20:18	19:08	17:02	16:24
5	08:45	08:11	07:15	07:03	05:58	05:17	05:20	06:00	06:51	07:42	07:37	08:27
	16:36	17:28	18:20	20:15	21:07	21:51	21:59	21:21	20:16	19:05	17:00	16:24
6	08:44	08:10	07:12	07:00	05:57	05:16	05:21	06:02	06:53	07:43	07:39	08:28
	16:38	17:30	18:22	20:17	21:08	21:52	21:59	21:19	20:14	19:03	16:58	16:23
7	08:44	08:08	07:10	06:58	05:55	05:16	05:22	06:04	06:55	07:45	07:41	08:30
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	16:40	17:34	18:26	20:20	21:12	21:54	21:57	21:16	20:09	18:58	16:55	16:23
9	08:43	08:04	07:06	06:53	05:51	05:14	05:23	06:07	06:58	07:48	07:44	08:32
	16:42	17:36	18:28	20:22	21:13	21:55	21:57	21:14	20:07	18:56	16:53	16:22
10	08:43	08:02	07:03	06:51	05:49	05:14	05:24	06:08	07:00	07:50	07:46	08:33
	16:43	17:37	18:29	20:24	21:15	21:55	21:56	21:12	20:04	18:54	16:52	16:22
11	08:42	08:01	07:01	06:49	05:48	05:14	05:26	06:10	07:01	07:52	07:48	08:34
	16:44	17:39	18:31	20:25	21:17	21:56	21:55	21:10	20:02	18:52	16:50	16:22
12	08:41	07:59	06:59	06:47	05:46	05:13	05:27	06:12	07:03	07:54	07:50	08:35
	16:46	17:41	18:33	20:27	21:18	21:57	21:54	21:08	19:59	18:49	16:48	16:22
13	08:40	07:57	06:56	06:44	05:44	05:13	05:28	06:13	07:05	07:55	07:51	08:36
	16:47	17:43	18:35	20:29	21:20	21:58	21:53	21:06	19:57	18:47	16:47	16:22
14	08:40	07:55	06:54	06:42	05:43	05:13	05:29	06:15	07:06	07:57	07:53	08:37
	16:49	17:45	18:36	20:31	21:21	21:58	21:52	21:04	19:55	18:45	16:45	16:22
15	08:39	07:53	06:52	06:40	05:41	05:13	05:30	06:17	07:08	07:59	07:55	08:38
	16:51	17:47	18:38	20:32	21:23	21:59	21:51	21:02	19:52	18:43	16:44	16:22
16	08:38	07:51	06:49	06:38	05:40	05:12	05:31	06:18	07:10	08:01	07:57	08:39
	16:52	17:49	18:40	20:34	21:25	21:59	21:50	21:00	19:50	18:40	16:42	16:22
17	08:37	07:49	06:47	06:35	05:38	05:12	05:33	06:20	07:11	08:02	07:59	08:40
	16:54	17:51	18:42	20:36	21:26	22:00	21:49	20:58	19:48	18:38	16:41	16:22
18	08:36	07:47	06:45	06:33	05:37	05:12	05:34	06:22	07:13	08:04	08:00	08:41
	16:55	17:53	18:44	20:38	21:28	22:00	21:48	20:56	19:45	18:36	16:40	16:22
19	08:35	07:45	06:42	06:31	05:35	05:12	05:35	06:23	07:15	08:06	08:02	08:41
	16:57	17:54	18:45	20:39	21:29	22:01	21:47	20:54	19:43	18:34	16:38	16:23
20	08:34	07:43	06:40	06:29	05:34	05:12	05:36	06:25	07:16	08:08	08:04	08:42
	16:59	17:56	18:47	20:41	21:31	22:01	21:46	20:52	19:41	18:32	16:37	16:23
21	08:33	07:41	06:38	06:27	05:32	05:13	05:38	06:27	07:18	08:10	08:05	08:43
	17:01	17:58	18:49	20:43	21:32	22:01	21:44	20:49	19:38	18:30	16:36	16:23
22	08:32	07:39	06:35	06:25	05:31	05:13	05:39	06:28	07:20	08:11	08:07	08:43
	17:02	18:00	18:51	20:44	21:34	22:01	21:43	20:47	19:36	18:27	16:35	16:24
23	08:31	07:37	06:33	06:22	05:30	05:13	05:41	06:30	07:21	08:13	08:09	08:44
	17:04	18:02	18:52	20:46	21:35	22:01	21:42	20:45	19:33	18:25	16:34	16:24
24	08:29	07:34	06:31	06:20	05:28	05:13	05:42	06:32	07:23	08:15	08:11	08:44
	17:06	18:04	18:54	20:48	21:36	22:02	21:40	20:43	19:31	18:23	16:32	16:25
25	08:28	07:32	06:28	06:18	05:27	05:14	05:43	06:33	07:25	07:17	08:12	08:45
	17:08	18:06	18:56	20:50	21:38	22:02	21:39	20:41	19:29	17:21	16:31	16:26
26	08:27	07:30	06:26	06:16	05:26	05:14	05:45	06:35	07:26	07:19	08:14	08:45
	17:09	18:07	18:58	20:51	21:39	22:02	21:38	20:39	19:26	17:19	16:30	16:26
27	08:25	07:28	06:24	06:14	05:25	05:14	05:46	06:37	07:28	07:20	08:15	08:45
	17:11	18:09	18:59	20:53	21:41	22:02	21:36	20:36	19:24	17:17	16:30	16:27
28	08:24	07:26	06:21	06:12	05:24	05:15	05:48	06:38	07:30	07:22	08:17	08:45
	17:13	18:11	19:01	20:55	21:42	22:01	21:35	20:34	19:22	17:15	16:29	16:28
29	08:22		07:19	06:10	05:23	05:16	05:49	06:40	07:31	07:24	08:18	08:45
	17:15		20:03	20:57	21:43	22:01	21:33	20:32	19:19	17:13	16:28	16:29
30	08:21		07:17	06:08	05:22	05:16	05:51	06:41	07:33	07:26	08:20	08:46
	17:17		20:05	20:58	21:44	22:01	21:31	20:30	19:17	17:11	16:27	16:30
31	08:19		07:14		05:21		05:52	06:43		07:28		08:46
	17:19		20:06		21:45		21:30	20:27		17:09		16:30
Potential sun hours	257	277	367	417	487	501	504	455	381	331	265	241
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

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Kathlyn Feeney / kfeeney@jodireland.com

SHADOW - Calendar

Calculation: 6839 Garrane WF Worst Case - V150 **Shadow receptor:** CO - 131

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:46	08:18	07:24	07:12	06:06	05:20	05:17	05:54	06:45	07:35	07:30	08:21
	16:32	17:20	18:13	20:08	21:00	21:47	22:01	21:28	20:25	19:15	17:07	16:26
2	08:45	08:16	07:21	07:10	06:04	05:19	05:17	05:56	06:46	07:36	07:31	08:23
	16:33	17:22	18:15	20:10	21:02	21:48	22:00	21:26	20:23	19:12	17:06	16:26
3	08:45	08:15	07:19	07:07	06:02	05:18	05:18	05:57	06:48	07:38	07:33	08:24
	16:34	17:24	18:17	20:11	21:03	21:49	22:00	21:25	20:20	19:10	17:04	16:25
4	08:45	08:13	07:17	07:05	06:00	05:17	05:19	05:59	06:50	07:40	07:35	08:26
	16:35	17:26	18:18	20:13	21:05	21:50	22:00	21:23	20:18	19:08	17:02	16:24
5	08:45	08:11	07:15	07:03	05:58	05:17	05:20	06:00	06:51	07:42	07:37	08:27
	16:36	17:28	18:20	20:15	21:07	21:51	21:59	21:21	20:16	19:05	17:00	16:24
6	08:44	08:10	07:12	07:00	05:57	05:16	05:21	06:02	06:53	07:43	07:39	08:28
	16:38	17:30	18:22	20:17	21:08	21:52	21:59	21:19	20:14	19:03	16:58	16:23
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	16:40	17:34	18:26	20:20	21:12	21:54	21:57	21:16	20:09	18:58	16:55	16:23
9	08:43	08:04	07:06	06:53	05:51	05:14	05:23	06:07	06:58	07:48	07:44	08:32
	16:42	17:36	18:28	20:22	21:13	21:55	21:57	21:14	20:07	18:56	16:53	16:22
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	16:54	17:51	18:42	20:36	21:26	22:00	21:49	20:58	19:48	18:38	16:41	16:22
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	16:55	17:53	18:44	20:38	21:28	22:00	21:48	20:56	19:45	18:36	16:40	16:22
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	16:59	17:56	18:47	20:41	21:31	22:01	21:46	20:52	19:41	18:32	16:37	16:23
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	17:13	18:11	19:01	20:55	21:42	22:01	21:35	20:34	19:22	17:15	16:29	16:28
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	17:15		20:03	20:57	21:43	22:01	21:33	20:32	19:19	17:13	16:28	16:29
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	17:17		20:05	20:58	21:44	22:01	21:31	20:30	19:17	17:11	16:27	16:30
31	08:19		07:14		05:21		05:52	06:43		07:28		08:46
	17:19		20:06		21:45		21:30	20:27		17:09		16:30
Potential sun hours	257	277	367	417	487	501	504	455	381	331	265	241
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
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+353719161416
Kathlyn Feeney / kfeeney@jodireland.com

Calculated:
09/06/2025 13:54/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Worst Case - V150 **Shadow receptor:** CP - 132

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:46	08:18	07:24	07:12	06:06	05:20	05:17	05:54	06:45	07:35	07:30	08:21
	16:32	17:20	18:13	20:08	21:00	21:47	22:01	21:28	20:25	19:15	17:07	16:26
2	08:45	08:16	07:21	07:10	06:04	05:19	05:17	05:56	06:46	07:36	07:31	08:23
	16:33	17:22	18:15	20:10	21:02	21:48	22:00	21:26	20:23	19:12	17:06	16:26
3	08:45	08:15	07:19	07:07	06:02	05:18	05:18	05:57	06:48	07:38	07:33	08:24
	16:34	17:24	18:17	20:11	21:03	21:49	22:00	21:25	20:20	19:10	17:04	16:25
4	08:45	08:13	07:17	07:05	06:00	05:18	05:19	05:59	06:50	07:40	07:35	08:26
	16:35	17:26	18:18	20:13	21:05	21:50	22:00	21:23	20:18	19:08	17:02	16:24
5	08:45	08:11	07:15	07:03	05:58	05:17	05:20	06:00	06:51	07:42	07:37	08:27
	16:36	17:28	18:20	20:15	21:07	21:51	21:59	21:21	20:16	19:05	17:00	16:24
6	08:44	08:10	07:12	07:00	05:57	05:16	05:21	06:02	06:53	07:43	07:39	08:28
	16:38	17:30	18:22	20:17	21:08	21:52	21:59	21:19	20:13	19:03	16:58	16:23
7	08:44	08:08	07:10	06:58	05:55	05:16	05:22	06:04	06:55	07:45	07:41	08:30
	16:39	17:32	18:24	20:18	21:10	21:53	21:58	21:18	20:11	19:01	16:57	16:23
8	08:44	08:06	07:08	06:56	05:53	05:15	05:23	06:05	06:56	07:47	07:42	08:31
	16:40	17:34	18:26	20:20	21:12	21:54	21:57	21:16	20:09	18:58	16:55	16:23
9	08:43	08:04	07:06	06:53	05:51	05:14	05:23	06:07	06:58	07:48	07:44	08:32
	16:42	17:36	18:28	20:22	21:13	21:55	21:57	21:14	20:06	18:56	16:53	16:22
10	08:42	08:02	07:03	06:51	05:49	05:14	05:25	06:08	07:00	07:50	07:46	08:33
	16:43	17:37	18:29	20:24	21:15	21:55	21:56	21:12	20:04	18:54	16:52	16:22
11	08:42	08:01	07:01	06:49	05:48	05:14	05:26	06:10	07:01	07:52	07:48	08:34
	16:44	17:39	18:31	20:25	21:17	21:56	21:55	21:10	20:02	18:52	16:50	16:22
12	08:41	07:59	06:59	06:47	05:46	05:13	05:27	06:12	07:03	07:54	07:50	08:35
	16:46	17:41	18:33	20:27	21:18	21:57	21:54	21:08	19:59	18:49	16:48	16:22
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	16:47	17:43	18:35	20:29	21:20	21:58	21:53	21:06	19:57	18:47	16:47	16:22
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15	08:39	07:53	06:52	06:40	05:41	05:13	05:30	06:17	07:08	07:59	07:55	08:38
	16:51	17:47	18:38	20:32	21:23	21:59	21:51	21:02	19:52	18:43	16:44	16:22
16	08:38	07:51	06:49	06:38	05:40	05:12	05:31	06:18	07:10	08:01	07:57	08:39
	16:52	17:49	18:40	20:34	21:25	21:59	21:50	21:00	19:50	18:40	16:42	16:22
17	08:37	07:49	06:47	06:35	05:38	05:12	05:33	06:20	07:11	08:02	07:59	08:40
	16:54	17:51	18:42	20:36	21:26	22:00	21:49	20:58	19:48	18:38	16:41	16:22
18	08:36	07:47	06:45	06:33	05:37	05:12	05:34	06:22	07:13	08:04	08:00	08:41
	16:55	17:53	18:44	20:38	21:28	22:00	21:48	20:56	19:45	18:36	16:40	16:22
19	08:35	07:45	06:42	06:31	05:35	05:12	05:35	06:23	07:15	08:06	08:02	08:41
	16:57	17:54	18:45	20:39	21:29	22:01	21:47	20:54	19:43	18:34	16:38	16:23
20	08:34	07:43	06:40	06:29	05:34	05:12	05:37	06:25	07:16	08:08	08:04	08:42
	16:59	17:56	18:47	20:41	21:31	22:01	21:46	20:52	19:41	18:32	16:37	16:23
21	08:33	07:41	06:38	06:27	05:32	05:13	05:38	06:27	07:18	08:10	08:05	08:43
	17:01	17:58	18:49	20:43	21:32	22:01	21:44	20:49	19:38	18:30	16:36	16:23
22	08:32	07:39	06:35	06:25	05:31	05:13	05:39	06:28	07:20	08:11	08:07	08:43
	17:02	18:00	18:51	20:44	21:34	22:01	21:43	20:47	19:36	18:27	16:35	16:24
23	08:31	07:37	06:33	06:22	05:30	05:13	05:41	06:30	07:21	08:13	08:09	08:44
	17:04	18:02	18:52	20:46	21:35	22:01	21:42	20:45	19:33	18:25	16:34	16:24
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25	08:28	07:32	06:28	06:18	05:27	05:14	05:43	06:33	07:25	07:17	08:12	08:44
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27	08:25	07:28	06:24	06:14	05:25	05:15	05:46	06:37	07:28	07:20	08:15	08:45
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	17:13	18:11	19:01	20:55	21:42	22:01	21:35	20:34	19:22	17:15	16:29	16:28
29	08:22		07:19	06:10	05:23	05:16	05:49	06:40	07:31	07:24	08:18	08:45
	17:15		20:03	20:57	21:43	22:01	21:33	20:32	19:19	17:13	16:28	16:29
30	08:21		07:17	06:08	05:22	05:16	05:51	06:41	07:33	07:26	08:20	08:45
	17:17		20:05	20:58	21:44	22:01	21:31	20:30	19:17	17:11	16:27	16:30
31	08:19		07:14		05:21		05:53	06:43		07:28		08:46
	17:19		20:06		21:45		21:30	20:27		17:09		16:30
Potential sun hours	257	277	367	417	487	501	504	455	381	331	265	241
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
Jennings O'Donovan
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+353719161416
Kathlyn Feeney / kfeeney@jodireland.com

Calculated:
09/06/2025 13:54/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Worst Case - V150 **Shadow receptor:** CQ - 141

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:46 16:32	08:18 17:20	07:24 18:13	07:12 20:08	06:06 21:00 5	06:31 (1) 06:36 (1) 21:47	05:20 06:18 (1) 16	05:17 22:01	05:54 21:28 29	06:23 (1) 06:52 (1)	06:45 20:25	07:35 19:15	07:30 17:07	08:21 16:26
2	08:45 16:33	08:16 17:22	07:21 18:15	07:10 20:10	06:04 21:02 8	06:29 (1) 06:37 (1) 21:48	05:19 06:32 (1) 13	05:17 22:00	05:56 21:26 27	06:25 (1) 06:52 (1)	06:46 20:23	07:36 19:12	07:31 17:06	08:23 16:26
3	08:45 16:34	08:15 17:24	07:19 18:17	07:07 20:11	06:02 21:03 11	06:27 (1) 06:38 (1) 21:49	05:18 06:21 (1) 11	05:18 22:00	05:57 21:25 26	06:26 (1) 06:52 (1)	06:48 20:20	07:38 19:10	07:33 17:04	08:24 16:25
4	08:45 16:35	08:13 17:26	07:17 18:18	07:05 20:13	06:00 21:05 13	06:25 (1) 06:38 (1) 21:50	05:17 06:23 (1) 6	05:19 22:00	05:59 21:23 24	06:28 (1) 06:52 (1)	06:50 20:18	07:40 19:08	07:35 17:02	08:26 16:24
5	08:45 16:36	08:11 17:28	07:15 18:20	07:03 20:15	05:58 21:07 16	06:24 (1) 06:40 (1) 21:51	05:17	05:20 21:59	06:00 21:21 22	06:29 (1) 06:51 (1)	06:51 20:16	07:42 19:05	07:37 17:00	08:27 16:24
6	08:44 16:38	08:10 17:30	07:12 18:22	07:00 20:17	05:57 21:08 18	06:22 (1) 06:40 (1) 21:52	05:16	05:21 21:59	06:02 21:19 20	06:31 (1) 06:51 (1)	06:53 20:14	07:43 19:03	07:39 16:58	08:28 16:23
7	08:44 16:39	08:08 17:32	07:10 18:24	06:58 20:18	05:55 21:10 21	06:20 (1) 06:41 (1) 21:53	05:16	05:22 21:58	06:04 21:18 18	06:32 (1) 06:50 (1)	06:55 20:11	07:45 19:01	07:41 16:57	08:30 16:23
8	08:44 16:40	08:06 17:34	07:08 18:26	06:56 20:20	05:53 21:12 23	06:19 (1) 06:42 (1) 21:54	05:15	05:22 21:57 3	06:31 (1) 06:34 (1) 21:16 15	06:05 06:49 (1)	06:34 (1) 20:09	07:47 18:58	07:42 16:55	08:31 16:23
9	08:43 16:42	08:04 17:36	07:06 18:28	06:53 20:22	05:51 21:13 25	06:17 (1) 06:42 (1) 21:55	05:14	05:23 21:57 9	06:28 (1) 06:37 (1) 21:14 13	06:07 06:48 (1)	06:58 20:07	07:49 18:56	07:44 16:53	08:32 16:22
10	08:43 16:43	08:02 17:37	07:03 18:29	06:51 20:24	05:49 21:15 26	06:15 (1) 06:41 (1) 21:55	05:14	05:24 21:56 12	06:27 (1) 06:39 (1) 21:12 10	06:08 06:47 (1)	07:00 20:04	07:50 18:54	07:46 16:52	08:33 16:22
11	08:42 16:44	08:01 17:39	07:01 18:31	06:49 20:25	05:48 21:17 28	06:14 (1) 06:42 (1) 21:56	05:14	05:26 21:55 14	06:26 (1) 06:40 (1) 21:10 7	06:10 06:45 (1)	06:38 (1) 20:02	07:01 18:52	07:48 16:50	08:34 16:22
12	08:41 16:46	07:59 17:41	06:59 18:33	06:47 20:27	05:46 21:18 30	06:12 (1) 06:42 (1) 21:57	05:13	05:27 21:54 17	06:25 (1) 06:42 (1) 21:08 4	06:12 06:44 (1)	06:40 (1) 19:59	07:03 18:49	07:50 16:48	08:35 16:22
13	08:41 16:47	07:57 17:43	06:56 18:35	06:44 20:29	05:44 21:20 31	06:11 (1) 06:42 (1) 21:58	05:13	05:28 21:53 19	06:24 (1) 06:43 (1) 21:06	06:13	07:05 19:57	07:55 18:47	07:51 16:47	08:36 16:22
14	08:40 16:49	07:55 17:45	06:54 18:36	06:42 20:31	05:43 21:22 33	06:09 (1) 06:42 (1) 21:58	05:13	05:29 21:52 21	06:24 (1) 06:45 (1) 21:04	06:15	07:06 19:55	07:57 18:45	07:53 16:45	08:37 16:22
15	08:39 16:51	07:53 17:47	06:52 18:38	06:40 20:32	05:41 21:23 34	06:08 (1) 06:42 (1) 21:59	05:13	05:30 21:51 23	06:23 (1) 06:46 (1) 21:02	06:17	07:08 19:52	07:59 18:43	07:55 16:44	08:38 16:22
16	08:38 16:52	07:51 17:49	06:49 18:40	06:38 20:34	05:40 21:25 34	06:07 (1) 06:41 (1) 21:59	05:12	05:31 21:50 23	06:23 (1) 06:46 (1) 21:00	06:18	07:10 19:50	08:01 18:40	07:57 16:42	08:39 16:22
17	08:37 16:54	07:49 17:51	06:47 18:42	06:35 20:36	05:38 21:26 34	06:08 (1) 06:42 (1) 22:00	05:12	05:33 21:49 25	06:22 (1) 06:47 (1) 20:58	06:20	07:11 19:48	08:03 18:38	07:59 16:41	08:40 16:22
18	08:36 16:55	07:47 17:53	06:45 18:44	06:33 20:38	05:37 21:28 34	06:08 (1) 06:42 (1) 22:00	05:12	05:34 21:48 27	06:21 (1) 06:48 (1) 20:56	06:22	07:13 19:45	08:04 18:36	08:00 16:40	08:41 16:22
19	08:35 16:57	07:45 17:54	06:42 18:45	06:31 20:39	05:35 21:29 33	06:08 (1) 06:41 (1) 22:01	05:12	05:35 21:47 28	06:20 (1) 06:48 (1) 20:54	06:23	07:15 19:43	08:06 18:34	08:02 16:38	08:41 16:23
20	08:34 16:59	07:43 17:56	06:40 18:47	06:29 20:41	05:34 21:31 32	06:09 (1) 06:41 (1) 22:01	05:12	05:36 21:46 28	06:21 (1) 06:49 (1) 20:52	06:25	07:16 19:41	08:08 18:32	08:04 16:37	08:42 16:23
21	08:33 17:01	07:41 17:58	06:38 18:49	06:27 20:43	05:32 21:32 32	06:09 (1) 06:41 (1) 22:01	05:13	05:38 21:44 30	06:20 (1) 06:50 (1) 20:49	06:27	07:18 19:38	08:10 18:30	08:06 16:36	08:43 16:23
22	08:32 17:02	07:39 18:00	06:35 18:51	06:25 20:44	05:31 21:34 30	06:10 (1) 06:40 (1) 22:01	05:13	05:39 21:43 31	06:19 (1) 06:50 (1) 20:47	06:28	07:20 19:36	08:11 18:27	08:07 16:35	08:43 16:24
23	08:31 17:04	07:37 18:02	06:33 18:52	06:22 20:46	05:30 21:35 29	06:10 (1) 06:39 (1) 22:02	05:13	05:41 21:42 31	06:20 (1) 06:51 (1) 20:45	06:30	07:21 19:33	08:13 18:25	08:09 16:34	08:44 16:24
24	08:29 17:06	07:34 18:04	06:31 18:54	06:20 20:48	05:28 21:36 29	06:10 (1) 06:39 (1) 22:02	05:13	05:42 21:40 32	06:19 (1) 06:51 (1) 20:43	06:32	07:23 19:31	08:15 18:23	08:11 16:32	08:44 16:25
25	08:28 17:08	07:32 18:06	06:28 18:56	06:18 20:50	05:27 21:38 27	06:11 (1) 06:38 (1) 22:02	05:14	05:43 21:39 33	06:18 (1) 06:51 (1) 20:41	06:33	07:25 19:29	07:17 17:21	08:12 16:31	08:45 16:25
26	08:27 17:09	07:30 18:07	06:26 18:58	06:16 20:51	05:26 21:39 26	06:12 (1) 06:38 (1) 22:02	05:14	05:45 21:38 33	06:19 (1) 06:52 (1) 20:39	06:35	07:26 19:26	07:19 17:19	08:14 16:30	08:45 16:26
27	08:25 17:11	07:28 18:09	06:24 18:59	06:14 20:53	05:25 21:41 24	06:13 (1) 06:37 (1) 22:02	05:14	05:46 21:36 34	06:18 (1) 06:52 (1) 20:36	06:37	07:28 19:24	07:20 17:17	08:15 16:29	08:45 16:27
28	08:24 17:13	07:26 18:11	06:21 19:01	06:12 20:55	05:24 21:42 23	06:13 (1) 06:36 (1) 22:01	05:15	05:48 21:35 34	06:18 (1) 06:52 (1) 20:34	06:38	07:30 19:22	07:22 17:15	08:17 16:29	08:45 16:28
29	08:22 17:15		07:19 20:03	06:10 20:57	05:23 21:43 22	06:14 (1) 06:36 (1) 22:01	05:16	05:49 21:33 34	06:19 (1) 06:53 (1) 20:32	06:40	07:31 19:19	07:24 17:13	08:18 16:28	08:45 16:29
30	08:21 17:17		07:17 20:05	06:08 20:58 1	06:33 (1) 06:34 (1) 21:44 20	06:16 (1) 06:36 (1) 22:01	05:16	05:51 21:31 32	06:20 (1) 06:52 (1) 20:30	06:41	07:33 19:17	07:26 17:11	08:20 16:27	08:46 16:30
31	08:19 17:19		07:14 20:06		05:21 21:46 18	06:17 (1) 06:35 (1)		05:52 21:30 31	06:22 (1) 06:53 (1) 20:27	06:43		07:28 17:09		08:46 16:30
Potential sun hours	257	277	367	417	487	501	504	455	381	331	265	241
Total, worst case				1	769	46	604	215				
Sun reduction				0.38	0.39	0.35	0.33	0.35				
Oper. time red.				1.00	1.00	1.00	1.00	1.00				
Wind dir. red.				0.60	0.60	0.60	0.60	0.60				
Total reduction				0.23	0.24	0.21	0.20	0.21				
Total, real				0	183	10	121	46				

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
Jennings O'Donovan
Finisklin Business Park
F91 RHH9 Sligo
+353719161416
Kathlyn Feeney / kfeeney@jodireland.com

Calculated:
09/06/2025 13:54/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Worst Case - V150 **Shadow receptor:** CR - 142

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:46	08:18	07:24	07:12	06:06	06:31 (1)	05:20	05:17	05:54	06:23 (1)	06:45	07:35	07:30	08:21
	16:32	17:20	18:13	20:08	21:00 11	06:42 (1)	21:47	22:01	21:28 33	06:56 (1)	20:25	19:15	17:07	16:26
2	08:45	08:16	07:21	07:10	06:04	06:29 (1)	05:19	05:17	05:56	06:25 (1)	06:46	07:36	07:31	08:23
	16:33	17:22	18:15	20:10	21:02 14	06:43 (1)	21:48	22:00	21:26 31	06:56 (1)	20:23	19:12	17:06	16:26
3	08:45	08:15	07:19	07:07	06:02	06:27 (1)	05:18	05:18	05:57	06:26 (1)	06:48	07:38	07:33	08:24
	16:34	17:24	18:17	20:11	21:03 16	06:43 (1)	21:49	22:00	21:25 30	06:56 (1)	20:20	19:10	17:04	16:25
4	08:45	08:13	07:17	07:05	06:00	06:25 (1)	05:17	05:19	05:59	06:28 (1)	06:50	07:40	07:35	08:26
	16:35	17:26	18:18	20:13	21:05 19	06:44 (1)	21:50	22:00	21:23 28	06:56 (1)	20:18	19:08	17:02	16:24
5	08:45	08:11	07:15	07:03	05:58	06:24 (1)	05:17	05:20	06:00	06:29 (1)	06:51	07:42	07:37	08:27
	16:36	17:28	18:20	20:15	21:07 21	06:45 (1)	21:51	21:59	21:21 26	06:55 (1)	20:16	19:05	17:00	16:24
6	08:44	08:10	07:12	07:00	05:57	06:22 (1)	05:16	05:21	06:02	06:31 (1)	06:53	07:43	07:39	08:28
	16:38	17:30	18:22	20:17	21:08 23	06:45 (1)	21:52	21:59	21:19 24	06:55 (1)	20:14	19:03	16:58	16:23
7	08:44	08:08	07:10	06:58	05:55	06:20 (1)	05:16	05:22	06:04	06:32 (1)	06:55	07:45	07:41	08:30
	16:39	17:32	18:24	20:18	21:10 25	06:45 (1)	21:53	21:58	21:18 22	06:54 (1)	20:11	19:01	16:57	16:23
8	08:44	08:06	07:08	06:56	05:53	06:19 (1)	05:15	05:22	06:05	06:34 (1)	06:56	07:47	07:42	08:31
	16:40	17:34	18:26	20:20	21:12 27	06:46 (1)	21:54	21:57	21:16 20	06:54 (1)	20:09	18:58	16:55	16:23
9	08:43	08:04	07:06	06:53	05:51	06:17 (1)	05:14	05:23	06:07	06:35 (1)	06:58	07:49	07:44	08:32
	16:42	17:36	18:28	20:22	21:13 29	06:46 (1)	21:55	21:57	21:14 18	06:53 (1)	20:07	18:56	16:53	16:22
10	08:43	08:02	07:03	06:51	05:49	06:15 (1)	05:14	05:24	06:08	06:37 (1)	07:00	07:50	07:46	08:33
	16:43	17:37	18:29	20:24	21:15 30	06:45 (1)	21:55	21:56	21:12 16	06:53 (1)	20:04	18:54	16:52	16:22
11	08:42	08:01	07:01	06:49	05:48	06:14 (1)	05:14	05:26	06:10	06:38 (1)	07:01	07:52	07:48	08:34
	16:44	17:39	18:31	20:25	21:17 32	06:46 (1)	21:56	21:55	21:10 13	06:51 (1)	20:02	18:52	16:50	16:22
12	08:41	07:59	06:59	06:47	05:46	06:12 (1)	05:13	05:27	06:12	06:40 (1)	07:03	07:54	07:50	08:35
	16:46	17:41	18:33	20:27	21:18 33	06:45 (1)	21:57	21:54	21:08 10	06:50 (1)	19:59	18:49	16:48	16:22
13	08:41	07:57	06:56	06:44	05:44	06:11 (1)	05:13	05:28 06:34 (1)	06:13	06:41 (1)	07:05	07:55	07:51	08:36
	16:47	17:43	18:35	20:29	21:20 35	06:46 (1)	21:58	21:53 6 06:40 (1)	21:06 7	06:48 (1)	19:57	18:47	16:47	16:22
14	08:40	07:55	06:54	06:42	05:43	06:11 (1)	05:13	05:29 06:32 (1)	06:15	06:43 (1)	07:06	07:57	07:53	08:37
	16:49	17:45	18:36	20:31	21:22 34	06:45 (1)	21:58	21:52 12 06:44 (1)	21:04 4	06:47 (1)	19:55	18:45	16:45	16:22
15	08:39	07:53	06:52	06:40	05:41	06:12 (1)	05:13	05:30 06:31 (1)	06:17		07:08	07:59	07:55	08:38
	16:51	17:47	18:38	20:32	21:23 33	06:45 (1)	21:59	21:51 14 06:45 (1)	21:02		19:52	18:43	16:44	16:22
16	08:38	07:51	06:49	06:38	05:40	06:11 (1)	05:12	05:31 06:29 (1)	06:18		07:10	08:01	07:57	08:39
	16:52	17:49	18:40	20:34	21:25 33	06:44 (1)	21:59	21:50 17 06:46 (1)	21:00		19:50	18:40	16:42	16:22
17	08:37	07:49	06:47	06:35	05:38	06:12 (1)	05:12	05:33 06:28 (1)	06:20		07:11	08:03	07:59	08:40
	16:54	17:51	18:42	20:36	21:26 32	06:44 (1)	22:00	21:49 20 06:48 (1)	20:58		19:48	18:38	16:41	16:22
18	08:36	07:47	06:45	06:33	05:37	06:13 (1)	05:12	05:34 06:27 (1)	06:22		07:13	08:04	08:00	08:41
	16:55	17:53	18:44	20:38	21:28 31	06:44 (1)	22:00	21:48 21 06:48 (1)	20:56		19:45	18:36	16:40	16:22
19	08:35	07:45	06:42	06:31	05:35	06:13 (1)	05:12	05:35 06:26 (1)	06:23		07:15	08:06	08:02	08:41
	16:57	17:54	18:45	20:39	21:29 30	06:43 (1)	22:01	21:47 23 06:49 (1)	20:54		19:43	18:34	16:38	16:23
20	08:34	07:43	06:40	06:29	05:34	06:14 (1)	05:12	05:36 06:26 (1)	06:25		07:16	08:08	08:04	08:42
	16:59	17:56	18:47	20:41	21:31 29	06:43 (1)	22:01	21:46 25 06:51 (1)	20:52		19:41	18:32	16:37	16:23
21	08:33	07:41	06:38	06:27	05:32	06:14 (1)	05:13	05:38 06:25 (1)	06:27		07:18	08:10	08:06	08:43
	17:01	17:58	18:49	20:43	21:32 29	06:43 (1)	22:01	21:44 27 06:52 (1)	20:49		19:38	18:30	16:36	16:23
22	08:32	07:39	06:35	06:25	05:31	06:15 (1)	05:13	05:39 06:24 (1)	06:28		07:20	08:11	08:07	08:43
	17:02	18:00	18:51	20:44	21:34 27	06:42 (1)	22:01	21:43 28 06:52 (1)	20:47		19:36	18:27	16:35	16:24
23	08:31	07:37	06:33	06:22	05:30	06:15 (1)	05:13	05:41 06:25 (1)	06:30		07:21	08:13	08:09	08:44
	17:04	18:02	18:52	20:46	21:35 26	06:41 (1)	22:02	21:42 28 06:53 (1)	20:45		19:33	18:25	16:34	16:24
24	08:29	07:34	06:31	06:20	05:28	06:16 (1)	05:13	05:42 06:24 (1)	06:32		07:23	08:15	08:11	08:44
	17:06	18:04	18:54	20:48	21:36 24	06:40 (1)	22:02	21:40 30 06:54 (1)	20:43		19:31	18:23	16:32	16:25
25	08:28	07:32	06:28	06:18	05:27	06:17 (1)	05:14	05:43 06:23 (1)	06:33		07:25	07:17	08:12	08:45
	17:08	18:06	18:56	20:50	21:38 22	06:39 (1)	22:02	21:39 31 06:54 (1)	20:41		19:29	17:21	16:31	16:25
26	08:27	07:30	06:26	06:16	05:26	06:18 (1)	05:14	05:45 06:23 (1)	06:35		07:26	07:19	08:14	08:45
	17:09	18:07	18:58	20:51	21:39 21	06:39 (1)	22:02	21:38 32 06:55 (1)	20:39		19:26	17:19	16:30	16:26
27	08:25	07:28	06:24	06:14	05:25	06:19 (1)	05:14	05:46 06:22 (1)	06:37		07:28	07:20	08:15	08:45
	17:11	18:09	18:59	20:53	21:41 19	06:38 (1)	22:02	21:36 33 06:55 (1)	20:36		19:24	17:17	16:29	16:27
28	08:24	07:26	06:21	06:12 06:36 (1)	05:24	06:21 (1)	05:15	05:48 06:22 (1)	06:38		07:30	07:22	08:17	08:45
	17:13	18:11	19:01	20:55 1 06:37 (1)	21:42 15	06:36 (1)	22:01	21:35 33 06:55 (1)	20:34		19:22	17:15	16:29	16:28
29	08:22		07:19	06:10 06:35 (1)	05:23	06:22 (1)	05:16	05:49 06:22 (1)	06:40		07:31	07:24	08:18	08:45
	17:15		20:03	20:57 5 06:40 (1)	21:43 13	06:35 (1)	22:01	21:33 34 06:56 (1)	20:32		19:19	17:13	16:28	16:29
30	08:21		07:17	06:08 06:33 (1)	05:22	06:25 (1)	05:16	05:51 06:21 (1)	06:41		07:33	07:26	08:20	08:46
	17:17		20:05	20:58 8 06:41 (1)	21:44 9	06:34 (1)	22:01	21:31 35 06:56 (1)	20:30		19:17	17:11	16:27	16:30
31	08:19		07:14		05:21			05:52 06:22 (1)	06:43			07:28		08:46
	17:19		20:06		21:46			21:30 34 06:56 (1)	20:27			17:09		16:30
Potential sun hours	257	277	367	417	487	501	504	455	381	331	265	241
Total, worst case				14	742		483	282				
Sun reduction				0.38	0.39		0.33	0.35				
Oper. time red.				1.00	1.00		1.00	1.00				
Wind dir. red.				0.60	0.60		0.60	0.60				
Total reduction				0.23	0.24		0.20	0.21				
Total, real				3	177		97	60				

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
Jennings O'Donovan
Finisklin Business Park
F91 RHH9 Sligo
+353719161416
Kathlyn Feeney / kfeeney@jodireland.com

Calculated:
09/06/2025 13:54/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Worst Case - V150 **Shadow receptor:** CS - 143

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:46	08:18	07:24	07:12	06:06	06:31 (2)	05:20	05:17	06:23 (2)	06:45	07:11 (1)	07:35	07:30	08:22
	16:32	17:20	18:13	20:08	21:00	06:32 (2)	21:47	22:01	06:47 (2)	20:25	07:36 (1)	19:15	17:07	16:26
2	08:45	08:16	07:21	07:10	07:32 (1)	06:04	06:29 (2)	05:19	05:17	05:56	06:25 (2)	06:46	07:13 (1)	07:37	07:31	08:23
	16:33	17:22	18:15	20:10	07:34 (1)	21:02	06:33 (2)	21:48	22:00	21:26	06:47 (2)	20:23	07:36 (1)	19:12	17:06	16:26
3	08:45	08:15	07:19	07:07	07:30 (1)	06:02	06:27 (2)	05:18	05:18	05:57	06:26 (2)	06:48	07:14 (1)	07:38	07:33	08:24
	16:34	17:24	18:17	20:12	07:35 (1)	21:03	06:34 (2)	21:49	22:00	21:25	06:47 (2)	20:20	07:35 (1)	19:10	17:04	16:25
4	08:45	08:13	07:17	07:05	07:28 (1)	06:00	06:25 (2)	05:17	05:19	05:59	06:28 (2)	06:50	07:16 (1)	07:40	07:35	08:26
	16:35	17:26	18:18	20:13	07:37 (1)	21:05	06:34 (2)	21:50	22:00	21:23	06:47 (2)	20:18	07:35 (1)	19:08	17:02	16:24
5	08:45	08:11	07:15	07:03	07:26 (1)	05:58	06:24 (2)	05:17	05:20	06:00	06:29 (2)	06:51	07:17 (1)	07:42	07:37	08:27
	16:36	17:28	18:20	20:15	07:37 (1)	21:07	06:36 (2)	21:51	21:59	21:21	06:46 (2)	20:16	07:34 (1)	19:05	17:00	16:24
6	08:44	08:10	07:12	07:00	07:23 (1)	05:57	06:22 (2)	05:16	05:21	06:02	06:31 (2)	06:53	07:19 (1)	07:43	07:39	08:28
	16:38	17:30	18:22	20:17	07:37 (1)	21:08	06:36 (2)	21:52	21:59	21:19	06:46 (2)	20:14	07:33 (1)	19:03	16:58	16:23
7	08:44	08:08	07:10	06:58	07:21 (1)	05:55	06:20 (2)	05:16	05:22	06:04	06:32 (2)	06:55	07:21 (1)	07:45	07:41	08:30
	16:39	17:32	18:24	20:18	07:38 (1)	21:10	06:36 (2)	21:53	21:58	21:18	06:45 (2)	20:11	07:33 (1)	19:01	16:57	16:23
8	08:44	08:06	07:08	06:56	07:19 (1)	05:53	06:19 (2)	05:15	05:22	06:05	06:34 (2)	06:56	07:22 (1)	07:47	07:42	08:31
	16:40	17:34	18:26	20:20	07:38 (1)	21:12	06:37 (2)	21:54	21:57	21:16	06:45 (2)	20:09	07:31 (1)	18:58	16:55	16:23
9	08:43	08:04	07:06	06:53	07:16 (1)	05:51	06:17 (2)	05:14	05:23	06:07	06:35 (2)	06:58	07:24 (1)	07:49	07:44	08:32
	16:42	17:36	18:28	20:22	07:37 (1)	21:13	06:37 (2)	21:55	21:57	21:14	06:43 (2)	20:07	07:30 (1)	18:56	16:53	16:22
10	08:43	08:02	07:03	06:51	07:14 (1)	05:49	06:15 (2)	05:14	05:24	06:08	06:37 (2)	07:00	07:25 (1)	07:50	07:46	08:33
	16:43	17:37	18:29	20:24	07:37 (1)	21:15	06:36 (2)	21:55	21:56	21:12	06:43 (2)	20:04	07:27 (1)	18:54	16:52	16:22
11	08:42	08:01	07:01	06:49	07:12 (1)	05:48	06:14 (2)	05:14	05:26	06:10	06:38 (2)	07:01		07:52	07:48	08:34
	16:44	17:39	18:31	20:25	07:37 (1)	21:17	06:37 (2)	21:56	21:55	21:10	06:41 (2)	20:02		18:52	16:50	16:22
12	08:41	07:59	06:59	06:47	07:10 (1)	05:46	06:12 (2)	05:13	05:27	06:12		07:03		07:54	07:50	08:35
	16:46	17:41	18:33	20:27	07:36 (1)	21:18	06:36 (2)	21:57	21:54	21:08		19:59		18:49	16:48	16:22
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	16:47	17:43	18:35	20:29	07:36 (1)	21:20	06:37 (2)	21:58	21:53	21:06		19:57		18:47	16:47	16:22
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16	08:38	07:51	06:49	06:38	07:10 (1)	05:40	06:06 (2)	05:12	05:31	06:24 (2)	06:18		07:10		08:01	07:57	08:39
	16:52	17:49	18:40	20:34	07:31 (1)	21:25	06:35 (2)	21:59	21:50	13	06:37 (2)	21:00		19:50		18:40	16:42	16:22
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	16:54	17:51	18:42	20:36	07:30 (1)	21:26	06:35 (2)	22:00	21:49	16	06:38 (2)	20:58		19:48		18:38	16:41	16:22
18	08:36	07:47	06:45	06:33	07:13 (1)	05:37	06:07 (2)	05:12	05:34	06:21 (2)	06:22		07:13		08:04	08:00	08:41
	16:55	17:53	18:44	20:38	07:28 (1)	21:28	06:35 (2)	22:00	21:48	18	06:39 (2)	20:56		19:45		18:36	16:40	16:22
19	08:35	07:45	06:42	06:31	07:16 (1)	05:35	06:06 (2)	05:12	05:35	06:20 (2)	06:23		07:15		08:06	08:02	08:41
	16:57	17:54	18:45	20:39	07:24 (1)	21:29	06:34 (2)	22:01	21:47	20	06:40 (2)	20:54		19:43		18:34	16:38	16:23
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	17:01	17:58	18:49	20:43	21:32	06:34 (2)	22:01	21:45	24	06:43 (2)	20:49		19:38		18:30	16:36	16:23
22	08:32	07:39	06:35	06:25	05:31	06:09 (2)	05:13	05:39	06:18 (2)	06:28		07:20		08:11	08:07	08:43
	17:02	18:00	18:51	20:44	21:34	24	06:33 (2)	22:01	21:43	25	06:43 (2)	20:47		19:36		18:27	16:35	16:24
23	08:31	07:37	06:33	06:22	05:30	06:09 (2)	05:13	05:41	06:18 (2)	06:30		07:21		08:13	08:09	08:44
	17:04	18:02	18:52	20:46	21:35	23	06:32 (2)	22:02	21:42	26	06:44 (2)	20:45		19:33		18:25	16:34	16:24
24	08:29	07:34	06:31	06:20	05:28	06:10 (2)	05:13	05:42	06:17 (2)	06:32	07:18 (1)	07:23		08:15	08:11	08:44
	17:06	18:04	18:54	20:48	21:36	21	06:31 (2)	22:02	21:40	28	06:45 (2)	20:43	9	07:27 (1)	19:31		18:23	16:32	16:25
25	08:28	07:32	06:28	06:18	05:27	06:11 (2)	05:14	05:43	06:17 (2)	06:33	07:16 (1)	07:25		07:17	08:12	08:45
	17:08	18:06	18:56	20:50	21:38	19	06:30 (2)	22:02	21:39	28	06:45 (2)	20:41	15	07:31 (1)	19:29		17:21	16:31	16:25
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	17:09	18:07	18:58	20:51	21:39	17	06:29 (2)	22:02	21:38	29	06:46 (2)	20:39	19	07:33 (1)	19:26		17:19	16:30	16:26
27	08:25	07:28	06:24	06:14	05:25	06:14 (2)	05:14	05:46	06:16 (2)	06:37	07:12 (1)	07:28		07:20	08:15	08:45
	17:11	18:09	18:59	20:53	21:41	14	06:28 (2)	22:02	21:36	30	06:46 (2)	20:36	21	07:33 (1)	19:24		17:17	16:29	16:27
28	08:24	07:26	06:21	06:12	05:24	06:15 (2)	05:15	05:48	06:17 (2)	06:38	07:11 (1)	07:30		07:22	08:17	08:45
	17:13	18:11	19:01	20:55	21:42	12	06:27 (2)	22:01	21:35	29	06:46 (2)	20:34	24	07:35 (1)	19:22		17:15	16:29	16:28
29	08:22		07:19	06:10	05:23	06:17 (2)	05:16	05:49	06:19 (2)	06:40	07:09 (1)	07:31		07:24	08:19	08:45
	17:15		20:03	20:57	21:43	7	06:24 (2)	22:01	21:33	28	06:47 (2)	20:32	26	07:35 (1)	19:19		17:13	16:28	16:29
30	08:21		07:17	06:08	05:22	05:16	05:51	06:20 (2)	06:41	07:08 (1)	07:33		07:26	08:20	08:46
	17:17		20:05	20:58	21:44	22:01	21:31	27	06:47 (2)	20:30	27	07:35 (1)	19:17		17:11	16:27	16:30
31	08:19		07:14		05:21		05:52	06:22 (2)	06:43	07:10 (1)			07:28		08:46
	17:19		20:06		21:46		21:30	25	06:47 (2)	20:27	26	07:36 (1)			17:09		16:30
Potential sun hours	257	277	367	417	487	501	504	455	381	331	265	241
Total, worst case				313	554		400	326	148			
Sun reduction				0.38	0.39		0.33	0.35	0.34			
Oper. time red.				1.00	1.00		1.00	1.00	1.00			
Wind dir. red.				0.60	0.60		0.60	0.60	0.60			
Total reduction				0.23	0.24		0.20	0.21	0.20			
Total, real				71	132		80	69	30			

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
Jennings O'Donovan
Finisklin Business Park
F91 RHH9 Sligo
+353719161416
Kathlyn Feeney / kfeeney@jodireland.com

SHADOW - Calendar

Calculation: 6839 Garrane WF Worst Case - V150 **Shadow receptor:** CT - 144

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:46	08:18	07:24	07:12	06:06	06:31 (2)	05:20	05:17		05:54	06:23 (2)	06:45	07:11 (1)	07:35	07:30	08:22
	16:32	17:20	18:13	20:08	21:00 5	06:36 (2)	21:47	22:01		21:28 22	06:45 (2)	20:25 16	07:27 (1)	19:15	17:07	16:26
2	08:45	08:16	07:21	07:10	06:04	06:29 (2)	05:19	05:17		05:56	06:25 (2)	06:46	07:13 (1)	07:37	07:31	08:23
	16:33	17:22	18:15	20:10	21:02 7	06:36 (2)	21:48	22:00		21:26 21	06:46 (2)	20:23 14	07:27 (1)	19:12	17:06	16:26
3	08:45	08:15	07:19	07:07	06:02	06:27 (2)	05:18	05:18		05:57	06:26 (2)	06:48	07:14 (1)	07:38	07:33	08:24
	16:34	17:24	18:17	20:12	21:03 9	06:36 (2)	21:49	22:00		21:25 20	06:46 (2)	20:20 12	07:26 (1)	19:10	17:04	16:25
4	08:45	08:13	07:17	07:05	06:00	06:25 (2)	05:17	05:19		05:59	06:28 (2)	06:50	07:16 (1)	07:40	07:35	08:26
	16:35	17:26	18:18	20:13	21:05 11	06:36 (2)	21:50	22:00		21:23 19	06:47 (2)	20:18 10	07:26 (1)	19:08	17:02	16:24
5	08:45	08:11	07:15	07:03	05:58	06:24 (2)	05:17	05:20		06:00	06:29 (2)	06:51	07:17 (1)	07:42	07:37	08:27
	16:36	17:28	18:20	20:15 1	07:27 (1) 21:07 13	06:37 (2)	21:51	21:59		21:21 17	06:46 (2)	20:16 7	07:24 (1)	19:05	17:00	16:24
6	08:44	08:10	07:12	07:00	07:23 (1) 05:57	06:22 (2)	05:16	05:21		06:02	06:31 (2)	06:53	07:19 (1)	07:43	07:39	08:28
	16:38	17:30	18:22	20:17 4	07:27 (1) 21:08 15	06:37 (2)	21:52	21:59		21:19 16	06:47 (2)	20:14 4	07:23 (1)	19:03	16:58	16:23
7	08:44	08:08	07:10	06:58	07:21 (1) 05:55	06:20 (2)	05:16	05:22		06:04	06:32 (2)	06:55	07:21 (1)	07:45	07:41	08:30
	16:39	17:32	18:24	20:18 7	07:28 (1) 21:10 16	06:36 (2)	21:53	21:58		21:18 14	06:46 (2)	20:11 1	07:22 (1)	19:01	16:57	16:23
8	08:44	08:06	07:08	06:56	07:19 (1) 05:53	06:19 (2)	05:15	05:22		06:05	06:34 (2)	06:56		07:47	07:42	08:31
	16:40	17:34	18:26	20:20 10	07:29 (1) 21:12 18	06:37 (2)	21:54	21:57		21:16 13	06:47 (2)	20:09		18:58	16:55	16:23
9	08:43	08:04	07:06	06:53	07:16 (1) 05:51	06:17 (2)	05:14	05:23		06:07	06:35 (2)	06:58		07:49	07:44	08:32
	16:42	17:36	18:28	20:22 12	07:28 (1) 21:13 19	06:36 (2)	21:55	21:57		21:14 11	06:46 (2)	20:07		18:56	16:53	16:22
10	08:43	08:02	07:03	06:51	07:14 (1) 05:49	06:15 (2)	05:14	05:24		06:08	06:37 (2)	07:00		07:50	07:46	08:33
	16:43	17:37	18:29	20:24 14	07:28 (1) 21:15 21	06:36 (2)	21:56	21:56		21:12 9	06:46 (2)	20:04		18:54	16:52	16:22
11	08:42	08:01	07:01	06:49	07:12 (1) 05:48	06:14 (2)	05:14	05:26		06:10	06:38 (2)	07:01		07:52	07:48	08:34
	16:44	17:39	18:31	20:25 16	07:28 (1) 21:17 22	06:36 (2)	21:56	21:55		21:10 6	06:44 (2)	20:02		18:52	16:50	16:22
12	08:41	07:59	06:59	06:47	07:10 (1) 05:46	06:12 (2)	05:13	05:27		06:12	06:40 (2)	07:03		07:54	07:50	08:35
	16:46	17:41	18:33	20:27 18	07:28 (1) 21:18 23	06:35 (2)	21:57	21:54		21:08 4	06:44 (2)	19:59		18:49	16:48	16:22
13	08:41	07:57	06:56	06:44	07:08 (1) 05:44	06:13 (2)	05:13	05:28		06:13	06:41 (2)	07:05		07:55	07:52	08:36
	16:47	17:43	18:35	20:29 19	07:27 (1) 21:20 22	06:35 (2)	21:58	21:53		21:06 1	06:42 (2)	19:57		18:47	16:47	16:22
14	08:40	07:55	06:54	06:42	07:05 (1) 05:43	06:13 (2)	05:13	05:29		06:15		07:06		07:57	07:53	08:37
	16:49	17:45	18:36	20:31 21	07:26 (1) 21:22 20	06:33 (2)	21:58	21:52		21:04		19:55		18:45	16:45	16:22
15	08:39	07:53	06:52	06:40	07:04 (1) 05:41	06:14 (2)	05:13	05:30		06:17		07:08		07:59	07:55	08:38
	16:51	17:47	18:38	20:32 21	07:25 (1) 21:23 19	06:33 (2)	21:59	21:51		21:02		19:52		18:43	16:44	16:22
16	08:38	07:51	06:49	06:38	07:05 (1) 05:40	06:15 (2)	05:12	05:31		06:18		07:10		08:01	07:57	08:39
	16:52	17:49	18:40	20:34 18	07:23 (1) 21:25 16	06:31 (2)	21:59	21:50		21:00		19:50		18:40	16:42	16:22
17	08:37	07:49	06:47	06:35	07:06 (1) 05:38	06:16 (2)	05:12	05:33		06:20		07:11		08:03	07:59	08:40
	16:54	17:51	18:42	20:36 16	07:22 (1) 21:26 14	06:30 (2)	22:00	21:49		20:58		19:48		18:38	16:41	16:22
18	08:36	07:47	06:45	06:33	07:08 (1) 05:37	06:18 (2)	05:12	05:34		06:22		07:13		08:04	08:00	08:41
	16:55	17:53	18:44	20:38 11	07:19 (1) 21:28 11	06:29 (2)	22:00	21:48		20:56		19:45		18:36	16:40	16:22
19	08:35	07:45	06:42	06:31	05:35	06:21 (2)	05:12	05:35		06:23		07:15		08:06	08:02	08:41
	16:57	17:54	18:45	20:39	21:29 4	06:25 (2)	22:01	21:47		20:54		19:43		18:34	16:38	16:23
20	08:34	07:43	06:40	06:29	05:34		05:12	05:36		06:25		07:16		08:08	08:04	08:42
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	17:02	18:00	18:51	20:44	21:34		22:01	21:43		20:47		19:36		18:27	16:35	16:24
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	17:04	18:02	18:52	20:46	21:35		22:02	21:42		20:45		19:33		18:25	16:34	16:24
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	17:06	18:04	18:54	20:48	21:37		22:02	21:40		20:43 3	07:18 (1)	19:31		18:23	16:32	16:25
25	08:28	07:32	06:28	06:18	05:27		05:14	05:43	06:29 (2)	06:33	07:11 (1)	07:25		07:17	08:12	08:45
	17:08	18:06	18:56	20:50	21:38		22:02	21:39 8	06:37 (2)	20:41 12	07:23 (1)	19:29		17:21	16:31	16:26
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28	08:24	07:26	06:21	06:12	05:24		05:15	05:48	06:24 (2)	06:38	07:06 (1)	07:30		07:22	08:17	08:45
	17:13	18:11	19:01	20:55	21:42		22:01	21:35 18	06:42 (2)	20:34 21	07:27 (1)	19:22		17:15	16:29	16:28
29	08:22		07:19	06:10	05:23		05:16	05:49	06:24 (2)	06:40	07:06 (1)	07:31		07:24	08:19	08:45
	17:15		20:03	20:57	21:43		22:01	21:33 20	06:44 (2)	20:32 20	07:26 (1)	19:19		17:13	16:28	16:29
30	08:21		07:17	06:08	06:33 (2) 05:22		05:16	05:51	06:23 (2)	06:42	07:08 (1)	07:33		07:26	08:20	08:46
	17:17		20:05	20:58 2	06:35 (2) 21:44		22:01	21:31 21	06:44 (2)	20:30 19	07:27 (1)	19:17		17:11	16:27	16:30
31	08:19		07:14		05:21			05:52	06:23 (2)	06:43	07:10 (1)			07:28		08:46
	17:19		20:06		21:46			21:30 22	06:45 (2)	20:27 18	07:28 (1)			17:09		16:30
Potential sun hours	257	277	367	417	487	501	504	455	381	331	265	241
Total, worst case				190	285		116	300	64			
Sun reduction				0.38	0.39		0.33	0.35	0.34			
Oper. time red.				1.00	1.00		1.00	1.00	1.00			
Wind dir. red.				0.60	0.60		0.60	0.60	0.60			
Total reduction				0.23	0.24		0.20	0.21	0.20			
Total, real				43	68		23	64	13			

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
Jennings O'Donovan
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Kathlyn Feeney / kfeeney@jodireland.com

Calculated:
09/06/2025 13:54/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Worst Case - V150 **Shadow receptor:** CU - 145

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January	February	March	April		May		June		
1	08:46	08:18	07:24	07:12		06:06		06:31 (2)	05:20	
	16:32	17:20	18:13	20:08		21:00	4	06:35 (2)	21:47	
2	08:45	08:16	07:21	07:10		06:04		06:29 (2)	05:19	
	16:33	17:22	18:15	20:10		21:02	6	06:35 (2)	21:48	
3	08:45	08:15	07:19	07:07		06:02		06:27 (2)	05:18	
	16:34	17:24	18:17	20:12		21:03	9	06:36 (2)	21:49	
4	08:45	08:13	07:17	07:05		06:00		06:25 (2)	05:18	
	16:35	17:26	18:18	20:13		21:05	11	06:36 (2)	21:50	
5	08:45	08:11	07:15	07:03		05:58		06:24 (2)	05:17	
	16:36	17:28	18:20	20:15		21:07	12	06:36 (2)	21:51	
6	08:44	08:10	07:12	07:00	07:23 (1)	05:57		06:22 (2)	05:16	
	16:38	17:30	18:22	20:17	1 07:24 (1)	21:08	14	06:36 (2)	21:52	
7	08:44	08:08	07:10	06:58	07:21 (1)	05:55		06:20 (2)	05:16	
	16:39	17:32	18:24	20:18	4 07:25 (1)	21:10	16	06:36 (2)	21:53	
8	08:44	08:06	07:08	06:56	07:19 (1)	05:53		06:19 (2)	05:15	
	16:40	17:34	18:26	20:20	7 07:26 (1)	21:12	17	06:36 (2)	21:54	
9	08:43	08:04	07:06	06:53	07:16 (1)	05:51		06:17 (2)	05:14	
	16:42	17:36	18:28	20:22	9 07:25 (1)	21:13	19	06:36 (2)	21:55	
10	08:43	08:02	07:03	06:51	07:14 (1)	05:49		06:15 (2)	05:14	
	16:43	17:37	18:29	20:24	12 07:26 (1)	21:15	20	06:35 (2)	21:56	
11	08:42	08:01	07:01	06:49	07:12 (1)	05:48		06:14 (2)	05:14	
	16:44	17:39	18:31	20:25	14 07:26 (1)	21:17	21	06:35 (2)	21:56	
12	08:41	07:59	06:59	06:47	07:10 (1)	05:46		06:12 (2)	05:13	
	16:46	17:41	18:33	20:27	16 07:26 (1)	21:18	22	06:34 (2)	21:57	
13	08:41	07:57	06:56	06:44	07:08 (1)	05:44		06:13 (2)	05:13	
	16:47	17:43	18:35	20:29	17 07:25 (1)	21:20	21	06:34 (2)	21:58	
14	08:40	07:55	06:54	06:42	07:05 (1)	05:43		06:13 (2)	05:13	
	16:49	17:45	18:36	20:31	19 07:24 (1)	21:22	19	06:32 (2)	21:58	
15	08:39	07:53	06:52	06:40	07:03 (1)	05:41		06:15 (2)	05:13	
	16:51	17:47	18:38	20:32	20 07:23 (1)	21:23	17	06:32 (2)	21:59	
16	08:38	07:51	06:49	06:38	07:03 (1)	05:40		06:15 (2)	05:12	05:43 (4)
	16:52	17:49	18:40	20:34	19 07:22 (1)	21:25	15	06:30 (2)	21:59	1 05:44 (4)
17	08:37	07:49	06:47	06:35	07:04 (1)	05:38		06:17 (2)	05:12	05:43 (4)
	16:54	17:51	18:42	20:36	16 07:20 (1)	21:26	12	06:29 (2)	22:00	1 05:44 (4)
18	08:36	07:47	06:45	06:33	07:06 (1)	05:37		06:20 (2)	05:12	05:43 (3)
	16:55	17:53	18:44	20:38	13 07:19 (1)	21:28	6	06:26 (2)	22:00	1 05:44 (3)
19	08:35	07:45	06:42	06:31	07:09 (1)	05:35			05:12	05:43 (3)
	16:57	17:54	18:45	20:39	6 07:15 (1)	21:29			22:01	1 05:44 (3)
20	08:34	07:43	06:40	06:29		05:34			05:12	05:43 (3)
	16:59	17:56	18:47	20:41		21:31			22:01	1 05:44 (3)
21	08:33	07:41	06:38	06:27		05:32			05:13	05:44 (3)
	17:01	17:58	18:49	20:43		21:32			22:01	1 05:45 (3)
22	08:32	07:39	06:35	06:25		05:31			05:13	05:44 (3)
	17:02	18:00	18:51	20:45		21:34			22:01	1 05:45 (3)
23	08:31	07:37	06:33	06:22		05:30			05:13	05:44 (3)
	17:04	18:02	18:52	20:46		21:35			22:02	1 05:45 (3)
24	08:29	07:34	06:31	06:20		05:28			05:13	05:44 (3)
	17:06	18:04	18:54	20:48		21:37			22:02	1 05:45 (3)
25	08:28	07:32	06:28	06:18		05:27			05:14	05:45 (4)
	17:08	18:06	18:56	20:50		21:38			22:02	1 05:46 (4)
26	08:27	07:30	06:26	06:16		05:26			05:14	05:45 (4)
	17:09	18:07	18:58	20:51		21:39			22:02	1 05:46 (4)
27	08:25	07:28	06:24	06:14		05:25			05:14	
	17:11	18:09	18:59	20:53		21:41			22:02	
28	08:24	07:26	06:21	06:12		05:24			05:15	
	17:13	18:11	19:01	20:55		21:42			22:01	
29	08:22		07:19	06:10		05:23			05:16	
	17:15		20:03	20:57		21:43			22:01	
30	08:21		07:17	06:08	06:33 (2)	05:22			05:16	
	17:17		20:05	20:58	1 06:34 (2)	21:44			22:01	
31	08:19		07:14			05:21				
	17:19		20:06			21:46				
Potential sun hours	257	277	367	417		487		501		
Total, worst case					174		261		11	
Sun reduction					0.38		0.39		0.35	
Oper. time red.					1.00		1.00		1.00	
Wind dir. red.					0.59		0.60		0.61	
Total reduction					0.23		0.24		0.21	
Total, real					39		62		2	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

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Kathlyn Feeney / kfeeney@jodireland.com
Calculated:
09/06/2025 13:54/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Worst Case - V150 **Shadow receptor:** CU - 145

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	July			August			September			October	November	December
1	05:17			05:54		06:23 (2)	06:45		07:11 (1)	07:35	07:30	08:22
	22:01			21:28	22	06:45 (2)	20:25	14	07:25 (1)	19:15	17:07	16:26
2	05:17			05:56		06:25 (2)	06:46		07:13 (1)	07:37	07:31	08:23
	22:00			21:26	21	06:46 (2)	20:23	12	07:25 (1)	19:12	17:06	16:26
3	05:18			05:57		06:26 (2)	06:48		07:14 (1)	07:38	07:33	08:24
	22:00			21:25	19	06:45 (2)	20:20	10	07:24 (1)	19:10	17:04	16:25
4	05:19			05:59		06:28 (2)	06:50		07:16 (1)	07:40	07:35	08:26
	22:00			21:23	18	06:46 (2)	20:18	7	07:23 (1)	19:08	17:02	16:24
5	05:20			06:00		06:29 (2)	06:51		07:18 (1)	07:42	07:37	08:27
	21:59			21:21	17	06:46 (2)	20:16	4	07:22 (1)	19:05	17:00	16:24
6	05:21			06:02		06:31 (2)	06:53		07:19 (1)	07:43	07:39	08:28
	21:59			21:19	15	06:46 (2)	20:14	1	07:20 (1)	19:03	16:58	16:23
7	05:22			06:04		06:32 (2)	06:55			07:45	07:41	08:30
	21:58			21:18	14	06:46 (2)	20:11			19:01	16:57	16:23
8	05:22			06:05		06:34 (2)	06:56			07:47	07:42	08:31
	21:57			21:16	12	06:46 (2)	20:09			18:58	16:55	16:23
9	05:23			06:07		06:35 (2)	06:58			07:49	07:44	08:32
	21:57			21:14	10	06:45 (2)	20:07			18:56	16:53	16:22
10	05:24			06:08		06:37 (2)	07:00			07:50	07:46	08:33
	21:56			21:12	8	06:45 (2)	20:04			18:54	16:52	16:22
11	05:26			06:10		06:38 (2)	07:01			07:52	07:48	08:34
	21:55			21:10	6	06:44 (2)	20:02			18:52	16:50	16:22
12	05:27			06:12		06:40 (2)	07:03			07:54	07:50	08:35
	21:54			21:08	3	06:43 (2)	19:59			18:49	16:48	16:22
13	05:28			06:13		06:41 (2)	07:05			07:55	07:52	08:36
	21:53			21:06	1	06:42 (2)	19:57			18:47	16:47	16:22
14	05:29			06:15			07:06			07:57	07:53	08:37
	21:52			21:04			19:55			18:45	16:45	16:22
15	05:30			06:17			07:08			07:59	07:55	08:38
	21:51			21:02			19:52			18:43	16:44	16:22
16	05:31			06:18			07:10			08:01	07:57	08:39
	21:50			21:00			19:50			18:40	16:42	16:22
17	05:33			06:20			07:11			08:03	07:59	08:40
	21:49			20:58			19:48			18:38	16:41	16:22
18	05:34			06:22			07:13			08:04	08:00	08:41
	21:48			20:56			19:45			18:36	16:40	16:22
19	05:35			06:23			07:15			08:06	08:02	08:41
	21:47			20:54			19:43			18:34	16:38	16:23
20	05:36			06:25			07:16			08:08	08:04	08:42
	21:46			20:52			19:41			18:32	16:37	16:23
21	05:38			06:27			07:18			08:10	08:06	08:43
	21:45			20:49			19:38			18:30	16:36	16:23
22	05:39			06:28			07:20			08:11	08:07	08:43
	21:43			20:47			19:36			18:27	16:35	16:24
23	05:41			06:30			07:21			08:13	08:09	08:44
	21:42			20:45			19:33			18:25	16:34	16:24
24	05:42			06:32		07:11 (1)	07:23			08:15	08:11	08:44
	21:40			20:43	8	07:19 (1)	19:31			18:23	16:32	16:25
25	05:43			06:33		07:08 (1)	07:25			07:17	08:12	08:45
	21:39			20:41	14	07:22 (1)	19:29			17:21	16:31	16:26
26	05:45		06:29 (2)	06:35		07:07 (1)	07:26			07:19	08:14	08:45
	21:38	9	06:38 (2)	20:39	16	07:23 (1)	19:26			17:19	16:30	16:26
27	05:46		06:27 (2)	06:37		07:05 (1)	07:28			07:21	08:15	08:45
	21:36	13	06:40 (2)	20:36	19	07:24 (1)	19:24			17:17	16:30	16:27
28	05:48		06:25 (2)	06:38		07:05 (1)	07:30			07:22	08:17	08:45
	21:35	16	06:41 (2)	20:34	20	07:25 (1)	19:22			17:15	16:29	16:28
29	05:49		06:25 (2)	06:40		07:06 (1)	07:31			07:24	08:19	08:45
	21:33	18	06:43 (2)	20:32	19	07:25 (1)	19:19			17:13	16:28	16:29
30	05:51		06:23 (2)	06:42		07:08 (1)	07:33			07:26	08:20	08:46
	21:31	20	06:43 (2)	20:30	17	07:25 (1)	19:17			17:11	16:27	16:30
31	05:52		06:23 (2)	06:43		07:10 (1)				07:28		08:46
	21:30	21	06:44 (2)	20:27	16	07:26 (1)				17:09		16:30
Potential sun hours	504			455			381			331	265	241
Total, worst case		97			295			48				
Sun reduction		0.33			0.35			0.34				
Oper. time red.		1.00			1.00			1.00				
Wind dir. red.		0.60			0.60			0.59				
Total reduction		0.20			0.21			0.20				
Total, real		19			63			10				

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

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Kathlyn Feeney / kfeeney@jodireland.com

Calculated:
09/06/2025 13:54/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Worst Case - V150 **Shadow receptor:** CV - 146

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January	February	March	April		May		June	
1	08:46	08:18	07:24	07:12		06:06		06:31 (2)	05:20	
	16:32	17:20	18:13	20:08		21:00	6	06:37 (2)	21:47	
2	08:45	08:16	07:21	07:10		06:04		06:29 (2)	05:19	
	16:33	17:22	18:15	20:10		21:02	9	06:38 (2)	21:48	
3	08:45	08:15	07:19	07:07		06:02		06:27 (2)	05:18	
	16:34	17:24	18:17	20:12		21:03	10	06:37 (2)	21:49	
4	08:45	08:13	07:17	07:05		06:00		06:25 (2)	05:18	
	16:35	17:26	18:19	20:13		21:05	12	06:37 (2)	21:50	
5	08:45	08:11	07:15	07:03		05:58		06:24 (2)	05:17	
	16:36	17:28	18:20	20:15		21:07	14	06:38 (2)	21:51	
6	08:44	08:10	07:12	07:00	07:23 (1)	05:57		06:22 (2)	05:16	
	16:38	17:30	18:22	20:17	1 07:24 (1)	21:08	15	06:37 (2)	21:52	
7	08:44	08:08	07:10	06:58	07:21 (1)	05:55		06:20 (2)	05:16	05:45 (3)
	16:39	17:32	18:24	20:18	4 07:25 (1)	21:10	17	06:37 (2)	21:53	1 05:46 (3)
8	08:44	08:06	07:08	06:56	07:19 (1)	05:53		06:19 (2)	05:15	05:45 (3)
	16:40	17:34	18:26	20:20	7 07:26 (1)	21:12	18	06:37 (2)	21:54	2 05:47 (3)
9	08:43	08:04	07:06	06:53	07:17 (1)	05:51		06:17 (2)	05:14	05:45 (3)
	16:42	17:36	18:28	20:22	9 07:26 (1)	21:13	19	06:36 (2)	21:55	3 05:48 (3)
10	08:43	08:02	07:03	06:51	07:14 (1)	05:49		06:15 (2)	05:14	05:44 (3)
	16:43	17:37	18:29	20:24	11 07:25 (1)	21:15	20	06:35 (2)	21:56	4 05:48 (3)
11	08:42	08:01	07:01	06:49	07:12 (1)	05:48		06:16 (2)	05:14	05:44 (3)
	16:44	17:39	18:31	20:25	13 07:25 (1)	21:17	19	06:35 (2)	21:56	4 05:48 (3)
12	08:41	07:59	06:59	06:47	07:10 (1)	05:46		06:16 (2)	05:13	05:44 (3)
	16:46	17:41	18:33	20:27	15 07:25 (1)	21:18	17	06:33 (2)	21:57	5 05:49 (3)
13	08:41	07:57	06:56	06:44	07:08 (1)	05:44		06:18 (2)	05:13	05:43 (3)
	16:47	17:43	18:35	20:29	17 07:25 (1)	21:20	15	06:33 (2)	21:58	5 05:48 (3)
14	08:40	07:55	06:54	06:42	07:05 (1)	05:43		06:19 (2)	05:13	05:43 (3)
	16:49	17:45	18:36	20:31	18 07:23 (1)	21:22	11	06:30 (2)	21:58	6 05:49 (3)
15	08:39	07:53	06:52	06:40	07:03 (1)	05:41		06:22 (2)	05:13	05:43 (3)
	16:51	17:47	18:38	20:32	19 07:22 (1)	21:23	6	06:28 (2)	21:59	6 05:49 (3)
16	08:38	07:51	06:49	06:38	07:04 (1)	05:40			05:12	05:43 (3)
	16:52	17:49	18:40	20:34	16 07:20 (1)	21:25			21:59	7 05:50 (3)
17	08:37	07:49	06:47	06:35	07:06 (1)	05:38			05:12	05:43 (3)
	16:54	17:51	18:42	20:36	13 07:19 (1)	21:26			22:00	7 05:50 (3)
18	08:36	07:47	06:45	06:33	07:09 (1)	05:37			05:12	05:43 (3)
	16:55	17:53	18:44	20:38	7 07:16 (1)	21:28			22:00	7 05:50 (3)
19	08:35	07:45	06:42	06:31		05:35			05:12	05:43 (3)
	16:57	17:54	18:45	20:39		21:29			22:01	7 05:50 (3)
20	08:34	07:43	06:40	06:29		05:34			05:12	05:43 (3)
	16:59	17:56	18:47	20:41		21:31			22:01	7 05:50 (3)
21	08:33	07:41	06:38	06:27		05:32			05:13	05:44 (3)
	17:01	17:58	18:49	20:43		21:32			22:01	7 05:51 (3)
22	08:32	07:39	06:35	06:25		05:31			05:13	05:44 (3)
	17:02	18:00	18:51	20:45		21:34			22:01	7 05:51 (3)
23	08:31	07:37	06:33	06:22		05:30			05:13	05:44 (3)
	17:04	18:02	18:52	20:46		21:35			22:02	7 05:51 (3)
24	08:29	07:34	06:31	06:20		05:28			05:13	05:44 (3)
	17:06	18:04	18:54	20:48		21:37			22:02	7 05:51 (3)
25	08:28	07:32	06:28	06:18		05:27			05:14	05:45 (3)
	17:08	18:06	18:56	20:50		21:38			22:02	7 05:52 (3)
26	08:27	07:30	06:26	06:16		05:26			05:14	05:45 (3)
	17:09	18:07	18:58	20:51		21:39			22:02	7 05:52 (3)
27	08:25	07:28	06:24	06:14		05:25			05:14	05:46 (3)
	17:11	18:09	18:59	20:53		21:41			22:02	6 05:52 (3)
28	08:24	07:26	06:21	06:12		05:24			05:15	05:46 (3)
	17:13	18:11	19:01	20:55		21:42			22:02	6 05:52 (3)
29	08:22		07:19	06:10	06:35 (2)	05:23			05:16	05:47 (3)
	17:15		20:03	20:57	2 06:37 (2)	21:43			22:01	6 05:53 (3)
30	08:21		07:17	06:08	06:33 (2)	05:22			05:16	05:47 (3)
	17:17		20:05	20:58	4 06:37 (2)	21:44			22:01	5 05:52 (3)
31	08:19		07:14			05:21				
	17:19		20:06			21:46				
Potential sun hours	257	277	367	417		487			501	
Total, worst case					156		208			136
Sun reduction					0.38		0.39			0.35
Oper. time red.					1.00		1.00			1.00
Wind dir. red.					0.59		0.60			0.60
Total reduction					0.23		0.24			0.21
Total, real					35		50			29

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
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Kathlyn Feeney / kfeeney@jodireland.com
Calculated:
09/06/2025 13:54/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Worst Case - V150 **Shadow receptor:** CV - 146

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	July			August			September			October	November	December
1	05:17		05:48 (3)	05:54		06:26 (2)	06:45		07:11 (1)	07:35	07:30	08:22
	22:01	4	05:52 (3)	21:28	18	06:44 (2)	20:25	13	07:24 (1)	19:15	17:07	16:26
2	05:17		05:49 (3)	05:56		06:26 (2)	06:47		07:13 (1)	07:37	07:31	08:23
	22:00	4	05:53 (3)	21:26	20	06:46 (2)	20:23	11	07:24 (1)	19:12	17:06	16:26
3	05:18		05:49 (3)	05:57		06:26 (2)	06:48		07:14 (1)	07:38	07:33	08:24
	22:00	3	05:52 (3)	21:25	20	06:46 (2)	20:20	9	07:23 (1)	19:10	17:04	16:25
4	05:19		05:50 (3)	05:59		06:28 (2)	06:50		07:16 (1)	07:40	07:35	08:26
	22:00	2	05:52 (3)	21:23	19	06:47 (2)	20:18	7	07:23 (1)	19:08	17:02	16:24
5	05:20		05:51 (3)	06:00		06:29 (2)	06:51		07:18 (1)	07:42	07:37	08:27
	21:59	1	05:52 (3)	21:21	18	06:47 (2)	20:16	4	07:22 (1)	19:05	17:00	16:24
6	05:21			06:02		06:31 (2)	06:53		07:19 (1)	07:43	07:39	08:28
	21:59			21:19	16	06:47 (2)	20:14	1	07:20 (1)	19:03	16:58	16:23
7	05:22			06:04		06:32 (2)	06:55			07:45	07:41	08:30
	21:58			21:18	15	06:47 (2)	20:11			19:01	16:57	16:23
8	05:22			06:05		06:34 (2)	06:56			07:47	07:42	08:31
	21:57			21:16	13	06:47 (2)	20:09			18:58	16:55	16:23
9	05:23			06:07		06:35 (2)	06:58			07:49	07:44	08:32
	21:57			21:14	12	06:47 (2)	20:07			18:56	16:53	16:22
10	05:25			06:08		06:37 (2)	07:00			07:50	07:46	08:33
	21:56			21:12	10	06:47 (2)	20:04			18:54	16:52	16:22
11	05:26			06:10		06:38 (2)	07:01			07:52	07:48	08:34
	21:55			21:10	8	06:46 (2)	20:02			18:52	16:50	16:22
12	05:27			06:12		06:40 (2)	07:03			07:54	07:50	08:35
	21:54			21:08	6	06:46 (2)	19:59			18:49	16:48	16:22
13	05:28			06:13		06:41 (2)	07:05			07:55	07:52	08:36
	21:53			21:06	4	06:45 (2)	19:57			18:47	16:47	16:22
14	05:29			06:15		06:43 (2)	07:06			07:57	07:53	08:37
	21:52			21:04	1	06:44 (2)	19:55			18:45	16:45	16:22
15	05:30			06:17			07:08			07:59	07:55	08:38
	21:51			21:02			19:52			18:43	16:44	16:22
16	05:31			06:18			07:10			08:01	07:57	08:39
	21:50			21:00			19:50			18:40	16:42	16:22
17	05:33			06:20			07:11			08:03	07:59	08:40
	21:49			20:58			19:48			18:38	16:41	16:22
18	05:34			06:22			07:13			08:04	08:00	08:41
	21:48			20:56			19:45			18:36	16:40	16:22
19	05:35			06:23			07:15			08:06	08:02	08:41
	21:47			20:54			19:43			18:34	16:38	16:23
20	05:37			06:25			07:16			08:08	08:04	08:42
	21:46			20:52			19:41			18:32	16:37	16:23
21	05:38			06:27			07:18			08:10	08:06	08:43
	21:45			20:49			19:38			18:30	16:36	16:23
22	05:39			06:28			07:20			08:11	08:07	08:43
	21:43			20:47			19:36			18:27	16:35	16:24
23	05:41			06:30			07:21			08:13	08:09	08:44
	21:42			20:45			19:33			18:25	16:34	16:24
24	05:42			06:32			07:23			08:15	08:11	08:44
	21:40			20:43			19:31			18:23	16:32	16:25
25	05:43			06:33		07:11 (1)	07:25			07:17	08:12	08:45
	21:39			20:41	8	07:19 (1)	19:29			17:21	16:31	16:26
26	05:45			06:35		07:08 (1)	07:26			07:19	08:14	08:45
	21:38			20:39	14	07:22 (1)	19:26			17:19	16:30	16:26
27	05:46			06:37		07:06 (1)	07:28			07:21	08:15	08:45
	21:36			20:36	16	07:22 (1)	19:24			17:17	16:30	16:27
28	05:48			06:38		07:05 (1)	07:30			07:22	08:17	08:45
	21:35			20:34	19	07:24 (1)	19:22			17:15	16:29	16:28
29	05:49		06:31 (2)	06:40		07:06 (1)	07:31			07:24	08:19	08:45
	21:33	9	06:40 (2)	20:32	18	07:24 (1)	19:19			17:13	16:28	16:29
30	05:51		06:29 (2)	06:42		07:08 (1)	07:33			07:26	08:20	08:46
	21:31	13	06:42 (2)	20:30	16	07:24 (1)	19:17			17:11	16:27	16:30
31	05:53		06:28 (2)	06:43		07:10 (1)				07:28		08:46
	21:30	15	06:43 (2)	20:27	15	07:25 (1)				17:09		16:30
Potential sun hours	504			455			381			331	265	241
Total, worst case		51			286			45				
Sun reduction		0.33			0.35			0.34				
Oper. time red.		1.00			1.00			1.00				
Wind dir. red.		0.60			0.60			0.59				
Total reduction		0.20			0.21			0.20				
Total, real		10			61			9				

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

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SHADOW - Calendar

Calculation: 6839 Garrane WF Worst Case - V150 **Shadow receptor:** CW - 147

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January	February	March	April		May		June	
1	08:46	08:18	07:24	07:12		06:06	06:31 (2)	05:20	
	16:32	17:20	18:13	20:08		21:00	8 06:39 (2)	21:47	
2	08:45	08:16	07:21	07:10		06:04	06:29 (2)	05:19	
	16:33	17:22	18:15	20:10		21:02	9 06:38 (2)	21:48	
3	08:45	08:15	07:19	07:07		06:02	06:27 (2)	05:18	
	16:34	17:24	18:17	20:12		21:03	11 06:38 (2)	21:49	
4	08:45	08:13	07:17	07:05		06:00	06:25 (2)	05:18	05:47 (3)
	16:35	17:26	18:19	20:13		21:05	13 06:38 (2)	21:50	1 05:48 (3)
5	08:45	08:11	07:15	07:03		05:58	06:24 (2)	05:17	05:46 (3)
	16:36	17:28	18:20	20:15		21:07	15 06:39 (2)	21:51	2 05:48 (3)
6	08:44	08:10	07:12	07:00	07:23 (1)	05:57	06:22 (2)	05:16	05:46 (3)
	16:38	17:30	18:22	20:17	1 07:24 (1)	21:08	16 06:38 (2)	21:52	3 05:49 (3)
7	08:44	08:08	07:10	06:58	07:21 (1)	05:55	06:20 (2)	05:16	05:45 (3)
	16:39	17:32	18:24	20:18	4 07:25 (1)	21:10	17 06:37 (2)	21:53	4 05:49 (3)
8	08:44	08:06	07:08	06:56	07:19 (1)	05:53	06:19 (2)	05:15	05:45 (3)
	16:40	17:34	18:26	20:20	7 07:26 (1)	21:12	18 06:37 (2)	21:54	5 05:50 (3)
9	08:43	08:04	07:06	06:53	07:17 (1)	05:51	06:17 (2)	05:14	05:45 (3)
	16:42	17:36	18:28	20:22	9 07:26 (1)	21:13	19 06:36 (2)	21:55	6 05:51 (3)
10	08:43	08:02	07:03	06:51	07:14 (1)	05:49	06:17 (2)	05:14	05:44 (3)
	16:43	17:37	18:29	20:24	11 07:25 (1)	21:15	18 06:35 (2)	21:56	7 05:51 (3)
11	08:42	08:01	07:01	06:49	07:12 (1)	05:48	06:18 (2)	05:14	05:44 (3)
	16:44	17:39	18:31	20:25	13 07:25 (1)	21:17	16 06:34 (2)	21:56	7 05:51 (3)
12	08:41	07:59	06:59	06:47	07:10 (1)	05:46	06:19 (2)	05:13	05:44 (3)
	16:46	17:41	18:33	20:27	15 07:25 (1)	21:18	14 06:33 (2)	21:57	8 05:52 (3)
13	08:41	07:57	06:56	06:44	07:08 (1)	05:44	06:21 (2)	05:13	05:43 (3)
	16:47	17:43	18:35	20:29	16 07:24 (1)	21:20	10 06:31 (2)	21:58	8 05:51 (3)
14	08:40	07:55	06:54	06:42	07:05 (1)	05:43	06:24 (2)	05:13	05:43 (3)
	16:49	17:45	18:36	20:31	17 07:22 (1)	21:22	3 06:27 (2)	21:58	9 05:52 (3)
15	08:39	07:53	06:52	06:40	07:04 (1)	05:41		05:13	05:43 (3)
	16:51	17:47	18:38	20:32	17 07:21 (1)	21:23		21:59	9 05:52 (3)
16	08:38	07:51	06:49	06:38	07:05 (1)	05:40		05:12	05:43 (3)
	16:52	17:49	18:40	20:34	15 07:20 (1)	21:25		21:59	10 05:53 (3)
17	08:37	07:49	06:47	06:35	07:07 (1)	05:38		05:12	05:43 (3)
	16:54	17:51	18:42	20:36	11 07:18 (1)	21:26		22:00	10 05:53 (3)
18	08:36	07:47	06:45	06:33		05:37		05:12	05:43 (3)
	16:55	17:53	18:44	20:38		21:28		22:00	10 05:53 (3)
19	08:35	07:45	06:42	06:31		05:35		05:12	05:43 (3)
	16:57	17:54	18:45	20:39		21:29		22:01	10 05:53 (3)
20	08:34	07:43	06:40	06:29		05:34		05:12	05:43 (3)
	16:59	17:56	18:47	20:41		21:31		22:01	10 05:53 (3)
21	08:33	07:41	06:38	06:27		05:32		05:13	05:44 (3)
	17:01	17:58	18:49	20:43		21:32		22:01	10 05:54 (3)
22	08:32	07:39	06:35	06:25		05:31		05:13	05:44 (3)
	17:02	18:00	18:51	20:45		21:34		22:01	10 05:54 (3)
23	08:31	07:37	06:33	06:22		05:30		05:13	05:44 (3)
	17:04	18:02	18:52	20:46		21:35		22:02	10 05:54 (3)
24	08:29	07:34	06:31	06:20		05:28		05:13	05:44 (3)
	17:06	18:04	18:54	20:48		21:37		22:02	10 05:54 (3)
25	08:28	07:32	06:28	06:18		05:27		05:14	05:45 (3)
	17:08	18:06	18:56	20:50		21:38		22:02	10 05:55 (3)
26	08:27	07:30	06:26	06:16		05:26		05:14	05:45 (3)
	17:09	18:07	18:58	20:51		21:39		22:02	10 05:55 (3)
27	08:25	07:28	06:24	06:14		05:25		05:14	05:46 (3)
	17:11	18:09	18:59	20:53		21:41		22:02	9 05:55 (3)
28	08:24	07:26	06:21	06:12		05:24		05:15	05:46 (3)
	17:13	18:11	19:01	20:55		21:42		22:02	9 05:55 (3)
29	08:22		07:19	06:10	06:35 (2)	05:23		05:16	05:47 (3)
	17:15		20:03	20:57	3 06:38 (2)	21:43		22:01	9 05:56 (3)
30	08:21		07:17	06:08	06:33 (2)	05:22		05:16	05:47 (3)
	17:17		20:05	20:58	5 06:38 (2)	21:44		22:01	8 05:55 (3)
31	08:19		07:14			05:21			
	17:19		20:06			21:46			
Potential sun hours	257	277	367	417		487		501	
Total, worst case					144		187		214
Sun reduction					0.38		0.39		0.35
Oper. time red.					1.00		1.00		1.00
Wind dir. red.					0.60		0.60		0.60
Total reduction					0.23		0.24		0.21
Total, real					33		45		45

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

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Calculated:
09/06/2025 13:54/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Worst Case - V150 **Shadow receptor:** CW - 147

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	July			August			September			October	November	December
1	05:17		05:48 (3)	05:54		06:29 (2)	06:45		07:11 (1)	07:35	07:30	08:22
	22:01	8	05:56 (3)	21:28	14	06:43 (2)	20:25	13	07:24 (1)	19:15	17:07	16:26
2	05:17		05:49 (3)	05:56		06:28 (2)	06:47		07:13 (1)	07:37	07:31	08:23
	22:00	7	05:56 (3)	21:26	17	06:45 (2)	20:23	11	07:24 (1)	19:12	17:06	16:26
3	05:18		05:49 (3)	05:57		06:27 (2)	06:48		07:14 (1)	07:38	07:33	08:24
	22:00	6	05:55 (3)	21:25	19	06:46 (2)	20:20	9	07:23 (1)	19:10	17:04	16:25
4	05:19		05:50 (3)	05:59		06:28 (2)	06:50		07:16 (1)	07:40	07:35	08:26
	22:00	6	05:56 (3)	21:23	19	06:47 (2)	20:18	7	07:23 (1)	19:08	17:02	16:24
5	05:20		05:51 (3)	06:00		06:29 (2)	06:51		07:18 (1)	07:42	07:37	08:27
	21:59	5	05:56 (3)	21:21	18	06:47 (2)	20:16	4	07:22 (1)	19:05	17:00	16:24
6	05:21		05:52 (3)	06:02		06:31 (2)	06:53		07:19 (1)	07:43	07:39	08:28
	21:59	4	05:56 (3)	21:19	17	06:48 (2)	20:14	1	07:20 (1)	19:03	16:58	16:23
7	05:22		05:53 (3)	06:04		06:32 (2)	06:55			07:45	07:41	08:30
	21:58	3	05:56 (3)	21:18	15	06:47 (2)	20:11			19:01	16:57	16:23
8	05:23		05:54 (3)	06:05		06:34 (2)	06:56			07:47	07:42	08:31
	21:57	2	05:56 (3)	21:16	14	06:48 (2)	20:09			18:58	16:55	16:23
9	05:23		05:54 (3)	06:07		06:35 (2)	06:58			07:49	07:44	08:32
	21:57	1	05:55 (3)	21:14	12	06:47 (2)	20:07			18:56	16:53	16:22
10	05:25			06:08		06:37 (2)	07:00			07:50	07:46	08:33
	21:56			21:12	11	06:48 (2)	20:04			18:54	16:52	16:22
11	05:26			06:10		06:38 (2)	07:01			07:52	07:48	08:34
	21:55			21:10	9	06:47 (2)	20:02			18:52	16:50	16:22
12	05:27			06:12		06:40 (2)	07:03			07:54	07:50	08:35
	21:54			21:08	7	06:47 (2)	19:59			18:49	16:48	16:22
13	05:28			06:13		06:41 (2)	07:05			07:55	07:52	08:36
	21:53			21:06	5	06:46 (2)	19:57			18:47	16:47	16:22
14	05:29			06:15		06:43 (2)	07:06			07:57	07:53	08:37
	21:52			21:04	2	06:45 (2)	19:55			18:45	16:45	16:22
15	05:30			06:17			07:08			07:59	07:55	08:38
	21:51			21:02			19:52			18:43	16:44	16:22
16	05:31			06:18			07:10			08:01	07:57	08:39
	21:50			21:00			19:50			18:40	16:42	16:22
17	05:33			06:20			07:11			08:03	07:59	08:40
	21:49			20:58			19:48			18:38	16:41	16:22
18	05:34			06:22			07:13			08:04	08:00	08:41
	21:48			20:56			19:45			18:36	16:40	16:22
19	05:35			06:23			07:15			08:06	08:02	08:41
	21:47			20:54			19:43			18:34	16:38	16:23
20	05:37			06:25			07:16			08:08	08:04	08:42
	21:46			20:52			19:41			18:32	16:37	16:23
21	05:38			06:27			07:18			08:10	08:06	08:43
	21:45			20:49			19:38			18:30	16:36	16:23
22	05:39			06:28			07:20			08:11	08:07	08:43
	21:43			20:47			19:36			18:27	16:35	16:24
23	05:41			06:30			07:21			08:13	08:09	08:44
	21:42			20:45			19:33			18:25	16:34	16:24
24	05:42			06:32			07:23			08:15	08:11	08:44
	21:40			20:43			19:31			18:23	16:33	16:25
25	05:43			06:33		07:13 (1)	07:25			07:17	08:12	08:45
	21:39			20:41	3	07:16 (1)	19:29			17:21	16:31	16:26
26	05:45			06:35		07:09 (1)	07:26			07:19	08:14	08:45
	21:38			20:39	12	07:21 (1)	19:26			17:19	16:30	16:26
27	05:46			06:37		07:07 (1)	07:28			07:21	08:15	08:45
	21:36			20:36	15	07:22 (1)	19:24			17:17	16:30	16:27
28	05:48			06:38		07:06 (1)	07:30			07:22	08:17	08:45
	21:35			20:34	17	07:23 (1)	19:22			17:15	16:29	16:28
29	05:49			06:40		07:06 (1)	07:31			07:24	08:19	08:45
	21:33			20:32	17	07:23 (1)	19:19			17:13	16:28	16:29
30	05:51		06:33 (2)	06:42		07:08 (1)	07:33			07:26	08:20	08:46
	21:31	6	06:39 (2)	20:30	16	07:24 (1)	19:17			17:11	16:27	16:30
31	05:53		06:31 (2)	06:43		07:10 (1)				07:28		08:46
	21:30	11	06:42 (2)	20:27	15	07:25 (1)				17:09		16:30
Potential sun hours	504			455			381			331	265	241
Total, worst case		59			274			45				
Sun reduction		0.33			0.35			0.34				
Oper. time red.		1.00			1.00			1.00				
Wind dir. red.		0.60			0.60			0.59				
Total reduction		0.20			0.21			0.20				
Total, real		12			58			9				

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

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SHADOW - Calendar

Calculation: 6839 Garrane WF Worst Case - V150 **Shadow receptor:** CX - 148

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January	February	March	April			May			June		
1	08:46	08:18	07:24	07:12			06:06		06:31 (2)	05:20		05:49 (3)
	16:32	17:20	18:13	20:08			21:00	9	06:40 (2)	21:47	1	05:50 (3)
2	08:45	08:16	07:21	07:10			06:04		06:29 (2)	05:19		05:48 (3)
	16:33	17:22	18:15	20:10			21:02	10	06:39 (2)	21:48	2	05:50 (3)
3	08:45	08:15	07:19	07:07			06:02		06:27 (2)	05:18		05:48 (3)
	16:34	17:24	18:17	20:12			21:03	12	06:39 (2)	21:49	3	05:51 (3)
4	08:45	08:13	07:17	07:05			06:00		06:25 (2)	05:18		05:47 (3)
	16:35	17:26	18:19	20:13			21:05	14	06:39 (2)	21:50	4	05:51 (3)
5	08:45	08:11	07:15	07:03			05:58		06:24 (2)	05:17		05:46 (3)
	16:36	17:28	18:20	20:15			21:07	15	06:39 (2)	21:51	5	05:51 (3)
6	08:44	08:10	07:12	07:00		07:23 (1)	05:57		06:22 (2)	05:16		05:46 (3)
	16:38	17:30	18:22	20:17	1	07:24 (1)	21:08	16	06:38 (2)	21:52	6	05:52 (3)
7	08:44	08:08	07:10	06:58		07:21 (1)	05:55		06:20 (2)	05:16		05:45 (3)
	16:39	17:32	18:24	20:18	4	07:25 (1)	21:10	17	06:37 (2)	21:53	7	05:52 (3)
8	08:44	08:06	07:08	06:56		07:19 (1)	05:53		06:19 (2)	05:15		05:45 (3)
	16:40	17:34	18:26	20:20	7	07:26 (1)	21:12	18	06:37 (2)	21:54	8	05:53 (3)
9	08:43	08:04	07:06	06:53		07:17 (1)	05:51		06:18 (2)	05:14		05:45 (3)
	16:42	17:36	18:28	20:22	9	07:26 (1)	21:13	18	06:36 (2)	21:55	9	05:54 (3)
10	08:43	08:02	07:03	06:51		07:14 (1)	05:49		06:19 (2)	05:14		05:44 (3)
	16:43	17:37	18:29	20:24	11	07:25 (1)	21:15	16	06:35 (2)	21:56	9	05:53 (3)
11	08:42	08:01	07:01	06:49		07:12 (1)	05:48		06:21 (2)	05:14		05:44 (3)
	16:44	17:39	18:31	20:25	13	07:25 (1)	21:17	13	06:34 (2)	21:56	10	05:54 (3)
12	08:41	07:59	06:59	06:47		07:10 (1)	05:46		06:22 (2)	05:13		05:44 (3)
	16:46	17:41	18:33	20:27	14	07:24 (1)	21:18	9	06:31 (2)	21:57	11	05:55 (3)
13	08:41	07:57	06:56	06:44		07:08 (1)	05:44			05:13		05:43 (3)
	16:47	17:43	18:35	20:29	16	07:24 (1)	21:20			21:58	11	05:54 (3)
14	08:40	07:55	06:54	06:42		07:05 (1)	05:43			05:13		05:43 (3)
	16:49	17:45	18:36	20:31	17	07:22 (1)	21:22			21:58	11	05:54 (3)
15	08:39	07:53	06:52	06:40		07:04 (1)	05:41			05:13		05:43 (3)
	16:51	17:47	18:38	20:32	17	07:21 (1)	21:23			21:59	12	05:55 (3)
16	08:38	07:51	06:49	06:38		07:06 (1)	05:40			05:12		05:43 (3)
	16:52	17:49	18:40	20:34	13	07:19 (1)	21:25			21:59	12	05:55 (3)
17	08:37	07:49	06:47	06:35		07:08 (1)	05:38			05:12		05:43 (3)
	16:54	17:51	18:42	20:36	8	07:16 (1)	21:26			22:00	12	05:55 (3)
18	08:36	07:47	06:45	06:33			05:37			05:12		05:43 (3)
	16:55	17:53	18:44	20:38			21:28			22:00	12	05:55 (3)
19	08:35	07:45	06:42	06:31			05:35			05:12		05:43 (3)
	16:57	17:54	18:45	20:39			21:29			22:01	13	05:56 (3)
20	08:34	07:43	06:40	06:29			05:34			05:12		05:43 (3)
	16:59	17:56	18:47	20:41			21:31			22:01	13	05:56 (3)
21	08:33	07:41	06:38	06:27			05:32			05:13		05:44 (3)
	17:01	17:58	18:49	20:43			21:32			22:01	13	05:57 (3)
22	08:32	07:39	06:35	06:25			05:31			05:13		05:44 (3)
	17:02	18:00	18:51	20:45			21:34			22:01	13	05:57 (3)
23	08:31	07:37	06:33	06:22			05:30			05:13		05:44 (3)
	17:04	18:02	18:52	20:46			21:35			22:02	13	05:57 (3)
24	08:29	07:34	06:31	06:20			05:28			05:13		05:44 (3)
	17:06	18:04	18:54	20:48			21:37			22:02	13	05:57 (3)
25	08:28	07:32	06:28	06:18			05:27			05:14		05:45 (3)
	17:08	18:06	18:56	20:50			21:38			22:02	12	05:57 (3)
26	08:27	07:30	06:26	06:16			05:26			05:14		05:45 (3)
	17:09	18:07	18:58	20:51			21:39			22:02	12	05:57 (3)
27	08:25	07:28	06:24	06:14			05:25			05:14		05:46 (3)
	17:11	18:09	18:59	20:53			21:41			22:02	12	05:58 (3)
28	08:24	07:26	06:21	06:12		06:37 (2)	05:24			05:15		05:46 (3)
	17:13	18:11	19:01	20:55	2	06:39 (2)	21:42			22:02	12	05:58 (3)
29	08:22		07:19	06:10		06:35 (2)	05:23			05:16		05:47 (3)
	17:15		20:03	20:57	4	06:39 (2)	21:43			22:01	11	05:58 (3)
30	08:21		07:17	06:08		06:33 (2)	05:22			05:16		05:47 (3)
	17:17		20:05	20:58	6	06:39 (2)	21:44			22:01	11	05:58 (3)
31	08:19		07:14				05:21					
	17:19		20:06				21:46					
Potential sun hours	257	277	367	417			487			501		
Total, worst case					142			167			293	
Sun reduction					0.38			0.39			0.35	
Oper. time red.					1.00			1.00			1.00	
Wind dir. red.					0.60			0.60			0.60	
Total reduction					0.23			0.24			0.21	
Total, real					32			40			61	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

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Kathlyn Feeney / kfeeney@jodireland.com
Calculated:
09/06/2025 13:54/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Worst Case - V150 **Shadow receptor:** CX - 148

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	July			August			September			October	November	December
1	05:17		05:48 (3)	05:54		06:32 (2)	06:45		07:11 (1)	07:35	07:30	08:22
	22:01	10	05:58 (3)	21:28	11	06:43 (2)	20:25	13	07:24 (1)	19:15	17:07	16:26
2	05:17		05:49 (3)	05:56		06:31 (2)	06:47		07:13 (1)	07:37	07:31	08:23
	22:01	10	05:59 (3)	21:26	14	06:45 (2)	20:23	11	07:24 (1)	19:12	17:06	16:26
3	05:18		05:49 (3)	05:57		06:29 (2)	06:48		07:14 (1)	07:38	07:33	08:24
	22:00	9	05:58 (3)	21:25	16	06:45 (2)	20:20	9	07:23 (1)	19:10	17:04	16:25
4	05:19		05:50 (3)	05:59		06:28 (2)	06:50		07:16 (1)	07:40	07:35	08:26
	22:00	8	05:58 (3)	21:23	19	06:47 (2)	20:18	7	07:23 (1)	19:08	17:02	16:24
5	05:20		05:51 (3)	06:00		06:29 (2)	06:51		07:18 (1)	07:42	07:37	08:27
	21:59	8	05:59 (3)	21:21	18	06:47 (2)	20:16	4	07:22 (1)	19:05	17:00	16:24
6	05:21		05:52 (3)	06:02		06:31 (2)	06:53		07:19 (1)	07:43	07:39	08:28
	21:59	7	05:59 (3)	21:19	17	06:48 (2)	20:14	1	07:20 (1)	19:03	16:58	16:23
7	05:22		05:53 (3)	06:04		06:32 (2)	06:55			07:45	07:41	08:30
	21:58	6	05:59 (3)	21:18	16	06:48 (2)	20:11			19:01	16:57	16:23
8	05:23		05:54 (3)	06:05		06:34 (2)	06:56			07:47	07:42	08:31
	21:57	5	05:59 (3)	21:16	15	06:49 (2)	20:09			18:58	16:55	16:23
9	05:23		05:54 (3)	06:07		06:35 (2)	06:58			07:49	07:44	08:32
	21:57	4	05:58 (3)	21:14	13	06:48 (2)	20:07			18:56	16:53	16:22
10	05:25		05:55 (3)	06:08		06:37 (2)	07:00			07:50	07:46	08:33
	21:56	3	05:58 (3)	21:12	12	06:49 (2)	20:04			18:54	16:52	16:22
11	05:26		05:56 (3)	06:10		06:38 (2)	07:01			07:52	07:48	08:34
	21:55	2	05:58 (3)	21:10	10	06:48 (2)	20:02			18:52	16:50	16:22
12	05:27			06:12		06:40 (2)	07:03			07:54	07:50	08:35
	21:54			21:08	8	06:48 (2)	19:59			18:49	16:48	16:22
13	05:28			06:13		06:41 (2)	07:05			07:56	07:52	08:36
	21:53			21:06	6	06:47 (2)	19:57			18:47	16:47	16:22
14	05:29			06:15		06:43 (2)	07:06			07:57	07:53	08:37
	21:52			21:04	4	06:47 (2)	19:55			18:45	16:45	16:22
15	05:30			06:17		06:44 (2)	07:08			07:59	07:55	08:38
	21:51			21:02	1	06:45 (2)	19:52			18:43	16:44	16:22
16	05:31			06:18			07:10			08:01	07:57	08:39
	21:50			21:00			19:50			18:40	16:42	16:22
17	05:33			06:20			07:11			08:03	07:59	08:40
	21:49			20:58			19:48			18:38	16:41	16:22
18	05:34			06:22			07:13			08:04	08:00	08:41
	21:48			20:56			19:45			18:36	16:40	16:22
19	05:35			06:23			07:15			08:06	08:02	08:41
	21:47			20:54			19:43			18:34	16:38	16:23
20	05:37			06:25			07:16			08:08	08:04	08:42
	21:46			20:52			19:41			18:32	16:37	16:23
21	05:38			06:27			07:18			08:10	08:06	08:43
	21:45			20:49			19:38			18:30	16:36	16:23
22	05:39			06:28			07:20			08:11	08:07	08:43
	21:43			20:47			19:36			18:27	16:35	16:24
23	05:41			06:30			07:21			08:13	08:09	08:44
	21:42			20:45			19:33			18:25	16:34	16:24
24	05:42			06:32			07:23			08:15	08:11	08:44
	21:41			20:43			19:31			18:23	16:33	16:25
25	05:43			06:33			07:25			07:17	08:12	08:45
	21:39			20:41			19:29			17:21	16:31	16:26
26	05:45			06:35		07:11 (1)	07:26			07:19	08:14	08:45
	21:38			20:39	9	07:20 (1)	19:26			17:19	16:30	16:26
27	05:46			06:37		07:08 (1)	07:28			07:21	08:15	08:45
	21:36			20:36	13	07:21 (1)	19:24			17:17	16:30	16:27
28	05:48			06:38		07:06 (1)	07:30			07:22	08:17	08:45
	21:35			20:34	17	07:23 (1)	19:22			17:15	16:29	16:28
29	05:49			06:40		07:06 (1)	07:31			07:24	08:19	08:45
	21:33			20:32	17	07:23 (1)	19:19			17:13	16:28	16:29
30	05:51			06:42		07:08 (1)	07:33			07:26	08:20	08:46
	21:31			20:30	16	07:24 (1)	19:17			17:11	16:27	16:30
31	05:53		06:35 (2)	06:43		07:10 (1)				07:28		08:46
	21:30	5	06:40 (2)	20:27	14	07:24 (1)				17:09		16:30
Potential sun hours	504			455			381			331	265	241
Total, worst case		77			266			45				
Sun reduction		0.33			0.35			0.34				
Oper. time red.		1.00			1.00			1.00				
Wind dir. red.		0.60			0.60			0.59				
Total reduction		0.20			0.21			0.20				
Total, real		15			57			9				

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

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Jennings O'Donovan
Finisklin Business Park
F91 RHH9 Sligo
+353719161416
Kathlyn Feeney / kfeeney@jodireland.com

Calculated:
09/06/2025 13:54/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Worst Case - V150 **Shadow receptor:** CY - 149

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January	February	March	April		May		June	
1	08:46	08:18	07:24	07:12		06:06		06:31 (2)	05:20		05:49 (3)
	16:32	17:20	18:13	20:08		21:00	9	06:40 (2)	21:47	4	05:53 (3)
2	08:45	08:16	07:21	07:10		06:04		06:29 (2)	05:19		05:48 (3)
	16:33	17:22	18:15	20:10		21:02	11	06:40 (2)	21:48	5	05:53 (3)
3	08:45	08:15	07:19	07:07		06:02		06:27 (2)	05:18		05:48 (3)
	16:34	17:24	18:17	20:12		21:03	13	06:40 (2)	21:49	6	05:54 (3)
4	08:45	08:13	07:17	07:05		06:00		06:25 (2)	05:18		05:47 (3)
	16:35	17:26	18:19	20:13		21:05	14	06:39 (2)	21:50	7	05:54 (3)
5	08:45	08:11	07:15	07:03		05:58		06:24 (2)	05:17		05:46 (3)
	16:36	17:28	18:20	20:15		21:07	16	06:40 (2)	21:51	8	05:54 (3)
6	08:44	08:10	07:12	07:00	07:23 (1)	05:57		06:22 (2)	05:16		05:46 (3)
	16:38	17:30	18:22	20:17	1 07:24 (1)	21:08	17	06:39 (2)	21:52	9	05:55 (3)
7	08:44	08:08	07:10	06:58	07:21 (1)	05:55		06:20 (2)	05:16		05:45 (3)
	16:39	17:32	18:24	20:18	4 07:25 (1)	21:10	18	06:38 (2)	21:53	10	05:55 (3)
8	08:44	08:06	07:08	06:56	07:19 (1)	05:53		06:20 (2)	05:15		05:45 (3)
	16:40	17:34	18:26	20:20	7 07:26 (1)	21:12	17	06:37 (2)	21:54	11	05:56 (3)
9	08:43	08:04	07:06	06:53	07:17 (1)	05:51		06:21 (2)	05:14		05:45 (3)
	16:42	17:36	18:28	20:22	9 07:26 (1)	21:13	15	06:36 (2)	21:55	11	05:56 (3)
10	08:43	08:02	07:03	06:51	07:14 (1)	05:49		06:21 (2)	05:14		05:44 (3)
	16:43	17:37	18:29	20:24	11 07:25 (1)	21:15	13	06:34 (2)	21:56	12	05:56 (3)
11	08:42	08:01	07:01	06:49	07:12 (1)	05:48		06:24 (2)	05:14		05:44 (3)
	16:44	17:39	18:31	20:25	13 07:25 (1)	21:17	8	06:32 (2)	21:56	12	05:56 (3)
12	08:41	07:59	06:59	06:47	07:10 (1)	05:46			05:13		05:44 (3)
	16:46	17:41	18:33	20:27	14 07:24 (1)	21:18			21:57	13	05:57 (3)
13	08:41	07:57	06:56	06:44	07:08 (1)	05:44			05:13		05:43 (3)
	16:47	17:43	18:35	20:29	16 07:24 (1)	21:20			21:58	13	05:56 (3)
14	08:40	07:55	06:54	06:42	07:05 (1)	05:43			05:13		05:43 (3)
	16:49	17:45	18:37	20:31	17 07:22 (1)	21:22			21:58	14	05:57 (3)
15	08:39	07:53	06:52	06:40	07:05 (1)	05:41			05:13		05:43 (3)
	16:51	17:47	18:38	20:32	15 07:20 (1)	21:23			21:59	14	05:57 (3)
16	08:38	07:51	06:49	06:38	07:07 (1)	05:40			05:12		05:43 (3)
	16:52	17:49	18:40	20:34	11 07:18 (1)	21:25			21:59	14	05:57 (3)
17	08:37	07:49	06:47	06:35	07:10 (1)	05:38			05:12		05:43 (3)
	16:54	17:51	18:42	20:36	5 07:15 (1)	21:26			22:00	14	05:57 (3)
18	08:36	07:47	06:45	06:33		05:37			05:12		05:43 (3)
	16:55	17:53	18:44	20:38		21:28			22:00	15	05:58 (3)
19	08:35	07:45	06:42	06:31		05:35			05:12		05:43 (3)
	16:57	17:54	18:45	20:39		21:29			22:01	15	05:58 (3)
20	08:34	07:43	06:40	06:29		05:34			05:12		05:43 (3)
	16:59	17:56	18:47	20:41		21:31			22:01	15	05:58 (3)
21	08:33	07:41	06:38	06:27		05:32			05:13		05:44 (3)
	17:01	17:58	18:49	20:43		21:32			22:01	15	05:59 (3)
22	08:32	07:39	06:35	06:25		05:31			05:13		05:44 (3)
	17:02	18:00	18:51	20:45		21:34			22:01	15	05:59 (3)
23	08:31	07:37	06:33	06:22		05:30			05:13		05:44 (3)
	17:04	18:02	18:52	20:46		21:35			22:02	15	05:59 (3)
24	08:29	07:34	06:31	06:20		05:28			05:13		05:44 (3)
	17:06	18:04	18:54	20:48		21:37			22:02	15	05:59 (3)
25	08:28	07:32	06:28	06:18		05:27			05:14		05:45 (3)
	17:08	18:06	18:56	20:50		21:38			22:02	15	06:00 (3)
26	08:27	07:30	06:26	06:16		05:26			05:14		05:45 (3)
	17:09	18:07	18:58	20:51		21:39			22:02	14	05:59 (3)
27	08:25	07:28	06:24	06:14	06:38 (2)	05:25			05:14		05:46 (3)
	17:11	18:09	18:59	20:53	1 06:39 (2)	21:41			22:02	14	06:00 (3)
28	08:24	07:26	06:21	06:12	06:37 (2)	05:24			05:15		05:46 (3)
	17:13	18:11	19:01	20:55	3 06:40 (2)	21:42			22:02	14	06:00 (3)
29	08:22		07:19	06:10	06:35 (2)	05:23			05:16		05:47 (3)
	17:15		20:03	20:57	5 06:40 (2)	21:43			22:01	13	06:00 (3)
30	08:21		07:17	06:08	06:33 (2)	05:22		05:51 (3)	05:16		05:47 (3)
	17:17		20:05	20:58	7 06:40 (2)	21:44	1	05:52 (3)	22:01	13	06:00 (3)
31	08:19		07:14			05:21		05:50 (3)			
	17:19		20:06			21:46	3	05:53 (3)			
Potential sun hours	257	277	367	417		487			501		
Total, worst case					139		155			365	
Sun reduction					0.38		0.39			0.35	
Oper. time red.					1.00		1.00			1.00	
Wind dir. red.					0.60		0.60			0.60	
Total reduction					0.23		0.24			0.21	
Total, real					32		37			76	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
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Kathlyn Feeney / kfeeney@jodireland.com
Calculated:
09/06/2025 13:54/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Worst Case - V150 **Shadow receptor:** CY - 149

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	July			August			September			October	November	December
1	05:17		05:48 (3)	05:54		06:36 (2)	06:45		07:11 (1)	07:35	07:30	08:22
	22:01	13	06:01 (3)	21:28	4	06:40 (2)	20:25	13	07:24 (1)	19:15	17:07	16:26
2	05:17		05:49 (3)	05:56		06:34 (2)	06:47		07:13 (1)	07:37	07:31	08:23
	22:01	12	06:01 (3)	21:26	10	06:44 (2)	20:23	11	07:24 (1)	19:12	17:06	16:26
3	05:18		05:49 (3)	05:57		06:31 (2)	06:48		07:14 (1)	07:38	07:33	08:24
	22:00	11	06:00 (3)	21:25	14	06:45 (2)	20:20	9	07:23 (1)	19:10	17:04	16:25
4	05:19		05:50 (3)	05:59		06:31 (2)	06:50		07:16 (1)	07:40	07:35	08:26
	22:00	11	06:01 (3)	21:23	16	06:47 (2)	20:18	7	07:23 (1)	19:08	17:02	16:24
5	05:20		05:51 (3)	06:00		06:29 (2)	06:51		07:18 (1)	07:42	07:37	08:27
	21:59	10	06:01 (3)	21:21	18	06:47 (2)	20:16	4	07:22 (1)	19:05	17:00	16:24
6	05:21		05:52 (3)	06:02		06:31 (2)	06:53		07:19 (1)	07:43	07:39	08:28
	21:59	9	06:01 (3)	21:19	17	06:48 (2)	20:14	1	07:20 (1)	19:03	16:58	16:23
7	05:22		05:53 (3)	06:04		06:32 (2)	06:55			07:45	07:41	08:30
	21:58	9	06:02 (3)	21:18	16	06:48 (2)	20:11			19:01	16:57	16:23
8	05:23		05:54 (3)	06:05		06:34 (2)	06:56			07:47	07:42	08:31
	21:57	8	06:02 (3)	21:16	15	06:49 (2)	20:09			18:58	16:55	16:23
9	05:23		05:54 (3)	06:07		06:35 (2)	06:58			07:49	07:44	08:32
	21:57	7	06:01 (3)	21:14	14	06:49 (2)	20:07			18:56	16:53	16:22
10	05:25		05:55 (3)	06:08		06:37 (2)	07:00			07:50	07:46	08:33
	21:56	6	06:01 (3)	21:12	12	06:49 (2)	20:04			18:54	16:52	16:22
11	05:26		05:56 (3)	06:10		06:38 (2)	07:01			07:52	07:48	08:34
	21:55	5	06:01 (3)	21:10	11	06:49 (2)	20:02			18:52	16:50	16:22
12	05:27		05:57 (3)	06:12		06:40 (2)	07:03			07:54	07:50	08:35
	21:54	3	06:00 (3)	21:08	9	06:49 (2)	20:00			18:49	16:48	16:22
13	05:28		05:59 (3)	06:13		06:41 (2)	07:05			07:56	07:52	08:36
	21:53	2	06:01 (3)	21:06	7	06:48 (2)	19:57			18:47	16:47	16:22
14	05:29		06:00 (3)	06:15		06:43 (2)	07:06			07:57	07:53	08:37
	21:52	1	06:01 (3)	21:04	5	06:48 (2)	19:55			18:45	16:45	16:22
15	05:30			06:17		06:44 (2)	07:08			07:59	07:55	08:38
	21:51			21:02	2	06:46 (2)	19:52			18:43	16:44	16:22
16	05:31			06:18			07:10			08:01	07:57	08:39
	21:50			21:00			19:50			18:40	16:42	16:22
17	05:33			06:20			07:11			08:03	07:59	08:40
	21:49			20:58			19:48			18:38	16:41	16:22
18	05:34			06:22			07:13			08:04	08:00	08:41
	21:48			20:56			19:45			18:36	16:40	16:22
19	05:35			06:23			07:15			08:06	08:02	08:41
	21:47			20:54			19:43			18:34	16:38	16:23
20	05:37			06:25			07:16			08:08	08:04	08:42
	21:46			20:52			19:41			18:32	16:37	16:23
21	05:38			06:27			07:18			08:10	08:06	08:43
	21:45			20:49			19:38			18:30	16:36	16:23
22	05:39			06:28			07:20			08:11	08:07	08:43
	21:43			20:47			19:36			18:27	16:35	16:24
23	05:41			06:30			07:21			08:13	08:09	08:44
	21:42			20:45			19:33			18:25	16:34	16:24
24	05:42			06:32			07:23			08:15	08:11	08:44
	21:41			20:43			19:31			18:23	16:33	16:25
25	05:44			06:33			07:25			07:17	08:12	08:45
	21:39			20:41			19:29			17:21	16:31	16:26
26	05:45			06:35		07:12 (1)	07:26			07:19	08:14	08:45
	21:38			20:39	6	07:18 (1)	19:26			17:19	16:30	16:26
27	05:46			06:37		07:08 (1)	07:28			07:21	08:15	08:45
	21:36			20:36	12	07:20 (1)	19:24			17:17	16:30	16:27
28	05:48			06:38		07:07 (1)	07:30			07:22	08:17	08:45
	21:35			20:34	15	07:22 (1)	19:22			17:15	16:29	16:28
29	05:49			06:40		07:06 (1)	07:31			07:24	08:19	08:45
	21:33			20:32	16	07:22 (1)	19:19			17:13	16:28	16:29
30	05:51			06:42		07:08 (1)	07:33			07:26	08:20	08:46
	21:31			20:30	15	07:23 (1)	19:17			17:11	16:27	16:30
31	05:53			06:43		07:10 (1)				07:28		08:46
	21:30			20:27	14	07:24 (1)				17:09		16:30
Potential sun hours	504			455			381			331	265	241
Total, worst case		107			248			45				
Sun reduction		0.33			0.35			0.34				
Oper. time red.		1.00			1.00			1.00				
Wind dir. red.		0.60			0.60			0.59				
Total reduction		0.20			0.21			0.20				
Total, real		21			53			9				

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
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SHADOW - Calendar

Calculation: 6839 Garrane WF Worst Case - V150 **Shadow receptor:** CZ - 150

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January	February	March	April		May		June	
1	08:46	08:18	07:24	07:12		06:06		05:20	
	16:32	17:20	18:13	20:08		21:00	10	21:47	6
2	08:45	08:16	07:21	07:10		06:04		05:19	
	16:33	17:22	18:15	20:10		21:02	11	21:48	7
3	08:45	08:15	07:19	07:07		06:02		05:18	
	16:34	17:24	18:17	20:12		21:03	13	21:49	8
4	08:45	08:13	07:17	07:05		06:00		05:18	
	16:35	17:26	18:19	20:13		21:05	14	21:50	9
5	08:45	08:11	07:15	07:03		05:58		05:17	
	16:36	17:28	18:20	20:15		21:07	16	21:51	10
6	08:44	08:10	07:12	07:00	07:23 (1)	05:57		05:16	
	16:38	17:30	18:22	20:17	1 07:24 (1)	21:08	17	21:52	11
7	08:44	08:08	07:10	06:58	07:21 (1)	05:55		05:16	
	16:39	17:32	18:24	20:18	3 07:24 (1)	21:10	17	21:53	12
8	08:44	08:06	07:08	06:56	07:19 (1)	05:53		05:15	
	16:40	17:34	18:26	20:20	6 07:25 (1)	21:12	16	21:54	12
9	08:43	08:04	07:06	06:53	07:17 (1)	05:51		05:14	
	16:42	17:36	18:28	20:22	8 07:25 (1)	21:13	13	21:55	13
10	08:43	08:02	07:03	06:51	07:14 (1)	05:49		05:14	
	16:43	17:37	18:29	20:24	10 07:24 (1)	21:15	9	21:56	14
11	08:42	08:01	07:01	06:49	07:12 (1)	05:48		05:14	
	16:44	17:39	18:31	20:25	12 07:24 (1)	21:17		21:56	14
12	08:41	07:59	06:59	06:47	07:10 (1)	05:46		05:13	
	16:46	17:41	18:33	20:27	14 07:24 (1)	21:18		21:57	14
13	08:41	07:57	06:56	06:44	07:08 (1)	05:44		05:13	
	16:47	17:43	18:35	20:29	15 07:23 (1)	21:20		21:58	15
14	08:40	07:55	06:54	06:42	07:05 (1)	05:43		05:13	
	16:49	17:45	18:37	20:31	16 07:21 (1)	21:22		21:58	15
15	08:39	07:53	06:52	06:40	07:05 (1)	05:41		05:13	
	16:51	17:47	18:38	20:32	15 07:20 (1)	21:23		21:59	16
16	08:38	07:51	06:49	06:38	07:07 (1)	05:40		05:12	
	16:52	17:49	18:40	20:34	11 07:18 (1)	21:25		21:59	16
17	08:37	07:49	06:47	06:35	07:11 (1)	05:38		05:12	
	16:54	17:51	18:42	20:36	2 07:13 (1)	21:26		22:00	16
18	08:36	07:47	06:45	06:33		05:37		05:12	
	16:55	17:53	18:44	20:38		21:28		22:00	16
19	08:35	07:45	06:42	06:31		05:35		05:12	
	16:57	17:54	18:45	20:39		21:29		22:01	16
20	08:34	07:43	06:40	06:29		05:34		05:12	
	16:59	17:56	18:47	20:41		21:31		22:01	16
21	08:33	07:41	06:38	06:27		05:32		05:13	
	17:01	17:58	18:49	20:43		21:32		22:01	16
22	08:32	07:39	06:35	06:25		05:31		05:13	
	17:02	18:00	18:51	20:45		21:34		22:01	16
23	08:31	07:37	06:33	06:22		05:30		05:13	
	17:04	18:02	18:52	20:46		21:35		22:02	16
24	08:29	07:34	06:31	06:20		05:28		05:13	
	17:06	18:04	18:54	20:48		21:37		22:02	16
25	08:28	07:32	06:28	06:18		05:27		05:14	
	17:08	18:06	18:56	20:50		21:38		22:02	16
26	08:27	07:30	06:26	06:16		05:26		05:14	
	17:09	18:07	18:58	20:51		21:39		22:02	16
27	08:25	07:28	06:24	06:14	06:38 (2)	05:25		05:14	
	17:11	18:09	18:59	20:53	1 06:39 (2)	21:41		22:02	16
28	08:24	07:26	06:21	06:12	06:37 (2)	05:24		05:15	
	17:13	18:11	19:01	20:55	4 06:41 (2)	21:42	1	05:53 (3)	22:02
29	08:22		07:19	06:10	06:35 (2)	05:23		05:51 (3)	05:16
	17:15		20:03	20:57	6 06:41 (2)	21:43	2	05:53 (3)	22:01
30	08:21		07:17	06:08	06:33 (2)	05:22		05:51 (3)	05:16
	17:17		20:05	20:58	8 06:41 (2)	21:44	4	05:55 (3)	22:01
31	08:19		07:14			05:21		05:50 (3)	
	17:19		20:06			21:46	5	05:55 (3)	
Potential sun hours	257	277	367	417		487		501	
Total, worst case					132		148		413
Sun reduction					0.38		0.39		0.35
Oper. time red.					1.00		1.00		1.00
Wind dir. red.					0.60		0.60		0.60
Total reduction					0.23		0.24		0.21
Total, real					30		35		86

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
Jennings O'Donovan
Finisklin Business Park
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Kathlyn Feeney / kfeeney@jodireland.com
Calculated:
09/06/2025 13:54/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Worst Case - V150 **Shadow receptor:** CZ - 150

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	July		August		September		October	November	December
1	05:17		05:54		06:45		07:35	07:30	08:22
	22:01	14	21:28		20:25	12	19:15	17:07	16:26
2	05:17		05:56		06:47		07:37	07:31	08:23
	22:01	14	21:26	5	20:23	10	19:12	17:06	16:26
3	05:18		05:57		06:48		07:38	07:33	08:24
	22:00	13	21:25	11	20:20	8	19:10	17:04	16:25
4	05:19		05:59		06:50		07:40	07:35	08:26
	22:00	13	21:23	14	20:18	6	19:08	17:02	16:24
5	05:20		06:00		06:51		07:42	07:37	08:27
	21:59	12	21:21	16	20:16	4	19:05	17:00	16:24
6	05:21		06:02		06:53		07:43	07:39	08:28
	21:59	11	21:19	17	20:14	1	19:03	16:58	16:23
7	05:22		06:04		06:55		07:45	07:41	08:30
	21:58	11	21:18	16	20:11		19:01	16:57	16:23
8	05:23		06:05		06:56		07:47	07:42	08:31
	21:57	10	21:16	15	20:09		18:58	16:55	16:23
9	05:23		06:07		06:58		07:49	07:44	08:32
	21:57	9	21:14	14	20:07		18:56	16:53	16:22
10	05:25		06:08		07:00		07:50	07:46	08:33
	21:56	8	21:12	13	20:04		18:54	16:52	16:22
11	05:26		06:10		07:01		07:52	07:48	08:34
	21:55	7	21:10	11	20:02		18:52	16:50	16:22
12	05:27		06:12		07:03		07:54	07:50	08:35
	21:54	6	21:08	9	20:00		18:49	16:48	16:22
13	05:28		06:13		07:05		07:56	07:52	08:36
	21:53	4	21:06	7	19:57		18:47	16:47	16:22
14	05:29		06:15		07:06		07:57	07:53	08:37
	21:52	3	21:04	5	19:55		18:45	16:45	16:22
15	05:30		06:17		07:08		07:59	07:55	08:38
	21:51	2	21:02	3	19:52		18:43	16:44	16:22
16	05:31		06:18		07:10		08:01	07:57	08:39
	21:50		21:00	1	19:50		18:40	16:42	16:22
17	05:33		06:20		07:11		08:03	07:59	08:40
	21:49		20:58		19:48		18:38	16:41	16:22
18	05:34		06:22		07:13		08:04	08:00	08:41
	21:48		20:56		19:45		18:36	16:40	16:22
19	05:35		06:23		07:15		08:06	08:02	08:41
	21:47		20:54		19:43		18:34	16:38	16:23
20	05:37		06:25		07:16		08:08	08:04	08:42
	21:46		20:52		19:41		18:32	16:37	16:23
21	05:38		06:27		07:18		08:10	08:06	08:43
	21:45		20:49		19:38		18:30	16:36	16:23
22	05:39		06:28		07:20		08:11	08:07	08:43
	21:43		20:47		19:36		18:27	16:35	16:24
23	05:41		06:30		07:21		08:13	08:09	08:44
	21:42		20:45		19:33		18:25	16:34	16:24
24	05:42		06:32		07:23		08:15	08:11	08:44
	21:41		20:43		19:31		18:23	16:33	16:25
25	05:44		06:33		07:25		07:17	08:12	08:45
	21:39		20:41		19:29		17:21	16:31	16:26
26	05:45		06:35		07:13 (1)		07:19	08:14	08:45
	21:38		20:39	4	07:17 (1)		19:26	17:19	16:30	16:26
27	05:46		06:37		07:09 (1)		07:28	07:21	08:15	08:45
	21:36		20:36	11	07:20 (1)		19:24	17:17	16:30	16:27
28	05:48		06:38		07:07 (1)		07:30	07:22	08:17	08:45
	21:35		20:34	15	07:22 (1)		19:22	17:15	16:29	16:28
29	05:49		06:40		07:06 (1)		07:31	07:24	08:19	08:45
	21:33		20:32	16	07:22 (1)		19:19	17:13	16:28	16:29
30	05:51		06:42		07:08 (1)		07:33	07:26	08:20	08:46
	21:31		20:30	15	07:23 (1)		19:17	17:11	16:27	16:30
31	05:53		06:43		07:10 (1)			07:28		08:46
	21:30		20:27	14	07:24 (1)			17:09		16:30
Potential sun hours	504		455		381		331	265	241
Total, worst case		137		232		41			
Sun reduction		0.33		0.35		0.34			
Oper. time red.		1.00		1.00		1.00			
Wind dir. red.		0.60		0.60		0.59			
Total reduction		0.20		0.21		0.20			
Total, real		27		49		8			

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

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Kathlyn Feeney / kfeeney@jodireland.com
Calculated:
09/06/2025 13:54/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Worst Case - V150 **Shadow receptor:** DA - 170

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January	February	March	April		May		June	
1	08:46	08:18	07:24	07:12		06:06		06:31 (2)	05:20		05:49 (3)
	16:32	17:20	18:13	20:08		21:00	15	06:46 (2)	21:47	10	05:59 (3)
2	08:45	08:16	07:21	07:10		06:04		06:29 (2)	05:19		05:48 (3)
	16:33	17:22	18:15	20:10		21:02	16	06:45 (2)	21:48	11	05:59 (3)
3	08:45	08:15	07:19	07:07	07:30 (1)	06:02		06:27 (2)	05:18		05:48 (3)
	16:34	17:24	18:17	20:12	2 07:32 (1)	21:03	17	06:44 (2)	21:49	12	06:00 (3)
4	08:45	08:13	07:17	07:05	07:28 (1)	06:00		06:25 (2)	05:18		05:47 (3)
	16:35	17:26	18:19	20:13	4 07:32 (1)	21:05	18	06:43 (2)	21:50	13	06:00 (3)
5	08:45	08:11	07:15	07:03	07:26 (1)	05:58		06:25 (2)	05:17		05:46 (3)
	16:36	17:28	18:20	20:15	7 07:33 (1)	21:07	18	06:43 (2)	21:51	14	06:00 (3)
6	08:44	08:10	07:12	07:00	07:23 (1)	05:57		06:26 (2)	05:16		05:46 (3)
	16:38	17:30	18:22	20:17	9 07:32 (1)	21:08	15	06:41 (2)	21:52	15	06:01 (3)
7	08:44	08:08	07:10	06:58	07:21 (1)	05:55		06:27 (2)	05:16		05:45 (3)
	16:39	17:32	18:24	20:18	11 07:32 (1)	21:10	12	06:39 (2)	21:53	15	06:00 (3)
8	08:44	08:06	07:08	06:56	07:19 (1)	05:53		06:30 (2)	05:15		05:45 (3)
	16:40	17:34	18:26	20:20	13 07:32 (1)	21:12	8	06:38 (2)	21:54	16	06:01 (3)
9	08:43	08:04	07:06	06:53	07:17 (1)	05:51			05:14		05:45 (3)
	16:42	17:36	18:28	20:22	15 07:32 (1)	21:13			21:55	17	06:02 (3)
10	08:43	08:02	07:03	06:51	07:14 (1)	05:49			05:14		05:44 (3)
	16:43	17:37	18:29	20:24	16 07:30 (1)	21:15			21:56	17	06:01 (3)
11	08:42	08:01	07:01	06:49	07:12 (1)	05:48			05:14		05:44 (3)
	16:44	17:39	18:31	20:25	17 07:29 (1)	21:17			21:56	18	06:02 (3)
12	08:41	07:59	06:59	06:47	07:12 (1)	05:46			05:13		05:44 (3)
	16:46	17:41	18:33	20:27	16 07:28 (1)	21:18			21:57	18	06:02 (3)
13	08:41	07:57	06:56	06:44	07:14 (1)	05:44			05:13		05:43 (3)
	16:47	17:43	18:35	20:29	12 07:26 (1)	21:20			21:58	18	06:01 (3)
14	08:40	07:55	06:54	06:42	07:17 (1)	05:43			05:13		05:43 (3)
	16:49	17:45	18:36	20:31	4 07:21 (1)	21:22			21:58	19	06:02 (3)
15	08:39	07:53	06:52	06:40		05:41			05:13		05:43 (3)
	16:51	17:47	18:38	20:32		21:23			21:59	19	06:02 (3)
16	08:38	07:51	06:49	06:38		05:40			05:12		05:43 (3)
	16:52	17:49	18:40	20:34		21:25			21:59	19	06:02 (3)
17	08:37	07:49	06:47	06:35		05:38			05:12		05:43 (3)
	16:54	17:51	18:42	20:36		21:26			22:00	19	06:02 (3)
18	08:36	07:47	06:45	06:33		05:37			05:12		05:43 (3)
	16:55	17:53	18:44	20:38		21:28			22:00	20	06:03 (3)
19	08:35	07:45	06:42	06:31		05:35			05:12		05:43 (3)
	16:57	17:54	18:45	20:39		21:29			22:01	20	06:03 (3)
20	08:34	07:43	06:40	06:29		05:34			05:12		05:43 (3)
	16:59	17:56	18:47	20:41		21:31			22:01	20	06:03 (3)
21	08:33	07:41	06:38	06:27		05:32			05:13		05:44 (3)
	17:01	17:58	18:49	20:43		21:32			22:01	20	06:04 (3)
22	08:32	07:39	06:35	06:25		05:31			05:13		05:44 (3)
	17:02	18:00	18:51	20:45		21:34			22:01	20	06:04 (3)
23	08:31	07:37	06:33	06:22		05:30			05:13		05:44 (3)
	17:04	18:02	18:52	20:46		21:35			22:02	20	06:04 (3)
24	08:29	07:34	06:31	06:20	06:44 (2)	05:28			05:13		05:44 (3)
	17:06	18:04	18:54	20:48	1 06:45 (2)	21:37			22:02	20	06:04 (3)
25	08:28	07:32	06:28	06:18	06:42 (2)	05:27		05:55 (3)	05:14		05:45 (3)
	17:08	18:06	18:56	20:50	3 06:45 (2)	21:38	1	05:56 (3)	22:02	19	06:04 (3)
26	08:27	07:30	06:26	06:16	06:40 (2)	05:26		05:54 (3)	05:14		05:45 (3)
	17:09	18:07	18:58	20:51	6 06:46 (2)	21:39	2	05:56 (3)	22:02	19	06:04 (3)
27	08:25	07:28	06:24	06:14	06:38 (2)	05:25		05:53 (3)	05:14		05:46 (3)
	17:11	18:09	18:59	20:53	8 06:46 (2)	21:41	4	05:57 (3)	22:02	19	06:05 (3)
28	08:24	07:26	06:21	06:12	06:37 (2)	05:24		05:52 (3)	05:15		05:46 (3)
	17:13	18:11	19:01	20:55	10 06:47 (2)	21:42	5	05:57 (3)	22:02	19	06:05 (3)
29	08:22		07:19	06:10	06:35 (2)	05:23		05:51 (3)	05:16		05:47 (3)
	17:15		20:03	20:57	12 06:47 (2)	21:43	7	05:58 (3)	22:01	18	06:05 (3)
30	08:21		07:17	06:08	06:33 (2)	05:22		05:51 (3)	05:16		05:47 (3)
	17:17		20:05	20:58	13 06:46 (2)	21:44	8	05:59 (3)	22:01	18	06:05 (3)
31	08:19		07:14			05:21		05:50 (3)			
	17:19		20:06			21:46	9	05:59 (3)			
Potential sun hours	257	277	367	417		487			501		
Total, worst case					179		155			522	
Sun reduction					0.38		0.39			0.35	
Oper. time red.					1.00		1.00			1.00	
Wind dir. red.					0.60		0.60			0.60	
Total reduction					0.23		0.24			0.21	
Total, real					41		37			108	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
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Kathlyn Feeney / kfeeney@jodireland.com

Calculated:
09/06/2025 13:54/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Worst Case - V150 **Shadow receptor:** DA - 170

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	July		August			September		October	November	December
1	05:17		05:48 (3)	05:54		06:45		07:11 (1)	07:35	07:30	08:22
	22:01	18	06:06 (3)	21:28		20:25	17	07:28 (1)	19:15	17:07	16:26
2	05:17		05:49 (3)	05:56		06:47		07:13 (1)	07:37	07:31	08:23
	22:01	17	06:06 (3)	21:26		20:23	16	07:29 (1)	19:12	17:06	16:26
3	05:18		05:49 (3)	05:57		06:48		07:14 (1)	07:38	07:33	08:24
	22:00	17	06:06 (3)	21:25		20:20	15	07:29 (1)	19:10	17:04	16:25
4	05:19		05:50 (3)	05:59		06:50		07:16 (1)	07:40	07:35	08:26
	22:00	16	06:06 (3)	21:23		20:18	13	07:29 (1)	19:08	17:02	16:24
5	05:20		05:51 (3)	06:00	06:39 (2)	06:51		07:18 (1)	07:42	07:37	08:27
	21:59	16	06:07 (3)	21:21	9 06:48 (2)	20:16	11	07:29 (1)	19:05	17:00	16:24
6	05:21		05:52 (3)	06:02	06:37 (2)	06:53		07:19 (1)	07:43	07:39	08:28
	21:59	15	06:07 (3)	21:19	13 06:50 (2)	20:14	9	07:28 (1)	19:03	16:58	16:23
7	05:22		05:53 (3)	06:04	06:35 (2)	06:55		07:21 (1)	07:45	07:41	08:30
	21:58	14	06:07 (3)	21:18	16 06:51 (2)	20:11	7	07:28 (1)	19:01	16:57	16:23
8	05:23		05:54 (3)	06:05	06:35 (2)	06:56		07:22 (1)	07:47	07:42	08:31
	21:57	13	06:07 (3)	21:16	18 06:53 (2)	20:09	5	07:27 (1)	18:58	16:55	16:23
9	05:23		05:54 (3)	06:07	06:35 (2)	06:58		07:24 (1)	07:49	07:44	08:32
	21:57	13	06:07 (3)	21:14	18 06:53 (2)	20:07	2	07:26 (1)	18:56	16:53	16:22
10	05:25		05:55 (3)	06:08	06:37 (2)	07:00			07:50	07:46	08:33
	21:56	12	06:07 (3)	21:12	17 06:54 (2)	20:04			18:54	16:52	16:22
11	05:26		05:56 (3)	06:10	06:38 (2)	07:01			07:52	07:48	08:34
	21:55	11	06:07 (3)	21:10	16 06:54 (2)	20:02			18:52	16:50	16:22
12	05:27		05:57 (3)	06:12	06:40 (2)	07:03			07:54	07:50	08:35
	21:54	10	06:07 (3)	21:08	14 06:54 (2)	19:59			18:49	16:48	16:22
13	05:28		05:59 (3)	06:13	06:41 (2)	07:05			07:56	07:52	08:36
	21:53	9	06:08 (3)	21:06	13 06:54 (2)	19:57			18:47	16:47	16:22
14	05:29		06:00 (3)	06:15	06:43 (2)	07:06			07:57	07:53	08:37
	21:52	7	06:07 (3)	21:04	11 06:54 (2)	19:55			18:45	16:45	16:22
15	05:30		06:01 (3)	06:17	06:44 (2)	07:08			07:59	07:55	08:38
	21:51	6	06:07 (3)	21:02	9 06:53 (2)	19:52			18:43	16:44	16:22
16	05:31		06:02 (3)	06:18	06:46 (2)	07:10			08:01	07:57	08:39
	21:50	5	06:07 (3)	21:00	7 06:53 (2)	19:50			18:40	16:42	16:22
17	05:33		06:03 (3)	06:20	06:48 (2)	07:11			08:03	07:59	08:40
	21:49	3	06:06 (3)	20:58	5 06:53 (2)	19:48			18:38	16:41	16:22
18	05:34		06:04 (3)	06:22	06:49 (2)	07:13			08:04	08:00	08:41
	21:48	2	06:06 (3)	20:56	3 06:52 (2)	19:45			18:36	16:40	16:22
19	05:35			06:23		07:15			08:06	08:02	08:41
	21:47			20:54		19:43			18:34	16:38	16:23
20	05:37			06:25		07:16			08:08	08:04	08:42
	21:46			20:52		19:41			18:32	16:37	16:23
21	05:38			06:27		07:18			08:10	08:06	08:43
	21:45			20:49		19:38			18:30	16:36	16:23
22	05:39			06:28		07:20			08:11	08:07	08:43
	21:43			20:47		19:36			18:27	16:35	16:24
23	05:41			06:30		07:21			08:13	08:09	08:44
	21:42			20:45		19:33			18:25	16:34	16:24
24	05:42			06:32		07:23			08:15	08:11	08:44
	21:41			20:43		19:31			18:23	16:33	16:25
25	05:43			06:33		07:25			07:17	08:12	08:45
	21:39			20:41		19:29			17:21	16:31	16:26
26	05:45			06:35		07:26			07:19	08:14	08:45
	21:38			20:39		19:26			17:19	16:30	16:26
27	05:46			06:37		07:28			07:21	08:15	08:45
	21:36			20:36		19:24			17:17	16:30	16:27
28	05:48			06:38		07:30			07:22	08:17	08:45
	21:35			20:34		19:22			17:15	16:29	16:28
29	05:49			06:40	07:17 (1)	07:31			07:24	08:19	08:45
	21:33			20:32	5 07:22 (1)	19:19			17:13	16:28	16:29
30	05:51			06:42	07:14 (1)	07:33			07:26	08:20	08:46
	21:31			20:30	12 07:26 (1)	19:17			17:11	16:27	16:30
31	05:53			06:43	07:12 (1)				07:28		08:46
	21:30			20:27	16 07:28 (1)				17:09		16:30
Potential sun hours	504			455		381			331	265	241
Total, worst case		204			202		95				
Sun reduction		0.33			0.35		0.34				
Oper. time red.		1.00			1.00		1.00				
Wind dir. red.		0.60			0.60		0.60				
Total reduction		0.20			0.21		0.20				
Total, real		40			43		19				

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

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SHADOW - Calendar

Calculation: 6839 Garrane WF Worst Case - V150 **Shadow receptor:** DB - 171

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January	February	March	April		May		June	
1	08:46	08:18	07:24	07:12		06:06	06:31 (2)	05:20	05:49 (3)
	16:32	17:20	18:13	20:08		21:00 14	06:45 (2)	21:47 6	05:55 (3)
2	08:45	08:16	07:21	07:10		06:04	06:29 (2)	05:19	05:48 (3)
	16:33	17:22	18:15	20:10		21:02 16	06:45 (2)	21:48 7	05:55 (3)
3	08:45	08:15	07:19	07:07	07:30 (1)	06:02	06:27 (2)	05:18	05:48 (3)
	16:34	17:24	18:17	20:12 2	07:32 (1)	21:03 17	06:44 (2)	21:49 9	05:57 (3)
4	08:45	08:13	07:17	07:05	07:28 (1)	06:00	06:25 (2)	05:18	05:47 (3)
	16:35	17:26	18:19	20:13 5	07:33 (1)	21:05 18	06:43 (2)	21:50 10	05:57 (3)
5	08:45	08:11	07:15	07:03	07:26 (1)	05:58	06:24 (2)	05:17	05:46 (3)
	16:36	17:28	18:20	20:15 7	07:33 (1)	21:07 19	06:43 (2)	21:51 10	05:56 (3)
6	08:44	08:10	07:12	07:00	07:23 (1)	05:57	06:23 (2)	05:16	05:46 (3)
	16:38	17:30	18:22	20:17 10	07:33 (1)	21:08 19	06:42 (2)	21:52 11	05:57 (3)
7	08:44	08:08	07:10	06:58	07:21 (1)	05:55	06:24 (2)	05:16	05:45 (3)
	16:39	17:32	18:24	20:18 12	07:33 (1)	21:10 17	06:41 (2)	21:53 12	05:57 (3)
8	08:44	08:06	07:08	06:56	07:19 (1)	05:53	06:26 (2)	05:15	05:45 (3)
	16:40	17:34	18:26	20:20 14	07:33 (1)	21:12 14	06:40 (2)	21:54 13	05:58 (3)
9	08:43	08:04	07:06	06:53	07:17 (1)	05:51	06:27 (2)	05:14	05:45 (3)
	16:42	17:36	18:28	20:22 15	07:32 (1)	21:13 11	06:38 (2)	21:55 13	05:58 (3)
10	08:43	08:02	07:03	06:51	07:14 (1)	05:49	06:30 (2)	05:14	05:44 (3)
	16:43	17:37	18:29	20:24 17	07:31 (1)	21:15 3	06:33 (2)	21:56 14	05:58 (3)
11	08:42	08:01	07:01	06:49	07:12 (1)	05:48		05:14	05:44 (3)
	16:44	17:39	18:31	20:25 18	07:30 (1)	21:17		21:56 15	05:59 (3)
12	08:41	07:59	06:59	06:47	07:12 (1)	05:46		05:13	05:44 (3)
	16:46	17:41	18:33	20:27 17	07:29 (1)	21:18		21:57 15	05:59 (3)
13	08:41	07:57	06:56	06:44	07:13 (1)	05:44		05:13	05:43 (3)
	16:47	17:43	18:35	20:29 14	07:27 (1)	21:20		21:58 15	05:58 (3)
14	08:40	07:55	06:54	06:42	07:15 (1)	05:43		05:13	05:43 (3)
	16:49	17:45	18:36	20:31 8	07:23 (1)	21:22		21:58 16	05:59 (3)
15	08:39	07:53	06:52	06:40		05:41		05:13	05:43 (3)
	16:51	17:47	18:38	20:32		21:23		21:59 16	05:59 (3)
16	08:38	07:51	06:49	06:38		05:40		05:12	05:43 (3)
	16:52	17:49	18:40	20:34		21:25		21:59 16	05:59 (3)
17	08:37	07:49	06:47	06:35		05:38		05:12	05:43 (3)
	16:54	17:51	18:42	20:36		21:26		22:00 17	06:00 (3)
18	08:36	07:47	06:45	06:33		05:37		05:12	05:43 (3)
	16:55	17:53	18:44	20:38		21:28		22:00 17	06:00 (3)
19	08:35	07:45	06:42	06:31		05:35		05:12	05:43 (3)
	16:57	17:54	18:45	20:39		21:29		22:01 17	06:00 (3)
20	08:34	07:43	06:40	06:29		05:34		05:12	05:43 (3)
	16:59	17:56	18:47	20:41		21:31		22:01 17	06:00 (3)
21	08:33	07:41	06:38	06:27		05:32		05:13	05:44 (3)
	17:01	17:58	18:49	20:43		21:32		22:01 17	06:01 (3)
22	08:32	07:39	06:35	06:25		05:31		05:13	05:44 (3)
	17:02	18:00	18:51	20:45		21:34		22:01 17	06:01 (3)
23	08:31	07:37	06:33	06:22		05:30		05:13	05:44 (3)
	17:04	18:02	18:52	20:46		21:35		22:02 17	06:01 (3)
24	08:29	07:34	06:31	06:20		05:28		05:13	05:44 (3)
	17:06	18:04	18:54	20:48		21:37		22:02 17	06:01 (3)
25	08:28	07:32	06:28	06:18	06:42 (2)	05:27		05:14	05:45 (3)
	17:08	18:06	18:56	20:50 2	06:44 (2)	21:38		22:02 17	06:02 (3)
26	08:27	07:30	06:26	06:16	06:40 (2)	05:26		05:14	05:45 (3)
	17:09	18:07	18:58	20:51 4	06:44 (2)	21:39		22:02 17	06:02 (3)
27	08:25	07:28	06:24	06:14	06:38 (2)	05:25		05:14	05:46 (3)
	17:11	18:09	18:59	20:53 7	06:45 (2)	21:41		22:02 16	06:02 (3)
28	08:24	07:26	06:21	06:12	06:37 (2)	05:24	05:52 (3)	05:15	05:46 (3)
	17:13	18:11	19:01	20:55 9	06:46 (2)	21:42 1	05:53 (3)	22:02 16	06:02 (3)
29	08:22		07:19	06:10	06:35 (2)	05:23	05:51 (3)	05:16	05:47 (3)
	17:15		20:03	20:57 11	06:46 (2)	21:43 2	05:53 (3)	22:01 16	06:03 (3)
30	08:21		07:17	06:08	06:33 (2)	05:22	05:51 (3)	05:16	05:47 (3)
	17:17		20:05	20:58 13	06:46 (2)	21:44 4	05:55 (3)	22:01 15	06:02 (3)
31	08:19		07:14			05:21	05:50 (3)		
	17:19		20:06			21:46 5	05:55 (3)		
Potential sun hours	257	277	367	417		487		501	
Total, worst case				185		160		431	
Sun reduction				0.38		0.39		0.35	
Oper. time red.				1.00		1.00		1.00	
Wind dir. red.				0.60		0.60		0.60	
Total reduction				0.23		0.24		0.21	
Total, real				42		38		90	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
Jennings O'Donovan
Finisklin Business Park
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Kathlyn Feeney / kfeeney@jodireland.com
Calculated:
09/06/2025 13:54/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Worst Case - V150 **Shadow receptor:** DB - 171

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	July		August		September		October	November	December
1	05:17		05:48 (3)	05:54		06:45	07:11 (1)	07:35	07:30	08:22
	22:01	15	06:03 (3)	21:28		20:25	18	07:29 (1)	19:15	17:07	16:26
2	05:17		05:49 (3)	05:56		06:47	07:13 (1)	07:37	07:31	08:23
	22:01	14	06:03 (3)	21:26		20:23	17	07:30 (1)	19:12	17:06	16:26
3	05:18		05:49 (3)	05:57	06:39 (2)	06:48	07:14 (1)	07:38	07:33	08:24
	22:00	14	06:03 (3)	21:25	7	06:46 (2)	20:20	15	07:29 (1)	19:10	17:04	16:25
4	05:19		05:50 (3)	05:59	06:37 (2)	06:50	07:16 (1)	07:40	07:35	08:26
	22:00	13	06:03 (3)	21:23	12	06:49 (2)	20:18	14	07:30 (1)	19:08	17:02	16:24
5	05:20		05:51 (3)	06:00	06:35 (2)	06:51	07:18 (1)	07:42	07:37	08:27
	21:59	12	06:03 (3)	21:21	15	06:50 (2)	20:16	12	07:30 (1)	19:05	17:00	16:24
6	05:21		05:52 (3)	06:02	06:34 (2)	06:53	07:19 (1)	07:43	07:39	08:28
	21:59	12	06:04 (3)	21:19	17	06:51 (2)	20:14	10	07:29 (1)	19:03	16:58	16:23
7	05:22		05:53 (3)	06:04	06:32 (2)	06:55	07:21 (1)	07:45	07:41	08:30
	21:58	11	06:04 (3)	21:18	20	06:52 (2)	20:11	7	07:28 (1)	19:01	16:57	16:23
8	05:22		05:54 (3)	06:05	06:34 (2)	06:56	07:22 (1)	07:47	07:42	08:31
	21:57	10	06:04 (3)	21:16	19	06:53 (2)	20:09	5	07:27 (1)	18:58	16:55	16:23
9	05:23		05:54 (3)	06:07	06:35 (2)	06:58	07:24 (1)	07:49	07:44	08:32
	21:57	9	06:03 (3)	21:14	18	06:53 (2)	20:07	2	07:26 (1)	18:56	16:53	16:22
10	05:25		05:55 (3)	06:08	06:37 (2)	07:00		07:50	07:46	08:33
	21:56	8	06:03 (3)	21:12	17	06:54 (2)	20:04		18:54	16:52	16:22
11	05:26		05:56 (3)	06:10	06:38 (2)	07:01		07:52	07:48	08:34
	21:55	7	06:03 (3)	21:10	15	06:53 (2)	20:02		18:52	16:50	16:22
12	05:27		05:57 (3)	06:12	06:40 (2)	07:03		07:54	07:50	08:35
	21:54	6	06:03 (3)	21:08	14	06:54 (2)	19:59		18:49	16:48	16:22
13	05:28		05:59 (3)	06:13	06:41 (2)	07:05		07:55	07:52	08:36
	21:53	4	06:03 (3)	21:06	12	06:53 (2)	19:57		18:47	16:47	16:22
14	05:29		06:00 (3)	06:15	06:43 (2)	07:06		07:57	07:53	08:37
	21:52	3	06:03 (3)	21:04	10	06:53 (2)	19:55		18:45	16:45	16:22
15	05:30		06:01 (3)	06:17	06:44 (2)	07:08		07:59	07:55	08:38
	21:51	2	06:03 (3)	21:02	8	06:52 (2)	19:52		18:43	16:44	16:22
16	05:31			06:18	06:46 (2)	07:10		08:01	07:57	08:39
	21:50			21:00	6	06:52 (2)	19:50		18:40	16:42	16:22
17	05:33			06:20	06:48 (2)	07:11		08:03	07:59	08:40
	21:49			20:58	4	06:52 (2)	19:48		18:38	16:41	16:22
18	05:34			06:22	06:49 (2)	07:13		08:04	08:00	08:41
	21:48			20:56	1	06:50 (2)	19:45		18:36	16:40	16:22
19	05:35			06:23		07:15		08:06	08:02	08:41
	21:47			20:54			19:43		18:34	16:38	16:23
20	05:37			06:25		07:16		08:08	08:04	08:42
	21:46			20:52			19:41		18:32	16:37	16:23
21	05:38			06:27		07:18		08:10	08:06	08:43
	21:45			20:49			19:38		18:30	16:36	16:23
22	05:39			06:28		07:20		08:11	08:07	08:43
	21:43			20:47			19:36		18:27	16:35	16:24
23	05:41			06:30		07:21		08:13	08:09	08:44
	21:42			20:45			19:33		18:25	16:34	16:24
24	05:42			06:32		07:23		08:15	08:11	08:44
	21:41			20:43			19:31		18:23	16:32	16:25
25	05:43			06:33		07:25		07:17	08:12	08:45
	21:39			20:41			19:29		17:21	16:31	16:26
26	05:45			06:35		07:26		07:19	08:14	08:45
	21:38			20:39			19:26		17:19	16:30	16:26
27	05:46			06:37		07:28		07:21	08:15	08:45
	21:36			20:36			19:24		17:17	16:30	16:27
28	05:48			06:38		07:30		07:22	08:17	08:45
	21:35			20:34			19:22		17:15	16:29	16:28
29	05:49			06:40	07:15 (1)	07:31		07:24	08:19	08:45
	21:33			20:32	9	07:24 (1)	19:19		17:13	16:28	16:29
30	05:51			06:42	07:13 (1)	07:33		07:26	08:20	08:46
	21:31			20:30	14	07:27 (1)	19:17		17:11	16:27	16:30
31	05:53			06:43	07:12 (1)			07:28		08:46
	21:30			20:27	16	07:28 (1)			17:09		16:30
Potential sun hours	504			455		381			331	265	241
Total, worst case		140			234		100				
Sun reduction		0.33			0.35		0.34				
Oper. time red.		1.00			1.00		1.00				
Wind dir. red.		0.60			0.60		0.60				
Total reduction		0.20			0.21		0.20				
Total, real		28			50		20				

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

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Kathlyn Feeney / kfeeney@jodireland.com

SHADOW - Calendar

Calculation: 6839 Garrane WF Worst Case - V150 **Shadow receptor:** DC - 172

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January	February	March	April		May		June	
1	08:46	08:18	07:24	07:12		06:06	06:31 (2)	05:20	05:49 (3)
	16:32	17:20	18:13	20:08		21:00 14	06:45 (2)	21:47 3	05:52 (3)
2	08:45	08:16	07:21	07:10		06:04	06:29 (2)	05:19	05:48 (3)
	16:33	17:22	18:15	20:10		21:02 16	06:45 (2)	21:48 4	05:52 (3)
3	08:45	08:15	07:19	07:07	07:30 (1)	06:02	06:27 (2)	05:18	05:48 (3)
	16:34	17:24	18:17	20:12 3	07:33 (1)	21:03 17	06:44 (2)	21:49 5	05:53 (3)
4	08:45	08:13	07:17	07:05	07:28 (1)	06:00	06:25 (2)	05:17	05:47 (3)
	16:35	17:26	18:18	20:13 6	07:34 (1)	21:05 19	06:44 (2)	21:50 6	05:53 (3)
5	08:45	08:11	07:15	07:03	07:26 (1)	05:58	06:24 (2)	05:17	05:46 (3)
	16:36	17:28	18:20	20:15 9	07:35 (1)	21:07 20	06:44 (2)	21:51 7	05:53 (3)
6	08:44	08:10	07:12	07:00	07:23 (1)	05:57	06:22 (2)	05:16	05:46 (3)
	16:38	17:30	18:22	20:17 11	07:34 (1)	21:08 21	06:43 (2)	21:52 8	05:54 (3)
7	08:44	08:08	07:10	06:58	07:21 (1)	05:55	06:22 (2)	05:16	05:45 (3)
	16:39	17:32	18:24	20:18 13	07:34 (1)	21:10 20	06:42 (2)	21:53 9	05:54 (3)
8	08:44	08:06	07:08	06:56	07:19 (1)	05:53	06:23 (2)	05:15	05:45 (3)
	16:40	17:34	18:26	20:20 15	07:34 (1)	21:12 18	06:41 (2)	21:54 10	05:55 (3)
9	08:43	08:04	07:06	06:53	07:16 (1)	05:51	06:24 (2)	05:14	05:45 (3)
	16:42	17:36	18:28	20:22 17	07:33 (1)	21:13 15	06:39 (2)	21:55 11	05:56 (3)
10	08:43	08:02	07:03	06:51	07:14 (1)	05:49	06:25 (2)	05:14	05:44 (3)
	16:43	17:37	18:29	20:24 18	07:32 (1)	21:15 12	06:37 (2)	21:56 11	05:55 (3)
11	08:42	08:01	07:01	06:49	07:12 (1)	05:48	06:28 (2)	05:14	05:44 (3)
	16:44	17:39	18:31	20:25 19	07:31 (1)	21:17 7	06:35 (2)	21:56 12	05:56 (3)
12	08:41	07:59	06:59	06:47	07:12 (1)	05:46		05:13	05:44 (3)
	16:46	17:41	18:33	20:27 18	07:30 (1)	21:18		21:57 12	05:56 (3)
13	08:41	07:57	06:56	06:44	07:14 (1)	05:44		05:13	05:43 (3)
	16:47	17:43	18:35	20:29 14	07:28 (1)	21:20		21:58 13	05:56 (3)
14	08:40	07:55	06:54	06:42	07:15 (1)	05:43		05:13	05:43 (3)
	16:49	17:45	18:36	20:31 10	07:25 (1)	21:22		21:58 13	05:56 (3)
15	08:39	07:53	06:52	06:40		05:41		05:13	05:43 (3)
	16:51	17:47	18:38	20:32		21:23		21:59 14	05:57 (3)
16	08:38	07:51	06:49	06:38		05:40		05:12	05:43 (3)
	16:52	17:49	18:40	20:34		21:25		21:59 14	05:57 (3)
17	08:37	07:49	06:47	06:35		05:38		05:12	05:43 (3)
	16:54	17:51	18:42	20:36		21:26		22:00 14	05:57 (3)
18	08:36	07:47	06:45	06:33		05:37		05:12	05:43 (3)
	16:55	17:53	18:44	20:38		21:28		22:00 14	05:57 (3)
19	08:35	07:45	06:42	06:31		05:35		05:12	05:43 (3)
	16:57	17:54	18:45	20:39		21:29		22:01 15	05:58 (3)
20	08:34	07:43	06:40	06:29		05:34		05:12	05:43 (3)
	16:59	17:56	18:47	20:41		21:31		22:01 15	05:58 (3)
21	08:33	07:41	06:38	06:27		05:32		05:13	05:44 (3)
	17:01	17:58	18:49	20:43		21:32		22:01 15	05:59 (3)
22	08:32	07:39	06:35	06:25		05:31		05:13	05:44 (3)
	17:02	18:00	18:51	20:45		21:34		22:01 15	05:59 (3)
23	08:31	07:37	06:33	06:22		05:30		05:13	05:44 (3)
	17:04	18:02	18:52	20:46		21:35		22:02 15	05:59 (3)
24	08:29	07:34	06:31	06:20		05:28		05:13	05:44 (3)
	17:06	18:04	18:54	20:48		21:37		22:02 14	05:58 (3)
25	08:28	07:32	06:28	06:18	06:42 (2)	05:27		05:14	05:45 (3)
	17:08	18:06	18:56	20:50 1	06:43 (2)	21:38		22:02 14	05:59 (3)
26	08:27	07:30	06:26	06:16	06:40 (2)	05:26		05:14	05:45 (3)
	17:09	18:07	18:58	20:51 4	06:44 (2)	21:39		22:02 14	05:59 (3)
27	08:25	07:28	06:24	06:14	06:38 (2)	05:25		05:14	05:46 (3)
	17:11	18:09	18:59	20:53 6	06:44 (2)	21:41		22:02 14	06:00 (3)
28	08:24	07:26	06:21	06:12	06:37 (2)	05:24		05:15	05:46 (3)
	17:13	18:11	19:01	20:55 8	06:45 (2)	21:42		22:02 13	05:59 (3)
29	08:22		07:19	06:10	06:35 (2)	05:23		05:16	05:47 (3)
	17:15		20:03	20:57 11	06:46 (2)	21:43		22:01 13	06:00 (3)
30	08:21		07:17	06:08	06:33 (2)	05:22		05:16	05:47 (3)
	17:17		20:05	20:58 12	06:45 (2)	21:44		22:01 13	06:00 (3)
31	08:19		07:14			05:21	05:50 (3)		
	17:19		20:06			21:46 1	05:51 (3)		
Potential sun hours	257	277	367	417		487		501	
Total, worst case				195		180		350	
Sun reduction				0.38		0.39		0.35	
Oper. time red.				1.00		1.00		1.00	
Wind dir. red.				0.60		0.60		0.60	
Total reduction				0.23		0.24		0.21	
Total, real				45		43		73	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
Jennings O'Donovan
Finisklin Business Park
F91 RHH9 Sligo
+353719161416
Kathlyn Feeney / kfeeney@jodireland.com
Calculated:
09/06/2025 13:54/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Worst Case - V150 **Shadow receptor:** DC - 172

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	July			August			September			October	November	December
1	05:17		05:48 (3)	05:54			06:45		07:11 (1)	07:35	07:30	08:22
	22:01	12	06:00 (3)	21:28			20:25	19	07:30 (1)	19:15	17:07	16:26
2	05:17		05:49 (3)	05:56		06:37 (2)	06:46		07:13 (1)	07:37	07:31	08:23
	22:00	11	06:00 (3)	21:26	10	06:47 (2)	20:23	18	07:31 (1)	19:12	17:06	16:26
3	05:18		05:49 (3)	05:57		06:35 (2)	06:48		07:14 (1)	07:38	07:33	08:24
	22:00	11	06:00 (3)	21:25	14	06:49 (2)	20:20	17	07:31 (1)	19:10	17:04	16:25
4	05:19		05:50 (3)	05:59		06:34 (2)	06:50		07:16 (1)	07:40	07:35	08:26
	22:00	10	06:00 (3)	21:23	16	06:50 (2)	20:18	15	07:31 (1)	19:08	17:02	16:24
5	05:20		05:51 (3)	06:00		06:32 (2)	06:51		07:18 (1)	07:42	07:37	08:27
	21:59	9	06:00 (3)	21:21	19	06:51 (2)	20:16	13	07:31 (1)	19:05	17:00	16:24
6	05:21		05:52 (3)	06:02		06:32 (2)	06:53		07:19 (1)	07:43	07:39	08:28
	21:59	9	06:01 (3)	21:19	20	06:52 (2)	20:14	11	07:30 (1)	19:03	16:58	16:23
7	05:22		05:53 (3)	06:04		06:32 (2)	06:55		07:21 (1)	07:45	07:41	08:30
	21:58	8	06:01 (3)	21:18	20	06:52 (2)	20:11	9	07:30 (1)	19:01	16:57	16:23
8	05:22		05:54 (3)	06:05		06:34 (2)	06:56		07:22 (1)	07:47	07:42	08:31
	21:57	7	06:01 (3)	21:16	19	06:53 (2)	20:09	6	07:28 (1)	18:58	16:55	16:23
9	05:23		05:54 (3)	06:07		06:35 (2)	06:58		07:24 (1)	07:49	07:44	08:32
	21:57	6	06:00 (3)	21:14	18	06:53 (2)	20:07	4	07:28 (1)	18:56	16:53	16:22
10	05:24		05:55 (3)	06:08		06:37 (2)	07:00		07:25 (1)	07:50	07:46	08:33
	21:56	4	05:59 (3)	21:12	17	06:54 (2)	20:04	1	07:26 (1)	18:54	16:52	16:22
11	05:26		05:56 (3)	06:10		06:38 (2)	07:01			07:52	07:48	08:34
	21:55	3	05:59 (3)	21:10	15	06:53 (2)	20:02			18:52	16:50	16:22
12	05:27		05:57 (3)	06:12		06:40 (2)	07:03			07:54	07:50	08:35
	21:54	2	05:59 (3)	21:08	14	06:54 (2)	19:59			18:49	16:48	16:22
13	05:28		05:59 (3)	06:13		06:41 (2)	07:05			07:55	07:52	08:36
	21:53	1	06:00 (3)	21:06	12	06:53 (2)	19:57			18:47	16:47	16:22
14	05:29			06:15		06:43 (2)	07:06			07:57	07:53	08:37
	21:52			21:04	10	06:53 (2)	19:55			18:45	16:45	16:22
15	05:30			06:17		06:44 (2)	07:08			07:59	07:55	08:38
	21:51			21:02	8	06:52 (2)	19:52			18:43	16:44	16:22
16	05:31			06:18		06:46 (2)	07:10			08:01	07:57	08:39
	21:50			21:00	6	06:52 (2)	19:50			18:40	16:42	16:22
17	05:33			06:20		06:48 (2)	07:11			08:03	07:59	08:40
	21:49			20:58	3	06:51 (2)	19:48			18:38	16:41	16:22
18	05:34			06:22			07:13			08:04	08:00	08:41
	21:48			20:56			19:45			18:36	16:40	16:22
19	05:35			06:23			07:15			08:06	08:02	08:41
	21:47			20:54			19:43			18:34	16:38	16:23
20	05:36			06:25			07:16			08:08	08:04	08:42
	21:46			20:52			19:41			18:32	16:37	16:23
21	05:38			06:27			07:18			08:10	08:06	08:43
	21:45			20:49			19:38			18:30	16:36	16:23
22	05:39			06:28			07:20			08:11	08:07	08:43
	21:43			20:47			19:36			18:27	16:35	16:24
23	05:41			06:30			07:21			08:13	08:09	08:44
	21:42			20:45			19:33			18:25	16:34	16:24
24	05:42			06:32			07:23			08:15	08:11	08:44
	21:40			20:43			19:31			18:23	16:32	16:25
25	05:43			06:33			07:25			07:17	08:12	08:45
	21:39			20:41			19:29			17:21	16:31	16:26
26	05:45			06:35			07:26			07:19	08:14	08:45
	21:38			20:39			19:26			17:19	16:30	16:26
27	05:46			06:37			07:28			07:21	08:15	08:45
	21:36			20:36			19:24			17:17	16:30	16:27
28	05:48			06:38			07:30			07:22	08:17	08:45
	21:35			20:34			19:22			17:15	16:29	16:28
29	05:49			06:40		07:15 (1)	07:31			07:24	08:19	08:45
	21:33			20:32	11	07:26 (1)	19:19			17:13	16:28	16:29
30	05:51			06:42		07:13 (1)	07:33			07:26	08:20	08:46
	21:31			20:30	15	07:28 (1)	19:17			17:11	16:27	16:30
31	05:52			06:43		07:12 (1)				07:28		08:46
	21:30			20:27	18	07:30 (1)				17:09		16:30
Potential sun hours	504			455			381			331	265	241
Total, worst case		93			265			113				
Sun reduction		0.33			0.35			0.34				
Oper. time red.		1.00			1.00			1.00				
Wind dir. red.		0.60			0.60			0.60				
Total reduction		0.20			0.21			0.20				
Total, real		19			57			23				

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
Jennings O'Donovan
Finisklin Business Park
F91 RHH9 Sligo
+353719161416
Kathlyn Feeney / kfeeney@jodireland.com

Calculated:
09/06/2025 13:54/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Worst Case - V150 **Shadow receptor:** DD - 173

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January	February	March	April		May		June	
1	08:46	08:18	07:24	07:12		06:06	06:31 (2)	05:20	
	16:32	17:20	18:13	20:08		21:00	14 06:45 (2)	21:47	
2	08:45	08:16	07:21	07:10	07:32 (1)	06:04	06:29 (2)	05:19	05:48 (3)
	16:33	17:22	18:15	20:10	1 07:33 (1)	21:02	16 06:45 (2)	21:48	1 05:49 (3)
3	08:45	08:15	07:19	07:07	07:30 (1)	06:02	06:27 (2)	05:18	05:48 (3)
	16:34	17:24	18:17	20:12	4 07:34 (1)	21:03	17 06:44 (2)	21:49	2 05:50 (3)
4	08:45	08:13	07:17	07:05	07:28 (1)	06:00	06:25 (2)	05:17	05:47 (3)
	16:35	17:26	18:18	20:13	7 07:35 (1)	21:05	19 06:44 (2)	21:50	4 05:51 (3)
5	08:45	08:11	07:15	07:03	07:26 (1)	05:58	06:24 (2)	05:17	05:46 (3)
	16:36	17:28	18:20	20:15	10 07:36 (1)	21:07	20 06:44 (2)	21:51	5 05:51 (3)
6	08:44	08:10	07:12	07:00	07:23 (1)	05:57	06:22 (2)	05:16	05:46 (3)
	16:38	17:30	18:22	20:17	12 07:35 (1)	21:08	21 06:43 (2)	21:52	6 05:52 (3)
7	08:44	08:08	07:10	06:58	07:21 (1)	05:55	06:20 (2)	05:16	05:45 (3)
	16:39	17:32	18:24	20:18	14 07:35 (1)	21:10	22 06:42 (2)	21:53	7 05:52 (3)
8	08:44	08:06	07:08	06:56	07:19 (1)	05:53	06:22 (2)	05:15	05:45 (3)
	16:40	17:34	18:26	20:20	16 07:35 (1)	21:12	20 06:42 (2)	21:54	8 05:53 (3)
9	08:43	08:04	07:06	06:53	07:16 (1)	05:51	06:22 (2)	05:14	05:45 (3)
	16:42	17:36	18:28	20:22	17 07:33 (1)	21:13	18 06:40 (2)	21:55	8 05:53 (3)
10	08:43	08:02	07:03	06:51	07:14 (1)	05:49	06:23 (2)	05:14	05:44 (3)
	16:43	17:37	18:29	20:24	19 07:33 (1)	21:15	16 06:39 (2)	21:56	9 05:53 (3)
11	08:42	08:01	07:01	06:49	07:12 (1)	05:48	06:25 (2)	05:14	05:44 (3)
	16:44	17:39	18:31	20:25	20 07:32 (1)	21:17	13 06:38 (2)	21:56	10 05:54 (3)
12	08:41	07:59	06:59	06:47	07:12 (1)	05:46	06:27 (2)	05:13	05:44 (3)
	16:46	17:41	18:33	20:27	19 07:31 (1)	21:18	8 06:35 (2)	21:57	10 05:54 (3)
13	08:41	07:57	06:56	06:44	07:14 (1)	05:44		05:13	05:43 (3)
	16:47	17:43	18:35	20:29	15 07:29 (1)	21:20		21:58	11 05:54 (3)
14	08:40	07:55	06:54	06:42	07:15 (1)	05:43		05:13	05:43 (3)
	16:49	17:45	18:36	20:31	11 07:26 (1)	21:22		21:58	11 05:54 (3)
15	08:39	07:53	06:52	06:40		05:41		05:13	05:43 (3)
	16:51	17:47	18:38	20:32		21:23		21:59	12 05:55 (3)
16	08:38	07:51	06:49	06:38		05:40		05:12	05:43 (3)
	16:52	17:49	18:40	20:34		21:25		21:59	12 05:55 (3)
17	08:37	07:49	06:47	06:35		05:38		05:12	05:43 (3)
	16:54	17:51	18:42	20:36		21:26		22:00	12 05:55 (3)
18	08:36	07:47	06:45	06:33		05:37		05:12	05:43 (3)
	16:55	17:53	18:44	20:38		21:28		22:00	12 05:55 (3)
19	08:35	07:45	06:42	06:31		05:35		05:12	05:43 (3)
	16:57	17:54	18:45	20:39		21:29		22:01	13 05:56 (3)
20	08:34	07:43	06:40	06:29		05:34		05:12	05:43 (3)
	16:59	17:56	18:47	20:41		21:31		22:01	13 05:56 (3)
21	08:33	07:41	06:38	06:27		05:32		05:13	05:44 (3)
	17:01	17:58	18:49	20:43		21:32		22:01	13 05:57 (3)
22	08:32	07:39	06:35	06:25		05:31		05:13	05:44 (3)
	17:02	18:00	18:51	20:45		21:34		22:01	13 05:57 (3)
23	08:31	07:37	06:33	06:22		05:30		05:13	05:44 (3)
	17:04	18:02	18:52	20:46		21:35		22:02	13 05:57 (3)
24	08:29	07:34	06:31	06:20		05:28		05:13	05:44 (3)
	17:06	18:04	18:54	20:48		21:37		22:02	12 05:56 (3)
25	08:28	07:32	06:28	06:18		05:27		05:14	05:45 (3)
	17:08	18:06	18:56	20:50		21:38		22:02	12 05:57 (3)
26	08:27	07:30	06:26	06:16	06:40 (2)	05:26		05:14	05:45 (3)
	17:09	18:07	18:58	20:51	3 06:43 (2)	21:39		22:02	12 05:57 (3)
27	08:25	07:28	06:24	06:14	06:38 (2)	05:25		05:14	05:46 (3)
	17:11	18:09	18:59	20:53	6 06:44 (2)	21:41		22:02	12 05:58 (3)
28	08:24	07:26	06:21	06:12	06:37 (2)	05:24		05:15	05:46 (3)
	17:13	18:11	19:01	20:55	8 06:45 (2)	21:42		22:02	11 05:57 (3)
29	08:22		07:19	06:10	06:35 (2)	05:23		05:16	05:47 (3)
	17:15		20:03	20:57	10 06:45 (2)	21:43		22:01	11 05:58 (3)
30	08:21		07:17	06:08	06:33 (2)	05:22		05:16	05:47 (3)
	17:17		20:05	20:58	12 06:45 (2)	21:44		22:01	10 05:57 (3)
31	08:19		07:14			05:21			
	17:19		20:06			21:46			
Potential sun hours	257	277	367	417		487		501	
Total, worst case					204		204		285
Sun reduction					0.38		0.39		0.35
Oper. time red.					1.00		1.00		1.00
Wind dir. red.					0.60		0.60		0.60
Total reduction					0.23		0.24		0.21
Total, real					47		49		60

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

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Kathlyn Feeney / kfeeney@jodireland.com
Calculated:
09/06/2025 13:54/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Worst Case - V150 **Shadow receptor:** DD - 173

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	July			August			September			October	November	December
1	05:17		05:48 (3)	05:54		06:36 (2)	06:45		07:11 (1)	07:35	07:30	08:22
	22:01	10	05:58 (3)	21:28	10	06:46 (2)	20:25	20	07:31 (1)	19:15	17:07	16:26
2	05:17		05:49 (3)	05:56		06:35 (2)	06:46		07:13 (1)	07:37	07:31	08:23
	22:00	9	05:58 (3)	21:26	14	06:49 (2)	20:23	19	07:32 (1)	19:12	17:06	16:26
3	05:18		05:49 (3)	05:57		06:33 (2)	06:48		07:14 (1)	07:38	07:33	08:24
	22:00	9	05:58 (3)	21:25	17	06:50 (2)	20:20	17	07:31 (1)	19:10	17:04	16:25
4	05:19		05:50 (3)	05:59		06:32 (2)	06:50		07:16 (1)	07:40	07:35	08:26
	22:00	8	05:58 (3)	21:23	19	06:51 (2)	20:18	16	07:32 (1)	19:08	17:02	16:24
5	05:20		05:51 (3)	06:00		06:31 (2)	06:51		07:18 (1)	07:42	07:37	08:27
	21:59	7	05:58 (3)	21:21	21	06:52 (2)	20:16	14	07:32 (1)	19:05	17:00	16:24
6	05:21		05:52 (3)	06:02		06:31 (2)	06:53		07:19 (1)	07:43	07:39	08:28
	21:59	6	05:58 (3)	21:19	22	06:53 (2)	20:14	12	07:31 (1)	19:03	16:58	16:23
7	05:22		05:53 (3)	06:04		06:32 (2)	06:55		07:21 (1)	07:45	07:41	08:30
	21:58	5	05:58 (3)	21:18	21	06:53 (2)	20:11	10	07:31 (1)	19:01	16:57	16:23
8	05:22		05:54 (3)	06:05		06:34 (2)	06:56		07:22 (1)	07:47	07:42	08:31
	21:57	4	05:58 (3)	21:16	20	06:54 (2)	20:09	7	07:29 (1)	18:58	16:55	16:23
9	05:23		05:54 (3)	06:07		06:35 (2)	06:58		07:24 (1)	07:49	07:44	08:32
	21:57	3	05:57 (3)	21:14	18	06:53 (2)	20:07	5	07:29 (1)	18:56	16:53	16:22
10	05:24		05:55 (3)	06:08		06:37 (2)	07:00		07:25 (1)	07:50	07:46	08:33
	21:56	2	05:57 (3)	21:12	17	06:54 (2)	20:04	1	07:26 (1)	18:54	16:52	16:22
11	05:26			06:10		06:38 (2)	07:01			07:52	07:48	08:34
	21:55			21:10	15	06:53 (2)	20:02			18:52	16:50	16:22
12	05:27			06:12		06:40 (2)	07:03			07:54	07:50	08:35
	21:54			21:08	14	06:54 (2)	19:59			18:49	16:48	16:22
13	05:28			06:13		06:41 (2)	07:05			07:55	07:52	08:36
	21:53			21:06	12	06:53 (2)	19:57			18:47	16:47	16:22
14	05:29			06:15		06:43 (2)	07:06			07:57	07:53	08:37
	21:52			21:04	10	06:53 (2)	19:55			18:45	16:45	16:22
15	05:30			06:17		06:44 (2)	07:08			07:59	07:55	08:38
	21:51			21:02	7	06:51 (2)	19:52			18:43	16:44	16:22
16	05:31			06:18		06:46 (2)	07:10			08:01	07:57	08:39
	21:50			21:00	5	06:51 (2)	19:50			18:40	16:42	16:22
17	05:33			06:20		06:48 (2)	07:11			08:03	07:59	08:40
	21:49			20:58	3	06:51 (2)	19:48			18:38	16:41	16:22
18	05:34			06:22			07:13			08:04	08:00	08:41
	21:48			20:56			19:45			18:36	16:40	16:22
19	05:35			06:23			07:15			08:06	08:02	08:41
	21:47			20:54			19:43			18:34	16:38	16:23
20	05:36			06:25			07:16			08:08	08:04	08:42
	21:46			20:52			19:41			18:32	16:37	16:23
21	05:38			06:27			07:18			08:10	08:06	08:43
	21:45			20:49			19:38			18:30	16:36	16:23
22	05:39			06:28			07:20			08:11	08:07	08:43
	21:43			20:47			19:36			18:27	16:35	16:24
23	05:41			06:30			07:21			08:13	08:09	08:44
	21:42			20:45			19:33			18:25	16:34	16:24
24	05:42			06:32			07:23			08:15	08:11	08:44
	21:40			20:43			19:31			18:23	16:32	16:25
25	05:43			06:33			07:25			07:17	08:12	08:45
	21:39			20:41			19:29			17:21	16:31	16:26
26	05:45			06:35			07:26			07:19	08:14	08:45
	21:38			20:39			19:26			17:19	16:30	16:26
27	05:46			06:37			07:28			07:21	08:15	08:45
	21:36			20:36			19:24			17:17	16:30	16:27
28	05:48			06:38		07:21 (1)	07:30			07:22	08:17	08:45
	21:35			20:34	3	07:24 (1)	19:22			17:15	16:29	16:28
29	05:49			06:40		07:15 (1)	07:31			07:24	08:19	08:45
	21:33			20:32	12	07:27 (1)	19:19			17:13	16:28	16:29
30	05:51			06:42		07:14 (1)	07:33			07:26	08:20	08:46
	21:31			20:30	15	07:29 (1)	19:17			17:11	16:27	16:30
31	05:52			06:43		07:12 (1)				07:28		08:46
	21:30			20:27	19	07:31 (1)				17:09		16:30
Potential sun hours	504			455			381			331	265	241
Total, worst case		63			294			121				
Sun reduction		0.33			0.35			0.34				
Oper. time red.		1.00			1.00			1.00				
Wind dir. red.		0.60			0.60			0.60				
Total reduction		0.20			0.21			0.20				
Total, real		13			63			25				

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

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Kathlyn Feeney / kfeeney@jodireland.com

SHADOW - Calendar

Calculation: 6839 Garrane WF Worst Case - V150 **Shadow receptor:** DE - 174

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January		February		March		April			May			June		
1	08:46		08:18		07:24		07:12			06:06		06:31 (2)	05:20		
	16:32		17:20		18:13		20:08			21:00	14	06:45 (2)	21:47		
2	08:45		08:16		07:21		07:10		07:32 (1)	06:04		06:29 (2)	05:19		
	16:33		17:22		18:15		20:10	2	07:34 (1)	21:02	15	06:44 (2)	21:48		
3	08:45		08:15		07:19		07:07		07:30 (1)	06:02		06:27 (2)	05:18		
	16:34		17:24		18:17		20:12	5	07:35 (1)	21:03	17	06:44 (2)	21:49		
4	08:45		08:13		07:17		07:05		07:28 (1)	06:00		06:25 (2)	05:17		05:47 (3)
	16:35		17:26		18:18		20:13	7	07:35 (1)	21:05	19	06:44 (2)	21:50	1	05:48 (3)
5	08:45		08:11		07:15		07:03		07:26 (1)	05:58		06:24 (2)	05:17		05:46 (3)
	16:36		17:28		18:20		20:15	10	07:36 (1)	21:07	20	06:44 (2)	21:51	2	05:48 (3)
6	08:44		08:10		07:12		07:00		07:23 (1)	05:57		06:22 (2)	05:16		05:46 (3)
	16:38		17:30		18:22		20:17	12	07:35 (1)	21:08	21	06:43 (2)	21:52	3	05:49 (3)
7	08:44		08:08		07:10		06:58		07:21 (1)	05:55		06:20 (2)	05:16		05:45 (3)
	16:39		17:32		18:24		20:18	14	07:35 (1)	21:10	22	06:42 (2)	21:53	4	05:49 (3)
8	08:44		08:06		07:08		06:56		07:19 (1)	05:53		06:20 (2)	05:15		05:45 (3)
	16:40		17:34		18:26		20:20	16	07:35 (1)	21:12	22	06:42 (2)	21:54	5	05:50 (3)
9	08:43		08:04		07:06		06:53		07:16 (1)	05:51		06:21 (2)	05:14		05:45 (3)
	16:42		17:36		18:28		20:22	18	07:34 (1)	21:13	20	06:41 (2)	21:55	6	05:51 (3)
10	08:43		08:02		07:03		06:51		07:14 (1)	05:49		06:21 (2)	05:14		05:44 (3)
	16:43		17:37		18:29		20:24	19	07:33 (1)	21:15	18	06:39 (2)	21:56	7	05:51 (3)
11	08:42		08:01		07:01		06:49		07:12 (1)	05:48		06:23 (2)	05:14		05:44 (3)
	16:44		17:39		18:31		20:25	20	07:32 (1)	21:17	15	06:38 (2)	21:56	8	05:52 (3)
12	08:41		07:59		06:59		06:47		07:12 (1)	05:46		06:24 (2)	05:13		05:44 (3)
	16:46		17:41		18:33		20:27	19	07:31 (1)	21:18	12	06:36 (2)	21:57	8	05:52 (3)
13	08:41		07:57		06:56		06:44		07:14 (1)	05:44		06:28 (2)	05:13		05:43 (3)
	16:47		17:43		18:35		20:29	16	07:30 (1)	21:20	6	06:34 (2)	21:58	9	05:52 (3)
14	08:40		07:55		06:54		06:42		07:14 (1)	05:43			05:13		05:43 (3)
	16:49		17:45		18:36		20:31	13	07:27 (1)	21:22			21:58	9	05:52 (3)
15	08:39		07:53		06:52		06:40		07:18 (1)	05:41			05:13		05:43 (3)
	16:51		17:47		18:38		20:32	5	07:23 (1)	21:23			21:59	10	05:53 (3)
16	08:38		07:51		06:49		06:38			05:40			05:12		05:43 (3)
	16:52		17:49		18:40		20:34			21:25			21:59	10	05:53 (3)
17	08:37		07:49		06:47		06:35			05:38			05:12		05:43 (3)
	16:54		17:51		18:42		20:36			21:26			22:00	10	05:53 (3)
18	08:36		07:47		06:45		06:33			05:37			05:12		05:43 (3)
	16:55		17:53		18:44		20:38			21:28			22:00	10	05:53 (3)
19	08:35		07:45		06:42		06:31			05:35			05:12		05:43 (3)
	16:57		17:54		18:45		20:39			21:29			22:01	11	05:54 (3)
20	08:34		07:43		06:40		06:29			05:34			05:12		05:43 (3)
	16:59		17:56		18:47		20:41			21:31			22:01	11	05:54 (3)
21	08:33		07:41		06:38		06:27			05:32			05:13		05:44 (3)
	17:01		17:58		18:49		20:43			21:32			22:01	11	05:55 (3)
22	08:32		07:39		06:35		06:25			05:31			05:13		05:44 (3)
	17:02		18:00		18:51		20:45			21:34			22:01	11	05:55 (3)
23	08:31		07:37		06:33		06:22			05:30			05:13		05:44 (3)
	17:04		18:02		18:52		20:46			21:35			22:02	11	05:55 (3)
24	08:29		07:34		06:31		06:20			05:28			05:13		05:44 (3)
	17:06		18:04		18:54		20:48			21:37			22:02	10	05:54 (3)
25	08:28		07:32		06:28		06:18			05:27			05:14		05:45 (3)
	17:08		18:06		18:56		20:50			21:38			22:02	10	05:55 (3)
26	08:27		07:30		06:26		06:16		06:40 (2)	05:26			05:14		05:45 (3)
	17:09		18:07		18:58		20:51	2	06:42 (2)	21:39			22:02	10	05:55 (3)
27	08:25		07:28		06:24		06:14		06:38 (2)	05:25			05:14		05:46 (3)
	17:11		18:09		18:59		20:53	5	06:43 (2)	21:41			22:02	10	05:56 (3)
28	08:24		07:26		06:21		06:12		06:37 (2)	05:24			05:15		05:46 (3)
	17:13		18:11		19:01		20:55	7	06:44 (2)	21:42			22:02	9	05:55 (3)
29	08:22				07:19		06:10		06:35 (2)	05:23			05:16		05:47 (3)
	17:15				20:03		20:57	10	06:45 (2)	21:43			22:01	9	05:56 (3)
30	08:21				07:17		06:08		06:33 (2)	05:22			05:16		05:47 (3)
	17:17				20:05		20:58	12	06:45 (2)	21:44			22:01	8	05:55 (3)
31	08:19				07:14					05:21					
	17:19				20:06					21:46					
Potential sun hours	257		277		367		417			487			501		
Total, worst case								212			221			223	
Sun reduction								0.38			0.39			0.35	
Oper. time red.								1.00			1.00			1.00	
Wind dir. red.								0.60			0.60			0.60	
Total reduction								0.23			0.24			0.21	
Total, real								48			53			47	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
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Kathlyn Feeney / kfeeney@jodireland.com
Calculated:
09/06/2025 13:54/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Worst Case - V150 **Shadow receptor:** DE - 174

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	July			August			September			October	November	December
1	05:17		05:48 (3)	05:54		06:34 (2)	06:45		07:11 (1)	07:35	07:30	08:22
	22:01	8	05:56 (3)	21:28	13	06:47 (2)	20:25	20	07:31 (1)	19:15	17:07	16:26
2	05:17		05:49 (3)	05:56		06:33 (2)	06:46		07:13 (1)	07:37	07:31	08:23
	22:00	7	05:56 (3)	21:26	16	06:49 (2)	20:23	19	07:32 (1)	19:12	17:06	16:26
3	05:18		05:49 (3)	05:57		06:31 (2)	06:48		07:14 (1)	07:38	07:33	08:24
	22:00	6	05:55 (3)	21:25	19	06:50 (2)	20:20	18	07:32 (1)	19:10	17:04	16:25
4	05:19		05:50 (3)	05:59		06:31 (2)	06:50		07:16 (1)	07:40	07:35	08:26
	22:00	6	05:56 (3)	21:23	21	06:52 (2)	20:18	16	07:32 (1)	19:08	17:02	16:24
5	05:20		05:51 (3)	06:00		06:30 (2)	06:51		07:18 (1)	07:42	07:37	08:27
	21:59	5	05:56 (3)	21:21	22	06:52 (2)	20:16	14	07:32 (1)	19:05	17:00	16:24
6	05:21		05:52 (3)	06:02		06:31 (2)	06:53		07:19 (1)	07:43	07:39	08:28
	21:59	4	05:56 (3)	21:19	22	06:53 (2)	20:14	12	07:31 (1)	19:03	16:58	16:23
7	05:22		05:53 (3)	06:04		06:32 (2)	06:55		07:21 (1)	07:45	07:41	08:30
	21:58	3	05:56 (3)	21:18	21	06:53 (2)	20:11	10	07:31 (1)	19:01	16:57	16:23
8	05:22		05:54 (3)	06:05		06:34 (2)	06:56		07:22 (1)	07:47	07:42	08:31
	21:57	2	05:56 (3)	21:16	19	06:53 (2)	20:09	8	07:30 (1)	18:58	16:55	16:23
9	05:23			06:07		06:35 (2)	06:58		07:24 (1)	07:49	07:44	08:32
	21:57			21:14	18	06:53 (2)	20:07	5	07:29 (1)	18:56	16:53	16:22
10	05:24			06:08		06:37 (2)	07:00		07:25 (1)	07:50	07:46	08:33
	21:56			21:12	17	06:54 (2)	20:04	2	07:27 (1)	18:54	16:52	16:22
11	05:26			06:10		06:38 (2)	07:01			07:52	07:48	08:34
	21:55			21:10	15	06:53 (2)	20:02			18:52	16:50	16:22
12	05:27			06:12		06:40 (2)	07:03			07:54	07:50	08:35
	21:54			21:08	13	06:53 (2)	19:59			18:49	16:48	16:22
13	05:28			06:13		06:41 (2)	07:05			07:55	07:52	08:36
	21:53			21:06	11	06:52 (2)	19:57			18:47	16:47	16:22
14	05:29			06:15		06:43 (2)	07:06			07:57	07:53	08:37
	21:52			21:04	9	06:52 (2)	19:55			18:45	16:45	16:22
15	05:30			06:17		06:44 (2)	07:08			07:59	07:55	08:38
	21:51			21:02	7	06:51 (2)	19:52			18:43	16:44	16:22
16	05:31			06:18		06:46 (2)	07:10			08:01	07:57	08:39
	21:50			21:00	4	06:50 (2)	19:50			18:40	16:42	16:22
17	05:33			06:20		06:48 (2)	07:11			08:03	07:59	08:40
	21:49			20:58	2	06:50 (2)	19:48			18:38	16:41	16:22
18	05:34			06:22			07:13			08:04	08:00	08:41
	21:48			20:56			19:45			18:36	16:40	16:22
19	05:35			06:23			07:15			08:06	08:02	08:41
	21:47			20:54			19:43			18:34	16:38	16:23
20	05:36			06:25			07:16			08:08	08:04	08:42
	21:46			20:52			19:41			18:32	16:37	16:23
21	05:38			06:27			07:18			08:10	08:06	08:43
	21:45			20:49			19:38			18:30	16:36	16:23
22	05:39			06:28			07:20			08:11	08:07	08:43
	21:43			20:47			19:36			18:27	16:35	16:24
23	05:41			06:30			07:21			08:13	08:09	08:44
	21:42			20:45			19:33			18:25	16:34	16:24
24	05:42			06:32			07:23			08:15	08:11	08:44
	21:40			20:43			19:31			18:23	16:32	16:25
25	05:43			06:33			07:25			07:17	08:12	08:45
	21:39			20:41			19:29			17:21	16:31	16:26
26	05:45			06:35			07:26			07:19	08:14	08:45
	21:38			20:39			19:26			17:19	16:30	16:26
27	05:46			06:37			07:28			07:21	08:15	08:45
	21:36			20:36			19:24			17:17	16:30	16:27
28	05:48			06:38		07:19 (1)	07:30			07:22	08:17	08:45
	21:35			20:34	6	07:25 (1)	19:22			17:15	16:29	16:28
29	05:49			06:40		07:15 (1)	07:31			07:24	08:19	08:45
	21:33			20:32	13	07:28 (1)	19:19			17:13	16:28	16:29
30	05:51			06:42		07:13 (1)	07:33			07:26	08:20	08:46
	21:31			20:30	17	07:30 (1)	19:17			17:11	16:27	16:30
31	05:52		06:37 (2)	06:43		07:12 (1)				07:28		08:46
	21:30	9	06:46 (2)	20:27	19	07:31 (1)				17:09		16:30
Potential sun hours	504			455			381			331	265	241
Total, worst case		50			304			124				
Sun reduction		0.33			0.35			0.34				
Oper. time red.		1.00			1.00			1.00				
Wind dir. red.		0.60			0.60			0.60				
Total reduction		0.20			0.21			0.20				
Total, real		10			65			25				

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
Jennings O'Donovan
Finisklin Business Park
F91 RHH9 Sligo
+353719161416
Kathlyn Feeney / kfeeney@jodireland.com
Calculated:
09/06/2025 13:54/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Worst Case - V150 **Shadow receptor:** DF - 177

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January	February		March		April		May		June	
1	08:46	08:18		07:24		07:12		07:35 (4)	06:06	06:35 (5)	05:20	05:58 (7)
	16:32	17:20		18:13		20:08	13	08:02 (3)	21:00	22 06:57 (5)	21:47	8 06:06 (7)
2	08:46	08:16		07:21		07:10		07:33 (4)	06:04	06:35 (5)	05:19	06:00 (7)
	16:33	17:22		18:15		20:10	7	07:40 (4)	21:02	20 06:55 (5)	21:48	4 06:04 (7)
3	08:45	08:15		07:19		07:07		07:30 (4)	06:02	06:36 (5)	05:18	
	16:34	17:24		18:17		20:12	9	07:39 (4)	21:03	18 06:54 (5)	21:49	
4	08:45	08:13		07:17	07:41 (2)	07:05		07:28 (4)	06:00	06:38 (5)	05:17	
	16:35	17:26		18:19	1 07:42 (2)	20:13	11	07:39 (4)	21:05	14 06:52 (5)	21:50	
5	08:45	08:11		07:15	07:38 (2)	07:03		07:26 (4)	05:58	06:41 (5)	05:17	
	16:36	17:28		18:20	4 07:42 (2)	20:15	13	07:39 (4)	21:07	9 06:50 (5)	21:51	
6	08:45	08:10		07:12	07:36 (2)	07:00		07:23 (4)	05:57		05:16	
	16:38	17:30		18:22	7 07:43 (2)	20:17	15	07:38 (4)	21:08		21:52	
7	08:44	08:08		07:10	07:34 (2)	06:58		07:21 (4)	05:55		05:15	
	16:39	17:32		18:24	9 07:43 (2)	20:18	16	07:37 (4)	21:10		21:53	
8	08:44	08:06		07:08	07:31 (2)	06:56		07:19 (4)	05:53		05:15	
	16:40	17:34		18:26	11 07:42 (2)	20:20	18	07:37 (4)	21:12		21:54	
9	08:43	08:04		07:06	07:29 (2)	06:53		07:18 (4)	05:51		05:14	
	16:42	17:36		18:28	13 07:42 (2)	20:22	17	07:35 (4)	21:13		21:55	
10	08:43	08:03		07:03	07:27 (2)	06:51		07:19 (4)	05:49		05:14	
	16:43	17:37		18:29	15 07:42 (2)	20:24	14	07:33 (4)	21:15		21:56	
11	08:42	08:01		07:01	07:24 (2)	06:49		07:21 (4)	05:48		05:14	
	16:44	17:39		18:31	17 07:41 (2)	20:25	9	07:30 (4)	21:17		21:56	
12	08:41	07:59		06:59	07:22 (2)	06:47			05:46		05:13	
	16:46	17:41		18:33	18 07:40 (2)	20:27			21:18		21:57	
13	08:41	07:57		06:56	07:23 (2)	06:44			05:44		05:13	
	16:47	17:43		18:35	16 07:39 (2)	20:29			21:20		21:58	
14	08:40	07:55		06:54	07:24 (2)	06:42			05:43	06:09 (7)	05:13	
	16:49	17:45		18:37	12 07:36 (2)	20:31			21:22	1 06:10 (7)	21:58	
15	08:39	07:53		06:52	07:27 (2)	06:40			05:41	06:08 (7)	05:13	
	16:51	17:47		18:38	5 07:32 (2)	20:32			21:23	3 06:11 (7)	21:59	
16	08:38	07:51		06:49		06:38			05:40	06:06 (7)	05:12	
	16:52	17:49		18:40		20:34			21:25	4 06:10 (7)	21:59	
17	08:37	07:49		06:47	07:10 (3)	06:35			05:38	06:05 (7)	05:12	
	16:54	17:51		18:42	2 07:12 (3)	20:36			21:26	6 06:11 (7)	22:00	
18	08:36	07:47	08:12 (1)	06:45	07:08 (3)	06:33			05:37	06:04 (7)	05:12	
	16:55	17:53	1 08:13 (1)	18:44	5 07:13 (3)	20:38			21:28	7 06:11 (7)	22:00	
19	08:35	07:45	08:09 (1)	06:42	07:05 (3)	06:31		06:55 (5)	05:35	06:02 (7)	05:12	
	16:57	17:54	3 08:12 (1)	18:45	8 07:13 (3)	20:39	3	06:58 (5)	21:29	9 06:11 (7)	22:01	
20	08:34	07:43	08:07 (1)	06:40	07:03 (3)	06:29		06:53 (5)	05:34	06:01 (7)	05:12	
	16:59	17:56	6 08:13 (1)	18:47	11 07:14 (3)	20:41	6	06:59 (5)	21:31	10 06:11 (7)	22:01	
21	08:33	07:41	08:05 (1)	06:38	07:01 (3)	06:27		06:50 (5)	05:32	06:00 (7)	05:13	
	17:01	17:58	8 08:13 (1)	18:49	14 07:15 (3)	20:43	9	06:59 (5)	21:32	11 06:11 (7)	22:01	
22	08:32	07:39	08:03 (1)	06:35	06:58 (3)	06:25		06:48 (5)	05:31	05:59 (7)	05:13	
	17:02	18:00	10 08:13 (1)	18:51	16 07:14 (3)	20:45	11	06:59 (5)	21:34	12 06:11 (7)	22:01	
23	08:31	07:37	08:01 (1)	06:33	06:56 (3)	06:22		06:46 (5)	05:30	05:57 (7)	05:13	
	17:04	18:02	12 08:13 (1)	18:52	19 07:15 (3)	20:46	14	07:00 (5)	21:35	13 06:10 (7)	22:02	
24	08:29	07:34	07:59 (1)	06:31	06:54 (3)	06:20		06:44 (5)	05:28	05:56 (7)	05:13	
	17:06	18:04	13 08:12 (1)	18:54	21 07:15 (3)	20:48	16	07:00 (5)	21:37	14 06:10 (7)	22:02	
25	08:28	07:32	07:56 (1)	06:28	06:51 (3)	06:18		06:42 (5)	05:27	05:55 (7)	05:14	
	17:08	18:06	14 08:10 (1)	18:56	22 07:13 (3)	20:50	17	06:59 (5)	21:38	15 06:10 (7)	22:02	
26	08:27	07:30	07:56 (1)	06:26	06:49 (3)	06:16		06:40 (5)	05:26	05:54 (7)	05:14	
	17:09	18:07	13 08:09 (1)	18:58	24 07:13 (3)	20:51	19	06:59 (5)	21:39	16 06:10 (7)	22:02	
27	08:25	07:28	07:58 (1)	06:24	06:47 (3)	06:14		06:38 (5)	05:25	05:53 (7)	05:14	
	17:11	18:09	9 08:07 (1)	18:59	26 07:13 (3)	20:53	21	06:59 (5)	21:41	16 06:09 (7)	22:02	
28	08:24	07:26		06:21	06:47 (3)	06:12		06:37 (5)	05:24	05:53 (7)	05:15	
	17:13	18:11		19:01	24 07:11 (3)	20:55	22	06:59 (5)	21:42	16 06:09 (7)	22:02	
29	08:23			07:19	07:48 (3)	06:10		06:35 (5)	05:23	05:54 (7)	05:15	
	17:15			20:03	22 08:10 (3)	20:57	24	06:59 (5)	21:43	14 06:08 (7)	22:01	
30	08:21			07:17	07:48 (3)	06:08		06:34 (5)	05:22	05:56 (7)	05:16	
	17:17			20:05	19 08:07 (3)	20:58	24	06:58 (5)	21:44	12 06:08 (7)	22:01	
31	08:20			07:14	07:37 (4)				05:21	05:57 (7)		
	17:19			20:06	16 08:05 (3)				21:46	10 06:07 (7)		
Potential sun hours	257	277		367		417			487		501	
Total, worst case			89		377		328			272		12
Sun reduction			0.24		0.28		0.38			0.39		0.35
Oper. time red.			1.00		1.00		1.00			1.00		1.00
Wind dir. red.			0.63		0.61		0.60			0.60		0.60
Total reduction			0.15		0.17		0.23			0.24		0.21
Total, real			14		64		75			64		2

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
Jennings O'Donovan
Finisklin Business Park
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+353719161416
Kathlyn Feeney / kfeeney@jodireland.com

Calculated:
09/06/2025 13:54/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Worst Case - V150 **Shadow receptor:** DF - 177

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	July		August		September		October		November	December
1	05:17		05:54		06:45		07:20 (4)	07:35	08:01 (2)	07:30	08:22
	22:01		21:28		20:25	9	07:29 (4)	19:15	17	08:18 (2)	17:07	16:26
2	05:17		05:56		06:46		07:18 (4)	07:37		08:02 (2)	07:32	08:23
	22:01		21:27		20:23	14	07:32 (4)	19:12	17	08:19 (2)	17:06	16:26
3	05:18		05:57		06:48		07:15 (4)	07:38		08:04 (2)	07:33	08:24
	22:00		21:25		20:21	17	07:32 (4)	19:10	16	08:20 (2)	17:04	16:25
4	05:19		05:59		06:50		07:16 (4)	07:40		08:05 (2)	07:35	08:26
	22:00		21:23		20:18	18	07:34 (4)	19:08	14	08:19 (2)	17:02	16:24
5	05:20		06:00		06:51		07:18 (4)	07:42		08:07 (2)	07:37	08:27
	21:59		21:21		20:16	16	07:34 (4)	19:05	12	08:19 (2)	17:00	16:24
6	05:21		06:02		06:53		07:19 (4)	07:43		08:09 (2)	07:39	08:28
	21:59		21:19		20:14	15	07:34 (4)	19:03	10	08:19 (2)	16:58	16:23
7	05:22		06:04	06:53 (5)	06:55		07:21 (4)	07:45		08:11 (2)	07:41	08:30
	21:58		21:18	2 06:55 (5)	20:11	13	07:34 (4)	19:01	8	08:19 (2)	16:57	16:23
8	05:22		06:05	06:49 (5)	06:56		07:22 (4)	07:47		08:12 (2)	07:42	08:31
	21:57		21:16	11 07:00 (5)	20:09	11	07:33 (4)	18:58	5	08:17 (2)	16:55	16:23
9	05:23		06:07	06:47 (5)	06:58		07:24 (4)	07:49		08:14 (2)	07:44	08:32
	21:57		21:14	15 07:02 (5)	20:07	9	07:33 (4)	18:56	2	08:16 (2)	16:53	16:22
10	05:24		06:08	06:45 (5)	07:00		07:25 (4)	07:50			07:46	08:33
	21:56		21:12	19 07:04 (5)	20:04	7	07:32 (4)	18:54			16:52	16:22
11	05:26	06:06 (7)	06:10	06:44 (5)	07:01		07:27 (4)	07:52			07:48	08:34
	21:55	6 06:12 (7)	21:10	20 07:04 (5)	20:02	12	07:54 (3)	18:52			16:50	16:22
12	05:27	06:05 (7)	06:12	06:43 (5)	07:03		07:29 (4)	07:54			07:50	08:35
	21:54	9 06:14 (7)	21:08	22 07:05 (5)	20:00	16	07:57 (3)	18:49			16:48	16:22
13	05:28	06:04 (7)	06:13	06:42 (5)	07:05		07:40 (3)	07:56			07:52	08:37
	21:53	11 06:15 (7)	21:06	23 07:05 (5)	19:57	18	07:58 (3)	18:47			16:47	16:22
14	05:29	06:04 (7)	06:15	06:43 (5)	07:06		07:38 (3)	07:57		08:33 (1)	07:53	08:37
	21:52	13 06:17 (7)	21:04	23 07:06 (5)	19:55	22	08:00 (3)	18:45	4	08:37 (1)	16:45	16:22
15	05:30	06:03 (7)	06:17	06:44 (5)	07:08		07:37 (3)	07:59		08:29 (1)	07:55	08:38
	21:51	15 06:18 (7)	21:02	22 07:06 (5)	19:52	24	08:01 (3)	18:43	11	08:40 (1)	16:44	16:22
16	05:31	06:02 (7)	06:18	06:46 (5)	07:10		07:36 (3)	08:01		08:28 (1)	07:57	08:39
	21:50	16 06:18 (7)	21:00	20 07:06 (5)	19:50	25	08:01 (3)	18:40	14	08:42 (1)	16:42	16:22
17	05:33	06:03 (7)	06:20	06:48 (5)	07:11		07:37 (3)	08:03		08:29 (1)	07:59	08:40
	21:49	16 06:19 (7)	20:58	19 07:07 (5)	19:48	24	08:01 (3)	18:38	14	08:43 (1)	16:41	16:22
18	05:34	06:04 (7)	06:22	06:49 (5)	07:13		07:38 (3)	08:04		08:31 (1)	08:00	08:41
	21:48	15 06:19 (7)	20:56	17 07:06 (5)	19:45	23	08:01 (3)	18:36	13	08:44 (1)	16:40	16:22
19	05:35	06:05 (7)	06:23	06:51 (5)	07:15		07:40 (3)	08:06		08:33 (1)	08:02	08:42
	21:47	15 06:20 (7)	20:54	15 07:06 (5)	19:43	21	08:01 (3)	18:34	11	08:44 (1)	16:38	16:22
20	05:36	06:07 (7)	06:25	06:52 (5)	07:16		07:42 (3)	08:08		08:34 (1)	08:04	08:42
	21:46	14 06:21 (7)	20:52	13 07:05 (5)	19:41	19	08:01 (3)	18:32	9	08:43 (1)	16:37	16:23
21	05:38	06:08 (7)	06:27	06:54 (5)	07:18		07:43 (3)	08:10		08:36 (1)	08:06	08:43
	21:45	13 06:21 (7)	20:49	11 07:05 (5)	19:38	17	08:00 (3)	18:30	7	08:43 (1)	16:36	16:23
22	05:39	06:09 (7)	06:28	06:55 (5)	07:20		07:45 (3)	08:11		08:38 (1)	08:07	08:43
	21:43	12 06:21 (7)	20:47	8 07:03 (5)	19:36	15	08:00 (3)	18:27	5	08:43 (1)	16:35	16:24
23	05:41	06:11 (7)	06:30	06:57 (5)	07:21		07:47 (3)	08:13		08:40 (1)	08:09	08:44
	21:42	11 06:22 (7)	20:45	6 07:03 (5)	19:33	12	07:59 (3)	18:25	3	08:43 (1)	16:34	16:24
24	05:42	06:12 (7)	06:32	06:58 (5)	07:23		07:48 (3)	08:15			08:11	08:44
	21:41	10 06:22 (7)	20:43	3 07:01 (5)	19:31	9	07:57 (3)	18:23			16:32	16:25
25	05:43	06:13 (7)	06:33		07:25		07:50 (3)	07:17			08:12	08:45
	21:39	8 06:21 (7)	20:41		19:29	6	07:56 (3)	17:21			16:31	16:25
26	05:45	06:15 (7)	06:35		07:26		07:52 (3)	07:19			08:14	08:45
	21:38	7 06:22 (7)	20:39		19:26	3	07:55 (3)	17:19			16:30	16:26
27	05:46	06:16 (7)	06:37		07:28			07:21			08:15	08:45
	21:36	5 06:21 (7)	20:36		19:24			17:17			16:29	16:27
28	05:48	06:17 (7)	06:38		07:30			07:22			08:17	08:45
	21:35	4 06:21 (7)	20:34		19:22			17:15			16:29	16:28
29	05:49	06:19 (7)	06:40		07:31		08:05 (2)	07:24			08:19	08:46
	21:33	2 06:21 (7)	20:32		19:19	10	08:15 (2)	17:13			16:28	16:29
30	05:51		06:42		07:33		08:02 (2)	07:26			08:20	08:46
	21:31		20:30		19:17	15	08:17 (2)	17:11			16:27	16:29
31	05:52		06:43					07:28				08:46
	21:30		20:27					17:09				16:30
Potential sun hours	504		455		381			331			264	241
Total, worst case		202		269		420			192			
Sun reduction		0.33		0.35		0.34			0.28			
Oper. time red.		1.00		1.00		1.00			1.00			
Wind dir. red.		0.60		0.60		0.61			0.61			
Total reduction		0.20		0.21		0.20			0.17			
Total, real		40		57		86			33			

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
Jennings O'Donovan
Finisklin Business Park
F91 RHH9 Sligo
+353719161416
Kathlyn Feeney / kfeeney@jodireland.com

Calculated:
09/06/2025 13:54/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Worst Case - V150 **Shadow receptor:** DG - 178

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:46	08:18	07:24	07:12	06:06	05:20	05:17	05:54	06:45	07:35	07:30	08:21
	16:32	17:20	18:13	20:08	21:00	21:47	22:01	21:28	20:25	19:15	17:07	16:26
2	08:45	08:16	07:21	07:10	06:04	05:19	05:17	05:56	06:46	07:36	07:31	08:23
	16:33	17:22	18:15	20:10	21:02	21:48	22:00	21:26	20:23	19:12	17:06	16:26
3	08:45	08:15	07:19	07:07	06:02	05:18	05:18	05:57	06:48	07:38	07:33	08:24
	16:34	17:24	18:17	20:11	21:03	21:49	22:00	21:25	20:20	19:10	17:04	16:25
4	08:45	08:13	07:17	07:05	06:00	05:18	05:19	05:59	06:50	07:40	07:35	08:26
	16:35	17:26	18:18	20:13	21:05	21:50	22:00	21:23	20:18	19:08	17:02	16:24
5	08:45	08:11	07:15	07:03	05:58	05:17	05:20	06:00	06:51	07:42	07:37	08:27
	16:36	17:28	18:20	20:15	21:07	21:51	21:59	21:21	20:16	19:05	17:00	16:24
6	08:44	08:10	07:12	07:00	05:57	05:16	05:21	06:02	06:53	07:43	07:39	08:28
	16:38	17:30	18:22	20:17	21:08	21:52	21:59	21:19	20:13	19:03	16:58	16:23
7	08:44	08:08	07:10	06:58	05:55	05:16	05:22	06:04	06:55	07:45	07:41	08:30
	16:39	17:32	18:24	20:18	21:10	21:53	21:58	21:18	20:11	19:01	16:57	16:23
8	08:44	08:06	07:08	06:56	05:53	05:15	05:23	06:05	06:56	07:47	07:42	08:31
	16:40	17:34	18:26	20:20	21:12	21:54	21:57	21:16	20:09	18:58	16:55	16:23
9	08:43	08:04	07:06	06:53	05:51	05:14	05:23	06:07	06:58	07:48	07:44	08:32
	16:42	17:36	18:28	20:22	21:13	21:55	21:57	21:14	20:06	18:56	16:53	16:22
10	08:42	08:02	07:03	06:51	05:49	05:14	05:25	06:08	07:00	07:50	07:46	08:33
	16:43	17:37	18:29	20:24	21:15	21:55	21:56	21:12	20:04	18:54	16:52	16:22
11	08:42	08:01	07:01	06:49	05:48	05:14	05:26	06:10	07:01	07:52	07:48	08:34
	16:44	17:39	18:31	20:25	21:17	21:56	21:55	21:10	20:02	18:52	16:50	16:22
12	08:41	07:59	06:59	06:47	05:46	05:13	05:27	06:12	07:03	07:54	07:50	08:35
	16:46	17:41	18:33	20:27	21:18	21:57	21:54	21:08	19:59	18:49	16:48	16:22
13	08:40	07:57	06:56	06:44	05:44	05:13	05:28	06:13	07:05	07:55	07:51	08:36
	16:47	17:43	18:35	20:29	21:20	21:58	21:53	21:06	19:57	18:47	16:47	16:22
14	08:40	07:55	06:54	06:42	05:43	05:13	05:29	06:15	07:06	07:57	07:53	08:37
	16:49	17:45	18:36	20:31	21:21	21:58	21:52	21:04	19:55	18:45	16:45	16:22
15	08:39	07:53	06:52	06:40	05:41	05:13	05:30	06:17	07:08	07:59	07:55	08:38
	16:51	17:47	18:38	20:32	21:23	21:59	21:51	21:02	19:52	18:43	16:44	16:22
16	08:38	07:51	06:49	06:38	05:40	05:12	05:31	06:18	07:10	08:01	07:57	08:39
	16:52	17:49	18:40	20:34	21:25	21:59	21:50	21:00	19:50	18:40	16:42	16:22
17	08:37	07:49	06:47	06:35	05:38	05:12	05:33	06:20	07:11	08:02	07:59	08:40
	16:54	17:51	18:42	20:36	21:26	22:00	21:49	20:58	19:48	18:38	16:41	16:22
18	08:36	07:47	06:45	06:33	05:37	05:12	05:34	06:22	07:13	08:04	08:00	08:41
	16:55	17:53	18:44	20:38	21:28	22:00	21:48	20:56	19:45	18:36	16:40	16:22
19	08:35	07:45	06:42	06:31	05:35	05:12	05:35	06:23	07:15	08:06	08:02	08:41
	16:57	17:54	18:45	20:39	21:29	22:01	21:47	20:54	19:43	18:34	16:38	16:23
20	08:34	07:43	06:40	06:29	05:34	05:12	05:37	06:25	07:16	08:08	08:04	08:42
	16:59	17:56	18:47	20:41	21:31	22:01	21:46	20:52	19:41	18:32	16:37	16:23
21	08:33	07:41	06:38	06:27	05:32	05:13	05:38	06:27	07:18	08:10	08:05	08:43
	17:01	17:58	18:49	20:43	21:32	22:01	21:44	20:49	19:38	18:30	16:36	16:23
22	08:32	07:39	06:35	06:25	05:31	05:13	05:39	06:28	07:20	08:11	08:07	08:43
	17:02	18:00	18:51	20:44	21:34	22:01	21:43	20:47	19:36	18:27	16:35	16:24
23	08:31	07:36	06:33	06:22	05:30	05:13	05:41	06:30	07:21	08:13	08:09	08:44
	17:04	18:02	18:52	20:46	21:35	22:01	21:42	20:45	19:33	18:25	16:34	16:24
24	08:29	07:34	06:31	06:20	05:28	05:13	05:42	06:32	07:23	08:15	08:11	08:44
	17:06	18:04	18:54	20:48	21:36	22:02	21:40	20:43	19:31	18:23	16:32	16:25
25	08:28	07:32	06:28	06:18	05:27	05:14	05:43	06:33	07:25	07:17	08:12	08:44
	17:08	18:06	18:56	20:50	21:38	22:02	21:39	20:41	19:29	17:21	16:31	16:26
26	08:27	07:30	06:26	06:16	05:26	05:14	05:45	06:35	07:26	07:19	08:14	08:45
	17:09	18:07	18:58	20:51	21:39	22:02	21:38	20:39	19:26	17:19	16:30	16:26
27	08:25	07:28	06:24	06:14	05:25	05:14	05:46	06:37	07:28	07:20	08:15	08:45
	17:11	18:09	18:59	20:53	21:40	22:02	21:36	20:36	19:24	17:17	16:30	16:27
28	08:24	07:26	06:21	06:12	05:24	05:15	05:48	06:38	07:30	07:22	08:17	08:45
	17:13	18:11	19:01	20:55	21:42	22:01	21:35	20:34	19:22	17:15	16:29	16:28
29	08:22		07:19	06:10	05:23	05:16	05:49	06:40	07:31	07:24	08:18	08:45
	17:15		20:03	20:57	21:43	22:01	21:33	20:32	19:19	17:13	16:28	16:29
30	08:21		07:17	06:08	05:22	05:16	05:51	06:41	07:33	07:26	08:20	08:45
	17:17		20:05	20:58	21:44	22:01	21:31	20:30	19:17	17:11	16:27	16:30
31	08:19		07:14		05:21		05:52	06:43		07:28		08:46
	17:19		20:06		21:45		21:30	20:27		17:09		16:30
Potential sun hours	257	277	367	417	487	501	504	455	381	331	265	241
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

Licensed user:
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Kathlyn Feeney / kfeeney@jodireland.com

Calculated:
09/06/2025 13:54/4.0.552

SHADOW - Calendar

Calculation: 6839 Garrane WF Worst Case - V150 **Shadow receptor:** DH - 179

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January		February		March		April		May		June		
1	08:46		15:34 (1)	08:18		07:23		07:12		18:59 (4)	06:06		19:56 (6)	05:20		20:55 (7)
	16:32	22	15:56 (1)	17:20		18:13		20:08	28	19:27 (4)	21:00	35	20:31 (8)	21:47	19	21:14 (7)
2	08:45		15:34 (1)	08:16		07:21		07:09		19:00 (4)	06:04		19:55 (6)	05:19		20:55 (7)
	16:33	23	15:57 (1)	17:22		18:15		20:10	24	19:24 (4)	21:02	38	20:33 (8)	21:48	20	21:15 (7)
3	08:45		15:35 (1)	08:15	16:50 (2)	07:19	17:47 (3)	07:07		19:02 (4)	06:02		19:55 (6)	05:18		20:55 (7)
	16:34	24	15:59 (1)	17:24	4 16:54 (2)	18:17	3 17:50 (3)	20:11	21	19:23 (4)	21:03	39	20:34 (8)	21:49	20	21:15 (7)
4	08:45		15:36 (1)	08:13	16:49 (2)	07:17	17:45 (3)	07:05		19:04 (4)	06:00		19:55 (6)	05:17		20:55 (7)
	16:35	24	16:00 (1)	17:26	7 16:56 (2)	18:18	7 17:52 (3)	20:13	19	19:47 (5)	21:05	41	20:36 (8)	21:50	22	21:17 (7)
5	08:45		15:36 (1)	08:11	16:48 (2)	07:15	17:44 (3)	07:02		19:08 (4)	05:58		19:55 (6)	05:17		20:55 (7)
	16:36	25	16:01 (1)	17:28	10 16:58 (2)	18:20	10 17:54 (3)	20:15	14	19:48 (5)	21:07	42	20:37 (8)	21:51	22	21:17 (7)
6	08:44		15:37 (1)	08:10	16:47 (2)	07:12	17:44 (3)	07:00		19:40 (5)	05:56		19:56 (6)	05:16		20:56 (7)
	16:37	26	16:03 (1)	17:30	12 16:59 (2)	18:22	12 17:56 (3)	20:17	10	19:50 (5)	21:08	43	20:39 (8)	21:52	23	21:19 (7)
7	08:44		15:37 (1)	08:08	16:48 (2)	07:10	17:42 (3)	06:58		19:40 (5)	05:55		19:56 (6)	05:15		20:55 (7)
	16:39	27	16:04 (1)	17:32	14 17:02 (2)	18:24	15 17:57 (3)	20:18	12	19:52 (5)	21:10	44	20:40 (8)	21:53	24	21:19 (7)
8	08:44		15:37 (1)	08:06	16:47 (2)	07:08	17:42 (3)	06:56		19:39 (5)	05:53		19:56 (6)	05:15		20:56 (7)
	16:40	28	16:05 (1)	17:33	17 17:04 (2)	18:26	17 17:59 (3)	20:20	15	19:54 (5)	21:12	44	20:40 (8)	21:54	24	21:20 (7)
9	08:43		15:38 (1)	08:04	16:47 (2)	07:05	17:42 (3)	06:53		19:38 (5)	05:51		19:57 (6)	05:14		20:55 (7)
	16:41	29	16:07 (1)	17:35	19 17:06 (2)	18:27	20 18:02 (3)	20:22	17	19:55 (5)	21:13	42	20:39 (8)	21:55	26	21:21 (7)
10	08:42		15:38 (1)	08:02	16:46 (2)	07:03	17:41 (3)	06:51		19:37 (5)	05:49		19:58 (6)	05:14		20:56 (7)
	16:43	30	16:08 (1)	17:37	22 17:08 (2)	18:29	22 18:03 (3)	20:24	20	19:57 (5)	21:15	39	20:37 (8)	21:55	26	21:22 (7)
11	08:42		15:38 (1)	08:01	16:46 (2)	07:01	17:42 (3)	06:49		19:37 (5)	05:48		19:59 (6)	05:13		20:57 (7)
	16:44	31	16:09 (1)	17:39	24 17:10 (2)	18:31	23 18:05 (3)	20:25	22	19:59 (5)	21:17	36	20:35 (8)	21:56	26	21:23 (7)
12	08:41		15:39 (1)	07:59	16:46 (2)	06:59	17:42 (3)	06:46		19:37 (5)	05:46		19:59 (6)	05:13		20:56 (7)
	16:46	30	16:09 (1)	17:41	27 17:13 (2)	18:33	25 18:07 (3)	20:27	24	20:01 (5)	21:18	29	20:28 (6)	21:57	27	21:23 (7)
13	08:40		15:39 (1)	07:57	16:46 (2)	06:56	17:42 (3)	06:44		19:36 (5)	05:44		20:00 (6)	05:13		20:56 (7)
	16:47	30	16:09 (1)	17:43	29 17:15 (2)	18:35	24 18:06 (3)	20:29	25	20:01 (5)	21:20	27	20:27 (6)	21:58	27	21:23 (7)
14	08:40		15:40 (1)	07:55	16:46 (2)	06:54	17:43 (3)	06:42		19:37 (5)	05:43		20:02 (6)	05:13		20:57 (7)
	16:49	29	16:09 (1)	17:45	31 17:17 (2)	18:36	22 18:05 (3)	20:31	26	20:03 (5)	21:21	24	20:26 (6)	21:58	27	21:24 (7)
15	08:39		15:40 (1)	07:53	16:47 (2)	06:52	17:45 (3)	06:40		19:37 (5)	05:41		20:03 (6)	05:12		20:57 (7)
	16:50	30	16:10 (1)	17:47	31 17:18 (2)	18:38	24 18:13 (4)	20:32	26	20:03 (5)	21:23	22	20:25 (6)	21:59	28	21:25 (7)
16	08:38		15:41 (1)	07:51	16:47 (2)	06:49	17:46 (3)	06:37		19:38 (5)	05:39		20:04 (6)	05:12		20:57 (7)
	16:52	29	16:10 (1)	17:49	30 17:17 (2)	18:40	24 18:14 (4)	20:34	24	20:02 (5)	21:25	19	20:23 (6)	21:59	28	21:25 (7)
17	08:37		15:42 (1)	07:49	16:48 (2)	06:47	17:49 (3)	06:35		19:39 (5)	05:38		20:07 (6)	05:12		20:58 (7)
	16:54	28	16:10 (1)	17:51	29 17:17 (2)	18:42	21 18:16 (4)	20:36	22	20:01 (5)	21:26	15	20:22 (6)	22:00	28	21:26 (7)
18	08:36		15:43 (1)	07:47	16:48 (2)	06:45	18:02 (4)	06:33		19:40 (5)	05:36		20:09 (6)	05:12		20:58 (7)
	16:55	27	16:10 (1)	17:52	27 17:15 (2)	18:43	16 18:18 (4)	20:37	20	20:10 (6)	21:28	9	20:18 (6)	22:00	28	21:26 (7)
19	08:35		15:44 (1)	07:45	16:49 (2)	06:42	18:01 (4)	06:31		19:42 (5)	05:35			05:12		20:58 (7)
	16:57	26	16:10 (1)	17:54	25 17:14 (2)	18:45	18 18:19 (4)	20:39	20	20:12 (6)	21:29			22:01	28	21:26 (7)
20	08:34		15:45 (1)	07:43	16:50 (2)	06:40	18:00 (4)	06:29		19:44 (5)	05:34			05:12		20:58 (7)
	16:59	25	16:10 (1)	17:56	23 17:13 (2)	18:47	21 18:21 (4)	20:41	18	20:13 (6)	21:31			22:01	28	21:26 (7)
21	08:33		15:46 (1)	07:41	16:52 (2)	06:38	17:59 (4)	06:27		20:02 (6)	05:32		21:00 (7)	05:12		20:58 (7)
	17:00	23	16:09 (1)	17:58	20 17:12 (2)	18:49	24 18:23 (4)	20:43	13	20:15 (6)	21:32	1	21:01 (7)	22:01	28	21:26 (7)
22	08:32		15:47 (1)	07:39	16:54 (2)	06:35	17:58 (4)	06:24		20:01 (6)	05:31		20:58 (7)	05:13		20:59 (7)
	17:02	21	16:08 (1)	18:00	16 17:10 (2)	18:50	27 18:25 (4)	20:44	15	20:16 (6)	21:34	4	21:02 (7)	22:01	28	21:27 (7)
23	08:30		15:49 (1)	07:36	16:58 (2)	06:33	17:58 (4)	06:22		20:00 (6)	05:30		20:57 (7)	05:13		20:59 (7)
	17:04	19	16:08 (1)	18:02	8 17:06 (2)	18:52	29 18:27 (4)	20:46	18	20:18 (6)	21:35	6	21:03 (7)	22:01	28	21:27 (7)
24	08:29		15:50 (1)	07:34		06:31	17:56 (4)	06:20		19:59 (6)	05:28		20:57 (7)	05:13		20:59 (7)
	17:06	16	16:06 (1)	18:04		18:54	32 18:28 (4)	20:48	21	20:20 (6)	21:36	7	21:04 (7)	22:02	28	21:27 (7)
25	08:28		15:53 (1)	07:32		06:28	17:57 (4)	06:18		19:58 (6)	05:27		20:56 (7)	05:13		21:00 (7)
	17:07	11	16:04 (1)	18:05		18:56	33 18:30 (4)	20:50	23	20:21 (6)	21:38	10	21:06 (7)	22:02	28	21:28 (7)
26	08:27		15:58 (1)	07:30		06:26	17:57 (4)	06:16		19:57 (6)	05:26		20:56 (7)	05:14		20:59 (7)
	17:09	1	15:59 (1)	18:07		18:57	35 18:32 (4)	20:51	26	20:23 (6)	21:39	11	21:07 (7)	22:02	28	21:27 (7)
27	08:25			07:28		06:23	17:56 (4)	06:14		19:56 (6)	05:25		20:56 (7)	05:14		21:00 (7)
	17:11			18:09		18:59	35 18:31 (4)	20:53	28	20:24 (6)	21:40	12	21:08 (7)	22:02	28	21:28 (7)
28	08:24			07:26		06:21	17:57 (4)	06:12		19:56 (6)	05:24		20:55 (7)	05:15		21:00 (7)
	17:13			18:11		19:01	34 18:31 (4)	20:55	30	20:26 (8)	21:42	14	21:09 (7)	22:01	27	21:27 (7)
29	08:22					07:19	18:57 (4)	06:10		19:55 (6)	05:23		20:55 (7)	05:15		21:01 (7)
	17:15					20:03	34 19:31 (4)	20:56	32	20:27 (8)	21:43	15	21:10 (7)	22:01	27	21:28 (7)
30	08:21					07:16	18:57 (4)	06:08		19:56 (6)	05:22		20:55 (7)	05:16		21:00 (7)
	17:17					20:04	32 19:29 (4)	20:58	34	20:30 (8)	21:44	16	21:11 (7)	22:01	27	21:27 (7)
31	08:19					07:14	18:58 (4)				05:21		20:56 (7)			
	17:18					20:06	30 19:28 (4)				21:45	17	21:13 (7)			
Potential sun hours	257		277			367		417			487			501		
Total, worst case		634		425		669		647			701			778		
Sun reduction		0.22		0.24		0.28		0.38			0.39			0.35		
Oper. time red.		1.00		1.00		1.00		1.00			1.00			1.00		
Wind dir. red.		0.62		0.60		0.60		0.61			0.62			0.64		
Total reduction		0.13		0.15		0.17		0.23			0.25			0.22		
Total, real		85		62		112		151			173			172		

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

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SHADOW - Calendar

Calculation: 6839 Garrane WF Worst Case - V150 **Shadow receptor:** DH - 179

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	July		August		September		October		November		December		
1	05:17		21:01 (7)	05:54		20:10 (6)	06:45		19:36 (5)	07:35		18:21 (3)	07:30		16:16 (2)	08:21		15:20 (1)
	22:01	26	21:27 (7)	21:28	29	20:39 (6)	20:25	22	19:58 (5)	19:14	25	18:46 (3)	17:07	22	16:38 (2)	16:26	31	15:51 (1)
2	05:17		21:00 (7)	05:55		20:08 (6)	06:46		19:36 (5)	07:36		18:21 (3)	07:31		16:16 (2)	08:23		15:21 (1)
	22:00	26	21:26 (7)	21:26	38	20:46 (8)	20:23	20	19:56 (5)	19:12	24	18:45 (3)	17:05	20	16:36 (2)	16:25	31	15:52 (1)
3	05:18		21:01 (7)	05:57		20:08 (6)	06:48		19:36 (5)	07:38		18:19 (3)	07:33		16:17 (2)	08:24		15:21 (1)
	22:00	25	21:26 (7)	21:25	40	20:48 (8)	20:20	17	19:53 (5)	19:10	23	18:42 (3)	17:04	17	16:34 (2)	16:25	29	15:50 (1)
4	05:19		21:01 (7)	05:59		20:07 (6)	06:50		19:36 (5)	07:40		18:19 (3)	07:35		16:17 (2)	08:26		15:22 (1)
	22:00	25	21:26 (7)	21:23	42	20:49 (8)	20:18	15	19:51 (5)	19:07	21	18:40 (3)	17:02	15	16:32 (2)	16:24	28	15:50 (1)
5	05:20		21:02 (7)	06:00		20:06 (6)	06:51		19:36 (5)	07:42		18:19 (3)	07:37		16:18 (2)	08:27		15:22 (1)
	21:59	24	21:26 (7)	21:21	44	20:50 (8)	20:16	12	19:48 (5)	19:05	18	18:37 (3)	17:00	12	16:30 (2)	16:24	27	15:49 (1)
6	05:20		21:02 (7)	06:02		20:05 (6)	06:53		19:36 (5)	07:43		18:19 (3)	07:39		16:19 (2)	08:28		15:22 (1)
	21:59	23	21:25 (7)	21:19	44	20:49 (8)	20:13	10	19:46 (5)	19:03	16	18:35 (3)	16:58	9	16:28 (2)	16:23	26	15:48 (1)
7	05:21		21:01 (7)	06:03		20:05 (6)	06:55		19:04 (4)	07:45		18:19 (3)	07:41		16:20 (2)	08:30		15:23 (1)
	21:58	23	21:24 (7)	21:17	43	20:48 (8)	20:11	12	19:44 (5)	19:01	14	18:33 (3)	16:56	6	16:26 (2)	16:23	25	15:48 (1)
8	05:22		21:02 (7)	06:05		20:04 (6)	06:56		18:59 (4)	07:47		18:19 (3)	07:42		16:21 (2)	08:31		15:23 (1)
	21:57	22	21:24 (7)	21:16	42	20:46 (8)	20:09	18	19:41 (5)	18:58	11	18:30 (3)	16:55	3	16:24 (2)	16:22	24	15:47 (1)
9	05:23		21:02 (7)	06:07		20:04 (6)	06:58		18:56 (4)	07:48		18:20 (3)	07:44			08:32		15:23 (1)
	21:57	21	21:23 (7)	21:14	40	20:44 (8)	20:06	21	19:17 (4)	18:56	8	18:28 (3)	16:53			16:22	24	15:47 (1)
10	05:24		21:02 (7)	06:08		20:05 (6)	07:00		18:53 (4)	07:50		18:21 (3)	07:46			08:33		15:24 (1)
	21:56	20	21:22 (7)	21:12	38	20:43 (8)	20:04	24	19:17 (4)	18:54	5	18:26 (3)	16:51			16:22	23	15:47 (1)
11	05:25		21:03 (7)	06:10		20:04 (6)	07:01		18:52 (4)	07:52		18:22 (3)	07:48			08:34		15:25 (1)
	21:55	19	21:22 (7)	21:10	37	20:41 (8)	20:02	27	19:19 (4)	18:51	2	18:24 (3)	16:50			16:22	22	15:47 (1)
12	05:26		21:03 (7)	06:12		20:04 (6)	07:03		18:50 (4)	07:54			07:50			08:35		15:25 (1)
	21:54	18	21:21 (7)	21:08	35	20:39 (8)	19:59	30	19:20 (4)	18:49			16:48			16:22	21	15:46 (1)
13	05:28		21:03 (7)	06:13		20:03 (6)	07:05		18:48 (4)	07:55			07:51			08:36		15:26 (1)
	21:53	17	21:20 (7)	21:06	34	20:37 (8)	19:57	32	19:20 (4)	18:47			16:47			16:21	20	15:46 (1)
14	05:29		21:03 (7)	06:15		20:04 (6)	07:06		18:48 (4)	07:57			07:53			08:37		15:26 (1)
	21:52	16	21:19 (7)	21:04	32	20:36 (8)	19:55	33	19:21 (4)	18:45			16:45			16:21	20	15:46 (1)
15	05:30		21:05 (7)	06:16		20:03 (6)	07:08		18:46 (4)	07:59			07:55			08:38		15:27 (1)
	21:51	14	21:19 (7)	21:02	30	20:33 (8)	19:52	34	19:20 (4)	18:42			16:44			16:22	19	15:46 (1)
16	05:31		21:05 (7)	06:18		20:04 (6)	07:10		18:46 (4)	08:01			07:57		15:31 (1)	08:39		15:27 (1)
	21:50	13	21:18 (7)	21:00	28	20:32 (6)	19:50	35	19:21 (4)	18:40			16:42	2	15:33 (1)	16:22	19	15:46 (1)
17	05:32		21:05 (7)	06:20		20:04 (6)	07:11		18:45 (4)	08:02			07:59		15:26 (1)	08:40		15:27 (1)
	21:49	12	21:17 (7)	20:58	25	20:29 (6)	19:48	36	19:21 (4)	18:38			16:41	12	15:38 (1)	16:22	19	15:46 (1)
18	05:34		21:06 (7)	06:21		20:04 (6)	07:13		18:44 (4)	08:04			08:00		15:24 (1)	08:41		15:28 (1)
	21:48	10	21:16 (7)	20:56	24	20:28 (6)	19:45	34	19:18 (4)	18:36			16:40	16	15:40 (1)	16:22	18	15:46 (1)
19	05:35		21:06 (7)	06:23		20:04 (6)	07:15		18:44 (4)	08:06		17:27 (2)	08:02		15:23 (1)	08:41		15:29 (1)
	21:47	9	21:15 (7)	20:54	21	20:25 (6)	19:43	32	19:16 (4)	18:34	11	17:38 (2)	16:38	19	15:42 (1)	16:22	18	15:47 (1)
20	05:36		21:08 (7)	06:25		20:05 (6)	07:16		18:44 (4)	08:08		17:24 (2)	08:04		15:22 (1)	08:42		15:29 (1)
	21:46	6	21:14 (7)	20:51	18	20:23 (6)	19:40	30	19:14 (4)	18:32	17	17:41 (2)	16:37	21	15:43 (1)	16:23	18	15:47 (1)
21	05:38		21:08 (7)	06:26		20:07 (6)	07:18		18:43 (4)	08:10		17:22 (2)	08:05		15:22 (1)	08:43		15:30 (1)
	21:44	5	21:13 (7)	20:49	15	20:22 (6)	19:38	28	19:11 (4)	18:29	21	17:43 (2)	16:36	23	15:45 (1)	16:23	17	15:47 (1)
22	05:39		21:09 (7)	06:28		20:07 (6)	07:20		18:44 (4)	08:11		17:20 (2)	08:07		15:21 (1)	08:43		15:30 (1)
	21:43	2	21:11 (7)	20:47	12	20:19 (6)	19:36	25	19:09 (4)	18:27	24	17:44 (2)	16:35	25	15:46 (1)	16:24	17	15:47 (1)
23	05:40		21:09 (7)	06:30		19:48 (5)	07:21		18:44 (4)	08:13		17:19 (2)	08:09		15:20 (1)	08:44		15:31 (1)
	21:42	1	21:10 (7)	20:45	19	20:17 (6)	19:33	23	19:07 (4)	18:25	26	17:45 (2)	16:33	26	15:46 (1)	16:24	17	15:48 (1)
24	05:42			06:31		19:45 (5)	07:23		18:44 (4)	08:15		17:18 (2)	08:10		15:20 (1)	08:44		15:31 (1)
	21:40			20:43	20	20:15 (6)	19:31	19	19:03 (4)	18:23	28	17:46 (2)	16:32	27	15:47 (1)	16:25	18	15:49 (1)
25	05:43		20:23 (6)	06:33		19:43 (5)	07:25		18:45 (4)	07:17		16:17 (2)	08:12		15:20 (1)	08:44		15:31 (1)
	21:39	3	20:26 (6)	20:41	20	20:13 (6)	19:29	16	19:01 (4)	17:21	30	16:47 (2)	16:31	28	15:48 (1)	16:25	18	15:49 (1)
26	05:45		20:18 (6)	06:35		19:41 (5)	07:26		18:34 (3)	07:19		16:17 (2)	08:14		15:20 (1)	08:45		15:32 (1)
	21:38	12	20:30 (6)	20:38	22	20:03 (5)	19:26	17	18:59 (4)	17:19	30	16:47 (2)	16:30	29	15:49 (1)	16:26	19	15:51 (1)
27	05:46		20:16 (6)	06:36		19:40 (5)	07:28		18:28 (3)	07:20		16:16 (2)	08:15		15:20 (1)	08:45		15:32 (1)
	21:36	17	20:33 (6)	20:36	24	20:04 (5)	19:24	24	18:56 (4)	17:17	31	16:47 (2)	16:29	30	15:50 (1)	16:27	19	15:51 (1)
28	05:48		20:14 (6)	06:38		19:39 (5)	07:30		18:26 (3)	07:22		16:16 (2)	08:17		15:20 (1)	08:45		15:33 (1)
	21:35	20	20:34 (6)	20:34	26	20:05 (5)	19:22	24	18:54 (4)	17:15	30	16:46 (2)	16:28	30	15:50 (1)	16:28	19	15:52 (1)
29	05:49		20:13 (6)	06:40		19:38 (5)	07:31		18:25 (3)	07:24		16:16 (2)	08:18		15:20 (1)	08:45		15:33 (1)
	21:33	23	20:36 (6)	20:32	26	20:04 (5)	19:19	22	18:52 (4)	17:13	28	16:44 (2)	16:28	30	15:50 (1)	16:28	20	15:53 (1)
30	05:51		20:12 (6)	06:41		19:37 (5)	07:33		18:22 (3)	07:26		16:16 (2)	08:20		15:21 (1)	08:45		15:34 (1)
	21:31	25	20:37 (6)	20:29	25	20:02 (5)	19:17	23	18:45 (3)	17:11	26	16:42 (2)	16:27	30	15:51 (1)	16:29	20	15:54 (1)
31	05:52		20:11 (6)	06:43		19:36 (5)				07:28		16:16 (2)				08:46		15:34 (1)
	21:30	28	20:39 (6)	20:27	23	19:59 (5)				17:09	24	16:40 (2)				16:30	21	15:55 (1)
Potential sun hours	504			455			381			331			264			241		
Total, worst case		505			916			715			493			452			667	
Sun reduction		0.33			0.35			0.34			0.28			0.26			0.22	
Oper. time red.		1.00			1.00			1.00			1.00			1.00			1.00	
Wind dir. red.		0.63			0.62			0.60			0.60			0.61			0.62	
Total reduction		0.21			0.22			0.20			0.17			0.16			0.13	
Total, real		106			201			146			83			72			90	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

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Kathlyn Feeney / kfeeney@jodireland.com

SHADOW - Calendar

Calculation: 6839 Garrane WF Worst Case - V150 **Shadow receptor:** DI - 180

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:45	08:18	07:23	07:12	06:06	05:20	05:17	05:54	06:45	07:35	07:30	08:21
	16:32	17:20	18:13	20:08	21:00	21:47	22:01	21:28	20:25	19:15	17:07	16:26
2	08:45	08:16	07:21	07:10	06:04	05:19	05:17	05:56	06:46	07:36	07:31	08:23
	16:33	17:22	18:15	20:10	21:02	21:48	22:00	21:26	20:23	19:12	17:06	16:26
3	08:45	08:15	07:19	07:07	06:02	05:18	05:18	05:57	06:48	07:38	07:33	08:24
	16:34	17:24	18:17	20:11	21:03	21:49	22:00	21:25	20:20	19:10	17:04	16:25
4	08:45	08:13	07:17	07:05	06:00	05:17	05:19	05:59	06:50	07:40	07:35	08:26
	16:35	17:26	18:18	20:13	21:05	21:50	22:00	21:23	20:18	19:08	17:02	16:24
5	08:45	08:11	07:15	07:03	05:58	05:17	05:20	06:00	06:51	07:42	07:37	08:27
	16:36	17:28	18:20	20:15	21:07	21:51	21:59	21:21	20:16	19:05	17:00	16:24
6	08:44	08:10	07:12	07:00	05:57	05:16	05:21	06:02	06:53	07:43	07:39	08:28
	16:38	17:30	18:22	20:17	21:08	21:52	21:59	21:19	20:13	19:03	16:58	16:23
7	08:44	08:08	07:10	06:58	05:55	05:15	05:22	06:04	06:55	07:45	07:41	08:30
	16:39	17:32	18:24	20:18	21:10	21:53	21:58	21:17	20:11	19:01	16:57	16:23
8	08:44	08:06	07:08	06:56	05:53	05:15	05:22	06:05	06:56	07:47	07:42	08:31
	16:40	17:34	18:26	20:20	21:12	21:54	21:57	21:16	20:09	18:58	16:55	16:23
9	08:43	08:04	07:05	06:53	05:51	05:14	05:23	06:07	06:58	07:48	07:44	08:32
	16:42	17:35	18:27	20:22	21:13	21:55	21:57	21:14	20:06	18:56	16:53	16:22
10	08:42	08:02	07:03	06:51	05:49	05:14	05:24	06:08	07:00	07:50	07:46	08:33
	16:43	17:37	18:29	20:24	21:15	21:55	21:56	21:12	20:04	18:54	16:52	16:22
11	08:42	08:01	07:01	06:49	05:48	05:14	05:26	06:10	07:01	07:52	07:48	08:34
	16:44	17:39	18:31	20:25	21:17	21:56	21:55	21:10	20:02	18:51	16:50	16:22
12	08:41	07:59	06:59	06:47	05:46	05:13	05:27	06:12	07:03	07:54	07:50	08:35
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	16:47	17:43	18:35	20:29	21:20	21:58	21:53	21:06	19:57	18:47	16:47	16:22
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16	08:38	07:51	06:49	06:38	05:40	05:12	05:31	06:18	07:10	08:01	07:57	08:39
	16:52	17:49	18:40	20:34	21:25	21:59	21:50	21:00	19:50	18:40	16:42	16:22
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	17:19		20:06		21:45		21:30	20:27		17:09		16:30
Potential sun hours	257	277	367	417	487	501	504	455	381	331	265	241
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

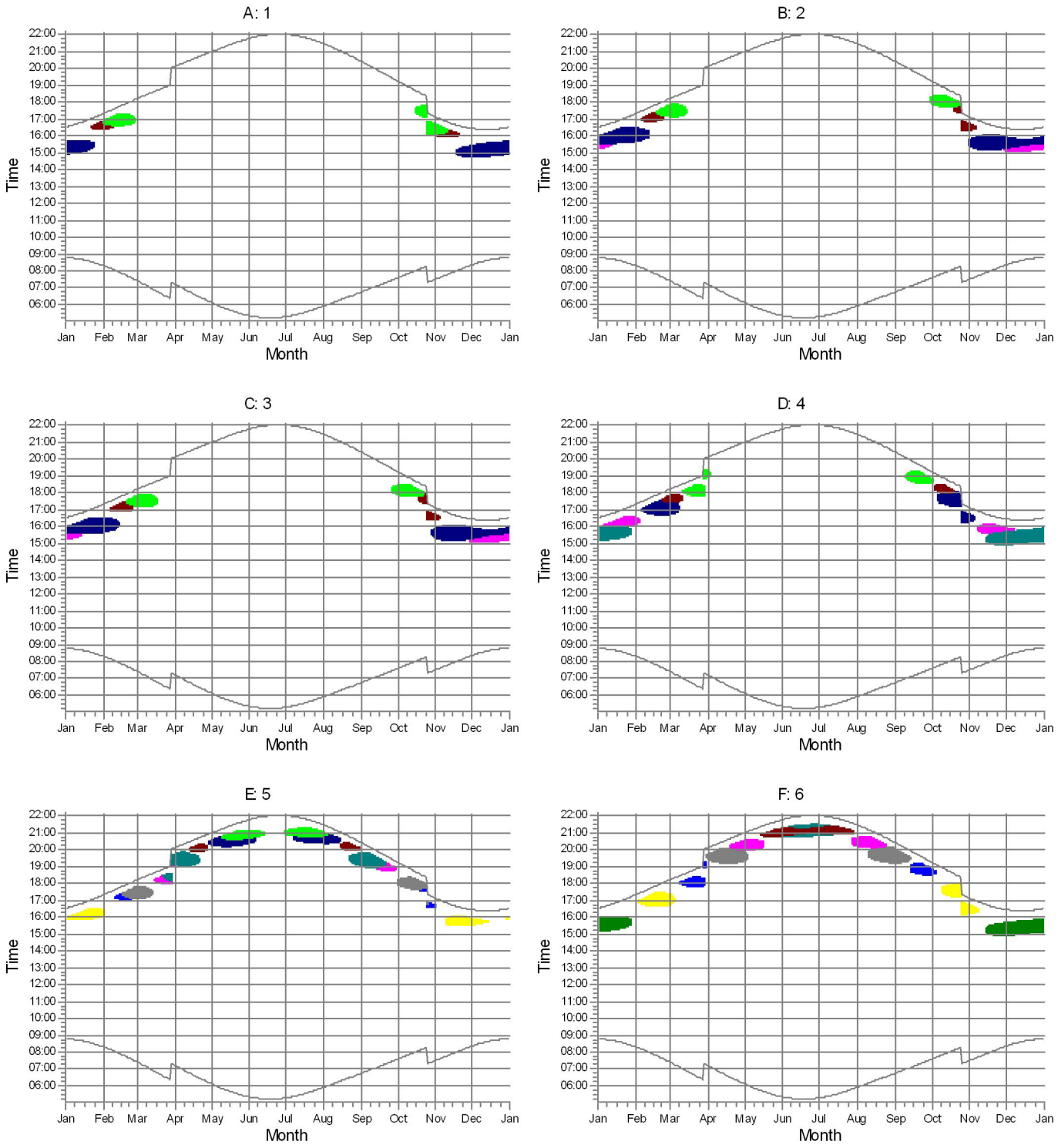
Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker Last time (hh:mm) with flicker	(WTG causing flicker first time) (WTG causing flicker last time)

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SHADOW - Calendar, graphical

Calculation: 6839 Garrane WF Worst Case - V150

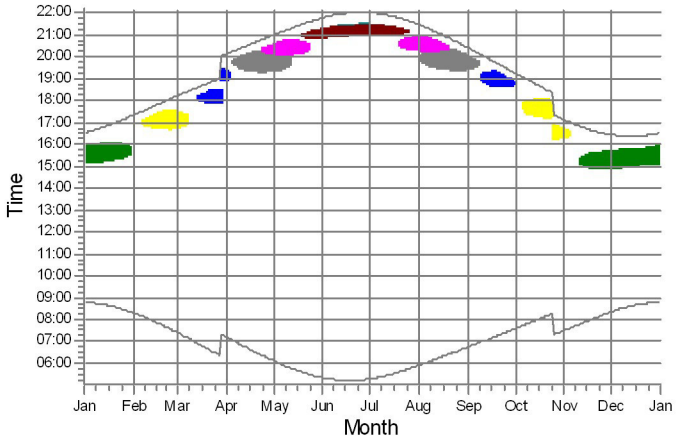


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Calculated:
09/06/2025 13:54/4.0.552

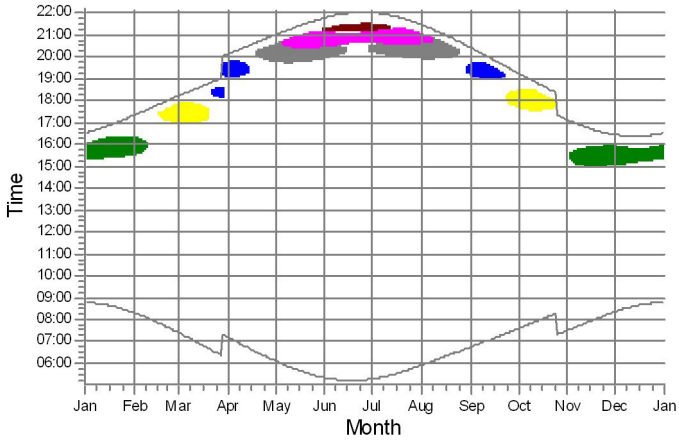
SHADOW - Calendar, graphical

Calculation: 6839 Garrane WF Worst Case - V150

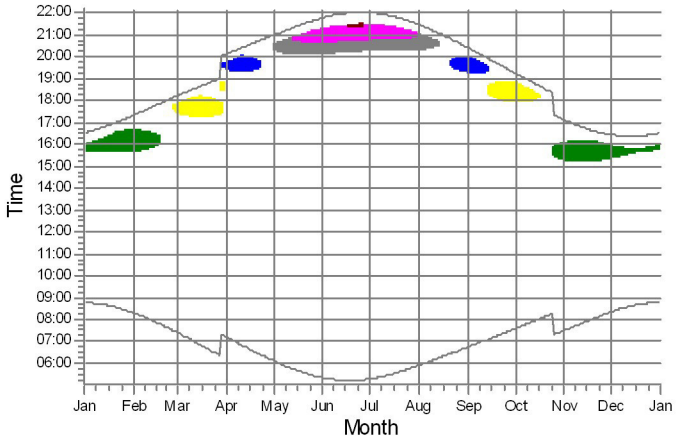
G: 7



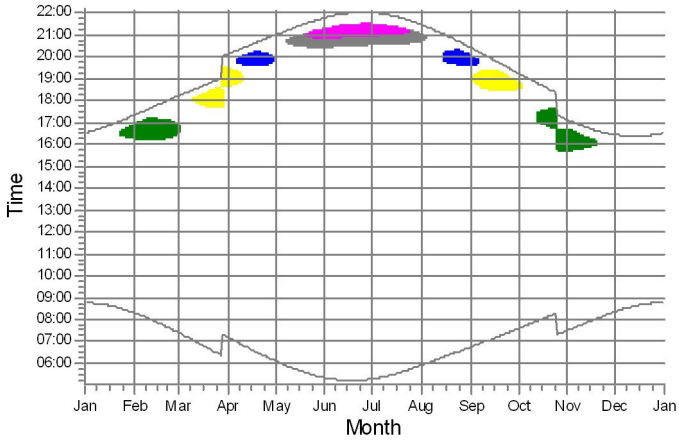
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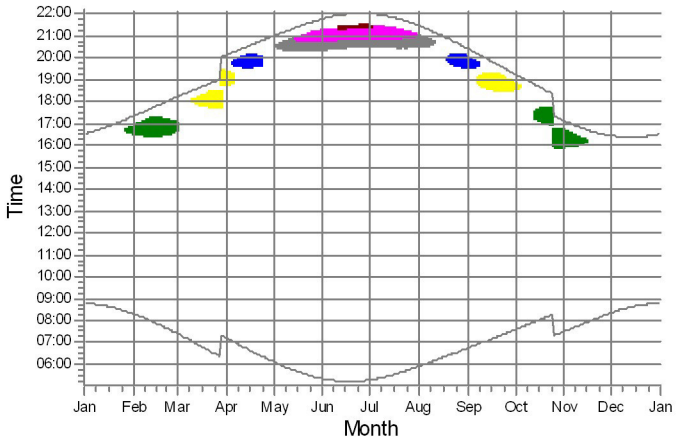
I: 9



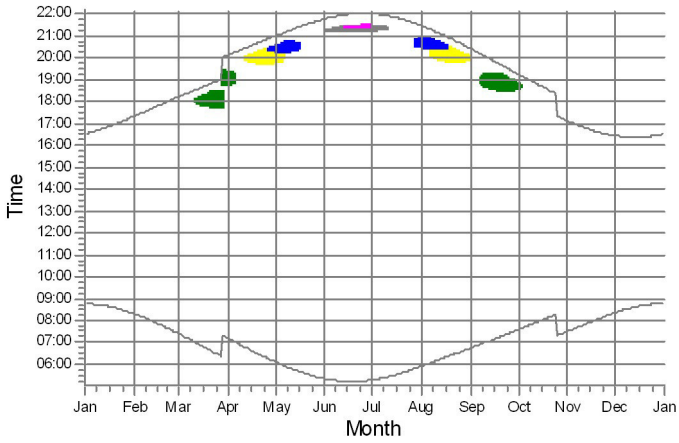
J: 10



K: 11



L: 12



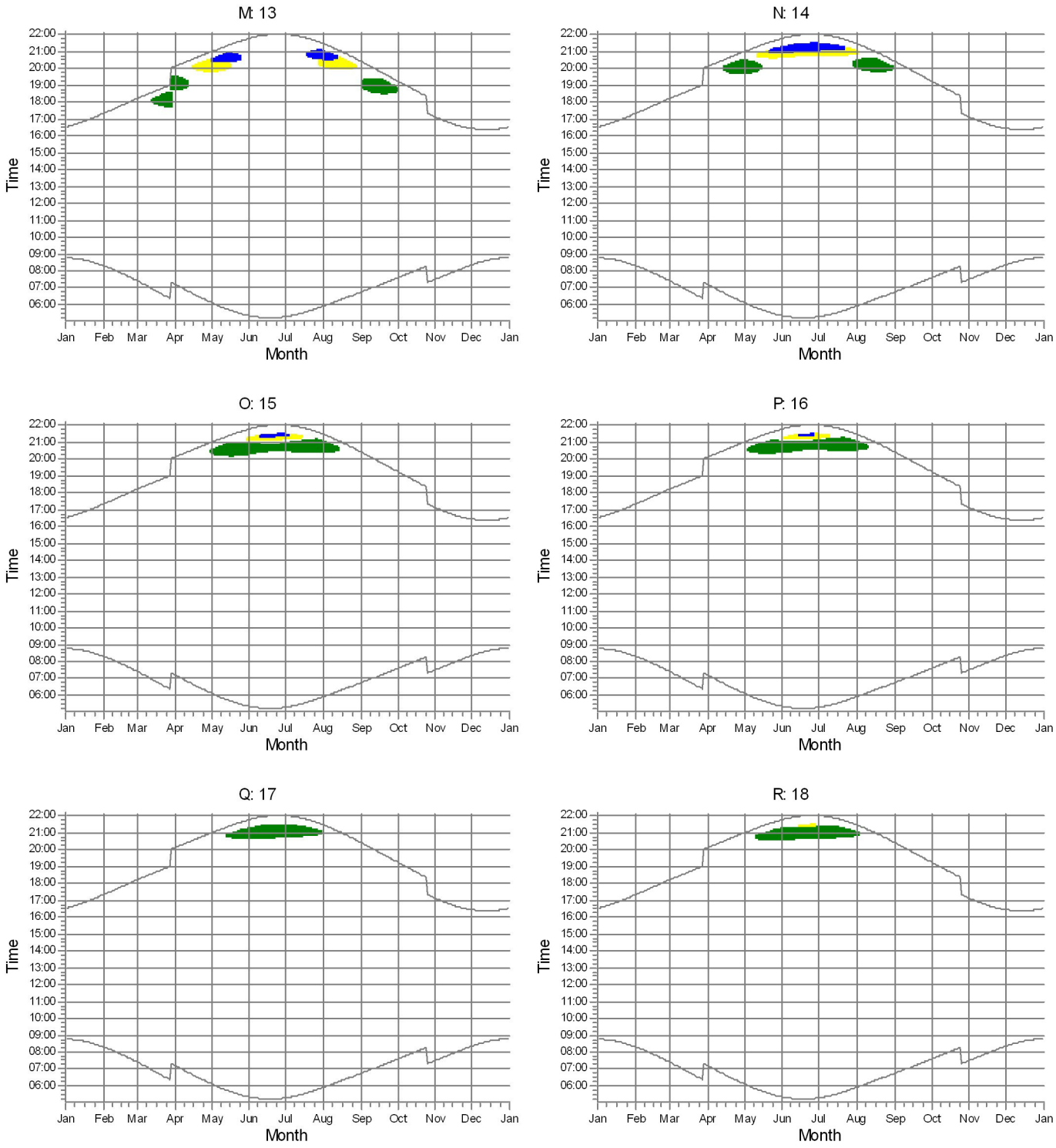
WTGs

	1: T01		3: T03		5: T05		8: T08
	2: T02		4: T04		6: T06		

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SHADOW - Calendar, graphical

Calculation: 6839 Garrane WF Worst Case - V150

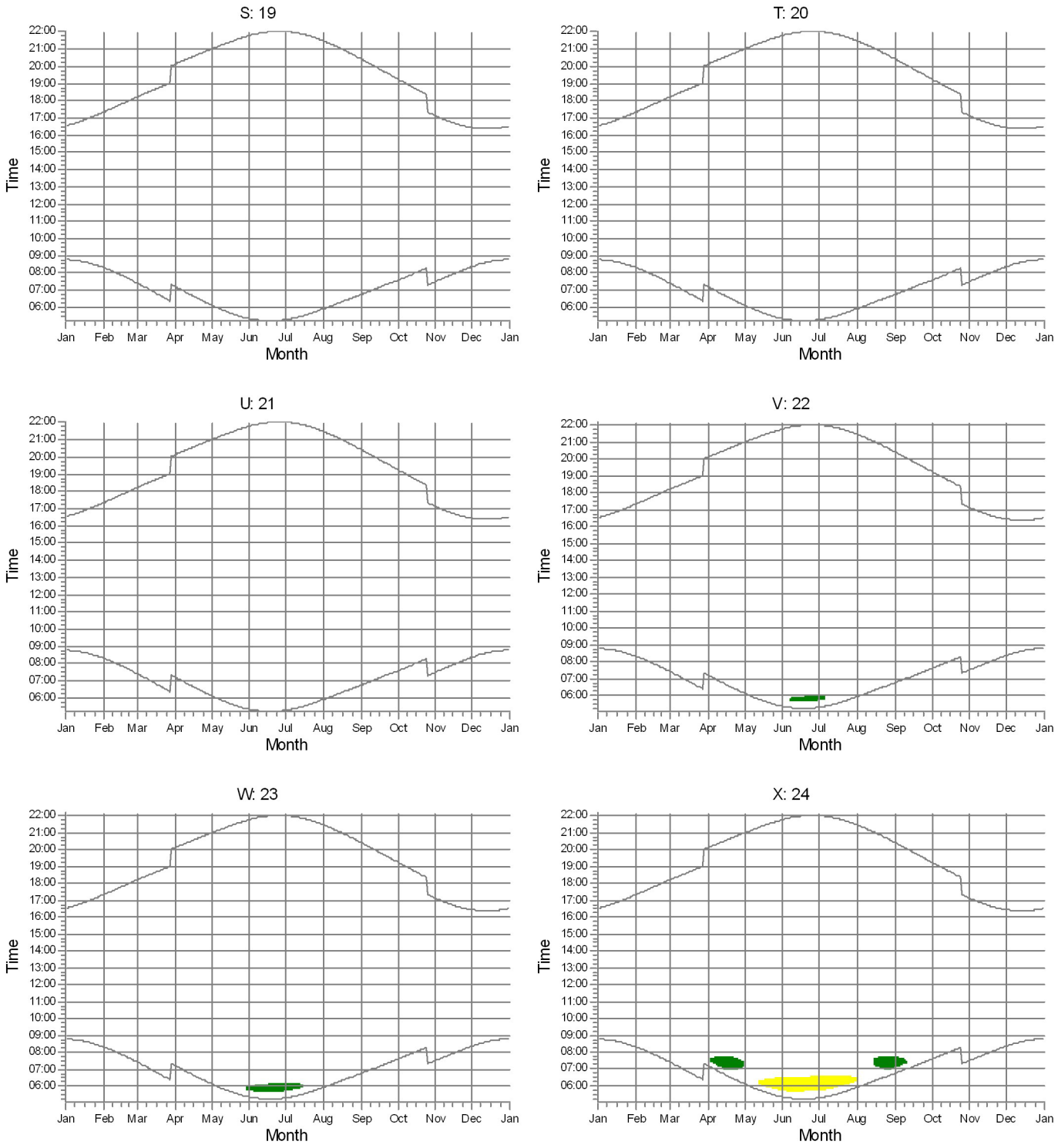


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SHADOW - Calendar, graphical

Calculation: 6839 Garrane WF Worst Case - V150

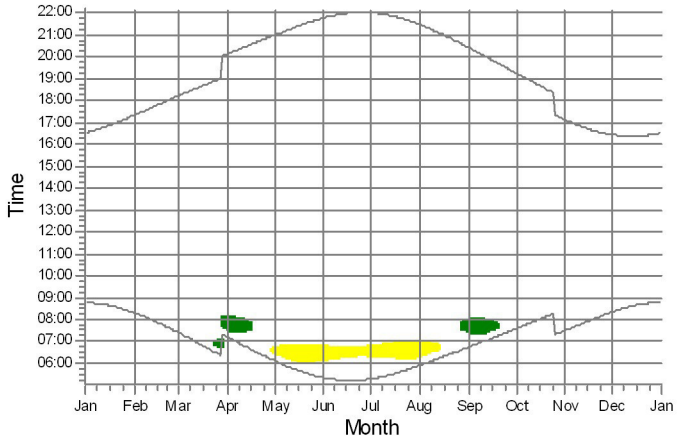


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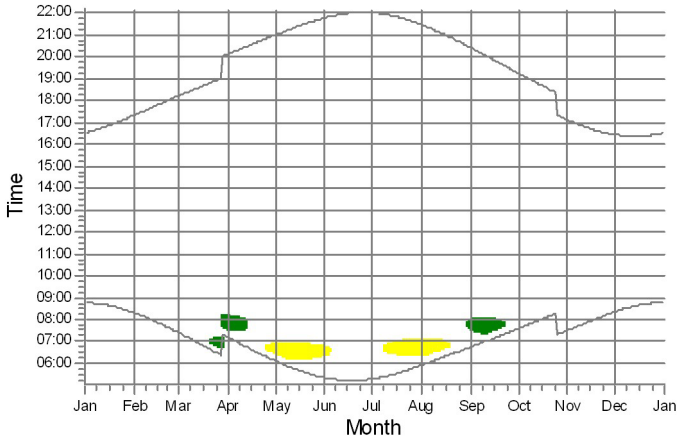
SHADOW - Calendar, graphical

Calculation: 6839 Garrane WF Worst Case - V150

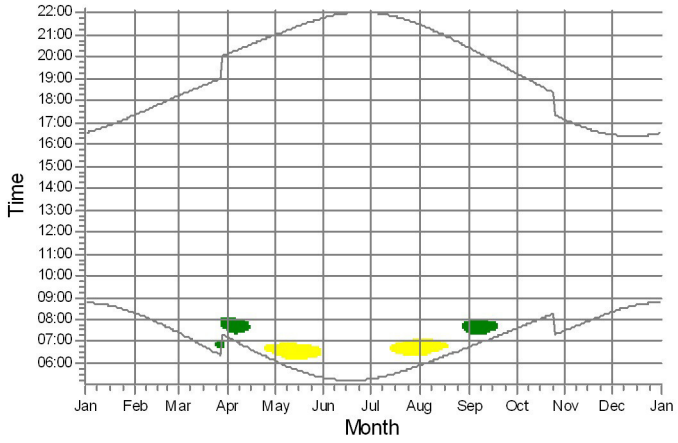
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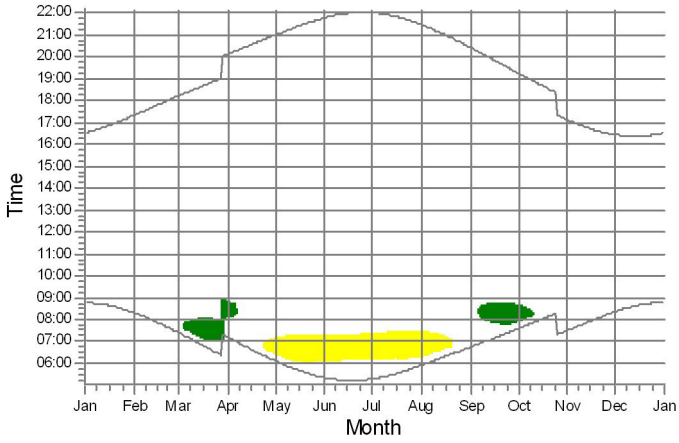
Z: 26



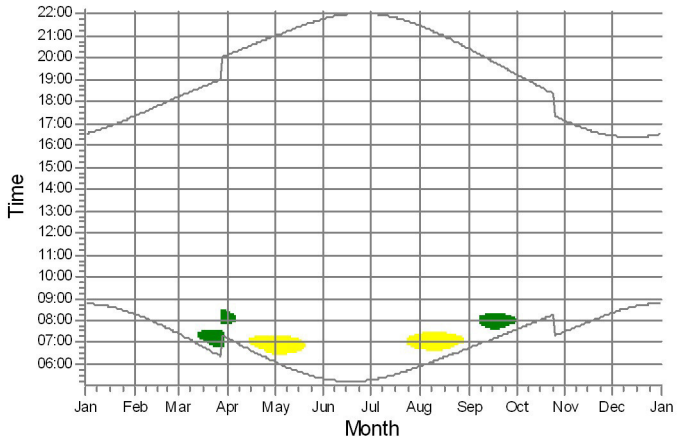
AA: 27



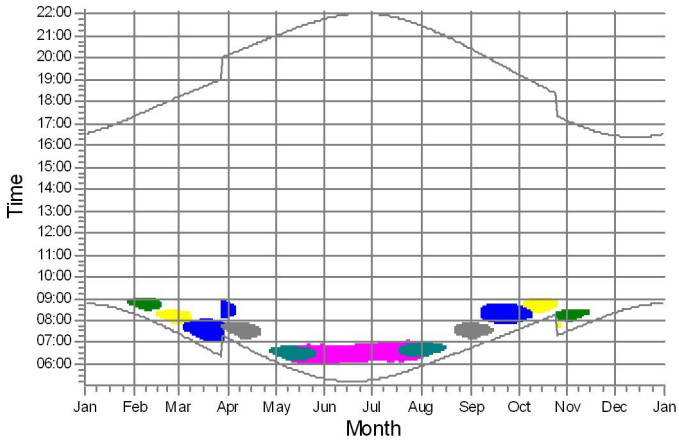
AB: 28



AC: 29



AD: 30



WTGs

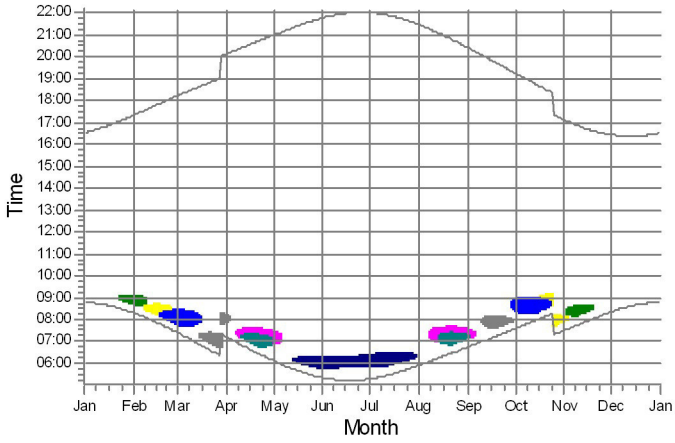
	1: T01		3: T03		5: T05
	2: T02		4: T04		6: T06

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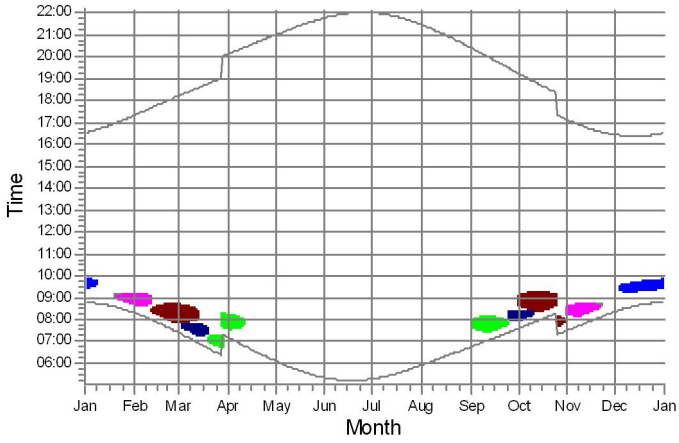
SHADOW - Calendar, graphical

Calculation: 6839 Garrane WF Worst Case - V150

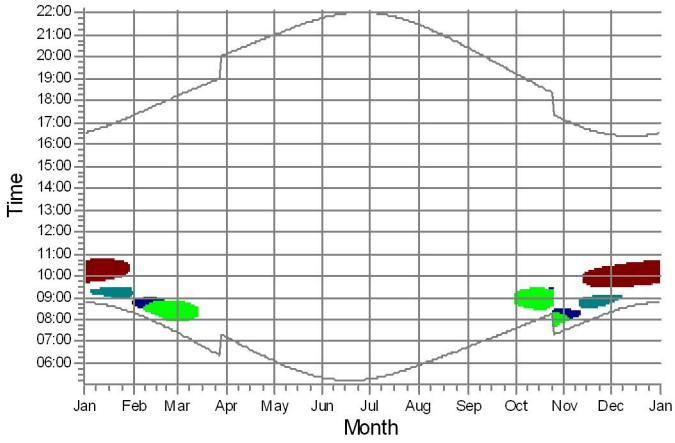
AE: 31



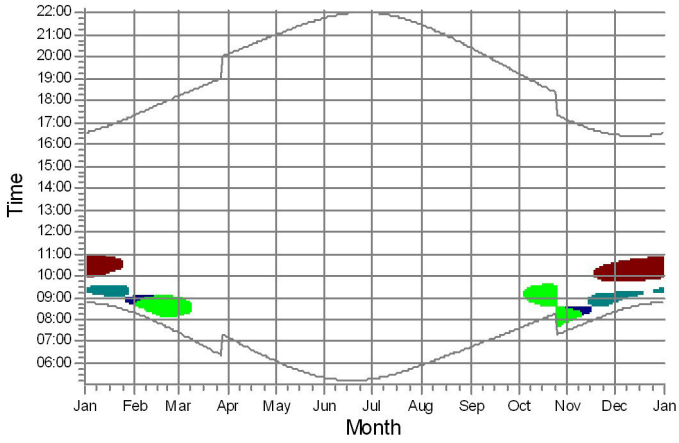
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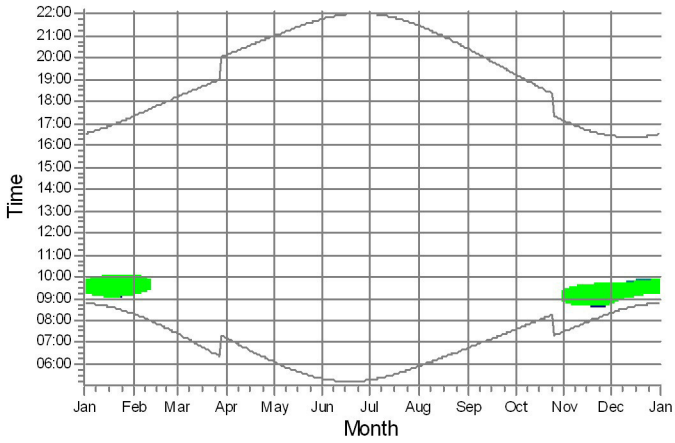
AG: 33



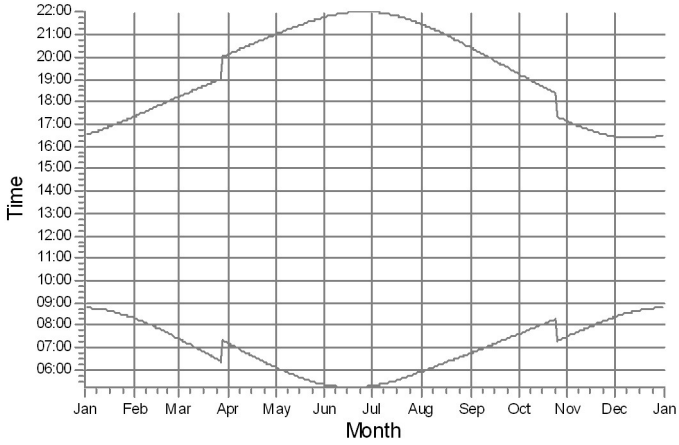
AH: 34



AI: 35



AJ: 36



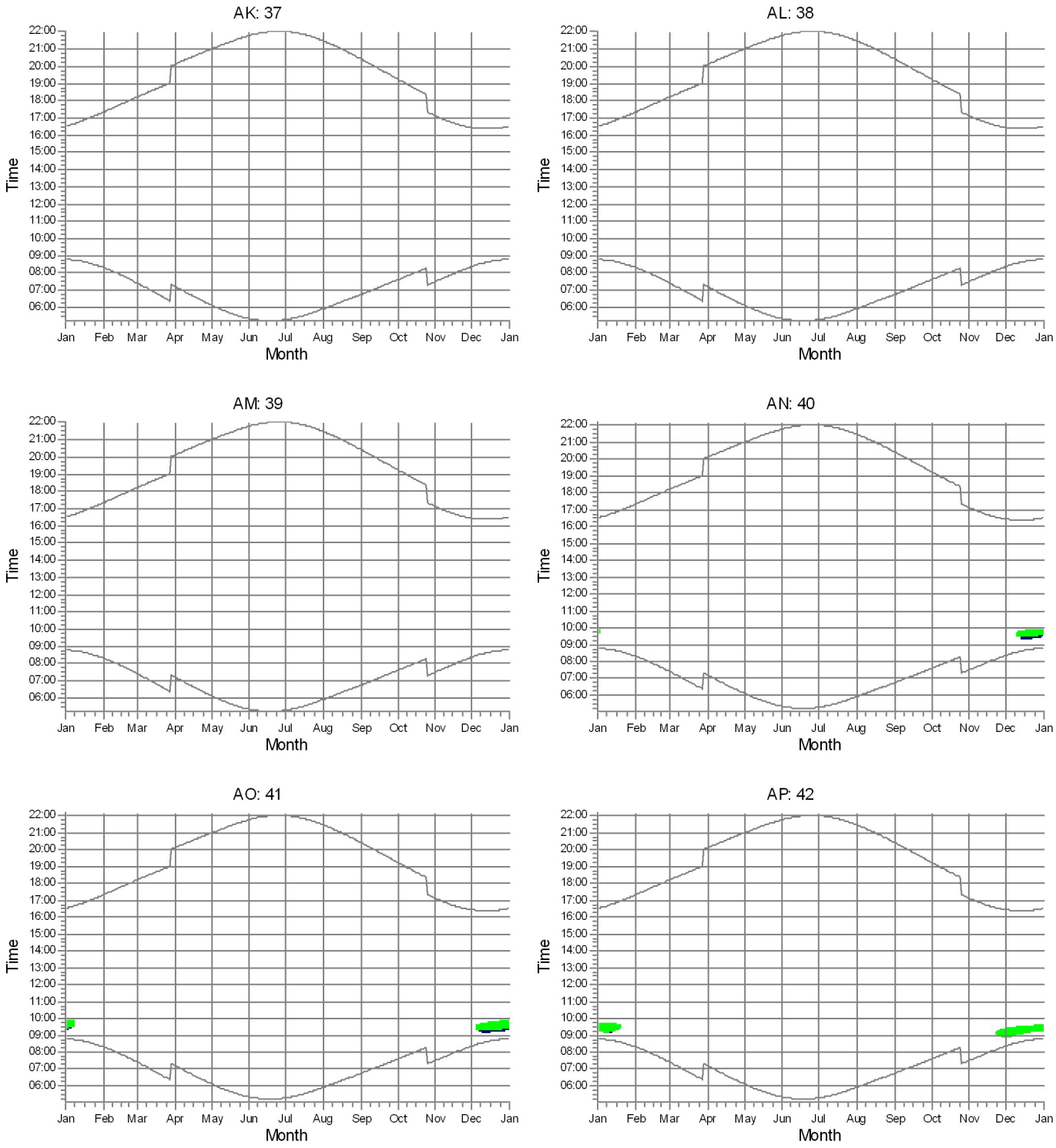
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SHADOW - Calendar, graphical

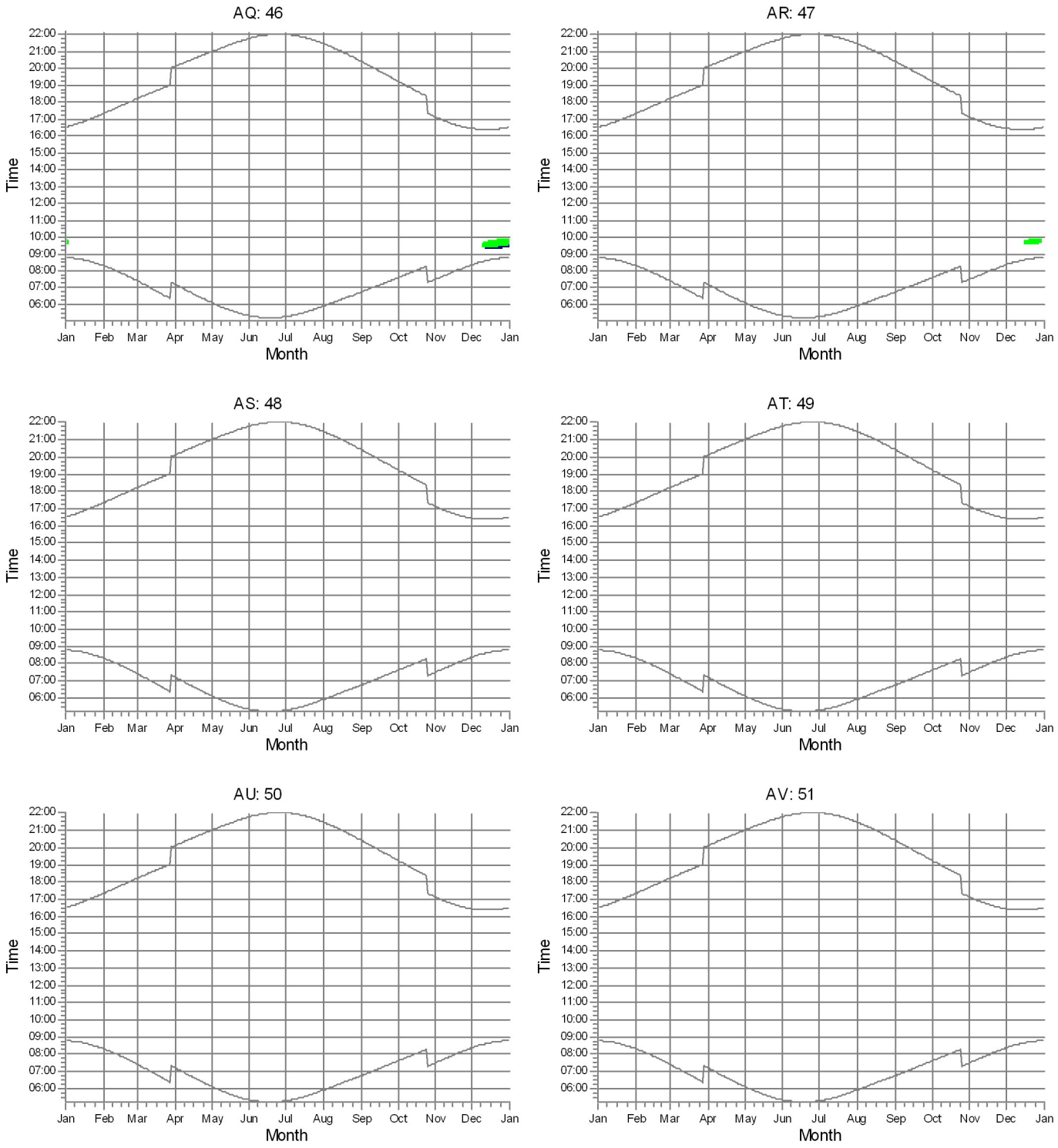
Calculation: 6839 Garrane WF Worst Case - V150



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Calculation: 6839 Garrane WF Worst Case - V150



WTGs

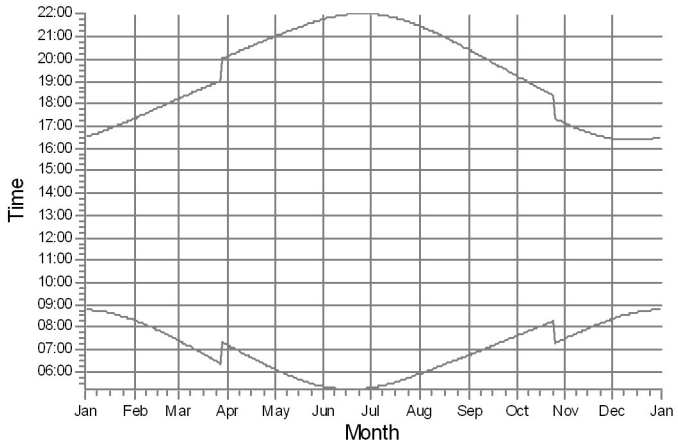
7: T07 9: T09

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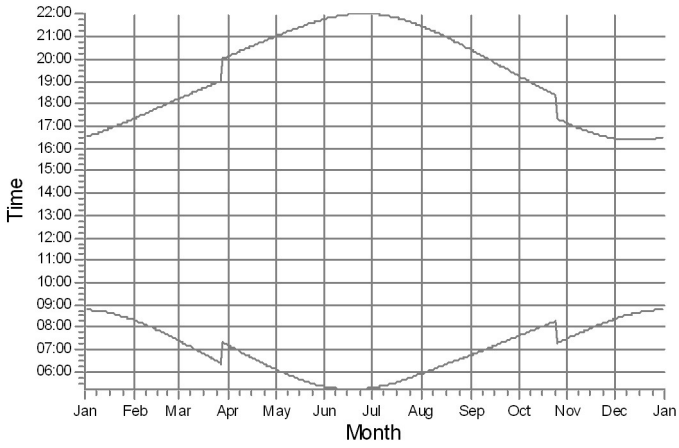
SHADOW - Calendar, graphical

Calculation: 6839 Garrane WF Worst Case - V150

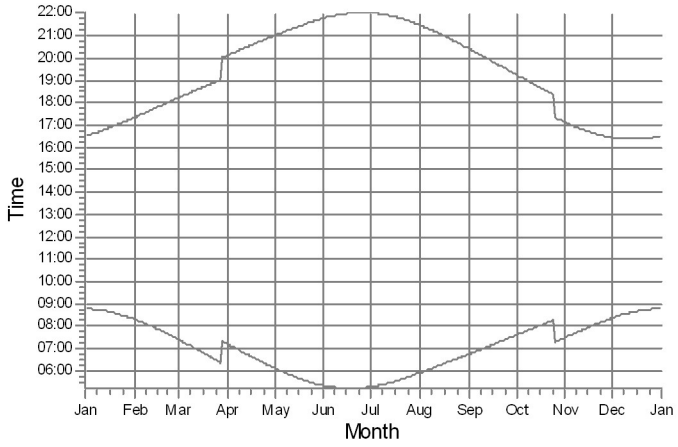
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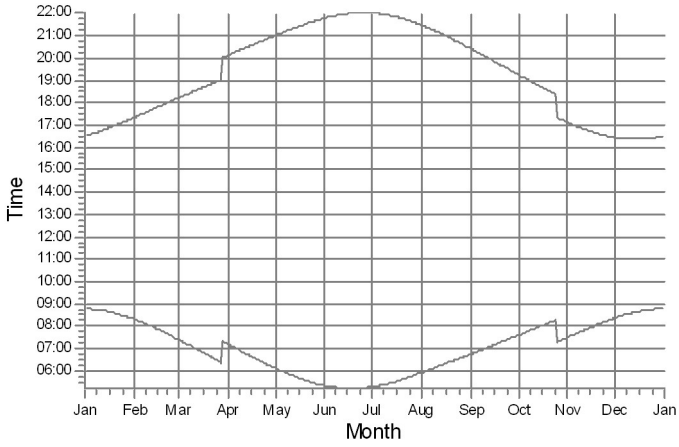
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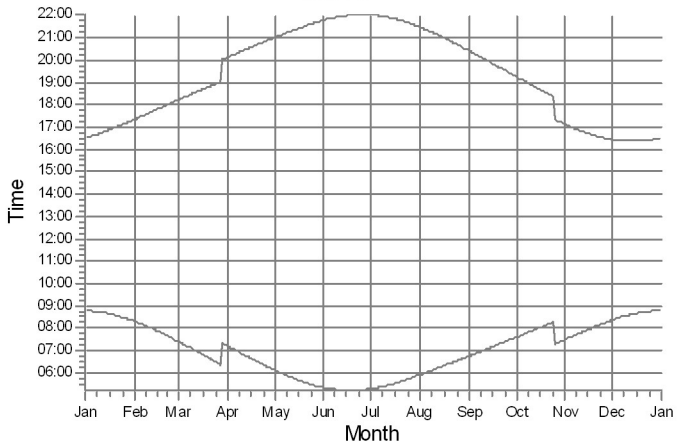
AY: 64



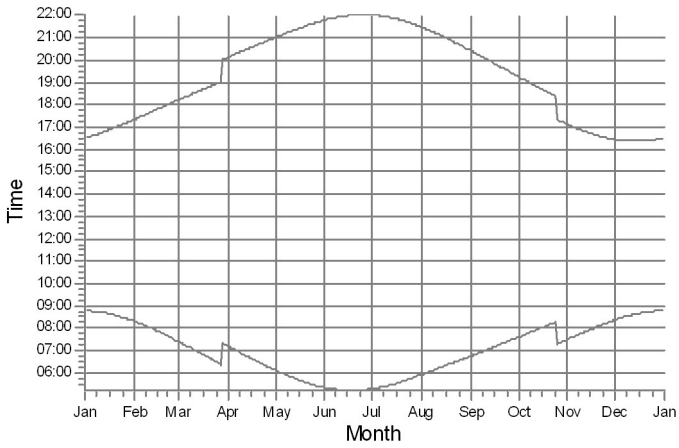
AZ: 65



BA: 66



BB: 67



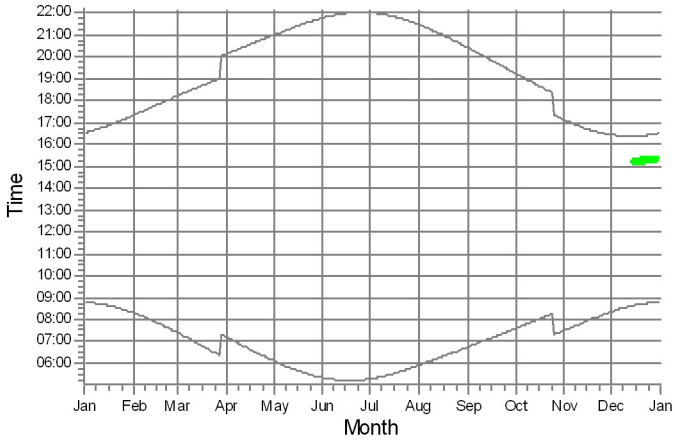
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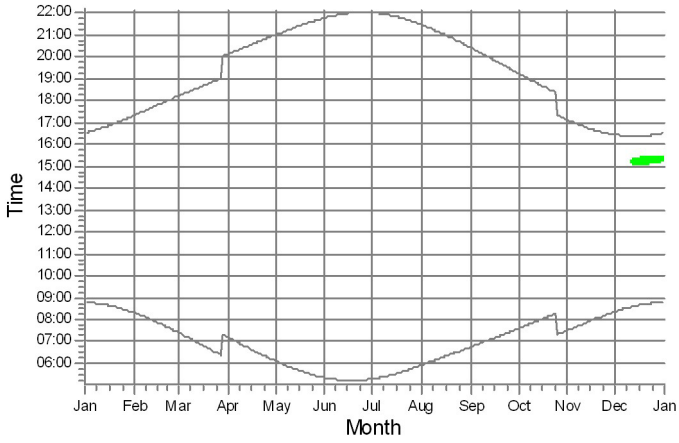
SHADOW - Calendar, graphical

Calculation: 6839 Garrane WF Worst Case - V150

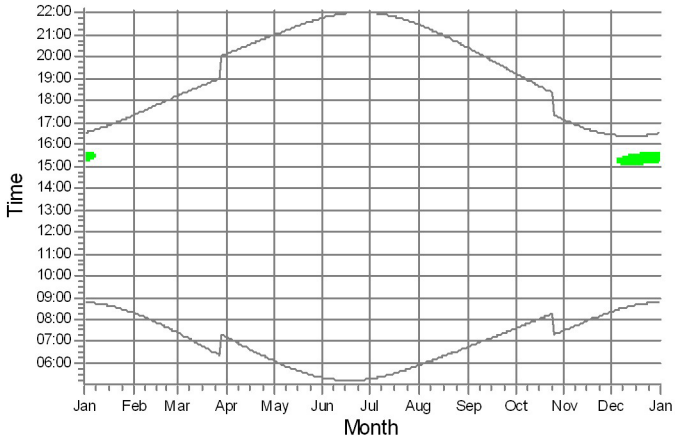
BC: 68



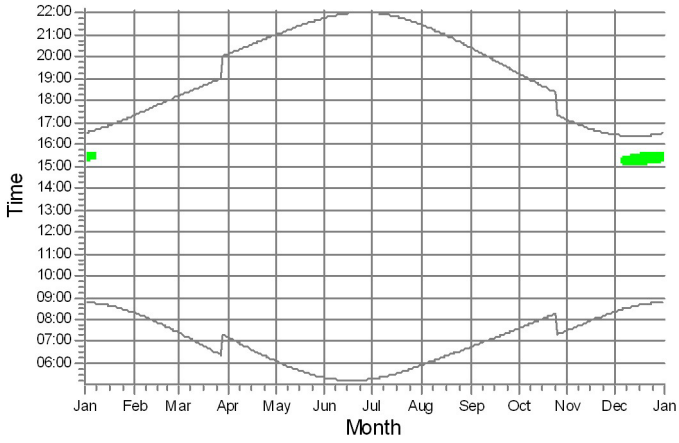
BD: 69



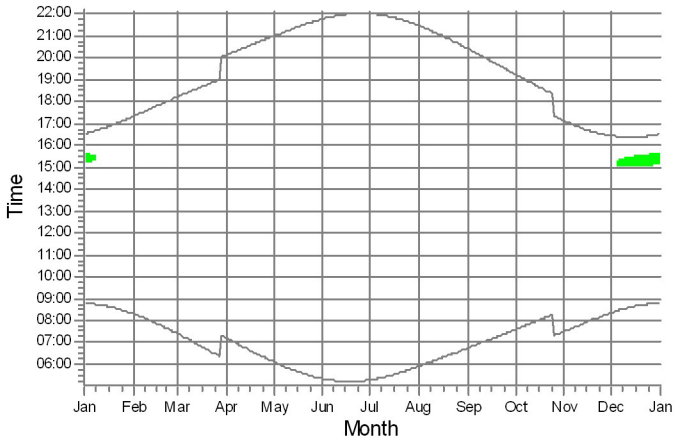
BE: 70



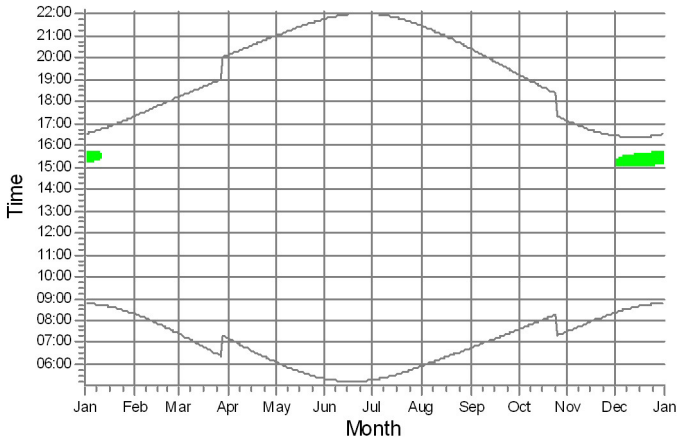
BF: 71



BG: 72



BH: 73



WTGs

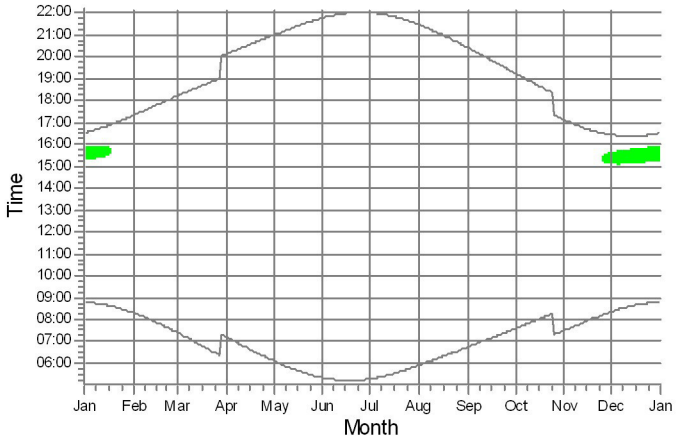
8: T08 9: T09

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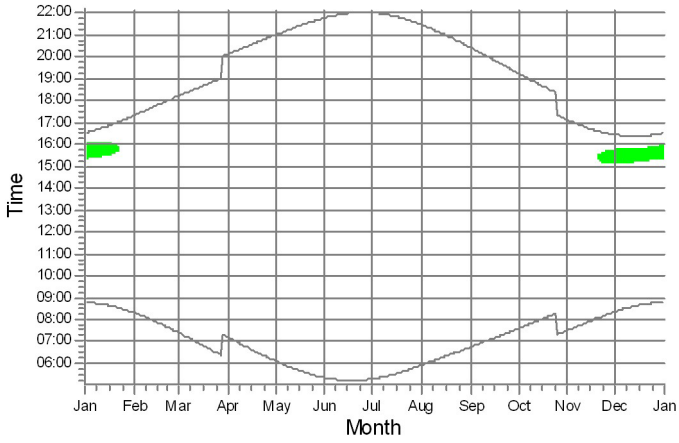
SHADOW - Calendar, graphical

Calculation: 6839 Garrane WF Worst Case - V150

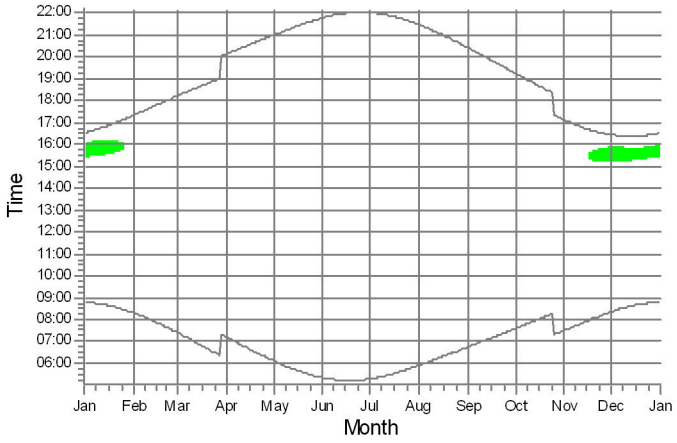
BI: 74



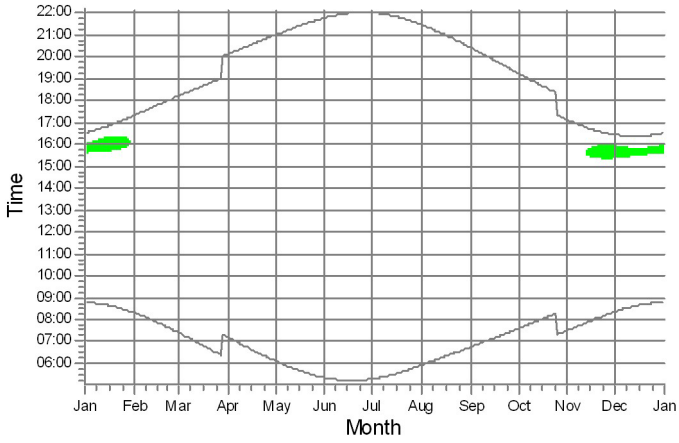
BJ: 75



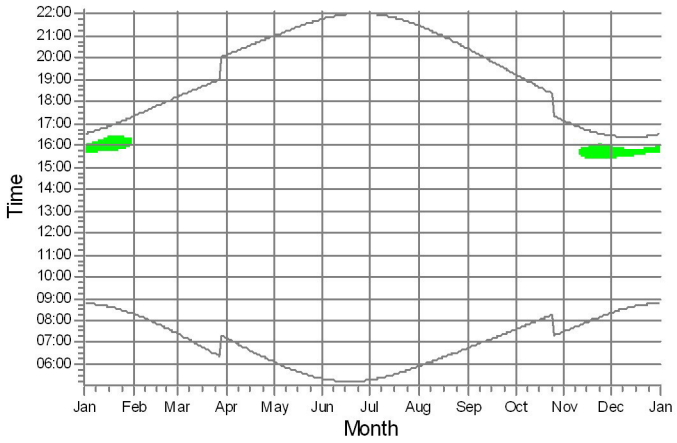
BK: 76



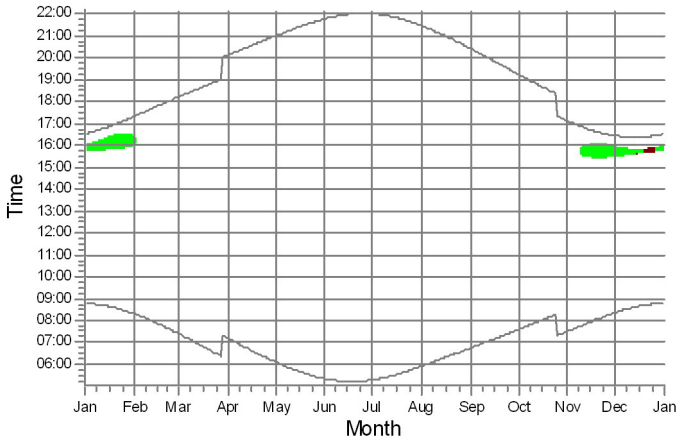
BL: 77



BM: 78



BN: 79



WTGs

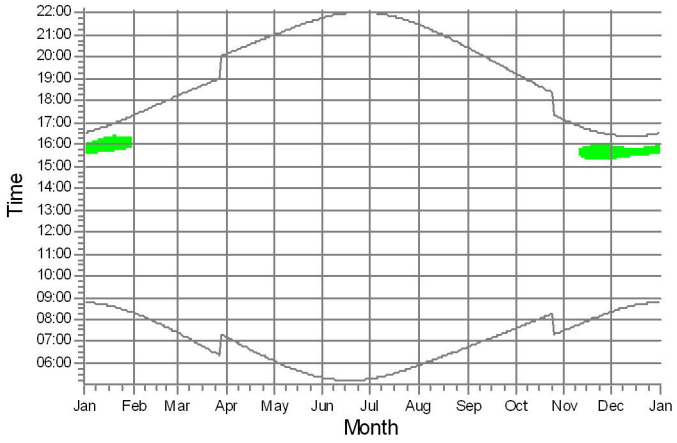
8: T08 9: T09

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09/06/2025 13:54/4.0.552

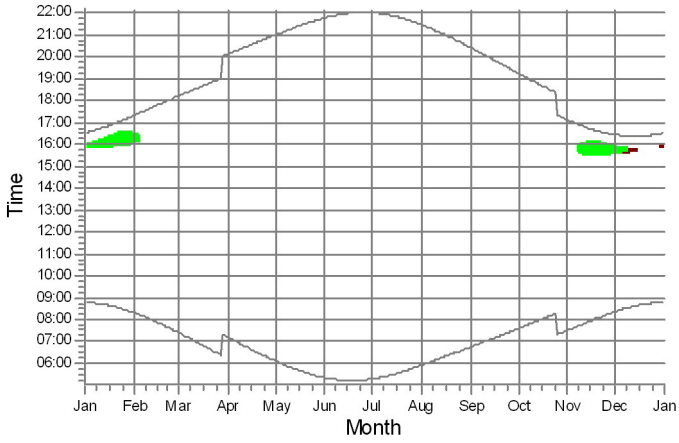
SHADOW - Calendar, graphical

Calculation: 6839 Garrane WF Worst Case - V150

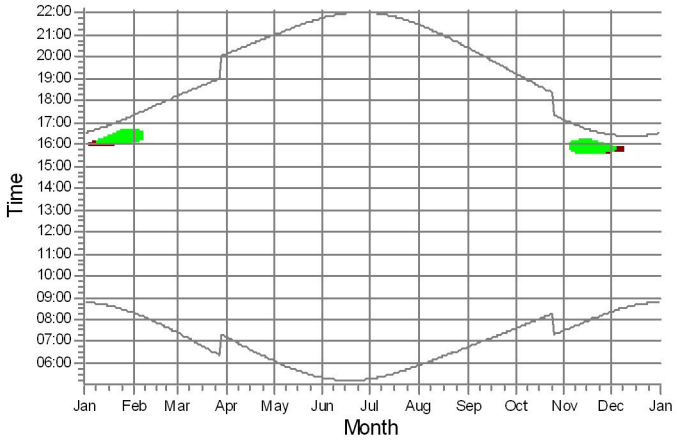
BO: 80



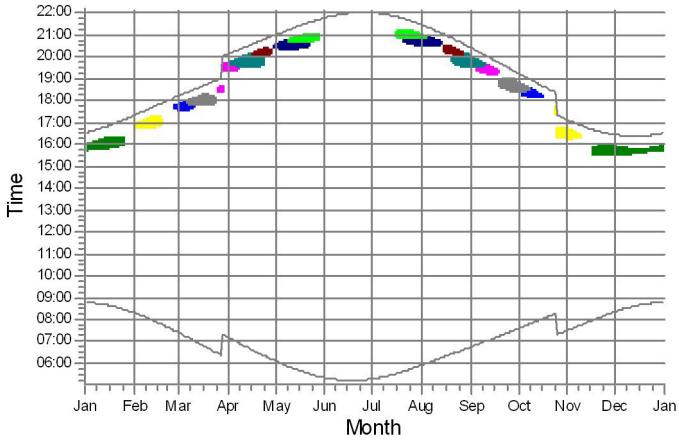
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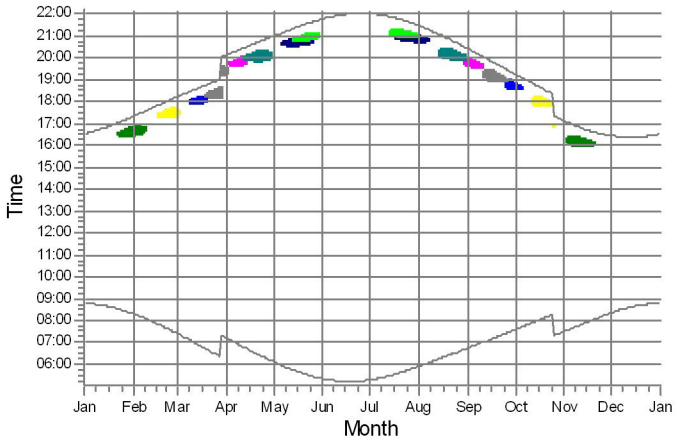
BQ: 82



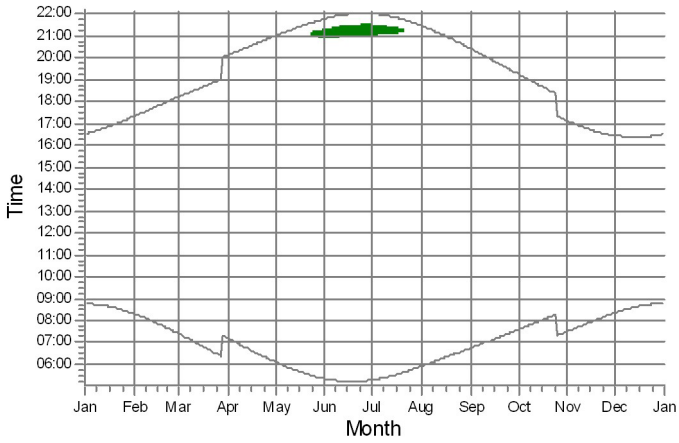
BR: 83



BS: 84



BT: 85



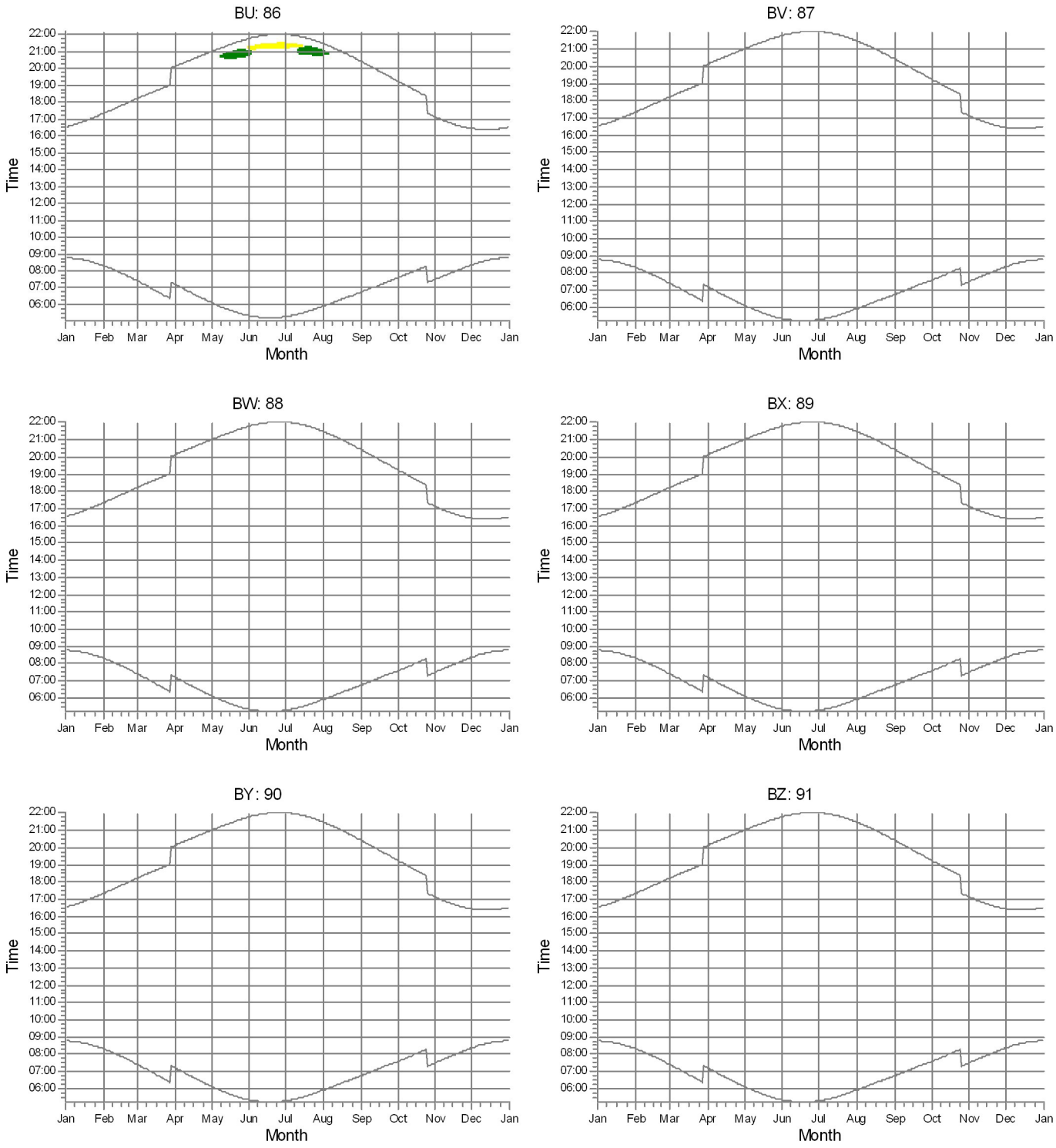
WTGs

1: T01	3: T03	5: T05	7: T07	9: T09
2: T02	4: T04	6: T06	8: T08	

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Calculated:
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SHADOW - Calendar, graphical

Calculation: 6839 Garrane WF Worst Case - V150



WTGs

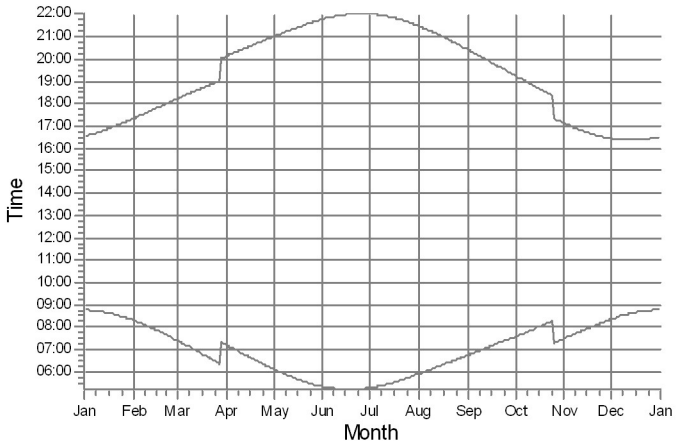
1: T01 2: T02

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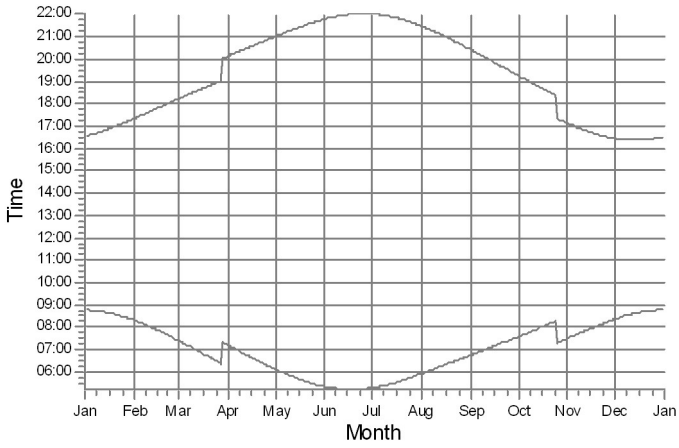
SHADOW - Calendar, graphical

Calculation: 6839 Garrane WF Worst Case - V150

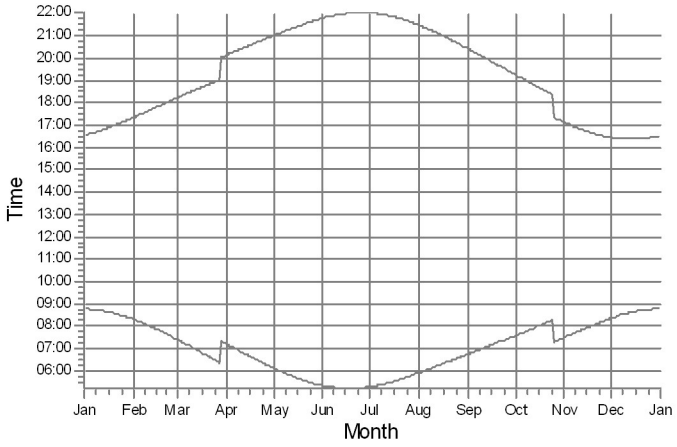
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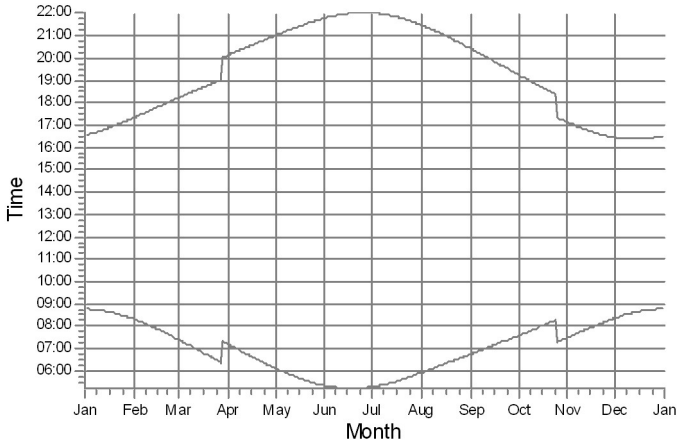
CB: 93



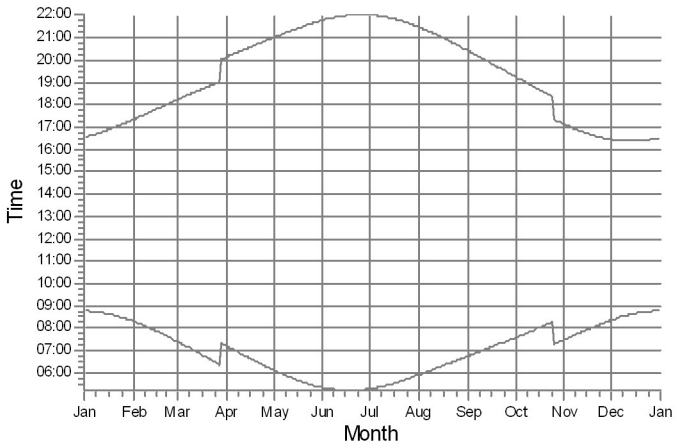
CC: 94



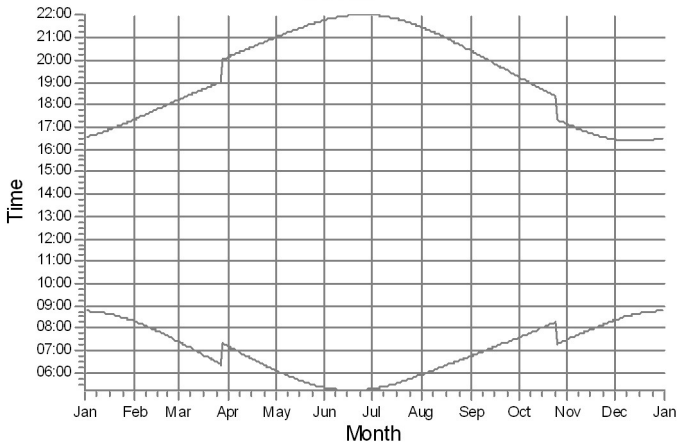
CD: 95



CE: 96



CF: 122

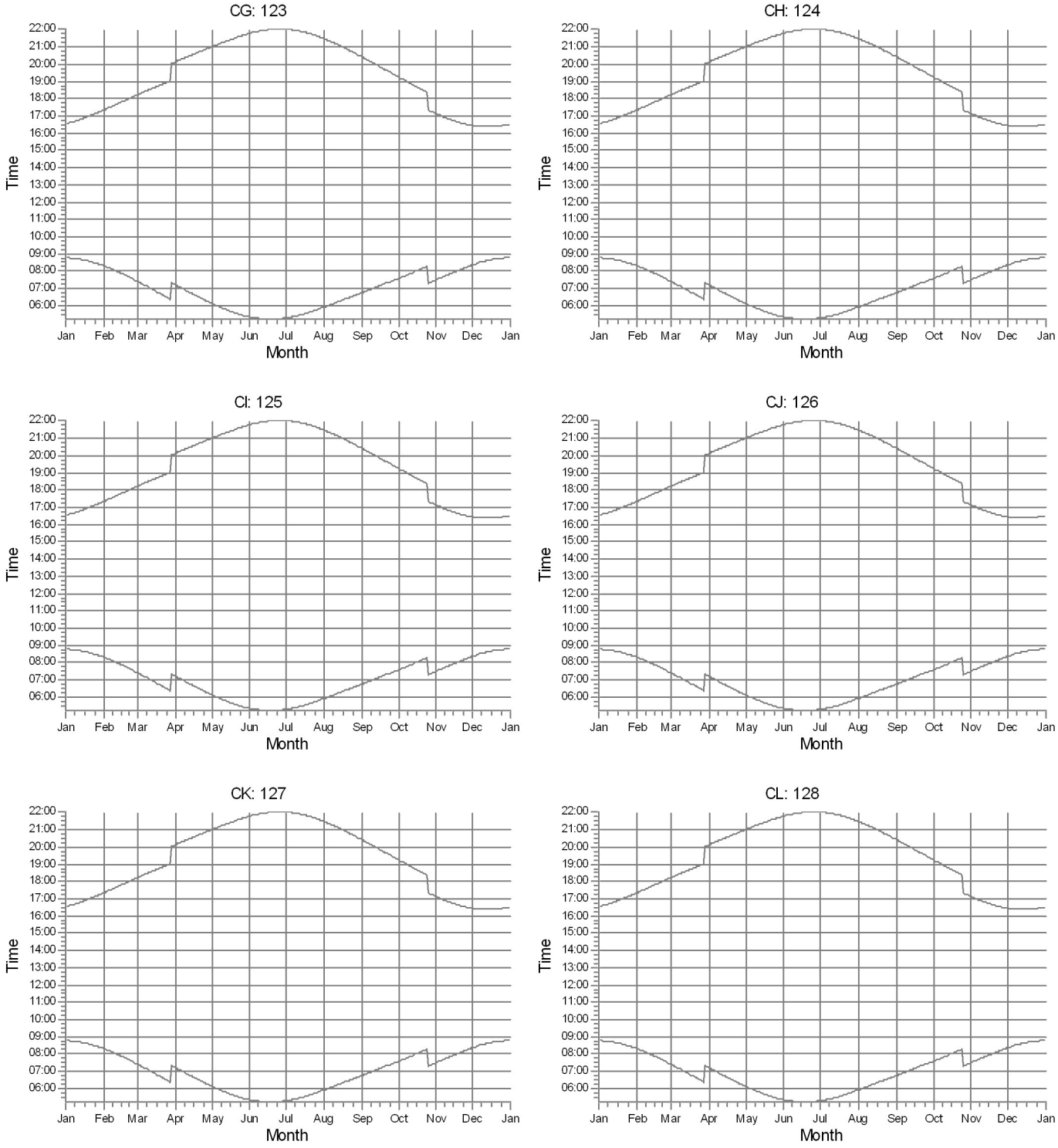


WTGs

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SHADOW - Calendar, graphical

Calculation: 6839 Garrane WF Worst Case - V150



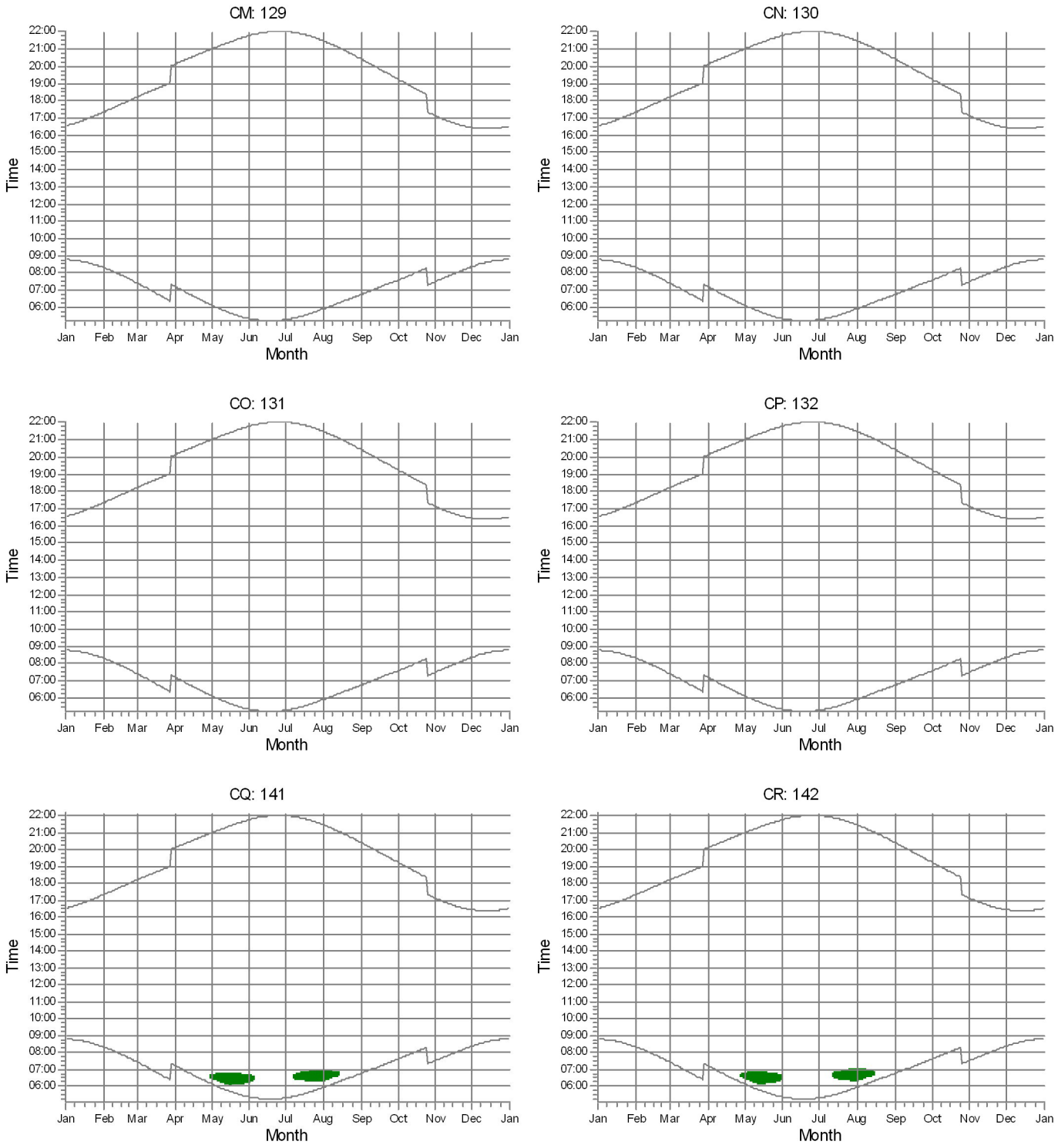
WTGs

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SHADOW - Calendar, graphical

Calculation: 6839 Garrane WF Worst Case - V150



WTGs

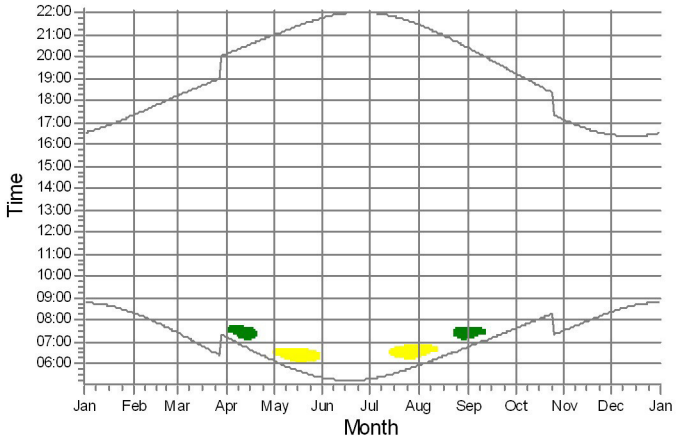
1: T01

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Calculated:
09/06/2025 13:54/4.0.552

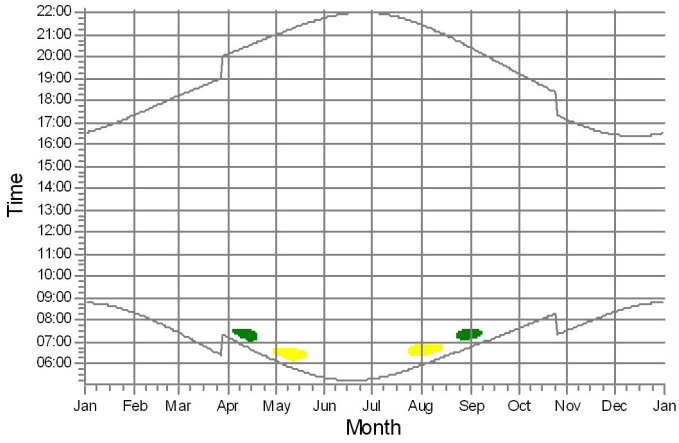
SHADOW - Calendar, graphical

Calculation: 6839 Garrane WF Worst Case - V150

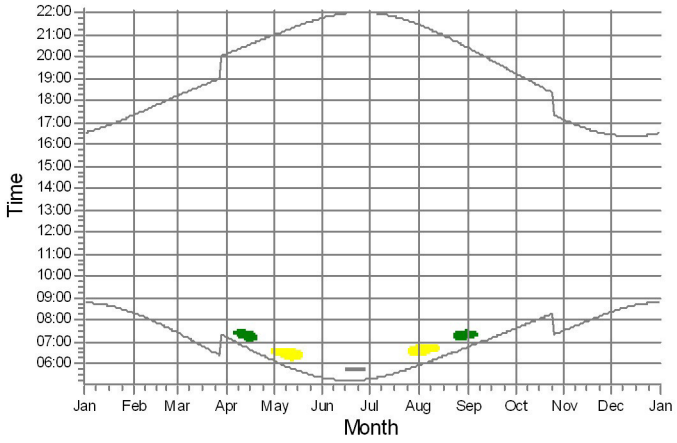
CS: 143



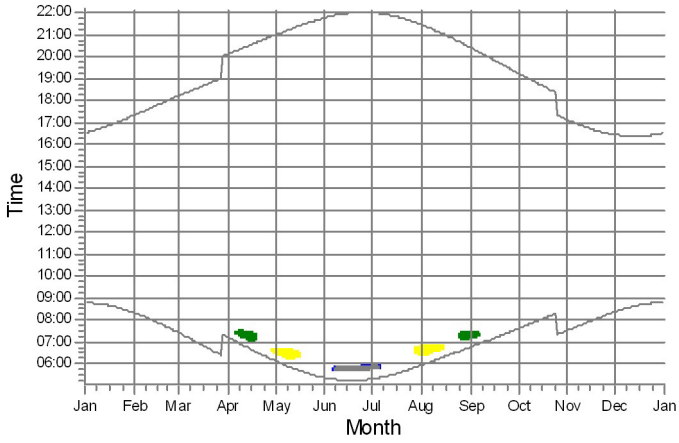
CT: 144



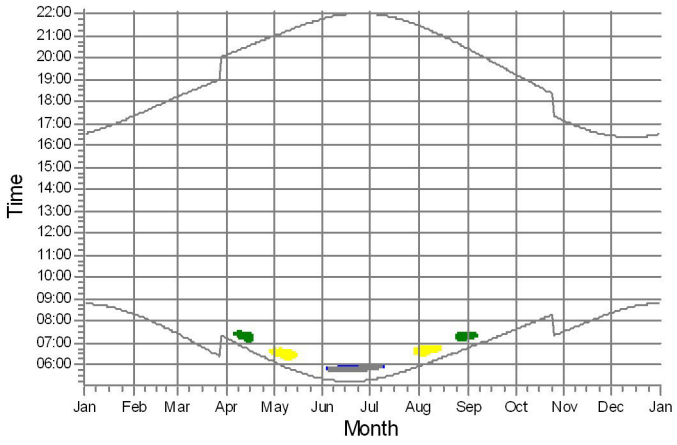
CU: 145



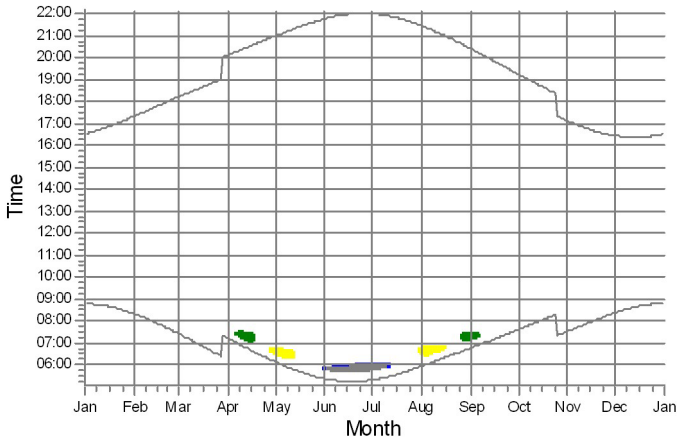
CV: 146



CW: 147



CX: 148



WTGs

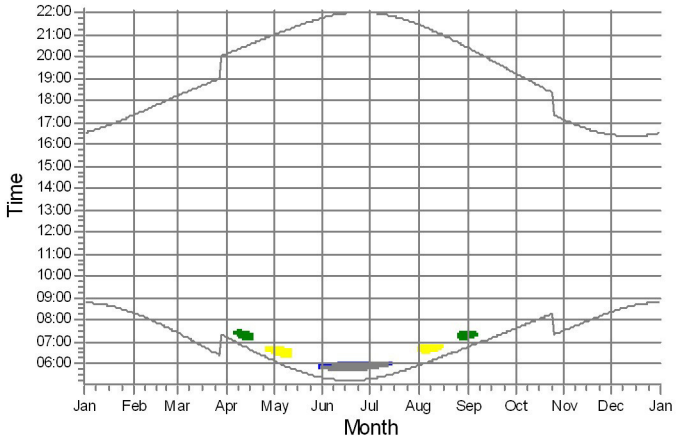
1: T01 2: T02 3: T03 4: T04

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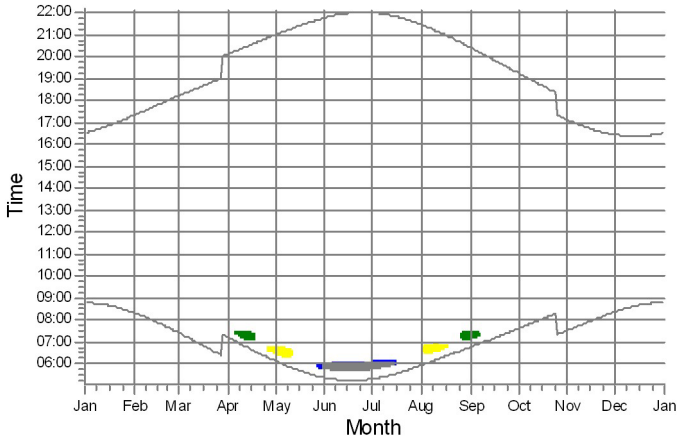
SHADOW - Calendar, graphical

Calculation: 6839 Garrane WF Worst Case - V150

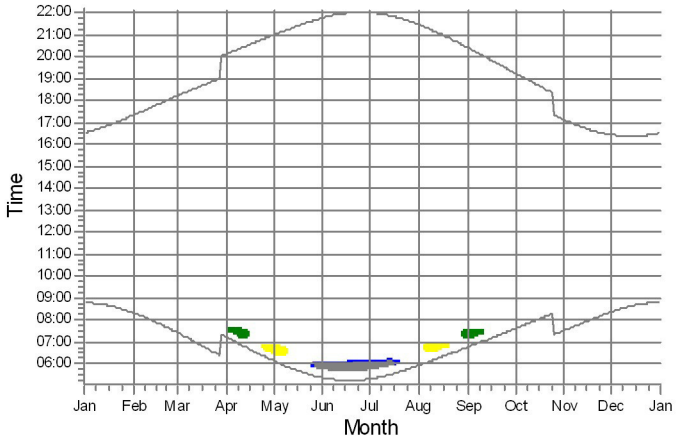
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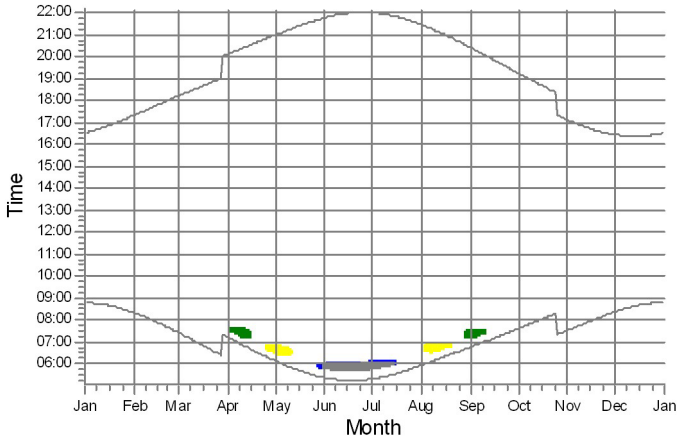
CZ: 150



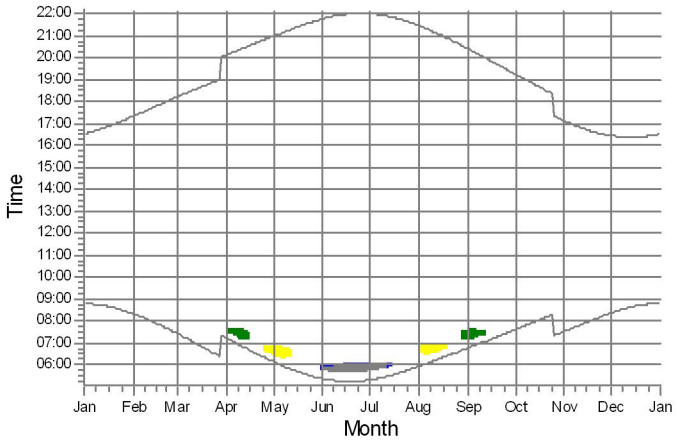
DA: 170



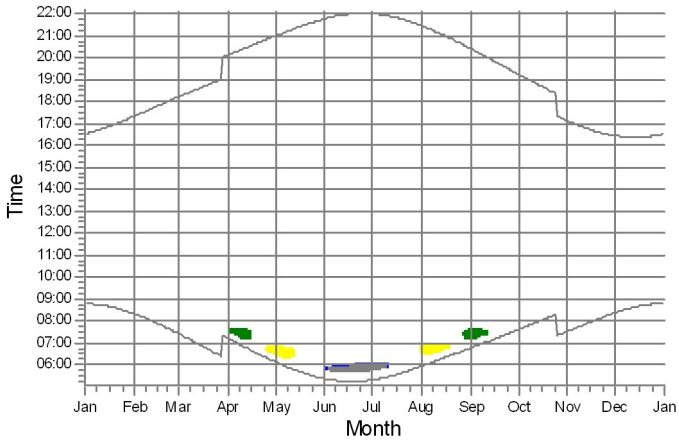
DB: 171



DC: 172



DD: 173



WTGs

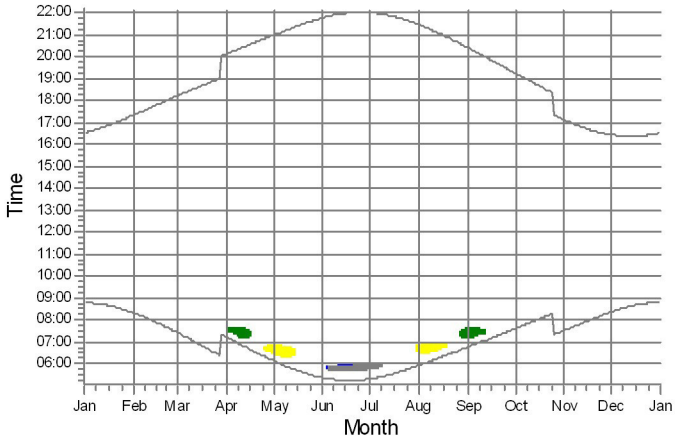
1: T01 2: T02 3: T03 4: T04

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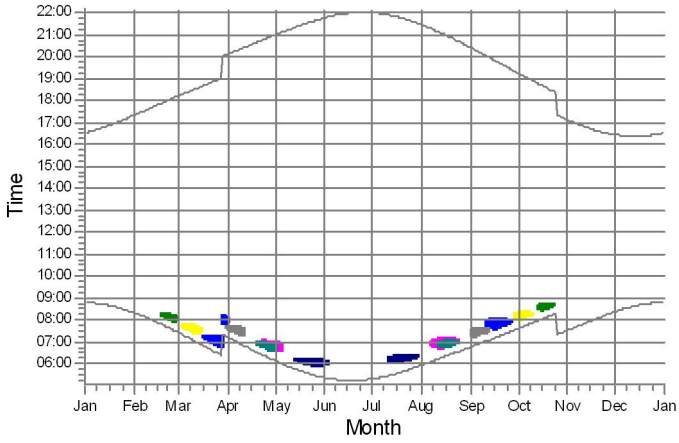
SHADOW - Calendar, graphical

Calculation: 6839 Garrane WF Worst Case - V150

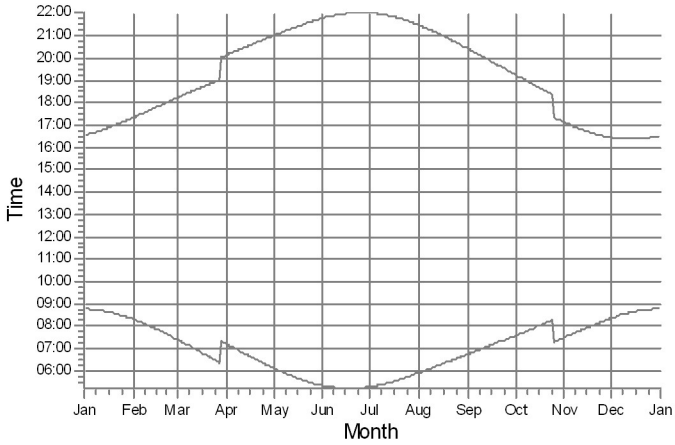
DE: 174



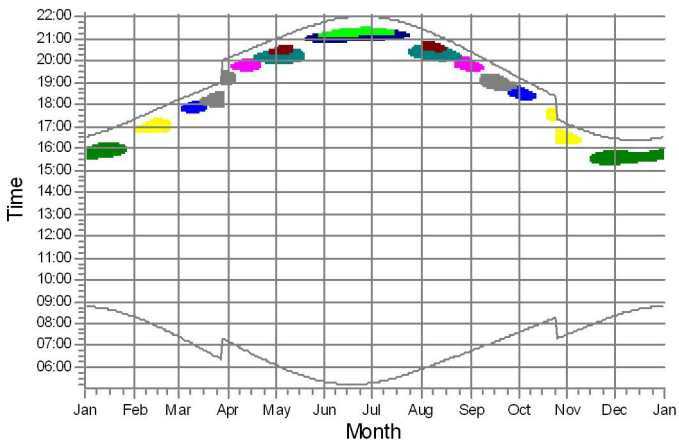
DF: 177



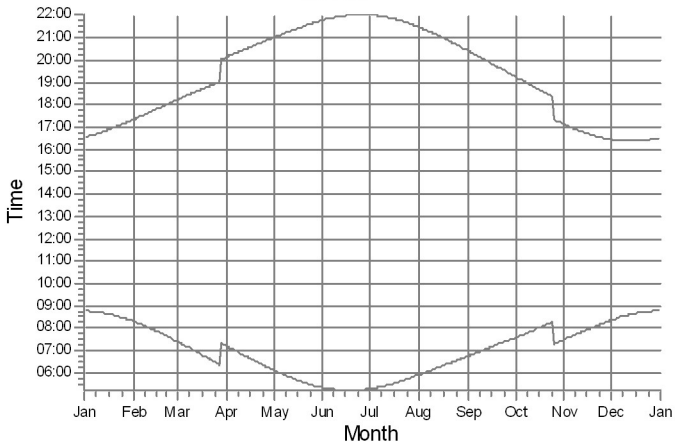
DG: 178



DH: 179



DI: 180



WTGs

1: T01	3: T03	5: T05	7: T07	9: T09
2: T02	4: T04	6: T06	8: T08	

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SHADOW - Calendar per WTG

Calculation: 6839 Garrane WF Worst Case - V150 **WTG:** 1 - T01

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January	February	March	April	May	June
1	08:46 15:11-15:56/45 16:32	08:18 15:36-16:49/73 17:20 08:45-09:04/19	07:23 18:13	07:12 07:35-08:46/71 20:08 18:47-19:30/43	06:06 06:31-06:42/11 21:00 19:46-20:31/45	05:20 06:18-06:34/16 05:49-05:54/5 21:47 20:21-21:14/53
2	08:45 15:12-15:57/45 16:33	08:16 15:38-16:52/74 17:22 08:43-09:03/20	07:21 18:15	07:09 07:32-08:43/71 20:10 18:46-19:28/42	06:04 06:29-06:43/14 21:02 19:46-20:33/47	05:19 06:19-06:32/13 05:48-05:54/6 21:48 20:21-21:15/54
3	08:45 15:13-15:59/46 16:34	08:15 15:40-16:54/74 17:24 08:41-09:03/22	07:19 18:17	07:07 07:30-08:41/71 20:11 18:47-19:27/40	06:02 06:27-06:43/16 21:03 19:46-20:34/48	05:18 06:21-06:32/11 05:48-05:56/8 21:49 20:22-21:15/53
4	08:45 15:14-16:00/46 16:35	08:13 15:41-16:56/75 17:26 08:39-09:02/23	07:17 18:18	07:05 07:28-08:12/44 18:48-19:26/38 20:13 08:14-08:39/25	06:00 06:25-06:44/19 21:05 19:47-20:35/48	05:17 06:23-06:29/6 05:47-05:56/9 21:50 20:23-21:17/54
5	08:45 15:14-16:01/47 16:36	08:11 15:43-16:58/75 17:28 08:37-09:01/24	07:15 07:38-07:43/5 18:20	07:03 07:26-08:06/40 18:48-19:24/36 20:15 08:17-08:35/18	05:58 06:24-06:45/21 21:07 19:48-20:38/50	05:17 20:23-21:17/54 21:51 05:46-05:56/10
6	08:44 15:15-16:03/48 16:38	08:10 15:45-17:00/75 17:30 08:36-09:01/25	07:12 07:36-07:47/11 18:22	07:00 07:23-08:04/41 18:50-19:23/33 20:17 08:22-08:28/6	05:56 06:22-06:45/23 21:08 19:48-20:39/51	05:16 20:25-21:19/54 21:52 05:46-05:58/12
7	08:44 15:15-16:04/49 16:39	08:08 15:48-17:02/74 17:32 08:34-08:59/25	07:10 07:34-07:50/16 18:24	06:58 07:21-08:03/42 20:18 18:51-19:21/30	05:55 06:20-06:45/25 21:10 19:49-20:40/51	05:15 20:25-21:19/54 21:53 05:45-05:58/13
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Potential sun hours	257	277	367	417	487	501
Sum of minutes with flicker	1889	2130	1897	1971	2337	2140

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

Licensed user:
Jennings O'Donovan
Finisklin Business Park
F91 RHH9 Sligo
+353719161416
Kathlyn Feeney / kfeeney@jodireland.com
Calculated:
09/06/2025 13:54/4.0.552

SHADOW - Calendar per WTG

Calculation: 6839 Garrane WF Worst Case - V150 **WTG:** 1 - T01

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	July	August	September	October	November	December
1	05:17 20:32-21:27/55	05:54 06:23-06:56/33	06:45 07:11-07:56/45	07:35 08:00-08:35/35	07:30 08:02-08:27/25	08:21 14:59-15:52/53
	22:01 05:48-06:04/16	21:28 20:05-20:58/53	20:25	19:15 18:39-18:47/8	17:07 15:22-16:38/76	16:26
2	05:17 20:32-21:27/55	05:56 06:25-06:56/31	06:46 07:13-07:58/45	07:36 08:02-08:34/32	07:31 08:01-08:27/26	08:23 14:59-15:52/53
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	21:36 20:25-21:05/40	20:36 19:56-20:09/13	19:24 18:34-18:56/22	17:17 15:31-16:43/72	16:29	16:27
28	05:48 06:18-06:55/37	06:38 07:05-07:50/45	07:30 07:55-08:38/43	07:22 08:05-08:23/18	08:17 14:58-15:55/57	08:45 15:10-15:52/42
	21:35 20:25-21:03/38	20:34 19:58-20:07/9	19:22 18:35-18:54/19	17:15 15:28-16:43/75	16:29	16:28
29	05:49 06:19-06:56/37	06:40 07:06-07:52/46	07:31 07:57-08:38/41	07:24 08:04-08:24/20	08:18 14:58-15:54/56	08:45 15:11-15:53/42
	21:33 20:25-21:03/38	20:32 19:59-20:04/5	19:19 18:36-18:52/16	17:13 15:26-16:43/77	16:28	16:29
30	05:51 06:20-06:56/36 20:11-20:20/9	06:41 07:08-07:54/46	07:33 07:58-08:36/38	07:26 08:03-08:25/22	08:20 14:59-15:53/54	08:45 15:11-15:54/43
	21:31 20:25-21:01/36	20:30	19:17 18:37-18:49/12	17:11 15:25-16:42/77	16:27	16:29
31	05:52 06:22-06:56/34 20:08-20:24/16	06:43 07:10-07:56/46		07:28 08:02-08:26/24		08:46 15:12-15:55/43
	21:30 20:26-21:00/34	20:27		17:09 15:23-16:40/77		16:30
Potential sun hours	504	455	381	331	265	241
Sum of minutes with flicker	2298	1909	2675	1372	2338	1361

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

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Finisklin Business Park
F91 RHH9 Sligo
+353719161416
Kathlyn Feeney / kfeeney@jodireland.com

Calculated:
09/06/2025 13:54/4.0.552

SHADOW - Calendar per WTG

Calculation: 6839 Garrane WF Worst Case - V150 **WTG:** 2 - T02

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January	February	March	April	May	June
1	08:46 15:54-15:57/3 16:32	08:18 16:10-16:20/10 17:20	07:23 16:48-17:46/58 18:13 07:52-08:24/32	07:12 18:45-19:25/40 20:08	06:06 06:31-07:14/43 21:00 19:50-20:30/40	05:20 20:42-21:14/32 21:47 05:49-07:13/84
2	08:45 15:53-15:57/4 16:33	08:16 16:51-16:52/1 17:22	07:21 16:49-17:48/59 18:15 07:52-08:23/31	07:09 18:44-19:24/40 20:10	06:04 06:29-07:14/45 21:02 19:51-20:30/39	05:19 20:42-21:15/33 21:48 05:48-07:13/85
3	08:45 15:54-15:58/4 16:34	08:15 16:50-16:54/4 17:24	07:19 07:53-08:23/30 18:17 16:51-17:51/60	07:07 18:46-19:22/36 20:11	06:02 06:27-07:13/46 21:03 19:52-20:29/37	05:18 20:42-21:15/33 21:49 05:48-07:13/85
4	08:45 15:54-16:00/6 16:35	08:13 16:49-16:56/7 17:26	07:17 07:41-07:42/1 16:51-17:52/61 18:18 07:54-08:22/28	07:05 18:47-19:21/34 20:13	06:00 06:25-07:13/48 21:05 19:53-20:28/35	05:17 20:43-21:17/34 21:50 05:47-07:13/86
5	08:45 15:54-16:01/7 16:36	08:11 16:48-16:58/10 17:28	07:15 07:38-07:42/4 16:53-17:54/61 18:20 07:55-08:20/25	07:03 18:48-19:19/31 20:15	05:58 06:24-07:13/49 21:07 19:54-20:29/35	05:17 20:43-21:17/34 21:51 05:46-07:13/87
6	08:44 15:54-16:03/9 16:38	08:10 16:47-16:59/12 17:30	07:12 07:36-07:43/7 16:56-17:56/60 18:22 07:56-08:18/22	07:00 18:49-19:17/28 20:17	05:56 06:22-07:12/50 21:08 19:54-20:28/34	05:16 20:44-21:19/35 21:52 05:46-07:13/87
7	08:44 15:54-16:04/10 16:39	08:08 16:48-17:02/14 17:32	07:10 07:34-07:43/9 16:58-17:57/59 18:24 07:58-08:16/18	06:58 18:52-19:15/23 20:18	05:55 06:20-07:11/51 21:10 19:54-20:27/33	05:15 20:44-21:19/35 21:53 05:45-07:13/88
8	08:44 15:54-16:05/11 16:40	08:06 16:47-17:04/17 17:34 08:32-08:34/2	07:08 07:31-07:42/11 17:02-17:59/57 18:26 08:01-08:12/11	06:56 18:55-19:12/17 20:20	05:53 06:18-07:11/53 21:12 19:55-20:25/30	05:15 20:45-21:20/35 21:54 05:45-07:13/88
9	08:43 15:54-16:07/13 16:42	08:04 16:46-17:06/20 17:35 08:30-08:35/5	07:05 07:29-07:42/13 18:27 17:03-18:02/59	06:53 19:00-19:05/5 20:22	05:51 06:17-07:10/53 21:13 19:56-20:25/29	05:14 20:45-21:20/35 21:55 05:45-07:13/88
10	08:43 15:54-16:08/14 16:43	08:02 16:45-17:08/23 17:37 08:28-08:36/8	07:03 07:27-07:42/15 18:29 17:03-18:03/60	06:51 20:24	05:49 06:15-07:10/55 21:15 19:57-20:24/27	05:14 20:45-21:22/37 21:55 05:45-07:13/88
11	08:42 15:54-16:10/16 16:44	08:01 16:45-17:10/25 17:39 08:26-08:37/11	07:01 07:24-07:41/17 18:31 17:04-18:05/61	06:49 20:25	05:48 06:14-07:11/57 21:17 19:59-20:23/24	05:14 20:46-21:23/37 21:56 05:45-07:13/88
12	08:41 15:54-16:11/17 16:46	07:59 16:44-17:13/29 17:41 08:24-08:38/14	06:59 07:22-07:40/18 18:33 17:05-18:07/62	06:47 19:58-20:01/3 20:27	05:46 06:12-07:11/59 20:00-20:21/21 21:18 20:45-20:48/3	05:13 20:47-21:23/36 21:57 05:46-07:14/88
13	08:41 15:54-16:13/19 16:47	07:57 16:43-17:15/32 17:43 08:22-08:38/16	06:56 07:23-07:39/16 18:35 17:05-18:08/63	06:44 19:55-20:01/6 20:29	05:44 06:11-07:12/61 20:02-20:20/18 21:20 20:45-20:50/5	05:13 20:46-21:23/37 21:58 05:45-07:13/88
14	08:40 15:54-16:14/20 16:49	07:55 16:43-17:17/34 17:45 08:20-08:38/18	06:54 07:24-07:36/12 18:36 17:06-18:11/65	06:42 19:53-20:03/10 20:31	05:43 06:09-07:12/63 20:04-20:17/13 21:21 20:43-20:51/8	05:13 20:47-21:24/37 21:58 05:45-07:13/88
15	08:39 15:55-16:16/21 16:50	07:53 16:43-17:19/36 17:47 08:18-08:39/21	06:52 07:27-07:32/5 18:38 17:08-18:13/65	06:40 19:52-20:05/13 20:32	05:41 06:08-07:12/64 20:08-20:13/5 21:23 20:43-20:53/10	05:12 20:47-21:25/38 21:59 05:46-07:13/87
16	08:38 15:55-16:18/23 16:52	07:51 16:42-17:21/39 17:49 08:16-08:39/23	06:49 17:09-18:14/65 18:40	06:38 07:01-07:05/4 20:34 19:51-20:07/16	05:39 06:06-07:12/66 21:25 20:42-20:54/12	05:12 20:48-21:25/37 21:59 05:46-07:14/88
17	08:37 15:55-16:20/25 16:54	07:49 16:42-17:23/41 17:51 08:14-08:39/25	06:47 17:11-18:16/65 18:42	06:35 06:59-07:07/8 20:36 19:50-20:09/19	05:38 06:05-07:13/68 21:26 20:42-20:55/13	05:12 20:48-21:26/38 22:00 05:46-07:14/88
18	08:36 15:56-16:22/26 16:55	07:47 16:41-17:24/43 17:52 08:12-08:38/26	06:45 17:14-18:18/64 18:43	06:33 06:57-07:09/12 20:38 19:49-20:10/21	05:36 06:04-07:13/69 21:28 20:41-20:56/15	05:12 20:48-21:26/38 22:00 05:47-07:14/87
19	08:35 15:56-16:24/28 16:57	07:45 16:42-17:26/44 17:54 08:09-08:37/28	06:42 17:17-18:19/62 18:45	06:31 06:55-07:10/15 20:39 19:49-20:12/23	05:35 06:02-07:12/70 21:29 20:41-20:58/17	05:12 20:48-21:26/38 22:01 05:47-07:14/87
20	08:34 15:57-16:26/29 16:59	07:43 16:42-17:28/46 17:56 08:07-08:36/29	06:40 17:20-18:21/61 18:47	06:29 06:53-07:12/19 20:41 19:47-20:13/26	05:34 06:01-07:13/72 21:31 20:41-20:59/18	05:12 20:49-21:26/37 22:01 05:47-07:14/87
21	08:33 15:57-16:27/30 17:00	07:41 16:42-17:31/49 17:58 08:05-08:36/31	06:38 17:21-18:23/62 18:49	06:27 06:50-07:12/22 20:43 19:47-20:15/28	05:32 06:00-07:13/73 21:32 20:41-21:01/20	05:12 20:49-21:26/37 22:01 05:48-07:15/87
22	08:32 15:58-16:28/30 17:02	07:39 16:43-17:33/50 18:00 08:03-08:35/32	06:35 17:21-18:25/64 18:51	06:24 06:48-07:12/24 20:44 19:47-20:16/29	05:31 05:59-07:13/74 21:34 20:40-21:01/21	05:13 20:50-21:27/37 22:01 05:48-07:15/87
23	08:31 15:59-16:28/29 17:04	07:36 16:43-17:35/52 18:02 08:01-08:33/32	06:33 17:22-18:27/65 18:52	06:22 06:46-07:13/27 20:46 19:46-20:18/32	05:30 05:57-07:12/75 21:35 20:40-21:03/23	05:13 20:50-21:27/37 22:01 05:48-07:15/87
24	08:29 15:59-16:28/29 17:06	07:34 16:43-17:36/53 18:04 07:59-08:31/32	06:31 17:22-18:28/66 18:54	06:20 06:44-07:13/29 20:48 19:46-20:20/34	05:28 05:56-07:13/77 21:36 20:40-21:04/24	05:13 20:49-21:27/38 22:02 05:48-07:15/87
25	08:28 16:00-16:28/28 17:07	07:32 16:44-17:38/54 18:06 07:56-08:27/31	06:28 17:24-18:30/66 18:56	06:18 06:42-07:14/32 20:50 19:46-20:21/35	05:27 05:55-07:13/78 21:38 20:40-21:06/26	05:14 20:50-21:28/38 22:02 05:48-07:16/88
26	08:27 16:00-16:27/27 17:09	07:30 16:45-17:41/56 18:07 07:54-08:25/31	06:26 17:26-18:30/64 18:58	06:16 06:40-07:14/34 20:51 19:47-20:23/36	05:26 05:54-07:13/79 21:39 20:40-21:07/27	05:14 20:50-21:27/37 22:02 05:48-07:16/88
27	08:25 16:02-16:27/25 17:11	07:28 16:46-17:43/57 18:09 07:52-08:25/33	06:24 17:27-18:29/62 18:59	06:14 06:38-07:14/36 20:53 19:47-20:24/37	05:25 05:53-07:13/80 21:41 20:41-21:08/27	05:14 20:50-21:28/38 22:02 05:49-07:16/87
28	08:24 16:02-16:26/24 17:13	07:26 16:48-17:45/57 18:11 07:52-08:25/33	06:21 17:30-18:29/59 19:01	06:12 06:36-07:14/38 20:55 19:47-20:26/39	05:24 05:52-07:13/81 21:42 20:41-21:09/28	05:15 20:50-21:27/37 22:01 05:49-07:16/87
29	08:22 16:04-16:26/22 17:15		07:19 18:34-19:28/54 20:03	06:10 06:35-07:15/40 20:57 19:48-20:27/39	05:23 05:51-07:13/82 21:43 20:41-21:10/29	05:15 20:50-21:28/38 22:01 05:49-07:17/88
30	08:21 16:05-16:24/19 17:17		07:16 18:43-19:27/44 20:04	06:08 06:33-07:15/42 20:58 19:49-20:30/41	05:22 05:51-07:13/82 21:44 20:41-21:11/30	05:16 20:50-21:27/37 22:01 05:49-07:17/88
31	08:19 16:07-16:23/16 17:18		07:14 18:44-19:26/42 20:06		05:21 20:42-21:13/31 21:46 05:50-07:13/83	
Potential sun hours	257	277	367	417	487	501
Sum of minutes with flicker	584	1396	2200	1123	2813	3706

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

Licensed user:
Jennings O'Donovan
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+353719161416
Kathlyn Feeney / kfeeney@jodireland.com
Calculated:
09/06/2025 13:54/4.0.552

SHADOW - Calendar per WTG

Calculation: 6839 Garrane WF Worst Case - V150 **WTG:** 2 - T02

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	July	August	September	October	November	December
1	05:17 20:50-21:27/37	05:54 06:23-07:22/59 20:10-20:32/22	06:45	07:35 08:01-08:18/17	07:30 16:15-16:38/23	08:21 15:36-15:52/16
	22:01 05:49-07:17/88	21:28 20:56-20:58/2	20:25	19:15 17:44-18:47/63	17:07 07:58-08:06/8	16:26
2	05:17 20:51-21:27/36	05:56 06:25-07:22/57	06:46	07:36 08:02-08:19/17	07:31 16:16-16:36/20	08:23 15:37-15:51/14
	22:00 05:50-07:18/88	21:26 20:08-20:33/25	20:23	19:12 17:43-18:45/62	17:05 08:00-08:05/5	16:25
3	05:18 20:50-21:26/36	05:57 06:26-07:21/55	06:48 18:58-19:02/4	07:38 08:04-08:20/16	07:33 16:17-16:34/17	08:24 15:37-15:50/13
	22:00 05:49-07:18/89	21:25 20:07-20:34/27	20:20	19:10 17:42-18:43/61	17:04 08:02-08:03/1	16:25
4	05:19 20:50-21:26/36	05:59 06:28-07:21/53	06:50 18:52-19:09/17	07:40 08:05-08:19/14	07:35 16:17-16:32/15	08:26 15:39-15:50/11
	22:00 05:50-07:18/88	21:23 20:05-20:35/30	20:18	19:08 17:40-18:40/60	17:02	16:24
5	05:20 20:50-21:26/36	06:00 06:29-07:21/52	06:51 18:48-19:11/23	07:42 08:07-08:19/12 17:40-18:37/57	07:37 16:18-16:30/12	08:27 15:39-15:49/10
	21:59 05:51-07:19/88	21:21 20:05-20:36/31	20:16	19:05 08:40-08:46/6	17:00	16:24
6	05:21 20:50-21:25/35	06:02 06:31-07:22/51	06:53 18:46-19:13/27	07:43 08:09-08:19/10 17:38-18:35/57	07:39 16:19-16:28/9	08:28 15:40-15:49/9
	21:59 05:52-07:19/87	21:19 20:04-20:36/32	20:13	19:03 08:36-08:51/15	16:58	16:23
7	05:21 20:50-21:24/34	06:03 06:32-07:22/50	06:55 18:44-19:15/31	07:45 08:11-08:19/8 17:33-18:33/60	07:41 16:20-16:26/6	08:30 15:41-15:48/7
	21:58 05:53-07:20/87	21:18 20:03-20:37/34	20:11	19:01 08:33-08:53/20	16:57	16:23
8	05:22 20:50-21:23/33	06:05 06:34-07:23/49	06:56 18:41-19:15/34	07:47 08:12-08:17/5 17:30-18:30/60	07:42 16:21-16:24/3	08:31 15:41-15:47/6
	21:57 05:53-07:19/86	21:16 20:02-20:37/35	20:09	18:58 08:30-08:54/24	16:55	16:22
9	05:23 20:50-21:23/33	06:07 06:35-07:22/47	06:58 18:40-19:17/37	07:48 08:14-08:16/2 17:27-18:28/61	07:44 16:22-16:23/1	08:32 15:42-15:47/5
	21:57 05:54-07:20/86	21:14 20:02-20:38/36	20:06	18:56 08:29-08:55/26	16:53	16:22
10	05:24 20:50-21:22/32	06:08 06:37-07:23/46	07:00 18:38-19:17/39	07:50 08:28-08:56/28	07:46 15:41-15:52/11	08:33 15:43-15:47/4
	21:56 05:55-07:20/85	21:12 20:01-20:39/38	20:04	18:54 17:25-18:26/61	16:51	16:22
11	05:25 20:50-21:22/32	06:10 06:38-07:22/44	07:01 18:37-19:18/41	07:52 08:27-08:57/30	07:48 15:39-15:55/16	08:34 15:44-15:47/3
	21:55 05:56-07:20/84	21:10 19:59-20:38/39	20:02	18:51 17:24-18:24/60	16:50	16:22
12	05:27 20:49-21:21/32	06:12 06:40-07:23/43	07:03 18:36-19:18/42	07:54 17:22-18:20/58	07:50 15:37-15:56/19	08:35 15:44-15:46/2
	21:54 05:57-07:21/84	21:08 19:58-20:39/41	19:59	18:49 08:26-08:58/32	16:48	16:22
13	05:28 20:49-21:20/31	06:13 06:41-07:22/41	07:05 18:34-19:18/44	07:55 17:21-18:18/57	07:51 15:35-15:57/22	08:36 15:45-15:46/1
	21:53 05:58-07:21/83	21:06 19:56-20:37/41	19:57	18:47 08:25-08:57/32	16:47	16:22
14	05:29 06:00-07:22/82	06:15 06:43-07:22/39	07:06 18:25-19:19/54	07:57 17:19-18:16/57	07:53 15:34-15:58/24	08:37
	21:52 20:49-21:19/30	21:04 19:56-20:36/40	19:55	18:45 08:24-08:57/33	16:45	16:22
15	05:30 06:01-07:22/81	06:17 06:44-07:21/37	07:08 18:20-19:18/58	07:59 17:18-18:14/56	07:55 15:34-15:59/25	08:38
	21:51 20:50-21:19/29	21:02 19:55-20:33/38	19:52	18:43 08:25-08:57/32	16:44	16:22
16	05:31 06:02-07:22/80	06:18 06:46-07:21/35	07:10 18:17-19:18/61	08:01 17:17-18:12/55	07:57 15:33-16:00/27	08:39
	21:50 20:50-21:18/28	21:00 19:54-20:32/38	19:50	18:40 08:27-08:57/30	16:42	16:22
17	05:32 06:03-07:22/79	06:20 06:47-07:20/33	07:11 18:15-19:18/63	08:02 17:16-18:10/54	07:59 15:33-16:01/28	08:40
	21:49 20:50-21:17/27	20:58 19:53-20:29/36	19:48	18:38 08:29-09:01/32	16:41	16:22
18	05:34 06:04-07:22/78	06:22 06:49-07:20/31	07:13 18:12-19:17/65	08:04 17:15-18:08/53	08:00 15:33-16:02/29	08:41
	21:48 20:50-21:16/26	20:56 19:53-20:27/34	19:45	18:36 08:31-09:03/32	16:40	16:22
19	05:35 06:05-07:22/77	06:23 06:51-07:20/29	07:15 18:10-19:16/66	08:06 17:13-18:05/52	08:02 15:33-16:02/29	08:41
	21:47 20:50-21:14/24	20:54 19:52-20:26/34	19:43	18:34 08:33-09:05/32	16:38	16:22
20	05:36 06:07-07:23/76	06:25 06:52-07:18/26	07:16 18:09-19:14/65	08:08 17:13-18:02/49	08:04 15:33-16:03/30	08:42
	21:46 20:51-21:14/23	20:52 19:52-20:23/31	19:40	18:32 08:34-09:05/31	16:37	16:23
21	05:38 06:08-07:23/75	06:26 06:54-07:18/24	07:18 18:06-19:11/65	08:10 17:12-18:00/48	08:05 15:33-16:03/30	08:43
	21:44 20:50-21:13/23	20:49 19:52-20:22/30	19:38	18:30 08:36-09:06/30	16:36	16:23
22	05:39 06:09-07:23/74	06:28 06:55-07:16/21	07:20 18:05-19:09/64	08:11 17:12-17:58/46	08:07 15:33-16:02/29	08:43
	21:43 20:50-21:11/21	20:47 19:52-20:19/27	19:36	18:27 08:38-09:07/29	16:35	16:24
23	05:41 06:11-07:23/72	06:30 06:57-07:15/18	07:21 18:05-19:07/62	08:13 17:12-17:56/44	08:09 15:32-16:00/28	08:44
	21:42 20:50-21:10/20	20:45 19:52-20:17/25	19:33	18:25 08:40-09:08/28	16:33	16:24
24	05:42 06:12-07:23/71	06:31 06:58-07:13/15	07:23 18:03-19:04/61	08:15 17:12-17:54/42	08:11 15:33-15:59/26	08:44
	21:40 20:51-21:09/18	20:43 19:51-20:15/24	19:31	18:23 08:42-09:08/26	16:32	16:25
25	05:43 06:13-07:23/70	06:33 07:00-07:12/12	07:25 17:58-19:01/63	07:17 16:12-16:52/40	08:12 15:33-15:58/25	08:45
	21:39 20:51-21:08/17	20:41 19:52-20:13/21	19:29	17:21 07:44-08:08/24	16:31	16:25
26	05:45 06:15-07:23/68	06:35 07:02-07:10/8	07:26 17:55-18:59/64	07:19 16:12-16:50/38	08:14 15:34-15:57/23	08:45
	21:38 20:52-21:07/15	20:38 19:53-20:11/18	19:26	17:19 07:46-08:08/22	16:30	16:26
27	05:46 06:16-07:23/67	06:36 07:03-07:06/3	07:28 17:51-18:56/65	07:20 16:12-16:48/36	08:15 15:35-15:56/21	08:45
	21:36 20:52-21:05/13	20:36 19:53-20:09/16	19:24	17:17 07:48-08:08/20	16:29	16:27
28	05:48 06:17-07:22/65	06:38 19:54-20:07/13	07:30 17:49-18:54/65	07:22 16:13-16:46/33	08:17 15:34-15:55/21	08:45
	21:35 20:53-21:03/10	20:34	19:22	17:15 07:50-08:08/18	16:29	16:28
29	05:49 06:19-07:23/64 20:17-20:26/9	06:40 19:54-20:04/10	07:31 08:05-08:15/10	07:24 16:13-16:44/31	08:18 15:35-15:54/19	08:45
	21:33 20:54-21:03/9	20:32	19:19 17:48-18:52/64	17:13 07:52-08:08/16	16:28	16:29
30	05:51 06:20-07:22/62 20:13-20:28/15	06:41 19:56-20:02/6	07:33 08:02-08:17/15	07:26 16:14-16:42/28	08:20 15:36-15:53/17	08:46 15:53-15:54/1
	21:31 20:54-21:01/7	20:30	19:17 17:45-18:49/64	17:11 07:54-08:07/13	16:27	16:29
31	05:52 06:22-07:22/60 20:12-20:31/19	06:43 19:57-19:59/2		07:28 16:14-16:40/26		08:46 15:53-15:55/2
	21:30 20:56-21:00/4	20:27		17:09 07:56-08:06/10		16:30
Potential sun hours	504	455	381	331	264	241
Sum of minutes with flicker	3254	1854	1433	2337	619	104

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

Licensed user:
Jennings O'Donovan
Finisklin Business Park
F91 RHH9 Sligo
+353719161416
Kathlyn Feeney / kfeeney@jodireland.com
Calculated:
09/06/2025 13:54/4.0.552

SHADOW - Calendar per WTG

Calculation: 6839 Garrane WF Worst Case - V150 **WTG:** 3 - T03

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January	February	March	April	May	June
1	08:46 09:30-09:47/17 16:32	08:18 17:20	07:24 17:37-17:46/9 18:13 07:47-08:23/36	07:12 07:53-08:02/9 19:01-19:42/41 20:08 08:13-08:45/32	06:06 20:19-20:31/12 21:00	05:20 05:49-05:59/10 21:47 21:00-21:14/14
2	08:45 09:30-09:46/16 16:33	08:16 17:22	07:21 17:37-17:48/11 18:15 07:45-08:24/39	07:10 08:14-08:42/28 20:10 19:03-19:43/40	06:04 20:19-20:33/14 21:02	05:19 05:48-05:59/11 21:48 21:00-21:15/15
3	08:45 09:31-09:46/15 16:34	08:15 17:24	07:19 17:37-17:50/13 18:17 07:44-08:24/40	07:07 08:16-08:39/23 20:11 19:10-19:45/35	06:02 20:18-20:34/16 21:03	05:18 05:48-06:00/12 21:49 20:59-21:15/16
4	08:45 09:33-09:47/14 16:35	08:13 17:26	07:17 17:36-17:52/16 18:18 07:44-08:24/40	07:05 08:20-08:36/16 20:13 19:11-19:47/36	06:00 20:18-20:35/17 21:05	05:17 05:47-06:00/13 21:50 21:00-21:17/17
5	08:45 09:33-09:46/13 16:36	08:11 17:28	07:15 17:37-17:54/17 18:20 07:38-08:22/44	07:03 19:10-19:48/38 20:15	05:58 20:19-20:38/19 21:07	05:17 05:46-06:00/14 21:51 21:00-21:17/17
6	08:44 09:35-09:46/11 16:38	08:10 17:30	07:12 17:37-17:56/19 18:22 07:36-08:22/46	07:00 19:11-19:50/39 20:17	05:56 20:18-20:39/21 21:08	05:16 05:46-06:01/15 21:52 21:01-21:19/18
7	08:44 09:36-09:44/8 16:39	08:08 17:32	07:10 17:37-17:57/20 18:24 07:34-08:22/48	06:58 19:11-19:52/41 20:18	05:55 20:18-20:40/22 21:10	05:15 05:45-06:00/15 21:53 21:01-21:19/18
8	08:44 09:40-09:43/3 16:40	08:06 17:34	07:08 17:39-17:59/20 18:26 07:31-08:20/49	06:56 19:12-19:54/42 20:20	05:53 20:18-20:42/24 21:12	05:15 05:45-06:01/16 21:54 21:01-21:20/19
9	08:43 16:42	08:04 17:35	07:06 17:41-18:02/21 18:27 07:29-08:19/50	06:53 19:12-19:55/43 20:22	05:51 20:19-20:44/25 21:13	05:14 05:45-06:02/17 21:55 21:01-21:20/19
10	08:43 16:43	08:02 17:37	07:03 17:41-18:03/22 18:29 07:27-08:18/51	06:51 19:14-19:57/43 20:24	05:49 20:20-20:45/25 21:15	05:14 05:44-06:01/17 21:55 21:02-21:22/20
11	08:42 16:44	08:01 17:09-17:10/1 17:39	07:01 17:42-18:05/23 18:31 07:24-08:16/52	06:49 19:16-19:59/43 20:25	05:48 20:21-20:47/26 21:17	05:14 05:44-06:02/18 21:56 21:03-21:23/20
12	08:41 16:46	07:59 17:08-17:12/4 17:41	06:59 17:42-18:07/25 18:33 07:22-08:14/52	06:47 19:18-20:01/43 20:27	05:46 20:21-20:48/27 21:18	05:13 05:44-06:02/18 21:57 21:03-21:23/20
13	08:41 16:47	07:57 17:07-17:15/8 17:43	06:56 17:42-18:08/26 18:35 07:20-08:12/52	06:44 19:21-20:01/40 20:29	05:44 20:23-20:50/27 21:20	05:13 05:43-06:01/18 21:58 21:03-21:23/20
14	08:40 16:49	07:55 17:06-17:17/11 17:45	06:54 17:43-18:11/28 18:36 07:17-08:09/52	06:42 19:24-20:03/39 20:31	05:43 20:24-20:51/27 21:22	05:13 05:43-06:02/19 21:58 21:03-21:24/21
15	08:39 16:50	07:53 17:06-17:19/13 17:47	06:52 17:45-18:13/28 18:38 07:15-08:03/48	06:40 19:24-20:05/41 20:32	05:41 20:26-20:52/26 21:23	05:12 05:43-06:02/19 21:59 21:04-21:25/21
16	08:38 16:52	07:51 17:06-17:21/15 17:49	06:49 17:46-18:14/28 18:40 07:12-07:57/45	06:38 19:25-20:07/42 20:34	05:39 20:26-20:51/25 21:25	05:12 05:43-06:02/19 21:59 21:04-21:25/21
17	08:37 16:54	07:49 17:05-17:23/18 17:51	06:47 17:49-18:16/27 18:42 07:10-07:58/48	06:35 19:26-20:09/43 20:36	05:38 20:27-20:51/24 21:26	05:12 05:43-06:02/19 22:00 21:04-21:26/22
18	08:36 16:55	07:47 08:12-08:14/2 17:52 17:04-17:24/20	06:45 07:08-07:58/50 18:44 17:52-18:18/26	06:33 19:28-20:10/42 20:38	05:36 20:27-20:50/23 21:28	05:12 05:43-06:03/20 22:00 21:04-21:26/22
19	08:35 16:57	07:45 08:09-08:15/6 17:54 17:04-17:26/22	06:42 07:05-07:57/52 18:45 17:51-18:19/28	06:31 19:29-20:12/43 20:39	05:35 20:28-20:49/21 21:29	05:12 05:43-06:03/20 22:01 21:05-21:26/21
20	08:34 16:59	07:43 08:07-08:17/10 17:56 17:05-17:28/23	06:40 07:03-07:58/55 18:47 17:51-18:21/30	06:29 19:30-20:10/40 20:41	05:34 20:29-20:49/20 21:31	05:12 05:43-06:03/20 22:01 21:05-21:26/21
21	08:33 17:00	07:41 08:05-08:19/14 17:58 17:05-17:31/26	06:38 07:01-07:58/57 18:49 17:51-18:23/32	06:27 19:34-20:09/35 20:43	05:32 20:31-20:48/17 21:32	05:12 05:44-06:04/20 22:01 21:05-21:26/21
22	08:32 17:02	07:39 08:03-08:20/17 18:00 17:06-17:31/25	06:35 06:58-07:56/58 18:51 17:51-18:25/34	06:24 19:39-20:08/29 20:44	05:31 21:00-21:01/1 21:34 20:31-20:46/15	05:13 05:44-06:04/20 22:01 21:06-21:27/21
23	08:31 17:04	07:37 08:01-08:22/21 18:02 17:07-17:30/23	06:33 06:56-07:56/60 18:52 17:51-18:27/36	06:22 19:40-20:07/27 20:46	05:30 21:00-21:03/3 21:35 20:33-20:45/12	05:13 05:44-06:04/20 22:02 21:06-21:27/21
24	08:29 17:06	07:34 07:59-08:23/24 18:04 17:07-17:28/21	06:31 06:54-07:56/62 18:54 17:51-18:28/37	06:20 19:41-20:06/25 20:48	05:28 20:59-21:04/5 21:36 20:35-20:43/8	05:13 05:44-06:04/20 22:02 21:05-21:27/22
25	08:28 17:07	07:32 07:56-08:22/26 18:06 17:08-17:27/19	06:28 06:51-07:54/63 18:56 17:52-18:30/38	06:18 19:42-20:05/23 20:50	05:27 05:55-05:56/1 21:38 20:59-21:06/7	05:14 05:45-06:04/19 22:02 21:06-21:28/22
26	08:27 17:09	07:30 07:54-08:23/29 18:07 17:10-17:25/15	06:26 06:49-07:54/65 18:58 17:53-18:32/39	06:16 19:44-20:03/19 20:51	05:26 05:54-05:56/2 21:39 20:59-21:07/8	05:14 05:45-06:04/19 22:02 21:06-21:27/21
27	08:25 17:11	07:28 17:39-17:43/4 17:14-17:22/8 18:09 07:52-08:24/32	06:24 06:47-07:52/65 18:59 17:53-18:33/40	06:14 20:22-20:24/2 20:53 19:46-20:00/14	05:25 05:53-05:57/4 21:41 20:59-21:08/9	05:14 05:46-06:05/19 22:02 21:07-21:28/21
28	08:24 17:13	07:26 17:39-17:45/6 18:11 07:50-08:24/34	06:21 06:47-07:51/64 19:01 17:55-18:35/40	06:12 20:21-20:26/5 20:55 19:49-19:56/7	05:24 05:52-05:57/5 21:42 20:59-21:09/10	05:15 05:46-06:05/19 22:01 21:06-21:27/21
29	08:22 17:15		07:19 07:48-08:50/62 20:03 18:57-19:37/40	06:10 20:20-20:27/7 20:57	05:23 05:51-05:58/7 21:43 20:59-21:10/11	05:15 05:47-06:05/18 22:01 21:07-21:28/21
30	08:21 17:17		07:17 07:48-08:07/19 18:57-19:38/41 20:05 08:10-08:48/38	06:08 20:20-20:30/10 20:58	05:22 05:51-05:59/8 21:44 20:59-21:11/12	05:16 05:47-06:05/18 22:01 21:06-21:27/21
31	08:19 17:18		07:14 07:50-08:05/15 18:59-19:40/41 20:06 08:11-08:47/36		05:21 05:50-05:59/9 21:46 21:00-21:13/13	
Potential sun hours	257	277	367	417	487	501
Sum of minutes with flicker	97	497	2468	1125	608	1116

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

Licensed user:
Jennings O'Donovan
Finisklin Business Park
F91 RHH9 Sligo
+353719161416
Kathlyn Feeney / kfeeney@jodireland.com
Calculated:
09/06/2025 13:54/4.0.552

SHADOW - Calendar per WTG

Calculation: 6839 Garrane WF Worst Case - V150 **WTG:** 3 - T03

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	July	August	September	October	November	December
1	05:17 05:48-06:06/18 22:01 21:07-21:27/20	05:54 20:31-20:58/27 21:28	06:45 19:15-19:58/43 20:25	07:35 18:21-18:47/26 19:15 08:00-08:52/52	07:30 17:07	08:22 16:26
2	05:17 05:49-06:06/17 22:00 21:07-21:27/20	05:56 20:30-20:56/26 21:26	06:46 19:13-19:56/43 20:23	07:36 18:21-18:45/24 19:12 08:02-08:54/52	07:31 17:05	08:23 16:25
3	05:18 05:49-06:06/17 22:00 21:07-21:26/19	05:57 20:30-20:55/25 21:25	06:48 19:10-19:53/43 20:20	07:38 18:19-18:42/23 19:10 08:04-08:56/52	07:33 17:04	08:24 16:25
4	05:19 05:50-06:06/16 22:00 21:07-21:26/19	05:59 20:29-20:53/24 21:23	06:50 19:09-19:51/42 20:18	07:40 18:19-18:40/21 19:08 08:05-08:56/51	07:35 17:02	08:26 09:24-09:27/3 16:24
5	05:20 05:51-06:07/16 21:59 21:07-21:26/19	06:00 20:29-20:51/22 21:21	06:51 19:07-19:48/41 20:16	07:42 18:17-18:37/20 19:05 08:07-08:57/50	07:37 17:00	08:27 09:21-09:29/8 16:24
6	05:21 05:52-06:07/15 21:59 21:07-21:25/18	06:02 20:28-20:49/21 21:19	06:53 19:07-19:46/39 20:13	07:43 18:15-18:35/20 19:03 08:09-08:57/48	07:39 16:58	08:28 09:21-09:32/11 16:23
7	05:21 05:53-06:07/14 21:58 21:07-21:24/17	06:03 20:28-20:48/20 21:18	06:55 19:06-19:44/38 20:11	07:45 18:13-18:33/20 19:01 08:11-08:58/47	07:41 16:57	08:30 09:20-09:33/13 16:23
8	05:22 05:54-06:07/13 21:57 21:07-21:23/16	06:05 20:27-20:46/19 21:16	06:56 08:14-08:30/16 20:09 19:05-19:41/36	07:47 18:12-18:30/18 18:58 08:12-08:57/45	07:42 16:55	08:31 09:20-09:34/14 16:22
9	05:23 05:54-06:07/13 21:57 21:07-21:23/16	06:07 20:27-20:44/17 21:14	06:58 08:11-08:33/22 20:06 19:05-19:40/35	07:48 18:12-18:28/16 18:56 08:18-08:58/40	07:44 16:53	08:32 09:20-09:35/15 16:22
10	05:24 05:55-06:07/12 21:56 21:07-21:22/15	06:08 20:28-20:43/15 21:12	07:00 08:07-08:35/28 20:04 18:56-19:37/41	07:50 18:11-18:26/15 18:54 08:18-08:58/40	07:46 16:51	08:33 09:20-09:36/16 16:22
11	05:25 05:56-06:07/11 21:55 21:07-21:22/15	06:10 20:27-20:41/14 21:10	07:01 07:46-07:54/8 18:54-19:35/41 20:02 08:05-08:37/32	07:52 18:11-18:24/13 18:51 08:18-08:58/40	07:48 16:50	08:34 09:20-09:37/17 16:22
12	05:27 05:57-06:07/10 21:54 21:07-21:21/14	06:12 20:28-20:39/11 21:08	07:03 07:43-07:57/14 18:52-19:33/41 19:59 08:04-08:39/35	07:54 18:10-18:20/10 18:49 08:20-08:58/38	07:50 16:48	08:35 09:20-09:38/18 16:22
13	05:28 05:59-06:08/9 21:53 21:07-21:20/13	06:13 20:28-20:37/9 21:06	07:05 07:40-07:58/18 18:49-19:30/41 19:57 08:02-08:39/37	07:55 18:11-18:18/7 18:47 08:21-08:57/36	07:51 16:47	08:36 09:20-09:38/18 16:22
14	05:29 06:00-06:07/7 21:52 21:07-21:19/12	06:15 20:29-20:36/7 21:04	07:06 07:38-08:40/62 19:55 18:48-19:28/40	07:57 18:11-18:16/5 18:45 08:23-08:56/33	07:53 16:45	08:37 09:20-09:39/19 16:22
15	05:30 06:01-06:07/6 21:51 21:08-21:19/11	06:17 20:29-20:33/4 21:02 19:56-20:05/9	07:08 07:37-08:41/64 19:52 18:45-19:25/40	07:59 18:12-18:14/2 17:44-17:56/12 18:43 08:25-08:56/31	07:55 16:44	08:38 09:21-09:40/19 16:22
16	05:31 06:02-06:07/5 21:50 21:08-21:18/10	06:18 20:30-20:32/2 21:00 19:53-20:08/15	07:10 07:36-08:41/65 19:50 18:43-19:23/40	08:01 08:27-08:55/28 18:40 17:42-17:58/16	07:57 16:42	08:39 09:21-09:41/20 16:22
17	05:32 06:03-06:06/3 21:49 21:09-21:17/8	06:20 19:50-20:10/20 20:58	07:11 07:37-08:42/65 19:48 18:42-19:21/39	08:02 08:29-08:54/25 18:38 17:40-18:00/20	07:59 16:41	08:40 09:21-09:41/20 16:22
18	05:34 06:04-06:06/2 21:48 21:09-21:16/7	06:22 19:48-20:11/23 20:56	07:13 07:38-08:42/64 19:45 18:39-19:18/39	08:04 08:31-08:54/23 18:36 17:39-18:01/22	08:00 16:40	08:41 09:21-09:41/20 16:22 15:18-15:21/3
19	05:35 21:09-21:14/5 21:47 20:47-20:51/4	06:23 19:47-20:13/26 20:54	07:15 07:40-08:42/62 19:43 18:38-19:16/38	08:06 08:33-08:53/20 18:34 17:37-18:01/24	08:02 16:38	08:41 09:22-09:42/20 16:22 15:18-15:23/5
20	05:36 21:10-21:14/4 21:46 20:44-20:54/10	06:25 19:46-20:13/27 20:52	07:16 07:42-08:43/61 19:41 18:38-19:14/36	08:08 08:34-08:50/16 18:32 17:36-18:02/26	08:04 16:37	08:42 09:23-09:43/20 16:23 15:18-15:23/5
21	05:38 21:10-21:13/3 21:44 20:43-20:56/13	06:26 19:45-20:14/29 20:49	07:18 07:43-08:42/59 19:38 18:36-19:11/35	08:10 08:36-08:49/13 18:30 17:35-18:00/25	08:06 16:36	08:43 09:23-09:43/20 16:23 15:18-15:24/6
22	05:39 20:41-20:57/16 21:43	06:28 19:38-20:14/36 20:47	07:20 07:45-08:42/57 19:36 18:36-19:09/33	08:11 08:38-08:47/9 18:27 17:35-17:58/23	08:07 16:35	08:43 09:24-09:44/20 16:24 15:18-15:24/6
23	05:41 20:40-20:58/18 21:42	06:30 19:35-20:15/40 20:45	07:21 07:47-08:42/55 19:33 18:36-19:07/31	08:13 08:40-08:45/5 18:25 17:35-17:56/21	08:09 16:33	08:44 09:24-09:44/20 16:24 15:20-15:25/5
24	05:42 20:39-20:59/20 21:40	06:31 19:32-20:14/42 20:43	07:23 07:48-08:41/53 19:31 18:34-19:04/30	08:15 17:35-17:54/19 18:23	08:11 16:32	08:44 09:24-09:44/20 16:25 15:20-15:25/5
25	05:43 20:38-21:00/22 21:39	06:33 19:30-20:13/43 20:41	07:25 07:50-08:41/51 19:29 18:34-19:01/27	07:17 16:35-16:52/17 17:21	08:12 16:31	08:45 09:25-09:45/20 16:25 15:22-15:25/3
26	05:45 20:38-21:01/23 21:38	06:35 19:29-20:11/42 20:39	07:26 18:34-18:59/25 19:26 07:52-08:41/49	07:19 16:35-16:50/15 17:19	08:14 16:30	08:45 09:25-09:45/20 16:26
27	05:46 20:37-21:02/25 21:36	06:36 19:27-20:09/42 20:36	07:28 18:28-18:56/28 19:24 07:53-08:39/46	07:20 16:36-16:48/12 17:17	08:15 16:29	08:45 09:26-09:45/19 16:27
28	05:48 20:36-21:02/26 21:35	06:38 19:26-20:07/41 20:34	07:30 18:26-18:54/28 19:22 07:55-08:39/44	07:22 16:36-16:46/10 17:15	08:17 16:29	08:45 09:26-09:46/20 16:28
29	05:49 20:35-21:03/28 21:33	06:40 19:24-20:04/40 20:32	07:31 18:25-18:52/27 19:19 07:57-08:48/51	07:24 16:37-16:44/7 17:13	08:19 16:28	08:45 09:27-09:46/19 16:29
30	05:51 20:33-21:01/28 21:31	06:41 19:21-20:02/41 20:30	07:33 18:22-18:49/27 19:17 07:58-08:50/52	07:26 16:38-16:42/4 17:11	08:20 16:27	08:46 09:28-09:46/18 16:29
31	05:52 20:33-21:00/27 21:30	06:43 19:17-19:59/42 20:27		07:28 16:39-16:40/1 17:09		08:46 09:29-09:47/18 16:30
Potential sun hours	504	455	381	331	264	241
Sum of minutes with flicker	745	821	2257	1308	0	523

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

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Calculated:
09/06/2025 13:54/4.0.552

SHADOW - Calendar per WTG

Calculation: 6839 Garrane WF Worst Case - V150 **WTG:** 4 - T04

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January	February	March	April	May	June
1	08:46 16:32	08:18 08:49-09:06/17 17:20	07:23 17:08-17:46/38 18:13	07:12 18:59-19:28/29 07:55-08:09/14 20:08 07:35-07:48/13 19:31-19:42/11	06:06 19:25-20:31/66 21:00	05:20 05:49-05:54/5 21:47 20:01-21:14/73
2	08:45 16:33	08:16 08:50-09:05/15 17:22	07:21 17:09-17:46/37 18:15	07:09 19:00-19:24/24 07:58-08:04/6 20:10 07:32-07:49/17 19:28-19:43/15	06:04 19:26-20:33/67 21:02	05:19 05:48-05:54/6 21:48 20:02-21:15/73
3	08:45 16:34	08:15 08:52-09:03/11 17:24	07:19 17:09-17:46/37 18:17	07:07 19:02-19:23/21 19:26-19:45/19 20:11 07:30-07:50/20	06:02 19:27-20:34/67 21:03	05:18 05:48-05:55/7 21:49 20:02-21:15/73
4	08:45 16:35	08:13 08:55-08:59/4 17:26	07:17 17:09-17:45/36 18:18	07:05 19:04-19:20/16 19:24-19:47/23 20:13 07:28-07:50/22	06:00 19:27-20:36/69 21:05	05:17 05:47-05:55/8 21:50 20:04-21:17/73
5	08:45 16:36	08:11 17:28	07:15 17:10-17:44/34 18:20	07:03 19:08-19:15/7 19:22-19:48/26 20:15 07:26-07:51/25	05:58 19:29-20:38/69 21:07	05:17 05:46-05:55/9 21:51 20:04-21:17/73
6	08:44 16:37	08:10 17:30	07:12 17:10-17:43/33 18:22	07:00 07:23-07:50/27 20:17 19:21-19:50/29	05:56 19:30-20:39/69 21:08	05:16 05:46-05:55/9 21:52 20:06-21:19/73
7	08:44 16:39	08:08 17:32	07:10 17:55-17:57/2 18:24 17:11-17:41/30	06:58 07:21-07:51/30 20:18 19:20-19:52/32	05:55 19:31-20:40/69 21:10	05:15 05:45-05:55/10 21:53 20:07-21:19/72
8	08:44 16:40	08:06 17:34	07:08 17:53-17:59/6 18:26 17:12-17:40/28	06:56 07:19-07:51/32 20:20 19:19-19:54/35	05:53 19:33-20:42/69 21:12	05:15 05:45-05:55/10 21:54 20:08-21:20/72
9	08:43 16:41	08:04 17:35	07:05 17:52-18:02/10 18:27 17:14-17:39/25	06:53 07:16-07:50/34 20:22 19:17-19:55/38	05:51 19:35-20:44/69 21:13	05:14 05:45-05:56/11 21:55 20:09-21:20/71
10	08:43 16:43	08:02 17:37	07:03 17:50-18:03/13 18:29 17:15-17:36/21	06:51 07:15-07:49/34 20:24 19:17-19:57/40	05:49 19:38-20:45/67 21:15	05:14 05:44-05:55/11 21:55 20:11-21:22/71
11	08:42 16:44	08:01 17:39	07:01 17:50-18:05/15 18:31 17:18-17:33/15	06:49 07:15-07:49/34 20:25 19:16-19:59/43	05:48 19:43-20:47/64 21:17	05:13 05:44-05:56/12 21:56 20:12-21:23/71
12	08:41 16:46	07:59 17:41	06:59 17:49-18:07/18 18:33 17:23-17:28/5	06:46 07:15-07:49/34 20:27 19:16-20:01/45	05:46 19:49-20:48/59 21:18	05:13 05:44-05:56/12 21:57 20:14-21:23/69
13	08:41 16:47	07:57 17:43	06:56 17:48-18:08/20 18:35	06:44 07:16-07:48/32 20:29 19:15-20:01/46	05:44 19:49-20:50/61 21:20	05:13 05:43-05:55/12 21:58 20:15-21:23/68
14	08:40 16:49	07:55 17:45	06:54 17:48-18:10/22 18:36	06:42 07:15-07:46/31 20:31 19:15-20:03/48	05:43 19:49-20:51/62 21:22	05:13 05:43-05:56/13 21:58 20:17-21:24/67
15	08:39 16:50	07:53 17:47	06:52 17:48-18:13/25 18:38	06:40 07:16-07:45/29 20:32 19:15-20:05/50	05:41 19:50-20:53/63 21:23	05:12 05:43-05:56/13 21:59 20:17-21:25/68
16	08:38 16:52	07:51 17:49	06:49 17:48-18:14/26 18:40 07:12-07:16/4	06:38 07:17-07:44/27 20:34 19:14-20:07/53	05:39 19:50-20:54/64 21:25	05:12 05:43-05:56/13 21:59 20:17-21:25/68
17	08:37 16:54	07:49 17:19-17:23/4 17:51	06:47 17:48-18:16/28 18:42 07:10-07:18/8	06:35 07:18-07:43/25 20:36 19:15-20:09/54	05:38 19:50-20:55/65 21:26	05:12 05:43-05:56/13 22:00 20:18-21:26/68
18	08:36 16:55	07:47 17:17-17:24/7 17:52	06:45 17:49-18:18/29 18:43 07:08-07:19/11	06:33 07:20-07:41/21 20:38 19:15-20:10/55	05:36 19:50-20:56/66 21:28	05:12 05:43-05:56/13 22:00 20:18-21:26/68
19	08:35 16:57	07:45 17:15-17:26/11 17:54	06:42 17:49-18:19/30 18:45 07:05-07:19/14	06:31 07:22-07:38/16 20:39 19:15-20:12/57	05:35 19:51-20:58/67 21:29	05:12 05:43-05:56/13 22:01 20:18-21:26/68
20	08:34 09:03-09:05/2 16:59	07:43 17:14-17:28/14 17:56	06:40 17:50-18:21/31 18:47 07:03-07:20/17	06:29 07:25-07:35/10 20:41 19:14-20:13/59	05:34 19:52-20:59/67 21:31	05:12 05:43-05:56/13 22:01 20:18-21:26/68
21	08:33 09:01-09:05/4 17:00	07:41 17:13-17:31/18 17:58	06:38 17:52-18:23/31 18:49 07:01-07:21/20	06:27 19:15-20:15/60 20:43	05:32 19:52-21:01/69 21:32	05:12 05:44-05:58/14 22:01 20:18-21:26/68
22	08:32 09:00-09:06/6 17:02	07:39 17:12-17:33/21 18:00	06:35 17:53-18:25/32 18:51 06:58-07:20/22	06:24 19:15-20:16/61 20:44	05:31 19:52-21:01/69 21:34	05:13 05:44-05:58/14 22:01 20:19-21:27/68
23	08:31 08:59-09:07/8 17:04	07:36 17:11-17:35/24 18:02	06:33 17:56-18:27/31 18:52 06:56-07:20/24	06:22 19:16-20:18/62 20:46	05:30 19:53-21:03/70 21:35	05:13 05:44-05:57/13 22:02 20:19-21:27/68
24	08:29 08:57-09:07/10 17:06	07:34 17:10-17:36/26 18:04	06:31 17:56-18:28/32 18:54 06:54-07:20/26	06:20 19:16-20:20/64 20:48	05:28 19:54-21:04/70 21:36	05:13 05:44-05:57/13 22:02 20:19-21:27/68
25	08:28 08:56-09:07/11 17:07	07:32 17:10-17:38/28 18:06	06:28 17:57-18:30/33 18:56 06:51-07:19/28	06:18 19:17-20:21/64 20:50	05:27 19:55-21:06/71 21:38	05:14 05:45-05:58/13 22:02 20:20-21:28/68
26	08:27 08:54-09:07/13 17:09	07:30 17:09-17:41/32 18:07	06:26 17:57-18:32/35 18:58 06:49-07:19/30	06:16 19:18-20:23/65 20:51	05:26 19:55-21:07/72 21:39	05:14 05:45-05:58/13 22:02 20:20-21:27/67
27	08:25 08:53-09:08/15 17:11	07:28 17:09-17:43/34 18:09	06:24 17:56-18:33/37 18:59 06:49-07:17/28	06:14 19:19-20:24/65 20:53	05:25 19:56-21:08/72 21:41	05:14 05:46-05:59/13 22:02 20:20-21:28/68
28	08:24 08:51-09:07/16 17:13	07:26 17:09-17:45/36 18:11	06:21 17:57-18:35/38 19:01 06:49-07:16/27	06:12 19:20-20:26/66 20:55	05:24 05:52-05:53/1 21:42 19:57-21:09/72	05:15 05:46-05:59/13 22:01 20:20-21:27/67
29	08:22 08:50-09:08/18 17:15		07:19 18:57-19:34/37 07:42-07:43/1 20:03 07:50-08:15/25	06:10 19:22-20:27/65 20:57	05:23 05:51-05:53/2 21:43 19:58-21:10/72	05:15 05:47-06:00/13 22:01 20:20-21:28/68
30	08:21 08:48-09:07/19 17:17		07:16 18:57-19:32/35 07:39-07:45/6 20:04 07:51-08:13/22	06:08 19:25-20:30/65 20:58	05:22 05:51-05:54/3 21:44 19:58-21:11/73	05:16 05:47-05:59/12 22:01 20:18-21:27/69
31	08:19 08:47-09:06/19 17:18		07:14 18:58-19:31/33 07:52-08:11/19 20:06 07:37-07:47/10 19:34-19:40/6		05:21 05:50-05:54/4 21:46 20:00-21:13/73	
Potential sun hours	257	277	367	417	487	501
Sum of minutes with flicker	141	302	1336	2045	2112	2430

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

Licensed user:
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F91 RHH9 Sligo
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Kathlyn Feeney / kfeeney@jodireland.com

Calculated:
09/06/2025 13:54/4.0.552

SHADOW - Calendar per WTG

Calculation: 6839 Garrane WF Worst Case - V150 **WTG:** 4 - T04

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	July	August	September	October	November	December
1	05:17 05:48-06:00/12	05:54 19:59-20:58/59	06:45 07:14-07:48/34	07:35 18:28-18:47/19	07:30	08:21
	22:01 20:17-21:27/70	21:28	20:25 19:15-19:58/43	19:15	17:07	16:26
2	05:17 05:49-06:01/12	05:55 19:50-20:56/66	06:46 07:14-07:48/34	07:36 18:28-18:45/17	07:31	08:23
	22:00 20:16-21:27/71	21:26	20:23 19:16-19:56/40	19:12 17:58-18:11/13	17:05	16:25
3	05:18 05:49-06:00/11	05:57 19:47-20:55/68	06:48 07:14-07:48/34	07:38 18:28-18:42/14	07:33	08:24
	22:00 20:15-21:26/71	21:25	20:20 19:15-19:53/38	19:10 17:54-18:13/19	17:04	16:25
4	05:19 05:50-06:01/11	05:59 19:44-20:53/69	06:50 07:16-07:48/32	07:40 18:29-18:40/11	07:35	08:26
	22:00 20:14-21:26/72	21:23	20:18 19:16-19:51/35	19:08 17:52-18:15/23	17:02	16:24
5	05:20 05:51-06:01/10	06:00 19:43-20:51/68	06:51 07:17-07:47/30	07:42 18:30-18:37/7	07:37	08:27
	21:59 20:13-21:26/73	21:21	20:16 19:16-19:48/32	19:05 17:50-18:17/27	17:00	16:24
6	05:21 05:52-06:02/10	06:02 19:40-20:49/69	06:53 07:19-07:46/27	07:43 18:31-18:35/4	07:39	08:28
	21:59 20:13-21:25/72	21:19	20:13 19:17-19:46/29	19:03 17:48-18:18/30	16:58	16:23
7	05:21 05:53-06:02/9	06:03 19:39-20:48/69	06:55 19:04-19:10/6 19:18-19:44/26	07:45 18:31-18:32/1	07:41 08:25-08:31/6	08:30
	21:58 20:11-21:24/73	21:18	20:11 07:21-07:46/25	19:01 17:47-18:19/32	16:56	16:23
8	05:22 05:54-06:02/8	06:05 19:37-20:46/69	06:56 18:59-19:14/15 19:18-19:41/23	07:47 17:45-18:19/34	07:42 08:23-08:34/11	08:31
	21:57 20:11-21:24/73	21:16	20:09 07:22-07:45/23	18:58	16:55	16:22
9	05:23 05:54-06:01/7	06:07 19:37-20:44/67	06:58 18:56-19:17/21 19:20-19:40/20	07:48 17:44-18:19/35	07:44 08:21-08:36/15	08:32
	21:57 20:10-21:23/73	21:14	20:06 07:24-07:44/20	18:56	16:53	16:22
10	05:24 05:55-06:02/7	06:08 19:36-20:43/67	07:00 18:53-19:17/24 07:52-07:56/4	07:50 17:44-18:20/36	07:46 08:20-08:37/17	08:33
	21:56 20:09-21:22/73	21:12	20:04 07:25-07:42/17 19:21-19:37/16	18:54	16:51	16:22
11	05:25 05:56-06:02/6	06:10 19:34-20:41/67	07:01 18:52-19:20/28 07:47-08:01/14	07:52 17:43-18:20/37	07:48 08:19-08:38/19	08:34
	21:55 20:09-21:22/73	21:10	20:02 07:27-07:41/14 19:23-19:35/12	18:51	16:50	16:22
12	05:27 05:57-06:02/5	06:12 19:34-20:39/65	07:03 18:50-19:23/33 07:45-08:03/18	07:54 17:42-18:19/37	07:50 08:20-08:39/19	08:35
	21:54 20:08-21:21/73	21:08	19:59 07:29-07:39/10 19:26-19:33/7	18:49	16:48	16:22
13	05:28 05:59-06:03/4	06:13 19:32-20:37/65	07:05 18:48-19:23/35 07:30-07:36/6	07:55 17:42-18:18/36	07:51 08:22-08:40/18	08:36
	21:53 20:07-21:20/73	21:06	19:57 07:42-08:04/22 19:29-19:30/1	18:47	16:47	16:22
14	05:29 06:00-06:03/3	06:15 19:30-20:36/66	07:06 18:48-19:25/37 07:32-07:34/2	07:57 17:41-18:16/35	07:53 08:24-08:40/16	08:37
	21:52 20:07-21:19/72	21:04	19:55 07:41-08:06/25	18:45	16:45	16:22
15	05:30 06:01-06:02/1	06:17 19:28-20:33/65	07:08 18:46-19:25/39	07:59 17:41-18:14/33	07:55 08:26-08:41/15	08:38
	21:51 20:07-21:19/72	21:02	19:52 07:40-08:07/27	18:43	16:44	16:22
16	05:31 20:06-21:18/72	06:18 19:26-20:32/66	07:10 18:46-19:23/37	08:01 17:42-18:12/30	07:57 08:27-08:40/13	08:39
	21:50	21:00	19:50 07:38-08:06/28	18:40	16:42	16:22
17	05:32 20:05-21:17/72	06:20 19:24-20:29/65	07:11 18:45-19:21/36	08:02 17:42-18:10/28	07:59 08:29-08:40/11	08:40 09:39-09:42/3
	21:49	20:58	19:48 07:38-08:07/29	18:38	16:41	16:22
18	05:34 20:05-21:16/71	06:21 19:24-20:28/64	07:13 18:44-19:18/34	08:04 17:42-18:08/26	08:00 08:31-08:41/10	08:41 09:38-09:42/4
	21:48	20:56	19:45 07:38-08:06/28	18:36	16:40	16:22
19	05:35 20:04-21:14/70	06:23 19:23-20:26/63	07:15 18:44-19:16/32	08:06 17:42-18:05/23	08:02 08:33-08:41/8	08:41 09:38-09:44/6
	21:47	20:54	19:43 07:40-08:07/27	18:34	16:38	16:22
20	05:36 20:04-21:14/70	06:25 19:21-20:23/62	07:16 18:44-19:14/30	08:08 17:43-18:02/19	08:04 08:35-08:41/6	08:42 09:38-09:45/7
	21:46	20:52	19:40 07:42-08:07/25	18:32	16:37	16:23
21	05:38 20:03-21:13/70	06:26 19:21-20:22/61	07:18 18:39-19:11/32	08:10 17:43-18:00/17	08:06 08:37-08:41/4	08:43 09:38-09:45/7
	21:44	20:49	19:38 07:43-08:06/23	18:29	16:36	16:23
22	05:39 20:02-21:11/69	06:28 19:19-20:19/60	07:20 18:37-19:09/32	08:11 17:45-17:58/13	08:07 08:39-08:41/2	08:43 09:39-09:46/7
	21:43	20:47	19:36 07:45-08:05/20	18:27	16:35	16:24
23	05:41 20:02-21:10/68	06:30 07:28-07:39/11	07:21 18:35-19:07/32	08:13 17:46-17:56/10	08:09	08:44 09:39-09:46/7
	21:42	20:45 19:19-20:17/58	19:33 07:47-08:05/18	18:25	16:33	16:24
24	05:42 20:02-21:09/67	06:31 07:24-07:42/18	07:23 18:33-19:03/30	08:15 17:47-17:54/7	08:11	08:44 09:40-09:46/6
	21:40	20:43 19:18-20:15/57	19:31 07:48-08:03/15	18:23	16:32	16:25
25	05:43 20:01-21:08/67	06:33 07:22-07:44/22	07:25 18:32-19:01/29	07:17 16:50-16:52/2	08:12	08:45 09:41-09:46/5
	21:39	20:41 19:17-20:13/56	19:29 07:50-08:02/12	17:21	16:31	16:25
26	05:45 20:01-21:07/66	06:35 07:21-07:46/25	07:26 18:31-18:59/28	07:19	08:14	08:45 09:42-09:46/4
	21:38	20:39 19:17-20:11/54	19:26 07:52-08:01/9	17:19	16:30	16:26
27	05:46 20:01-21:05/64	06:36 07:19-07:46/27	07:28 18:29-18:56/27	07:20	08:15	08:45
	21:36	20:36 19:16-20:09/53	19:24 07:53-07:59/6	17:17	16:29	16:27
28	05:48 20:00-21:03/63	06:38 07:18-07:47/29	07:30 18:29-18:54/25	07:22	08:17	08:45
	21:35	20:34 19:16-20:07/51	19:22 07:55-07:57/2	17:15	16:28	16:28
29	05:49 20:00-21:03/63	06:40 07:16-07:47/31	07:31 18:29-18:52/23	07:24	08:18	08:45
	21:33	20:32 19:15-20:04/49	19:19	17:13	16:28	16:28
30	05:51 19:59-21:01/62	06:41 07:16-07:48/32	07:33 18:28-18:49/21	07:26	08:20	08:46
	21:31	20:30 19:16-20:02/46	19:17	17:11	16:27	16:29
31	05:52 20:00-21:00/60	06:43 07:15-07:49/34		07:28		08:46
	21:30	20:27 19:15-19:59/44		17:09		16:30
Potential sun hours	504	455	381	331	264	241
Sum of minutes with flicker	2274	2137	1668	675	190	56

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

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Calculated:
09/06/2025 13:54/4.0.552

SHADOW - Calendar per WTG

Calculation: 6839 Garrane WF Worst Case - V150 **WTG:** 5 - T05

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January	February	March	April	May	June
1	08:46 09:58-10:05/7	08:18 08:45-09:09/24	07:24	07:12 19:24-19:42/18	06:06 06:35-07:24/49 20:01-20:31/30	05:20 06:05-06:49/44
	16:32 15:18-15:44/26	17:20 16:12-16:29/17	18:13	20:08 19:09-19:21/12	21:00 06:31-06:32/1	21:47 20:32-21:14/42
2	08:45 10:01-10:02/1	08:16 08:43-09:09/26	07:21	07:09 19:24-19:43/19	06:04 06:29-06:55/26 20:01-20:33/32	05:19 06:05-06:49/44
	16:33 15:18-15:43/25	17:22 16:14-16:27/13	18:15	20:10	21:02 06:57-07:22/25	21:48 20:33-21:15/42
3	08:45 15:19-15:44/25	08:15 08:41-09:09/28	07:19	07:07 19:24-19:45/21	06:02 06:27-06:54/27 20:01-20:34/33	05:18 06:06-06:49/43
	16:34	17:24 16:18-16:23/5	18:17	20:11	21:03 06:59-07:20/21	21:49 20:33-21:15/42
4	08:45 15:20-15:44/24	08:13 08:41-09:08/27	07:17	07:05 19:25-19:47/22	06:00 06:25-06:52/27 20:01-20:36/35	05:17 06:06-06:49/43
	16:35	17:26	18:18	20:13	21:05 07:01-07:17/16	21:50 20:34-21:17/43
5	08:45 15:20-15:44/24	08:11 08:42-09:09/27	07:15	07:03 19:26-19:48/22	05:58 06:24-06:50/26 20:02-20:38/36	05:17 06:06-06:49/43
	16:36	17:28	18:20	20:15	21:07 07:05-07:14/9	21:51 20:34-21:17/43
6	08:44 16:02-16:03/1	08:10 08:43-09:08/25	07:12	07:00 19:27-19:50/23	05:56 06:22-06:43/21	05:16 06:07-06:49/42
	16:38 15:22-15:44/22	17:30	18:22	20:17	21:08 20:02-20:39/37	21:52 20:35-21:19/44
7	08:44 16:01-16:04/3	08:08 08:43-09:07/24	07:10	06:58 19:40-19:52/12 07:21-07:23/2	05:55 06:20-06:43/23	05:15 06:07-06:48/41
	16:39 15:22-15:44/22	17:32	18:24	20:18 19:30-19:39/9	21:10 20:02-20:40/38	21:53 20:35-21:19/44
8	08:44 16:01-16:05/4	08:06 08:44-09:06/22	07:08	06:56 19:39-19:54/15	05:53 06:18-06:44/26	05:15 06:08-06:49/41
	16:40 15:23-15:43/20	17:34	18:26	20:20 07:19-07:26/7	21:12 20:02-20:42/40	21:54 20:36-21:20/44
9	08:43 16:02-16:07/5	08:04 08:46-09:04/18	07:06	06:53 19:38-19:55/17	05:51 06:17-06:45/28	05:14 06:07-06:48/41
	16:42 15:25-15:43/18	17:35	18:27	20:22 07:16-07:27/11	21:13 20:04-20:44/40	21:55 20:36-21:21/45
10	08:43 16:01-16:08/7	08:02 08:48-09:02/14	07:03	06:51 19:37-19:57/20	05:49 06:15-06:45/30	05:14 06:08-06:49/41
	16:43 15:26-15:43/17	17:37	18:29	20:24 07:14-07:29/15	21:15 20:04-20:45/41	21:56 20:37-21:22/45
11	08:42 16:01-16:10/9	08:01 08:51-09:00/9	07:01	06:49 19:37-19:59/22	05:48 06:14-06:47/33	05:13 06:09-06:49/40
	16:44 15:27-15:42/15	17:39	18:31	20:25 07:12-07:30/18	21:17 20:05-20:47/42	21:56 20:38-21:23/45
12	08:41 16:01-16:11/10	07:59	06:59	06:47 19:37-20:01/24	05:46 06:12-06:47/35	05:13 06:09-06:49/40
	16:46 15:29-15:41/12	17:41	18:33	20:27 07:10-07:31/21	21:18 20:06-20:48/42	21:57 20:39-21:23/44
13	08:41 16:01-16:13/12	07:57	06:56	06:44 19:36-20:01/25	05:44 06:11-06:48/37	05:13 06:09-06:48/39
	16:47 15:31-15:39/8	17:43	18:35	20:29 07:08-07:32/24	21:20 20:07-20:50/43	21:58 20:39-21:23/44
14	08:40 16:01-16:14/13	07:55	06:54	06:42 19:37-20:03/26	05:43 06:09-06:48/39	05:13 06:10-06:49/39
	16:49	17:45	18:36	20:31 07:05-07:32/27	21:22 20:09-20:51/42	21:58 20:39-21:24/45
15	08:39 16:01-16:16/15	07:53	06:52 18:12-18:13/1	06:40 19:37-20:03/26	05:41 06:08-06:48/40	05:12 06:10-06:49/39
	16:50	17:47	18:38	20:32 07:03-07:32/29	21:23 20:11-20:53/42	21:59 20:40-21:25/45
16	08:38 16:01-16:18/17	07:51	06:49 18:09-18:14/5	06:38 19:38-20:02/24	05:39 06:06-06:48/42	05:12 06:10-06:49/39
	16:52	17:49	18:40	20:34 07:01-07:33/32	21:25 20:12-20:54/42	21:59 20:41-21:25/44
17	08:37 16:01-16:20/19	07:49	06:47 18:08-18:16/8	06:35 19:39-20:01/22	05:38 06:05-06:49/44	05:12 06:11-06:49/38
	16:54	17:51	18:42	20:36 06:59-07:33/34	21:26 20:13-20:55/42	22:00 20:41-21:26/45
18	08:36 16:02-16:22/20	07:47	06:45 18:07-18:18/11	06:33 19:40-19:59/19	05:36 06:04-06:49/45	05:12 06:11-06:49/38
	16:55	17:52	18:44	20:38 06:57-07:33/36	21:28 20:13-20:56/43	22:00 20:41-21:26/45
19	08:35 16:02-16:24/22	07:45	06:42 18:05-18:19/14	06:31 19:42-19:57/15	05:35 06:03-06:49/46	05:12 06:11-06:49/38
	16:57	17:54	18:45	20:39 06:55-07:33/38	21:29 20:14-20:58/44	22:01 20:42-21:26/44
20	08:34 16:03-16:26/23	07:43	06:40 18:04-18:21/17	06:29 19:44-19:53/9 20:11-20:13/2	05:34 06:03-06:49/46	05:12 06:11-06:49/38
	16:59	17:56	18:47	20:41 06:53-07:33/40	21:31 20:16-20:59/43	22:01 20:42-21:26/44
21	08:33 16:02-16:27/25	07:41	06:38 18:04-18:23/19	06:27 06:50-07:32/42	05:32 06:03-06:49/46	05:12 06:12-06:50/38
	17:00	17:58	18:49	20:43 20:09-20:15/6	21:32 20:18-21:01/43	22:01 20:42-21:26/44
22	08:32 09:00-09:03/3	07:39	06:35 18:02-18:25/23	06:24 06:48-07:31/43	05:31 06:03-06:50/47	05:13 06:12-06:50/38
	17:02 16:03-16:29/26	18:00	18:51	20:44 20:07-20:16/9	21:34 20:18-21:01/43	22:01 20:43-21:27/44
23	08:31 08:59-09:04/5	07:37	06:33 18:02-18:27/25	06:22 06:46-07:31/45	05:30 06:02-06:49/47	05:13 06:12-06:50/38
	17:04 16:04-16:32/28	18:02	18:52	20:46 20:06-20:18/12	21:35 20:21-21:03/42	22:02 20:43-21:27/44
24	08:29 08:57-09:04/7	07:34	06:31 18:02-18:28/26	06:20 06:44-07:30/46	05:28 06:03-06:49/46	05:13 06:12-06:50/38
	17:06 16:04-16:33/29	18:04	18:54	20:48 20:05-20:20/15	21:37 20:29-21:04/35	22:02 20:42-21:27/45
25	08:28 08:56-09:06/10	07:32	06:28 18:02-18:30/28	06:18 06:42-07:30/48	05:27 06:03-06:49/46	05:14 06:13-06:51/38
	17:07 16:05-16:33/28	18:06	18:56	20:50 20:04-20:21/17	21:38 20:29-21:06/37	22:02 20:43-21:28/45
26	08:27 08:54-09:06/12	07:30	06:26 18:02-18:32/30	06:16 06:40-07:29/49	05:26 06:03-06:49/46	05:14 06:12-06:51/39
	17:09 16:05-16:32/27	18:07	18:58	20:51 20:03-20:23/20	21:39 20:30-21:07/37	22:02 20:43-21:27/44
27	08:25 08:53-09:07/14	07:28	06:24 18:02-18:33/31	06:14 06:38-07:28/50	05:25 06:03-06:49/46	05:14 06:13-06:52/39
	17:11 16:06-16:33/27	18:09	18:59	20:53 20:02-20:24/22	21:41 20:30-21:08/38	22:02 20:43-21:28/45
28	08:24 08:51-09:07/16	07:26	06:21 18:03-18:35/32	06:12 06:37-07:27/50	05:24 06:04-06:49/45	05:15 06:13-06:52/39
	17:13 16:06-16:32/26	18:11	19:01	20:55 20:02-20:26/24	21:42 20:30-21:09/39	22:02 20:43-21:27/44
29	08:22 08:50-09:08/18		07:19 19:04-19:37/33	06:10 06:35-07:27/52	05:23 06:04-06:49/45	05:15 06:13-06:52/39
	17:15 16:08-16:32/24		20:03	20:57 20:01-20:27/26	21:43 20:31-21:10/39	22:01 20:43-21:28/45
30	08:21 08:48-09:08/20		07:16 19:04-19:38/34	06:08 06:34-07:25/51	05:22 06:05-06:50/45	05:16 06:13-06:52/39
	17:17 16:09-16:31/22		20:05	20:58 20:02-20:30/28	21:44 20:31-21:11/40	22:01 20:42-21:27/45
31	08:19 08:46-09:08/22		07:14 19:06-19:40/34		05:21 06:05-06:49/44	
	17:18 16:10-16:30/20		20:06		21:46 20:32-21:13/41	
Potential sun hours	257	277	367	417	487	501
Sum of minutes with flicker	855	279	371	1413	2486	2520

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

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SHADOW - Calendar per WTG

Calculation: 6839 Garrane WF Worst Case - V150 **WTG:** 5 - T05

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	July	August	September	October	November	December
1	05:17 06:13-06:53/40	05:54 06:23-06:57/34	06:45 19:36-19:58/22	07:35	07:30 08:17-08:33/16	08:22 15:43-15:52/9
	22:01 20:43-21:27/44	21:28 20:16-20:58/42	20:25 07:11-07:29/18	19:15	17:07	16:26 15:09-15:24/15
2	05:17 06:13-06:54/41	05:56 06:25-06:57/32	06:46 19:36-19:56/20	07:36	07:31 08:15-08:34/19	08:23 15:44-15:51/7
	22:00 20:43-21:27/44	21:26 20:14-20:56/42	20:23 07:13-07:28/15	19:12	17:05	16:25 15:09-15:26/17
3	05:18 06:13-06:53/40	05:57 06:26-06:56/30	06:48 19:36-19:53/17	07:38	07:33 08:14-08:36/22	08:24 15:45-15:50/5
	22:00 20:42-21:26/44	21:25 20:14-20:55/41	20:20 07:14-07:25/11	19:10	17:04	16:25 15:08-15:26/18
4	05:19 06:13-06:54/41	05:59 06:28-06:55/27	06:50 19:36-19:51/15	07:40	07:35 08:13-08:37/24	08:26 15:46-15:50/4
	22:00 20:42-21:26/44	21:23 20:13-20:53/40	20:18 07:16-07:23/7	19:08	17:02	16:24 15:08-15:28/20
5	05:20 06:13-06:55/42	06:00 06:29-06:54/25	06:51 19:36-19:48/12 07:17-07:20/3	07:42	07:37 08:12-08:38/26	08:27 15:46-15:49/3
	21:59 20:42-21:26/44	21:21 20:12-20:51/39	20:16 19:26-19:35/9	19:05	17:00	16:24 15:07-15:29/22
6	05:21 06:13-06:55/42	06:02 06:31-06:53/22	06:53 19:24-19:46/22	07:43	07:39 08:12-08:38/26	08:28 15:48-15:49/1
	21:59 20:42-21:25/43	21:19 20:11-20:49/38	20:13	19:03	16:58	16:23 15:08-15:30/22
7	05:21 06:13-06:56/43	06:03 06:53-06:55/2 20:11-20:48/37	06:55 19:22-19:44/22	07:45	07:41 08:11-08:39/28	08:30 15:07-15:31/24
	21:58 20:41-21:24/43	21:18 06:32-06:52/20	20:11	19:01	16:57	16:23
8	05:22 06:13-06:55/42	06:05 06:34-07:00/26 20:10-20:46/36	06:56 19:20-19:41/21	07:47	07:42 08:12-08:39/27	08:31 15:07-15:31/24
	21:57 20:41-21:24/43	21:16 07:13-07:25/12	20:09	18:58	16:55 15:48-15:54/6	16:22
9	05:23 06:13-06:56/43	06:07 06:35-07:02/27 20:10-20:44/34	06:58 19:19-19:40/21	07:48	07:44 08:14-08:40/26	08:32 15:07-15:32/25
	21:57 20:40-21:23/43	21:14 07:09-07:27/18	20:06	18:56	16:53 15:45-15:58/13	16:22
10	05:24 06:13-06:56/43	06:08 06:37-07:04/27 20:10-20:43/33	07:00 19:17-19:37/20	07:50	07:46 08:16-08:40/24	08:33 15:08-15:33/25
	21:56 20:40-21:22/42	21:12 07:08-07:30/22	20:04	18:54	16:51 15:43-16:00/17	16:22
11	05:25 06:13-06:56/43	06:10 06:44-07:04/20 06:38-06:43/5	07:01 19:17-19:35/18	07:52	07:48 08:18-08:40/22	08:34 09:48-09:55/7
	21:55 20:40-21:22/42	21:10 07:05-07:31/26 20:10-20:41/31	20:02 19:01-19:13/12	18:51	16:50 15:42-16:02/20	16:22 15:08-15:34/26
12	05:27 06:12-06:57/45	06:12 06:43-07:33/50	07:03 18:59-19:33/34	07:54	07:50 08:20-08:40/20	08:35 09:47-09:57/10
	21:54 20:40-21:21/41	21:08 20:10-20:39/29	19:59	18:49	16:48 15:40-16:03/23	16:22 15:08-15:34/26
13	05:28 06:12-06:57/45	06:13 06:42-07:33/51	07:05 18:56-19:30/34	07:55	07:51 08:22-08:40/18	08:36 09:47-09:58/11
	21:53 20:40-21:20/40	21:06 20:09-20:37/28	19:57	18:47	16:47 15:40-16:04/24	16:22 15:08-15:35/27
14	05:29 06:13-06:58/45	06:15 06:43-07:34/51	07:06 18:54-19:28/34	07:57	07:53 08:24-08:40/16	08:37 09:47-09:59/12
	21:52 20:39-21:19/40	21:04 20:10-20:36/26	19:55	18:45	16:45 15:38-16:04/26	16:22 15:09-15:35/26
15	05:30 06:13-06:58/45	06:17 06:44-07:35/51	07:08 18:52-19:25/33	07:59	07:55 08:26-08:40/14	08:38 09:47-10:00/13
	21:51 20:40-21:19/39	21:02 20:09-20:33/24	19:52	18:43	16:44 15:38-16:05/27	16:22 15:09-15:36/27
16	05:31 06:13-06:59/46	06:18 06:46-07:36/50	07:10 18:51-19:23/32	08:01	07:57 08:27-08:39/12	08:39 09:47-10:01/14
	21:50 20:40-21:18/38	21:00 20:10-20:32/22	19:50	18:40	16:42 15:38-16:05/27	16:22 15:10-15:37/27
17	05:32 06:13-06:59/46	06:20 06:48-07:36/48	07:11 18:51-19:21/30	08:02	07:59 08:29-08:39/10	08:40 09:47-10:02/15
	21:49 20:39-21:17/38	20:58 20:10-20:29/19	19:48	18:38	16:41 15:37-16:06/29	16:22 15:09-15:36/27
18	05:34 06:13-06:59/46	06:21 06:49-07:36/47	07:13 18:49-19:18/29	08:04	08:00 08:31-08:38/7	08:41 09:47-10:02/15
	21:48 20:39-21:16/37	20:56 20:10-20:28/18	19:45	18:36	16:40 15:37-16:07/30	16:22 15:10-15:37/27
19	05:35 06:12-06:59/47	06:23 06:51-07:37/46	07:15 18:49-19:16/27	08:06	08:02 08:33-08:38/5	08:41 09:47-10:03/16
	21:47 20:39-21:14/35	20:54 20:12-20:26/14	19:43	18:34	16:38 15:38-16:06/28	16:22 15:11-15:38/27
20	05:36 06:13-06:59/46	06:25 06:52-07:37/45	07:16 18:49-19:14/25	08:08	08:04 08:35-08:38/3	08:42 09:48-10:04/16
	21:46 20:33-21:14/41	20:52 20:12-20:23/11	19:41	18:32	16:37 15:38-16:05/27	16:23 15:10-15:38/28
21	05:38 06:13-06:59/46	06:26 06:54-07:37/43	07:18 18:48-19:11/23	08:10	08:06 15:38-16:03/25	08:43 09:48-10:04/16
	21:45 20:30-21:13/43	20:49 20:13-20:22/9	19:38	18:30	16:36	16:23 15:11-15:39/28
22	05:39 06:13-06:59/46	06:28 06:55-07:36/41	07:20 18:48-19:09/21	08:11	08:07 15:39-16:02/23	08:43 09:49-10:05/16
	21:43 20:28-21:11/43	20:47 20:14-20:19/5	19:36	18:27	16:35	16:24 15:11-15:39/28
23	05:41 06:13-07:00/47	06:30 19:48-19:59/11 20:16-20:17/1	07:21 18:49-19:07/18	08:13	08:09 15:39-16:01/22	08:44 09:49-10:05/16
	21:42 20:26-21:10/44	20:45 06:57-07:37/40	19:33	18:25	16:33	16:24 15:12-15:40/28
24	05:42 06:13-06:59/46	06:31 19:45-20:00/15	07:23 18:48-19:03/15	08:15	08:11 15:39-15:59/20	08:44 09:49-10:05/16
	21:40 20:26-21:09/43	20:43 06:58-07:36/38	19:31	18:23	16:32	16:25 15:12-15:40/28
25	05:43 06:13-06:59/46	06:33 19:43-20:02/19	07:25 18:49-19:01/12	07:17	08:12 15:39-15:58/19	08:45 09:51-10:06/15
	21:39 20:24-21:08/44	20:41 07:00-07:36/36	19:29	17:21	16:31	16:25 15:14-15:41/27
26	05:45 06:15-06:59/44	06:35 19:41-20:03/22	07:26 18:50-18:59/9	07:19	08:14 15:40-15:57/17	08:45 09:51-10:06/15
	21:38 20:24-21:07/43	20:39 07:02-07:36/34	19:26	17:19	16:30	16:26 15:14-15:41/27
27	05:46 06:16-06:59/43	06:36 19:40-20:04/24	07:28 18:50-18:56/6	07:20	08:15 15:41-15:56/15	08:45 09:52-10:06/14
	21:36 20:23-21:05/42	20:36 07:03-07:34/31	19:24	17:17	16:29	16:27 15:14-15:42/28
28	05:48 06:17-06:58/41	06:38 19:39-20:05/26	07:30 18:52-18:54/2	07:22	08:17 15:41-15:55/14	08:45 09:52-10:06/14
	21:35 20:22-21:03/41	20:34 07:05-07:34/29	19:22	17:15	16:29	16:28 15:15-15:42/27
29	05:49 06:19-06:59/40	06:40 19:38-20:04/26	07:31	07:24	08:19 15:42-15:54/12	08:45 09:53-10:06/13
	21:33 20:21-21:03/42	20:32 07:06-07:33/27	19:19	17:13	16:28 15:12-15:20/8	16:28 15:15-15:42/27
30	05:51 06:20-06:58/38	06:41 19:37-20:02/25	07:33	07:26	08:20 15:43-15:53/10	08:46 09:55-10:06/11
	21:31 20:19-21:01/42	20:30 07:08-07:32/24	19:17	17:11	16:27 15:11-15:23/12	16:29 15:16-15:43/27
31	05:52 06:22-06:58/36	06:43 19:36-19:59/23		07:28 08:19-08:30/11		08:46 09:56-10:06/10
	21:30 20:18-21:00/42	20:27 07:10-07:31/21		17:09		16:30 15:17-15:43/26
Potential sun hours	504	455	381	331	264	241
Sum of minutes with flicker	2638	1988	669	11	859	1095

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

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+353719161416
Kathlyn Feeney / kfeeney@jodireland.com

Calculated:
09/06/2025 13:54/4.0.552

SHADOW - Calendar per WTG

Calculation: 6839 Garrane WF Worst Case - V150 **WTG:** 6 - T06

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January	February	March	April	May	June
1	08:46 09:37-09:52/15 15:13-15:54/41	08:18	07:23	07:12 19:08-19:42/34	06:06 19:56-20:31/35	05:20 20:49-21:14/25
	16:32 09:18-09:23/5	17:20	18:13	20:08	21:00 06:31-06:46/15	21:47
2	08:45 09:37-09:51/14 15:12-15:53/41	08:16	07:21	07:09 19:07-19:43/36	06:04 19:55-20:33/38	05:19 20:49-21:15/26
	16:33 09:17-09:23/6	17:22	18:15	20:10	21:02 06:29-06:43/14	21:48
3	08:45 09:39-09:51/12 15:13-15:54/41	08:15	07:19	07:07 19:07-19:45/38	06:02 19:55-20:34/39	05:18 20:48-21:15/27
	16:34 09:17-09:23/6	17:24	18:17	20:11	21:03 06:27-06:43/16	21:49
4	08:45 09:40-09:51/11 15:14-15:55/41	08:13	07:17	07:05 19:06-19:47/41	06:00 19:55-20:33/38	05:17 20:49-21:17/28
	16:35 09:17-09:25/8	17:26	18:18	20:13	21:05 06:25-06:43/18	21:50
5	08:45 09:42-09:49/7 15:14-15:55/41	08:11	07:15	07:03 19:05-19:48/43	05:58 19:55-20:32/37	05:17 20:48-21:17/29
	16:36 09:16-09:25/9	17:28	18:20	20:15	21:07 06:24-06:45/21	21:51
6	08:44 09:45-09:48/3 15:15-15:56/41	08:10	07:12	07:00 19:05-19:50/45	05:56 19:56-20:33/37	05:16 20:48-21:19/31
	16:37 09:16-09:26/10	17:30	18:22	20:17	21:08 06:22-06:44/22	21:52
7	08:44 09:15-09:26/11	08:08	07:10	06:58 19:05-19:52/47	05:55 19:56-20:32/36	05:15 20:48-21:19/31
	16:39 15:15-15:56/41	17:32	18:24	20:18	21:10 06:20-06:44/24	21:53
8	08:44 09:15-09:27/12	08:06	07:08	06:56 19:06-19:54/48	05:53 19:56-20:31/35	05:15 20:48-21:20/32
	16:40 15:15-15:56/41	17:34	18:26	20:20	21:12 06:18-06:44/26	21:54
9	08:43 09:14-09:27/13	08:04	07:05	06:53 19:05-19:55/50	05:51 19:57-20:31/34	05:14 20:48-21:21/33
	16:41 15:16-15:57/41	17:35	18:27	20:22	21:13 06:17-06:45/28	21:55
10	08:43 09:13-09:28/15	08:02	07:03	06:51 19:05-19:57/52	05:49 19:58-20:30/32	05:14 20:48-21:22/34
	16:43 15:17-15:57/40	17:37	18:29	20:24	21:15 06:15-06:44/29	21:55
11	08:42 09:12-09:28/16	08:01	07:01	06:49 19:06-19:59/53	05:48 19:59-20:30/31	05:13 20:48-21:23/35
	16:44 15:17-15:57/40	17:39	18:31	20:25 07:12-07:13/1	21:17 06:14-06:44/30	21:56
12	08:41 09:11-09:28/17	07:59 08:24-08:25/1	06:59	06:46 19:07-20:01/54	05:46 19:59-20:28/29	05:13 20:49-21:24/35
	16:46 15:17-15:57/40	17:41	18:33	20:27 07:10-07:15/5	21:18 06:13-06:44/31	21:57
13	08:41 09:11-09:30/19	07:57 08:22-08:26/4	06:56	06:44 19:06-20:01/55	05:44 20:00-20:27/27	05:13 20:48-21:23/35
	16:47 15:18-15:57/39	17:43	18:35	20:29 07:08-07:16/8	21:20 06:14-06:44/30	21:58
14	08:40 09:10-09:30/20	07:55 08:20-08:27/7	06:54	06:42 19:07-20:03/56	05:43 20:02-20:26/24	05:13 20:48-21:24/36
	16:49 15:19-15:57/38	17:45	18:36	20:31 07:05-07:16/11	21:22 06:14-06:43/29	21:58
15	08:39 09:09-09:30/21	07:53 08:18-08:27/9	06:52	06:40 19:09-20:05/56	05:41 20:03-20:25/22	05:12 20:48-21:25/37
	16:50 15:19-15:57/38	17:47	18:38	20:32 07:03-07:16/13	21:23 06:15-06:43/28	21:59
16	08:38 09:08-09:31/23	07:51 08:16-08:27/11	06:49	06:38 19:10-20:07/57	05:39 20:04-20:23/19	05:12 20:49-21:25/36
	16:52 15:20-15:57/37	17:49	18:40	20:34 07:01-07:17/16	21:25 06:14-06:42/28	21:59
17	08:37 09:06-09:30/24	07:49 08:14-08:28/14	06:47	06:35 19:12-20:09/57	05:38 20:07-20:22/15	05:12 20:49-21:26/37
	16:54 15:21-15:57/36	17:51	18:42	20:36 06:59-07:17/18	21:26 06:15-06:42/27	22:00
18	08:36 09:05-09:30/25	07:47 08:12-08:28/16	06:45	06:33 19:14-20:10/56	05:36 20:09-20:18/9	05:12 20:49-21:26/37
	16:55 15:22-15:57/35	17:52	18:43	20:38 06:57-07:17/20	21:28 06:16-06:41/25	22:00
19	08:35 09:04-09:30/26	07:45 08:09-08:27/18	06:42	06:31 19:37-20:12/35 19:16-19:33/17	05:35 06:17-06:40/23	05:12 20:49-21:26/37
	16:57 15:23-15:57/34	17:54	18:45	20:39 06:55-07:17/22	21:29	22:01
20	08:34 09:03-09:31/28	07:43 08:07-08:26/19	06:40	06:29 19:37-20:13/36 19:20-19:27/7	05:34 06:18-06:39/21	05:12 20:49-21:26/37
	16:59 15:24-15:57/33	17:56	18:47	20:41 06:53-07:17/24	21:31	22:01
21	08:33 09:01-09:30/29	07:41 08:05-08:26/21	06:38	06:27 19:39-20:15/36	05:32 06:19-06:39/20	05:12 20:49-21:26/37
	17:00 15:25-15:56/31	17:58	18:49	20:43 06:50-07:15/25	21:32 20:59-21:01/2	22:01
22	08:32 09:00-09:30/30	07:39 08:06-08:25/19	06:35	06:24 19:41-20:16/35	05:31 06:20-06:38/18	05:13 20:50-21:27/37
	17:02 15:26-15:55/29	18:00	18:51	20:44 06:48-07:15/27	21:34 20:56-21:01/5	22:01
23	08:31 09:00-09:30/30	07:36 08:07-08:23/16	06:33 18:25-18:27/2	06:22 19:53-20:18/25 19:47-19:48/1	05:30 06:21-06:36/15	05:13 20:50-21:27/37
	17:04 15:28-15:55/27	18:02	18:52	20:46 06:46-07:14/28	21:35 20:55-21:03/8	22:02
24	08:29 09:00-09:28/28	07:34 08:09-08:22/13	06:31 18:20-18:28/8	06:20 19:54-20:20/26	05:28 06:23-06:34/11	05:13 20:50-21:27/37
	17:06 15:29-15:54/25	18:04	18:54	20:48 06:44-07:13/29	21:36 20:54-21:04/10	22:02
25	08:28 09:01-09:28/27	07:32 08:11-08:17/6	06:28 18:18-18:30/12	06:18 19:55-20:21/26	05:27 06:26-06:32/6	05:13 20:51-21:28/37
	17:07 15:31-15:53/22	18:06	18:56	20:50 06:42-07:12/30	21:38 20:53-21:06/13	22:02
26	08:27 09:02-09:26/24	07:30	06:26 18:16-18:32/16	06:16 19:56-20:23/27	05:26 20:52-21:07/15	05:14 20:51-21:27/36
	17:09 15:33-15:51/18	18:07	18:58	20:51 06:40-07:11/31	21:39	22:02
27	08:25 09:03-09:25/22	07:28	06:24 18:14-18:33/19	06:14 19:56-20:24/28	05:25 20:51-21:08/17	05:14 20:51-21:28/37
	17:11 15:36-15:49/13	18:09	18:59	20:53 06:38-07:09/31	21:41	22:02
28	08:24 09:04-09:22/18	07:26	06:21 18:12-18:35/23	06:12 19:56-20:26/30	05:24 20:50-21:09/19	05:15 20:51-21:27/36
	17:13	18:11	19:01	20:55 06:36-07:07/31	21:42	22:01
29	08:22 09:06-09:22/16		07:19 19:11-19:37/26	06:10 19:55-20:27/32 06:56-07:05/9	05:23 20:50-21:10/20	05:15 20:52-21:28/36
	17:15		20:03	20:57 06:35-06:51/16	21:43	22:01
30	08:21 09:08-09:19/11		07:16 19:09-19:38/29	06:08 19:56-20:30/34	05:22 20:49-21:11/22	05:16 20:52-21:27/35
	17:17		20:04	20:58 06:33-06:49/16	21:44	22:01
31	08:19 09:12-09:15/3		07:14 19:09-19:40/31		05:21 20:50-21:13/23	
	17:18		20:06		21:46	
Potential sun hours	257	277	367	417	487	501
Sum of minutes with flicker	1558	174	166	1684	1246	1023

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

Licensed user:
Jennings O'Donovan
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F91 RHH9 Sligo
+353719161416
Kathlyn Feeney / kfeeney@jodireland.com

Calculated:
09/06/2025 13:54/4.0.552

SHADOW - Calendar per WTG

Calculation: 6839 Garrane WF Worst Case - V150 **WTG:** 6 - T06

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	July	August	September	October	November	December
1	05:17 20:52-21:27/35 22:01	05:54 20:10-20:39/29 21:28 06:23-06:54/31	06:45 19:05-19:58/53 20:25 07:11-07:12/1	07:35 19:15	07:30 17:07	08:22 08:54-09:10/16 16:26 14:59-15:39/40
2	05:17 20:52-21:27/35 22:00	05:55 20:08-20:39/31 21:26 06:25-06:55/30	06:46 19:04-19:56/52 20:23	07:36 19:12	07:31 17:05	08:23 08:56-09:11/15 16:25 15:00-15:40/40
3	05:18 20:53-21:26/33 22:00	05:57 20:08-20:41/33 21:25 06:26-06:55/29	06:48 19:03-19:53/50 20:20	07:38 19:10	07:33 17:04	08:24 08:57-09:10/13 16:25 14:59-15:40/41
4	05:19 20:53-21:26/33 22:00	05:59 20:07-20:41/34 21:23 06:28-06:55/27	06:50 19:03-19:51/48 20:18	07:40 19:08	07:35 17:02	08:26 08:59-09:11/12 16:24 15:00-15:41/41
5	05:20 20:54-21:26/32 21:59	06:00 20:06-20:42/36 21:21 06:29-06:54/25	06:51 19:01-19:48/47 20:16	07:42 19:05	07:37 17:00	08:27 09:00-09:11/11 16:24 15:00-15:41/41
6	05:20 20:55-21:25/30 21:59	06:02 20:05-20:42/37 21:19 06:31-06:55/24	06:53 19:01-19:46/45 20:13	07:43 19:03	07:39 16:58	08:28 09:32-09:33/1 15:01-15:42/41 16:23 09:02-09:12/10
7	05:21 20:54-21:24/30 21:58	06:03 20:05-20:42/37 21:18 06:32-06:54/22	06:55 19:01-19:44/43 20:11	07:45 19:01	07:41 16:56	08:30 09:29-09:36/7 15:01-15:42/41 16:23 09:03-09:12/9
8	05:22 20:55-21:24/29 21:57	06:05 20:04-20:42/38 21:16 06:34-06:54/20	06:56 19:00-19:41/41 20:09	07:47 18:58	07:42 16:55	08:31 09:28-09:38/10 15:01-15:42/41 16:22 09:04-09:12/8
9	05:23 20:55-21:23/28 21:57	06:07 20:04-20:43/39 21:14 06:35-06:53/18	06:58 19:01-19:40/39 20:06	07:48 18:56	07:44 16:53	08:32 09:28-09:40/12 15:01-15:42/41 16:22 09:06-09:13/7
10	05:24 20:56-21:22/26 21:56	06:08 20:05-20:43/38 21:12 06:37-06:53/16	07:00 19:00-19:37/37 20:04	07:50 18:54	07:46 16:51	08:33 09:27-09:41/14 15:03-15:43/40 16:22 09:07-09:13/6
11	05:25 20:56-21:22/26 21:55	06:10 20:04-20:41/37 21:10 06:38-06:51/13	07:01 19:00-19:35/35 20:02	07:52 18:51	07:48 08:43-08:48/5 16:50	08:34 09:27-09:42/15 15:03-15:44/41 16:22 09:08-09:13/5
12	05:26 20:57-21:21/24 21:54	06:12 20:04-20:39/35 21:08 06:40-06:56/16	07:03 19:01-19:33/32 19:59	07:54 18:49	07:50 08:40-08:51/11 16:48	08:35 09:27-09:43/16 15:03-15:44/41 16:22 09:09-09:13/4
13	05:28 20:57-21:20/23 21:53	06:13 20:03-20:37/34 21:06 06:41-06:57/16	07:05 19:01-19:30/29 19:57	07:55 18:47	07:51 08:38-08:53/15 16:47	08:36 09:27-09:44/17 15:04-15:44/40 16:22 09:10-09:13/3
14	05:29 20:58-21:19/21 21:52	06:15 20:04-20:36/32 07:02-07:14/12 21:04 06:43-06:59/16	07:06 19:01-19:28/27 19:55	07:57 18:45	07:53 08:37-08:55/18 16:45	08:37 09:27-09:44/17 15:04-15:45/41 16:22 09:11-09:13/2
15	05:30 21:00-21:19/19 21:51	06:17 20:03-20:33/30 21:02 06:44-07:15/31	07:08 19:02-19:25/23 19:52	07:59 18:42	07:55 08:36-08:58/22 16:44 15:08-15:21/13	08:38 09:27-09:45/18 15:05-15:45/40 16:22 09:12-09:14/2
16	05:31 21:00-21:18/18 21:50	06:18 20:04-20:32/28 21:00 06:46-07:17/31	07:10 19:03-19:23/20 19:50	08:01 18:40	07:57 08:34-08:59/25 16:42 15:06-15:24/18	08:39 09:28-09:46/18 15:05-15:46/41 16:22 09:13-09:14/1
17	05:32 21:01-21:17/16 21:49	06:20 20:02-20:29/27 20:58 06:48-07:18/30	07:11 19:04-19:21/17 19:48	08:02 08:42-08:51/9 18:38	07:59 08:34-09:01/27 16:41 15:04-15:26/22	08:40 09:28-09:47/19 15:05-15:46/41 16:22 09:14-09:15/1
18	05:34 21:02-21:16/14 21:48	06:21 20:01-20:28/27 20:56 06:49-07:19/30	07:13 19:05-19:18/13 19:45	08:04 08:39-08:54/15 18:36	08:00 08:34-09:02/28 16:40 15:03-15:28/25	08:41 09:28-09:47/19 16:22 15:06-15:46/40
19	05:35 06:34-06:42/8 21:47 21:03-21:15/12	06:23 19:59-20:25/26 20:54 06:51-07:20/29	07:15 19:07-19:16/9 19:43	08:06 08:38-08:55/17 18:34	08:02 08:34-09:04/30 16:38 15:02-15:29/27	08:41 09:28-09:48/20 16:22 15:06-15:47/41
20	05:36 06:32-06:45/13 21:46 21:05-21:14/9	06:25 19:59-20:23/24 19:50-19:56/6 20:52 06:52-07:20/28	07:16 19:10-19:14/4 19:40	08:08 08:36-08:55/19 18:32	08:04 08:35-09:05/30 16:37 15:01-15:31/30	08:42 09:29-09:49/20 16:23 15:06-15:46/40
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22	05:39 06:29-06:48/19 21:43 21:07-21:11/4	06:28 19:43-20:19/36 20:47 06:55-07:20/25	07:20 19:36	08:11 08:38-08:57/19 18:27	08:07 08:39-09:07/28 16:35 15:00-15:33/33	08:43 09:30-09:50/20 16:24 15:07-15:47/40
23	05:40 06:29-06:50/21 21:42 21:09-21:10/1	06:30 19:42-20:17/35 19:24-19:33/9 20:45 06:57-07:20/23	07:21 19:33	08:13 08:40-08:57/17 18:25	08:09 08:41-09:07/26 16:33 15:00-15:34/34	08:44 09:30-09:50/20 16:24 15:08-15:48/40
24	05:42 06:28-06:50/22 21:40	06:31 19:39-20:15/36 19:19-19:36/17 20:43 06:58-07:20/22	07:23 19:31	08:15 08:42-08:57/15 18:23	08:11 08:42-09:07/25 16:32 14:59-15:34/35	08:44 09:30-09:50/20 16:25 15:08-15:49/41
25	05:43 20:23-20:26/3 21:39 06:27-06:51/24	06:33 19:16-20:13/57 20:41 07:00-07:20/20	07:25 19:29	07:17 07:44-07:57/13 17:21	08:12 08:44-09:08/24 16:31 14:59-15:35/36	08:45 09:32-09:51/19 16:25 15:10-15:50/40
26	05:45 20:18-20:30/12 21:38 06:27-06:52/25	06:35 19:14-20:10/56 20:39 07:02-07:20/18	07:26 19:26	07:19 07:46-07:57/11 17:19	08:14 08:46-09:09/23 16:30 14:59-15:36/37	08:45 09:32-09:51/19 15:10-15:50/40 16:26 09:18-09:19/1
27	05:46 20:16-20:33/17 21:36 06:26-06:52/26	06:36 19:12-20:09/57 20:36 07:03-07:18/15	07:28 19:24	07:20 07:48-07:57/9 17:17	08:15 08:48-09:09/21 16:29 14:59-15:37/38	08:45 09:32-09:51/19 15:10-15:51/41 16:27 09:18-09:19/1
28	05:48 20:14-20:34/20 21:35 06:25-06:53/28	06:38 19:10-20:07/57 20:34 07:05-07:18/13	07:30 19:22	07:22 07:50-07:56/6 17:15	08:17 08:49-09:09/20 16:28 14:59-15:37/38	08:45 09:33-09:51/18 15:11-15:51/40 16:28 09:18-09:19/1
29	05:49 20:13-20:36/23 21:33 06:25-06:54/29	06:40 19:08-20:04/56 20:32 07:06-07:16/10	07:31 19:19	07:24 07:52-07:55/3 17:13	08:19 08:51-09:10/19 16:28 14:59-15:38/39	08:45 09:34-09:51/17 15:11-15:52/41 16:28 09:18-09:20/2
30	05:51 20:12-20:37/25 21:31 06:24-06:54/30	06:41 19:07-20:02/55 20:30 07:08-07:16/8	07:33 19:17	07:26 17:11	08:20 08:53-09:10/17 16:27 15:00-15:39/39	08:46 09:35-09:51/16 15:11-15:52/41 16:29 09:18-09:21/3
31	05:52 20:11-20:39/28 21:30 06:24-06:55/31	06:43 19:06-19:59/53 20:27 07:10-07:14/4		07:28 17:09		08:46 09:35-09:52/17 15:12-15:53/41 16:30 09:18-09:22/4
Potential sun hours	504	455	381	331	264	241
Sum of minutes with flicker	925	1897	665	173	938	1823

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

Licensed user:
Jennings O'Donovan
Finisklin Business Park
F91 RHH9 Sligo
+353719161416
Kathlyn Feeney / kfeeney@jodireland.com
Calculated:
09/06/2025 13:54/4.0.552

SHADOW - Calendar per WTG

Calculation: 6839 Garrane WF Worst Case - V150 **WTG:** 7 - T07

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January	February	March	April	May	June
1	08:46 09:18-09:36/18 16:32 14:59-15:56/57	08:18 08:45-09:01/16 17:20 15:44-16:29/45	07:24 16:46-17:25/39 18:13	07:12 20:08	06:06 20:21-20:31/10 21:00	05:20 20:55-21:14/19 20:26-20:44/18 21:47 05:49-06:16/27
2	08:45 09:17-09:35/18 16:33 14:59-15:57/58	08:16 08:43-09:01/18 17:22 15:44-16:29/45	07:21 16:47-17:24/37 18:15	07:09 20:10	06:04 20:19-20:33/14 21:02	05:19 20:55-21:15/20 20:27-20:42/15 21:48 05:48-06:16/28
3	08:45 09:17-09:35/18 16:34 15:00-15:58/58	08:15 08:41-09:02/21 17:24 15:45-16:28/43	07:19 16:48-17:23/35 18:17	07:07 20:11	06:02 20:18-20:34/16 21:03	05:18 20:55-21:15/20 20:28-20:41/13 21:49 05:49-06:17/28
4	08:45 09:17-09:35/18 16:35 15:01-16:00/59	08:13 08:39-09:02/23 17:26 15:45-16:27/42	07:17 07:41-07:43/2 18:18 16:49-17:20/31	07:05 20:13	06:00 20:17-20:36/19 21:05	05:17 20:55-21:17/22 20:30-20:40/10 21:50 05:49-06:16/27
5	08:45 09:16-09:35/19 16:36 15:01-16:01/60	08:11 08:37-09:02/25 17:28 15:46-16:26/40	07:15 07:38-07:43/5 18:20 16:51-17:19/28	07:03 20:15	05:58 20:16-20:37/21 21:07	05:17 20:55-21:17/22 20:32-20:38/6 21:51 05:49-06:16/27
6	08:44 09:16-09:36/20 16:37 15:02-16:03/61	08:10 08:36-09:03/27 15:48-16:26/38 17:30 16:59-17:00/1	07:12 07:36-07:44/8 18:22 16:53-17:17/24	07:00 20:17	05:56 20:16-20:39/23 21:08	05:16 20:56-21:19/23 21:52 05:50-06:16/26
7	08:44 09:15-09:36/21 16:39 15:02-16:04/62	08:08 08:34-09:03/29 15:49-16:25/36 17:32 16:56-17:02/6	07:10 07:34-07:45/11 18:24 16:56-17:13/17	06:58 20:18	05:55 20:15-20:40/25 21:10	05:15 20:55-21:19/24 21:53 05:50-06:16/26
8	08:44 09:15-09:37/22 16:40 15:02-16:05/63	08:06 08:32-09:03/31 15:50-16:24/34 17:34 16:54-17:04/10	07:08 07:31-07:45/14 18:26 17:01-17:08/7	06:56 20:20	05:53 20:15-20:42/27 21:12	05:15 20:56-21:20/24 21:54 05:50-06:16/26
9	08:43 09:14-09:37/23 16:41 15:04-16:07/63	08:04 08:30-09:03/33 15:52-16:23/31 17:35 16:52-17:06/14	07:05 07:29-07:45/16 18:27	06:53 20:22	05:51 20:15-20:44/29 21:13	05:14 20:55-21:21/26 21:55 05:50-06:16/26
10	08:43 09:13-09:38/25 16:43 15:04-16:08/64	08:02 08:28-09:03/35 15:54-16:21/27 17:37 16:51-17:08/17	07:03 07:27-07:46/19 18:29	06:51 20:24	05:49 20:14-20:45/31 21:15	05:14 20:56-21:22/26 21:56 05:51-06:16/25
11	08:42 09:12-09:38/26 16:44 15:05-16:10/65	08:01 08:26-09:02/36 15:56-16:19/23 17:39 16:50-17:10/20	07:01 07:24-07:45/21 18:31	06:49 20:25	05:48 20:15-20:47/32 21:17	05:13 20:57-21:23/26 21:56 05:52-06:16/24
12	08:41 09:11-09:38/27 16:46 15:05-16:11/66	07:59 08:24-09:02/38 15:59-16:16/17 17:41 16:49-17:12/23	06:59 07:22-07:44/22 18:33	06:46 20:27	05:46 20:14-20:48/34 21:18	05:13 20:56-21:23/27 21:57 05:52-06:16/24
13	08:41 09:11-09:40/29 16:47 15:06-16:13/67	07:57 08:22-09:01/39 16:04-16:11/7 17:43 16:48-17:15/27	06:56 07:20-07:44/24 18:35	06:44 20:29	05:44 20:14-20:49/35 21:20	05:13 20:56-21:23/27 21:58 05:52-06:16/24
14	08:40 09:10-09:40/30 16:49 15:08-16:15/67	07:55 08:23-09:00/37 17:45 16:47-17:17/30	06:54 07:18-07:43/25 18:36	06:42 20:31	05:43 06:09-06:10/1 21:22 20:14-20:51/37	05:13 20:57-21:24/27 21:58 05:52-06:16/24
15	08:39 09:09-09:40/31 16:50 15:08-16:16/68	07:53 08:23-08:59/36 17:47 16:46-17:19/33	06:52 07:19-07:42/23 18:38	06:40 20:32	05:41 06:08-06:12/4 21:23 20:15-20:53/38	05:12 20:57-21:25/28 21:59 05:53-06:16/23
16	08:38 09:08-09:41/33 16:52 15:09-16:18/69	07:51 08:24-08:58/34 17:49 16:46-17:21/35	06:49 07:19-07:40/21 18:40	06:38 20:34	05:39 06:06-06:12/6 21:25 20:14-20:54/40	05:12 20:57-21:25/28 21:59 05:53-06:16/23
17	08:37 09:06-09:40/34 16:54 15:11-16:20/69	07:49 08:25-08:56/31 17:51 16:45-17:23/38	06:47 07:21-07:38/17 18:42	06:35 20:36	05:38 06:05-06:13/8 21:26 20:15-20:55/40	05:12 20:58-21:26/28 22:00 05:54-06:16/22
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19	08:35 09:08-09:41/33 16:57 15:14-16:24/70	07:45 08:26-08:50/24 17:54 16:44-17:26/42	06:42 18:45	06:31 20:39	05:35 06:02-06:14/12 21:29 20:15-20:57/42	05:12 20:58-21:26/28 22:01 05:54-06:16/22
20	08:34 09:08-09:41/33 15:16-15:38/22 16:59 15:39-16:26/47	07:43 08:27-08:48/21 17:56 16:44-17:28/44	06:40 18:47	06:29 20:41	05:34 06:01-06:15/14 21:31 20:16-20:57/41	05:12 20:58-21:26/28 22:01 05:54-06:16/22
21	08:33 09:08-09:40/32 15:17-15:36/19 17:00 15:38-16:27/49	07:41 08:30-08:46/16 17:58 16:44-17:29/45	06:38 18:49	06:27 20:43	05:32 21:00-21:01/1 20:17-20:56/39 21:32 06:00-06:15/15	05:12 20:58-21:26/28 22:01 05:55-06:17/22
22	08:32 09:09-09:41/32 15:20-15:35/15 17:02 15:39-16:28/49	07:39 08:33-08:43/10 18:00 16:44-17:29/45	06:35 18:51	06:24 20:44	05:31 20:58-21:02/4 20:17-20:55/38 21:34 05:59-06:16/17	05:13 20:59-21:27/28 22:01 05:55-06:17/22
23	08:31 09:10-09:41/31 15:24-15:32/8 17:04 15:40-16:28/48	07:37 16:44-17:29/45 18:02	06:33 18:52	06:22 20:46	05:30 20:57-21:03/6 20:17-20:54/37 21:35 05:57-06:15/18	05:13 20:59-21:27/28 22:02 05:55-06:17/22
24	08:29 09:11-09:40/29 17:06 15:39-16:28/49	07:34 16:43-17:28/45 18:04	06:31 18:54	06:20 20:48	05:28 20:57-21:04/7 20:18-20:53/35 21:37 05:56-06:15/19	05:13 20:59-21:27/28 22:02 05:55-06:17/22
25	08:28 09:12-09:40/28 17:07 15:40-16:29/49	07:32 16:44-17:28/44 18:06	06:28 18:56	06:18 20:50	05:27 20:56-21:06/10 20:19-20:51/32 21:38 05:55-06:16/21	05:13 21:00-21:28/28 22:02 05:56-06:18/22
26	08:27 09:13-09:39/26 17:09 15:40-16:29/49	07:30 16:44-17:27/43 18:07	06:26 18:58	06:16 20:51	05:26 20:56-21:07/11 20:20-20:47/27 21:39 05:54-06:16/22	05:14 20:59-21:27/28 22:02 05:55-06:18/23
27	08:25 09:14-09:38/24 15:41-16:29/48 17:11 08:53-08:55/2	07:28 16:45-17:27/42 18:09	06:24 18:59	06:14 20:53	05:25 20:56-21:08/12 20:20-20:47/27 21:41 05:53-06:16/23	05:14 21:00-21:28/28 22:02 05:56-06:19/23
28	08:24 09:15-09:37/22 15:41-16:29/48 17:13 08:51-08:56/5	07:26 16:46-17:26/40 18:11	06:21 19:01	06:12 20:55	05:24 20:55-21:09/14 20:21-20:46/25 21:42 05:52-06:16/24	05:15 21:00-21:27/27 22:02 05:56-06:19/23
29	08:22 09:18-09:36/18 15:42-16:29/47 17:15 08:50-08:58/8		07:19 20:03	06:10 20:23-20:27/4 20:57	05:23 20:55-21:10/15 20:22-20:45/23 21:43 05:51-06:16/25	05:15 21:01-21:28/27 22:01 05:56-06:20/24
30	08:21 09:20-09:34/14 15:42-16:29/47 17:17 08:48-08:59/11		07:16 20:04	06:08 20:22-20:30/8 20:58	05:22 20:55-21:11/16 20:23-20:45/22 21:44 05:51-06:17/26	05:16 21:00-21:27/27 22:01 05:56-06:20/24
31	08:19 09:23-09:30/7 15:42-16:29/47 17:18 08:46-08:59/13		07:14 20:06		05:21 20:56-21:13/17 20:25-20:45/20 21:46 05:50-06:17/27	
Potential sun hours	257	277	367	417	487	501
Sum of minutes with flicker	2670	1765	459	12	1325	1563

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

Licensed user:
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Finisklin Business Park
F91 RHH9 Sligo
+353719161416
Kathlyn Feeney / kfeeney@jodireland.com

SHADOW - Calendar per WTG

Calculation: 6839 Garrane WF Worst Case - V150 **WTG:** 7 - T07

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	July	August	September	October	November	December
1	05:17 21:01-21:27/26	05:54 20:25-20:58/33	06:45	07:35 08:00-08:23/23	07:30 07:58-08:32/34 15:23-15:51/28	08:22 08:54-09:20/26
	22:01 05:56-06:20/24	21:28	20:25	19:15	17:07 16:21-16:38/17	16:26 14:47-15:52/65
2	05:17 21:00-21:26/26	05:55 20:24-20:56/32	06:46	07:36 08:02-08:23/21	07:31 08:00-08:33/33 15:21-15:53/32	08:23 08:56-09:21/25
	22:01 05:56-06:21/25	21:26	20:23	19:12	17:05 16:22-16:36/14	16:25 14:47-15:51/64
3	05:18 21:01-21:26/25	05:57 20:25-20:55/30	06:48	07:38 08:04-08:23/19	07:33 08:02-08:33/31 15:20-15:54/34	08:24 08:57-09:20/23
	22:00 05:56-06:21/25	21:25	20:20	19:10	17:04 16:24-16:34/10	16:25 14:47-15:50/63
4	05:19 21:01-21:26/25	05:59 20:24-20:53/29	06:50	07:40 08:05-08:22/17	07:35 08:04-08:33/29 15:19-15:55/36	08:26 08:59-09:21/22
	22:00 05:56-06:21/25	21:23	20:18	19:08	17:02 16:26-16:32/6	16:24 14:47-15:50/63
5	05:20 21:02-21:26/24	06:00 20:25-20:51/26	06:51	07:42 08:07-08:22/15	07:37 08:06-08:33/27	08:27 09:00-09:21/21
	21:59 05:56-06:22/26	21:21	20:16	19:05	17:00 15:18-15:56/38	16:24 14:47-15:49/62
6	05:20 21:02-21:25/23	06:02 20:25-20:49/24	06:53	07:43 08:09-08:22/13	07:39 08:08-08:33/25	08:28 09:02-09:22/20
	21:59 05:56-06:23/27	21:19	20:13	19:03 17:35-17:48/13	16:58 15:17-15:57/40	16:23 14:48-15:49/61
7	05:21 21:01-21:24/23	06:03 20:26-20:48/22	06:55	07:45 08:11-08:21/10	07:41 08:10-08:33/23	08:30 09:03-09:22/19
	21:58 05:56-06:23/27	21:18	20:11	19:01 17:31-17:52/21	16:56 15:16-15:58/42	16:23 14:48-15:48/60
8	05:22 21:02-21:24/22 20:37-20:46/9	06:05 20:26-20:46/20	06:56	07:47 08:12-08:19/7	07:42 08:12-08:32/20	08:31 09:04-09:22/18
	21:57 05:55-06:23/28	21:16	20:09	18:58 17:27-17:53/26	16:55 15:15-15:59/44	16:22 14:48-15:47/59
9	05:23 21:02-21:23/21 20:36-20:48/12	06:07 20:27-20:45/18	06:58	07:48 08:14-08:18/4	07:44 08:14-08:32/18	08:32 09:06-09:24/18
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10	05:24 21:02-21:22/20 20:35-20:49/14	06:08 20:28-20:43/15	07:00	07:50 17:23-17:56/33	07:46 08:16-08:32/16	08:33 09:07-09:25/18
	21:56 05:55-06:23/28	21:12	20:04	18:54	16:51 15:15-16:00/45	16:22 14:49-15:47/58
11	05:25 21:03-21:22/19 20:34-20:50/16	06:10 20:28-20:41/13	07:01	07:52 17:22-17:57/35	07:48 08:54-09:03/9 15:14-16:00/46	08:34 09:08-09:26/18
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12	05:26 21:03-21:21/18 20:33-20:52/19	06:12 20:30-20:39/9	07:03	07:54 17:21-17:58/37	07:50 08:51-09:06/15 15:14-16:01/47	08:35 09:09-09:27/18
	21:54 05:57-06:24/27	21:08	19:59	18:49	16:48 08:20-08:30/10	16:22 14:49-15:46/57
13	05:28 21:03-21:20/17 20:32-20:53/21	06:13 20:30-20:37/7	07:05	07:55 17:19-17:58/39	07:51 08:50-09:08/18 15:14-16:01/47	08:36 09:10-09:28/18
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14	05:29 21:03-21:19/16 20:31-20:54/23	06:15 20:32-20:36/4	07:06	07:57 17:18-17:59/41	07:53 08:48-09:10/22 15:13-16:01/48	08:37 09:11-09:29/18
	21:52 06:00-06:25/25	21:04	19:55	18:45	16:45 08:24-08:29/5	16:21 14:50-15:46/56
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	21:50 06:02-06:25/23	21:00	19:50	18:40	16:42 15:13-16:01/48	16:22 14:51-15:46/55
17	05:32 21:05-21:17/12 20:29-20:57/28	06:20	07:11	08:02 17:16-18:00/44	07:59 08:45-09:13/28	08:40 09:14-09:33/19
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18	05:34 21:06-21:16/10 20:29-20:58/29	06:21	07:13	08:04 17:16-18:00/44	08:00 08:45-09:14/29	08:41 09:14-09:33/19
	21:48 06:04-06:25/21	20:56	19:45	18:36	16:40 15:13-16:02/49	16:22 14:51-15:46/55
19	05:35 21:06-21:15/9 20:28-21:01/33	06:23	07:15	08:06 17:14-18:00/46	08:02 08:44-09:15/31 14:58-15:06/8	08:41 09:15-09:34/19
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21	05:38 21:08-21:13/5 20:27-21:05/38	06:26	07:18	08:10 08:59-09:17/18	08:06 08:44-09:16/32 14:53-15:12/19	08:43 09:16-09:35/19
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22	05:39 21:09-21:11/2 20:27-21:06/39	06:28	07:20	08:11 08:57-09:19/22	08:07 08:44-09:17/33 14:52-15:14/22	08:43 09:17-09:36/19
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23	05:40 21:09-21:10/1 20:26-21:06/40	06:30	07:21	08:13 08:56-09:21/25	08:09 08:45-09:18/33	08:44 09:17-09:36/19
	21:42 06:11-06:26/15	20:45	19:33	18:25 17:14-17:56/42	16:33 14:51-16:01/70	16:24 14:54-15:48/54
24	05:42 06:12-06:25/13	06:31	07:23	08:15 08:55-09:24/29	08:11 08:44-09:17/33	08:44 09:17-09:36/19
	21:40 20:26-21:07/41	20:43	19:31	18:23 17:15-17:54/39	16:32 14:49-15:59/70	16:25 14:54-15:49/55
25	05:43 06:13-06:24/11	06:33	07:25 08:07-08:17/10	07:17 07:54-08:26/32	08:12 08:44-09:18/34	08:45 09:18-09:37/19
	21:39 20:26-21:08/42	20:41	19:29	17:21 16:15-16:52/37	16:31 14:49-15:58/69	16:25 14:55-15:50/55
26	05:45 06:15-06:24/9	06:35	07:26 08:04-08:20/16	07:19 07:53-08:28/35	08:14 08:46-09:19/33	08:45 09:18-09:37/19
	21:38 20:25-21:06/41	20:39	19:26	17:19 16:15-16:50/35	16:30 14:48-15:57/69	16:26 14:55-15:50/55
27	05:46 06:16-06:23/7	06:36	07:28 08:01-08:21/20	07:20 07:52-08:29/37	08:15 08:48-09:19/31	08:45 09:18-09:37/19
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28	05:48 06:17-06:22/5	06:38	07:30 08:00-08:22/22	07:22 07:52-08:30/38	08:17 08:49-09:19/30	08:45 09:18-09:37/19
	21:35 20:25-21:03/38	20:34	19:22	17:15 16:17-16:46/29	16:28 14:47-15:54/67	16:28 14:56-15:52/56
29	05:49 06:19-06:22/3	06:40	07:31 07:59-08:23/24	07:24 07:52-08:31/39 15:32-15:43/11	08:19 08:51-09:20/29	08:45 09:18-09:36/18
	21:33 20:25-21:03/38	20:32	19:19	17:13 16:18-16:44/26	16:28 14:47-15:54/67	16:28 14:57-15:53/56
30	05:51 20:25-21:01/36	06:41	07:33 07:58-08:23/25	07:26 07:54-08:32/38 15:28-15:47/19	08:20 08:53-09:20/27	08:46 09:18-09:36/18
	21:31	20:30	19:17	17:11 16:18-16:42/24	16:27 14:47-15:53/66	16:29 14:57-15:54/57
31	05:52 20:25-21:00/35	06:43		07:28 07:56-08:32/36 15:25-15:49/24		08:46 09:18-09:36/18
	21:30	20:27		17:09 16:20-16:40/20		16:30 14:58-15:55/57
Potential sun hours	504	455	381	331	264	241
Sum of minutes with flicker	1689	282	117	1458	2458	2381

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

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SHADOW - Calendar per WTG

Calculation: 6839 Garrane WF Worst Case - V150 **WTG:** 8 - T08

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January	February	March	April	May	June
1	08:46 15:33-15:56/23 16:32 09:45-10:49/64	08:18 16:29-16:50/21 17:20	07:24 07:54-08:39/45 18:13 17:28-17:46/18	07:12 20:08	06:06 20:22-20:31/9 21:00	05:20 20:51-21:14/23 21:47
2	08:46 15:33-15:57/24 16:33 09:45-10:49/64	08:16 16:29-16:52/23 17:22	07:21 07:54-08:38/44 18:15 17:28-17:48/20	07:10 20:10	06:04 20:21-20:33/12 21:02	05:19 20:52-21:15/23 21:48
3	08:45 15:34-15:58/24 16:34 09:46-10:49/63	08:15 16:29-16:54/25 17:24	07:19 07:55-08:38/43 18:17 17:28-17:50/22	07:07 20:11	06:02 20:21-20:34/13 21:03	05:18 20:52-21:15/23 21:49
4	08:45 15:36-16:00/24 16:35 09:47-10:50/63	08:13 16:29-16:55/26 17:26	07:17 07:55-08:37/42 18:18 17:28-17:52/24	07:05 20:13	06:00 20:21-20:36/15 21:05	05:17 20:53-21:17/24 21:50
5	08:45 15:36-16:01/25 16:36 09:47-10:49/62	08:11 16:30-16:55/25 17:28	07:15 07:55-08:36/41 18:20 17:28-17:53/25	07:03 20:15	05:58 20:21-20:37/16 21:07	05:17 20:53-21:17/24 21:51
6	08:45 15:38-16:03/25 16:38 09:48-10:50/62	08:10 16:58-17:00/2 17:30 16:31-16:55/24	07:12 07:56-08:35/39 18:22 17:29-17:52/23	07:00 20:17	05:56 20:22-20:39/17 21:08	05:16 20:54-21:19/25 21:52
7	08:44 15:39-16:04/25 16:39 09:48-10:50/62	08:08 16:57-17:02/5 17:32 16:32-16:54/22	07:10 07:57-08:34/37 18:24 17:29-17:50/21	06:58 20:18	05:55 20:23-20:40/17 21:10	05:15 20:54-21:19/25 21:53
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14	08:40 15:49-16:15/26 16:49 09:53-10:49/56	07:55 08:20-08:31/11 17:45 16:54-17:17/23	06:54 18:36	06:42 19:58-20:03/5 20:31	05:43 21:22	05:13 20:59-21:24/25 21:58
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17	08:37 15:53-16:20/27 16:54 09:55-10:47/52	07:49 08:14-08:36/22 17:51 16:55-17:23/28	06:47 18:42	06:35 19:56-20:09/13 20:36	05:38 20:50-20:55/5 21:26	05:12 21:01-21:26/25 22:00
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19	08:35 15:56-16:24/28 16:57 09:57-10:45/48	07:45 08:09-08:37/28 17:54 16:56-17:22/26	06:42 18:45	06:31 19:56-20:12/16 20:39	05:35 20:49-20:58/9 21:29	05:12 21:02-21:26/24 22:01
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22	08:32 16:04-16:27/23 17:02 10:00-10:40/40	07:39 08:03-08:39/36 18:00 17:00-17:20/20	06:35 18:51	06:24 19:56-20:16/20 20:44	05:31 20:48-21:01/13 21:34	05:13 21:03-21:27/24 22:01
23	08:31 16:06-16:27/21 16:30-16:32/2 17:04 10:02-10:37/35	07:37 08:01-08:40/39 17:02-17:18/16 18:02 17:34-17:35/1	06:33 18:52	06:22 19:57-20:18/21 20:46	05:30 20:49-21:03/14 21:35	05:13 21:03-21:27/24 22:02
24	08:29 16:08-16:26/18 16:29-16:33/4 17:06 10:03-10:35/32	07:34 07:59-08:40/41 17:05-17:15/10 18:04 17:32-17:36/4	06:31 18:54	06:20 19:57-20:20/23 20:48	05:28 20:49-21:04/15 21:37	05:13 21:03-21:27/24 22:02
25	08:28 16:10-16:26/16 16:29-16:36/7 17:07 10:05-10:34/29	07:32 07:56-08:39/43 18:06 17:31-17:38/7	06:28 18:56	06:18 19:59-20:21/22 20:50	05:27 20:49-21:06/17 21:38	05:14 21:03-21:28/25 22:02
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28	08:24 10:13-10:27/14 17:13 16:28-16:41/13	07:26 07:54-08:40/46 18:11 17:29-17:45/16	06:21 19:01	06:12 20:23-20:26/3 20:55	05:24 20:50-21:09/19 21:42	05:15 21:02-21:27/25 22:02
29	08:22 16:28-16:44/16 17:15		07:19 20:03	06:10 20:22-20:27/5 20:57	05:23 20:50-21:10/20 21:43	05:15 21:03-21:28/25 22:01
30	08:21 16:28-16:46/18 17:17		07:17 20:05	06:08 20:22-20:30/8 20:58	05:22 20:50-21:11/21 21:44	05:16 21:02-21:27/25 22:01
31	08:19 16:28-16:47/19 17:18		07:14 20:06		05:21 20:51-21:13/22 21:46	
Potential sun hours	257	277	367	417	487	501
Sum of minutes with flicker	2139	1110	624	231	372	736

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

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Kathlyn Feeney / kfeeney@jodireland.com
Calculated:
09/06/2025 13:54/4.0.552

SHADOW - Calendar per WTG

Calculation: 6839 Garrane WF Worst Case - V150 **WTG:** 8 - T08

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	July	August	September	October	November	December
1	05:17 21:02-21:27/25 22:01	05:54 21:28	06:45 20:25	07:35 08:46-08:59/13 19:15	07:30 16:24-16:38/14 17:07 16:06-16:20/14	08:22 15:26-15:52/26 16:26 09:32-10:31/59
2	05:17 21:01-21:27/26 22:01	05:56 20:37-20:46/9 21:26	06:46 20:23	07:36 08:42-09:03/21 19:12	07:31 16:25-16:36/11 17:05 16:04-16:22/18	08:23 15:25-15:51/26 16:25 09:33-10:33/60
3	05:18 21:01-21:26/25 22:00	05:57 20:36-20:48/12 21:25	06:48 20:20	07:38 08:40-09:06/26 19:10	07:33 16:25-16:34/9 17:04 16:03-16:23/20	08:24 15:24-15:50/26 16:25 09:33-10:33/60
4	05:19 21:01-21:26/25 22:00	05:59 20:34-20:49/15 21:23	06:50 20:18	07:40 08:37-09:07/30 19:08 18:11-18:23/12	07:35 16:26-16:32/6 17:02 16:02-16:24/22	08:26 15:25-15:50/25 16:24 09:33-10:34/61
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31	05:52 21:30	06:43 20:27		07:28 16:24-16:40/16 17:09 16:09-16:17/8		08:46 15:31-15:55/24 16:30 09:44-10:48/64
Potential sun hours	504	455	381	331	264	241
Sum of minutes with flicker	504	380	0	1496	1445	2733

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

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SHADOW - Calendar per WTG

Calculation: 6839 Garrane WF Worst Case - V150 **WTG:** 9 - T09

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	January	February	March	April	May	June
1	08:46 15:17-15:56/39	08:18 16:09-16:37/28 16:46-16:50/4	07:24 07:59-08:56/57	07:12 07:37-08:11/34	06:06	05:20 21:09-21:14/5
	16:32 09:18-09:50/32	17:20 09:16-10:01/45	18:13 17:11-17:46/35	20:08 18:59-19:15/16	21:00	21:47 20:44-21:05/21
2	08:46 15:17-15:57/40	08:16 16:11-16:36/25 16:44-16:52/8	07:21 08:00-08:55/55	07:09 07:36-08:10/34	06:04	05:19 21:09-21:15/6
	16:33 09:17-09:50/33	17:22 09:17-10:00/43	18:15 17:11-17:48/37	20:10 19:03-19:09/6	21:02	21:48 20:44-21:04/20
3	08:45 15:18-15:58/40	08:15 16:12-16:35/23 08:41-08:44/3	07:19 08:01-08:54/53	07:07 07:37-08:09/32	06:02	05:18 21:08-21:15/7
	16:34 09:17-09:51/34	17:24 09:17-09:59/42 16:43-16:54/11	18:17 17:11-17:50/39	20:11	21:03	21:49 20:45-21:04/19
4	08:45 15:20-16:00/40	08:13 16:14-16:34/20 08:39-08:47/8	07:17 08:01-08:52/51	07:05 07:37-08:09/32	06:00	05:17 21:09-21:17/8
	16:35 09:17-09:52/35	17:26 09:18-09:58/40 16:42-16:56/14	18:18 17:10-17:52/42	20:13	21:05	21:50 20:46-21:04/18
5	08:45 15:20-16:01/41	08:11 16:16-16:32/16 08:37-08:49/12	07:15 08:01-08:49/48	07:03 07:38-08:08/30	05:58	05:17 21:08-21:17/9
	16:36 09:16-09:52/36	17:28 09:19-09:57/38 16:41-16:57/16	18:20 17:11-17:53/42	20:15	21:07	21:51 20:47-21:03/16
6	08:45 15:22-16:03/41	08:10 16:19-16:30/11 08:36-08:52/16	07:12 08:02-08:47/45	07:00 07:38-08:05/27	05:56	05:16 21:09-21:19/10
	16:37 09:16-09:53/37	17:30 09:21-09:57/36 16:41-17:00/19	18:22 17:11-17:53/42	20:17	21:08	21:52 20:48-21:03/15
7	08:44 15:23-16:04/41	08:08 09:23-09:55/32 16:40-17:02/22	07:10 08:03-08:44/41	06:58 07:40-08:04/24	05:55	05:15 21:09-21:19/10
	16:39 09:15-09:54/39	17:32 08:34-08:54/20	18:24 17:11-17:52/41	20:18	21:10	21:53 20:48-21:02/14
8	08:44 15:25-16:05/40	08:06 09:24-09:53/29 16:39-17:04/25	07:08 08:04-08:40/36	06:56 07:41-08:02/21	05:53	05:15 21:09-21:20/11
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11	08:42 15:30-16:10/40	08:01 09:34-09:43/9 16:38-17:10/32	07:01 08:09-08:33/24	06:49	05:48 20:42-20:47/5	05:13 21:10-21:23/13
	16:44 09:12-09:56/44	17:39 08:26-08:58/32	18:31 17:15-17:48/33	20:25	21:17	21:56 20:53-21:00/7
12	08:41 15:31-16:11/40	07:59 08:24-08:59/35	06:59 08:12-08:29/17 17:16-17:47/31	06:46	05:46 20:41-20:48/7	05:13 21:09-21:23/14
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	16:52 09:09-10:00/51	17:49 16:39-17:16/37	18:40 17:23-17:37/14	20:34	21:25	21:59
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	17:18 09:15-10:01/46		20:06 18:57-19:17/20		21:46 20:44-21:06/22	
Potential sun hours	257	277	367	417	487	501
Sum of minutes with flicker	2678	2385	1771	278	402	547

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

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SHADOW - Calendar per WTG

Calculation: 6839 Garrane WF Worst Case - V150 **WTG:** 9 - T09

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.80	2.40	3.30	5.30	6.20	5.80	5.40	5.20	4.30	3.00	2.30	1.70

Operational time

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Sum
211	277	155	351	176	225	510	804	979	1,075	826	665	564	773	750	419	8,760

	July	August	September	October	November	December
1	05:17 21:14-21:27/13 22:01 20:58-21:03/5	05:54 20:52-20:58/6 21:28	06:45 20:25	07:35 08:53-09:06/13 17:56-18:26/30 19:15 18:42-18:47/5	07:30 08:58-09:18/20 16:08-16:38/30 17:07 07:58-08:26/28	08:22 15:12-15:52/40 16:26 08:54-09:38/44
2	05:17 21:13-21:26/13 22:01 20:56-21:04/8	05:55 20:52-20:56/4 21:26	06:46 07:46-07:53/7 20:23	07:36 08:49-09:10/21 19:12 17:54-18:27/33	07:31 08:56-09:21/25 16:09-16:36/27 17:05 08:00-08:25/25	08:23 15:11-15:51/40 16:25 08:56-09:39/43
3	05:18 21:14-21:26/12 22:00 20:56-21:05/9	05:57 20:53-20:55/2 21:25	06:48 07:41-07:56/15 20:20	07:38 08:46-09:13/27 19:10 17:53-18:28/35	07:33 08:54-09:23/29 16:09-16:34/25 17:04 08:02-08:24/22	08:24 15:09-15:50/41 16:25 08:57-09:38/41
4	05:19 21:14-21:26/12 22:00 20:55-21:07/12	05:59 21:23	06:50 07:38-07:59/21 20:18	07:40 08:43-09:14/31 19:08 17:51-18:27/36	07:35 08:52-09:25/33 16:10-16:32/22 17:02 08:04-08:23/19	08:26 15:09-15:50/41 16:24 08:59-09:39/40
5	05:20 21:15-21:26/11 21:59 20:55-21:08/13	06:00 21:21	06:51 07:36-08:00/24 20:16	07:42 08:42-09:16/34 19:05 17:49-18:28/39	07:37 15:48-16:00/12 08:06-08:22/16 17:00 08:51-09:26/35 16:11-16:30/19	08:27 15:08-15:49/41 16:24 09:00-09:39/39
6	05:20 21:15-21:25/10 21:59 20:55-21:09/14	06:02 21:19	06:53 07:34-08:01/27 20:14	07:43 08:40-09:19/39 19:03 17:48-18:28/40	07:39 15:46-16:03/17 08:08-08:20/12 16:58 08:50-09:28/38 16:12-16:28/16	08:28 15:08-15:49/41 16:23 09:02-09:40/38
7	05:21 21:15-21:24/9 21:58 20:53-21:09/16	06:03 21:18	06:55 07:33-08:03/30 20:11	07:45 08:39-09:22/43 19:01 17:48-18:29/41	07:41 15:44-16:05/21 08:10-08:18/8 16:56 08:49-09:29/40 16:13-16:26/13	08:30 15:07-15:48/41 16:23 09:03-09:39/36
8	05:22 21:15-21:24/9 21:57 20:53-21:10/17	06:05 21:16	06:56 07:31-08:03/32 20:09	07:47 08:37-09:23/46 18:58 17:46-18:28/42	07:42 15:43-16:06/23 08:12-08:15/3 16:55 08:48-09:30/42 16:14-16:24/10	08:31 15:07-15:47/40 16:22 09:04-09:39/35
9	05:23 21:16-21:23/7 21:57 20:52-21:11/19	06:07 21:14	06:58 07:31-08:03/32 20:07	07:48 08:36-09:25/49 18:56 17:46-18:28/42	07:44 15:41-16:07/26 16:15-16:22/7 16:53 08:47-09:31/44	08:32 15:08-15:47/39 16:22 09:06-09:40/34
10	05:24 21:16-21:22/6 21:56 20:52-21:11/19	06:08 21:12	07:00 07:29-08:03/34 20:04 18:58-19:00/2	07:50 08:35-09:27/52 18:54 17:45-18:26/41	07:46 15:40-16:08/28 16:17-16:21/4 16:51 08:47-09:32/45	08:33 15:07-15:47/40 16:22 09:07-09:40/33
11	05:25 21:16-21:22/6 21:55 20:52-21:12/20	06:10 21:10	07:01 07:29-08:04/35 20:02 18:52-19:06/14	07:52 08:34-09:28/54 18:51 17:45-18:24/39	07:48 15:38-16:09/31 16:50 08:46-09:33/47	08:34 15:07-15:47/40 16:22 09:08-09:40/32
12	05:26 21:17-21:21/4 21:54 20:51-21:13/22	06:12 21:08	07:03 07:29-08:04/35 19:59 18:49-19:09/20	07:54 08:34-09:29/55 18:49 17:45-18:21/36	07:50 15:32-16:10/38 16:48 08:46-09:33/47	08:35 15:06-15:46/40 16:22 09:09-09:42/33
13	05:28 21:17-21:20/3 21:53 20:51-21:13/22	06:13 21:06	07:05 07:30-08:03/33 19:57 18:46-19:10/24	07:55 08:32-09:29/57 18:47 17:44-18:18/34	07:52 15:30-16:10/40 16:47 08:46-09:34/48	08:36 15:06-15:46/40 16:22 09:10-09:43/33
14	05:29 21:18-21:19/1 21:52 20:50-21:14/24	06:15 21:04	07:06 07:32-08:03/31 19:55 18:45-19:11/26	07:57 08:32-09:30/58 18:45 17:44-18:16/32	07:53 15:28-16:11/43 16:45 08:46-09:34/48	08:37 15:07-15:46/39 16:22 09:11-09:44/33
15	05:30 20:51-21:15/24 21:51	06:17 21:02	07:08 07:34-08:03/29 19:52 18:43-19:12/29	07:59 08:32-09:31/59 18:43 17:44-18:14/30	07:55 15:26-16:10/44 16:44 08:46-09:35/49	08:38 15:07-15:46/39 16:22 09:12-09:45/33
16	05:31 20:51-21:15/24 21:50	06:18 21:00	07:10 07:35-08:02/27 19:50 18:42-19:13/31	08:01 08:32-09:31/59 17:23-17:34/11 18:40 17:45-18:12/27	07:57 15:25-16:10/45 16:42 08:45-09:35/50	08:39 15:07-15:46/39 16:22 09:13-09:46/33
17	05:32 20:50-21:16/26 21:49	06:20 20:58	07:11 07:37-08:01/24 19:48 18:41-19:13/32	08:03 08:32-09:32/60 17:20-17:38/18 18:38 17:45-18:10/25	07:59 15:25-16:09/44 16:41 08:45-09:35/50	08:40 15:08-15:46/38 16:22 09:14-09:47/33
18	05:34 20:50-21:16/26 21:48	06:21 20:56	07:13 07:38-08:00/22 19:45 18:39-19:13/34	08:04 08:32-09:32/60 17:17-17:40/23 18:36 17:46-18:08/22	08:00 15:24-16:07/43 16:40 08:45-09:35/50	08:41 15:07-15:46/39 16:22 09:14-09:47/33
19	05:35 20:49-21:15/26 21:47	06:23 20:54	07:15 07:40-07:59/19 19:43 18:39-19:13/34	08:06 08:33-09:32/59 17:14-17:41/27 18:34 17:46-18:05/19	08:02 15:22-16:06/44 16:38 08:45-09:36/51	08:42 15:08-15:47/39 16:22 09:15-09:48/33
20	05:36 20:50-21:14/24 21:46	06:25 20:52	07:16 07:42-07:58/16 19:41 18:39-19:14/35	08:08 08:34-09:32/58 17:13-17:42/29 18:32 17:47-18:02/15	08:04 15:21-16:04/43 16:37 08:45-09:36/51	08:42 15:09-15:47/38 16:23 09:16-09:49/33
21	05:38 20:50-21:13/23 21:45	06:26 20:49	07:18 07:43-07:56/13 19:38 18:37-19:11/34	08:10 08:36-09:32/56 17:12-17:43/31 18:29 17:48-18:00/12	08:06 15:20-16:03/43 16:36 08:46-09:37/51	08:43 15:08-15:47/39 16:23 09:16-09:49/33
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23	05:40 20:49-21:10/21 21:42	06:30 20:45	07:21 07:47-07:52/5 19:33 18:37-19:07/30	08:13 08:40-09:31/51 17:10-17:44/34 18:25 17:52-17:56/4	08:09 15:18-16:01/43 16:33 08:46-09:38/52	08:44 15:10-15:48/38 16:24 09:17-09:50/33
24	05:42 20:50-21:09/19 21:41	06:31 20:43	07:23 07:48-07:49/1 19:31 18:37-19:03/26	08:15 08:42-09:31/49 18:23 17:09-17:45/36	08:11 15:16-15:59/43 16:32 08:46-09:37/51	08:44 15:10-15:48/38 16:25 09:17-09:50/33
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26	05:45 20:49-21:06/17 21:38	06:35 20:39	07:26 18:38-18:59/21 19:26	07:19 07:46-08:31/45 17:19 16:08-16:46/38	08:14 15:15-15:57/42 16:30 08:47-09:38/51	08:45 15:11-15:50/39 16:26 09:18-09:51/33
27	05:46 20:50-21:05/15 21:36	06:36 20:36	07:28 18:37-18:56/19 19:24 18:07-18:17/10	07:20 07:48-08:30/42 17:17 16:08-16:46/38	08:15 15:15-15:56/41 16:29 08:48-09:38/50	08:45 15:12-15:51/39 16:27 09:18-09:51/33
28	05:48 20:50-21:03/13 21:35	06:38 20:34	07:30 18:38-18:54/16 19:22 18:03-18:21/18	07:22 07:50-08:29/39 17:15 16:08-16:46/38	08:17 15:14-15:54/40 16:28 08:49-09:38/49	08:45 15:12-15:52/40 16:28 09:18-09:51/33
29	05:49 20:51-21:03/12 21:33	06:40 20:32	07:31 18:40-18:52/12 19:19 18:00-18:23/23	07:24 07:52-08:29/37 17:13 16:08-16:44/36	08:19 15:13-15:54/41 16:28 08:51-09:38/47	08:46 15:13-15:53/40 16:28 09:18-09:51/33
30	05:51 20:51-21:01/10 21:31	06:41 20:30	07:33 18:40-18:49/9 19:17 17:57-18:24/27	07:26 07:54-08:28/34 17:11 16:08-16:42/34	08:20 15:13-15:53/40 16:27 08:53-09:39/46	08:46 15:14-15:54/40 16:29 09:18-09:51/33
31	05:52 20:52-21:00/8 21:30	06:43 20:27		07:28 09:02-09:14/12 16:08-16:40/32 17:09 07:56-08:27/31		08:46 15:15-15:55/40 16:30 09:18-09:51/33
Potential sun hours	504	455	381	331	264	241
Sum of minutes with flicker	665	12	1103	2612	2606	2301

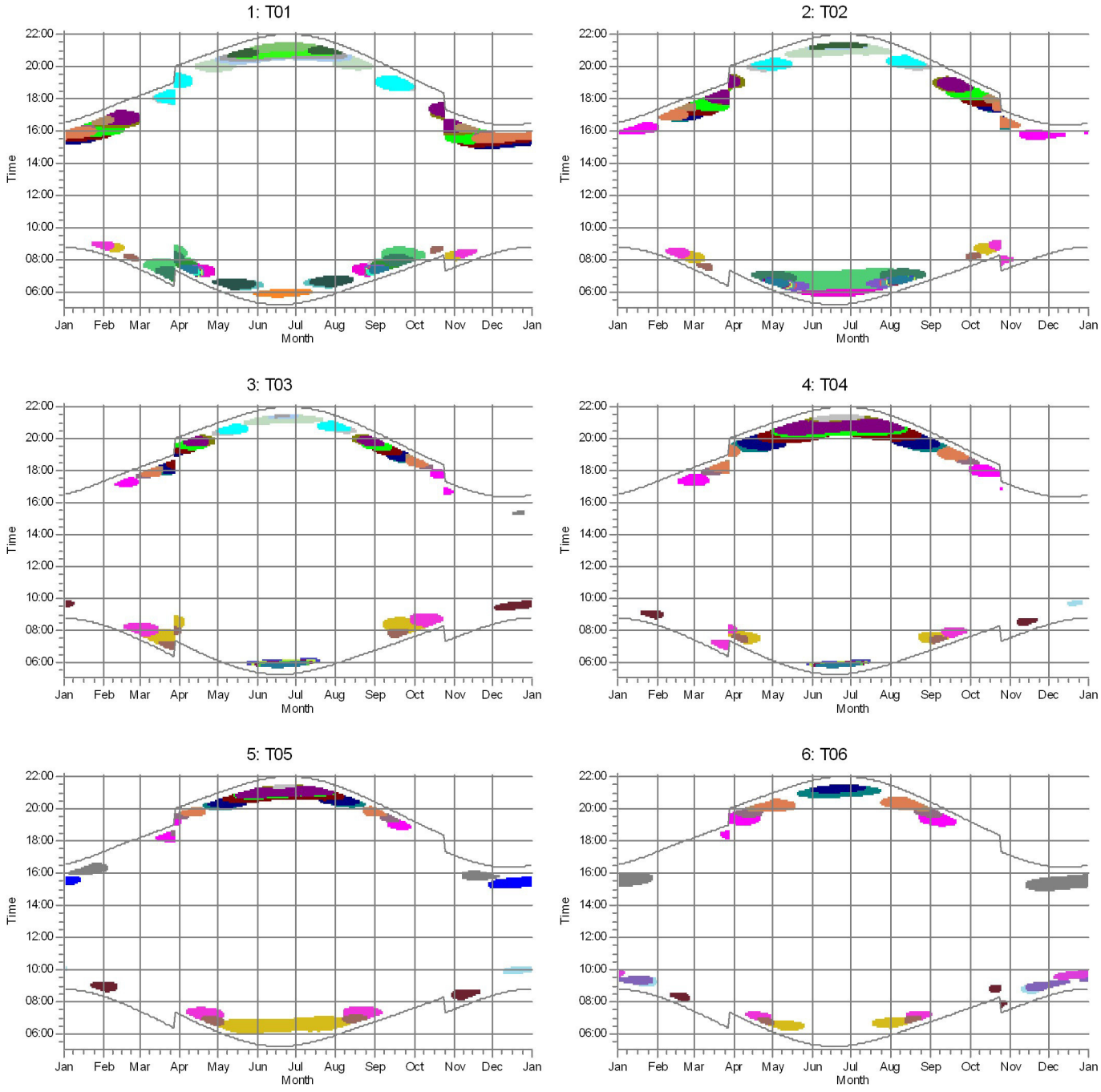
Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

Licensed user:
Jennings O'Donovan
Finisklin Business Park
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Kathlyn Feeney / kfeeney@jodireland.com
Calculated:
09/06/2025 13:54/4.0.552

SHADOW - Calendar per WTG, graphical

Calculation: 6839 Garrane WF Worst Case - V150



Shadow receptors

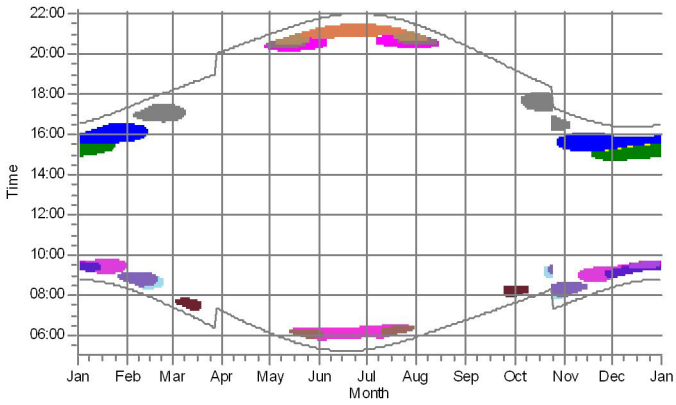
B: 2	H: 8	N: 14	W: 23	AC: 29	AI: 35	CR: 142	CX: 148	DD: 173			
C: 3	I: 9	O: 15	X: 24	AD: 30	BR: 83	CS: 143	CY: 149	DE: 174			
D: 4	J: 10	P: 16	Y: 25	AE: 31	BS: 84	CT: 144	CZ: 150	DF: 177			
E: 5	K: 11	Q: 17	Z: 26	AF: 32	BT: 85	CU: 145	DA: 170	DH: 179			
F: 6	L: 12	R: 18	AA: 27	AG: 33	BU: 86	CV: 146	DB: 171				
G: 7	M: 13	V: 22	AB: 28	AH: 34	CQ: 141	CW: 147	DC: 172				

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Kathlyn Feeney / kfeeney@jodireland.com
Calculated:
09/06/2025 13:54/4.0.552

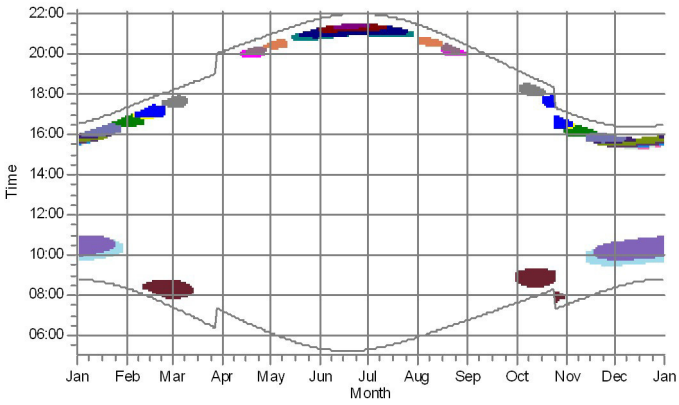
SHADOW - Calendar per WTG, graphical

Calculation: 6839 Garrane WF Worst Case - V150

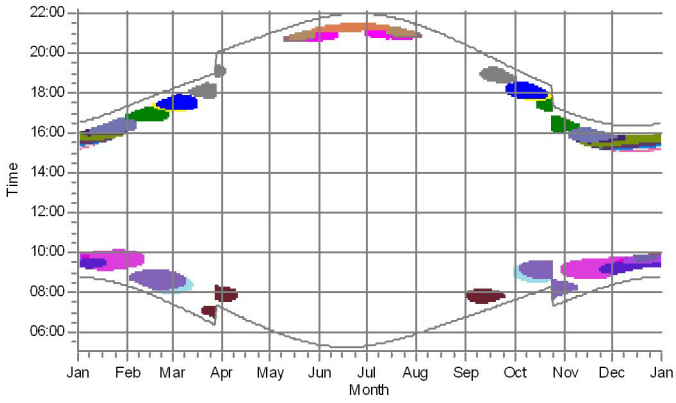
7: T07



8: T08



9: T09



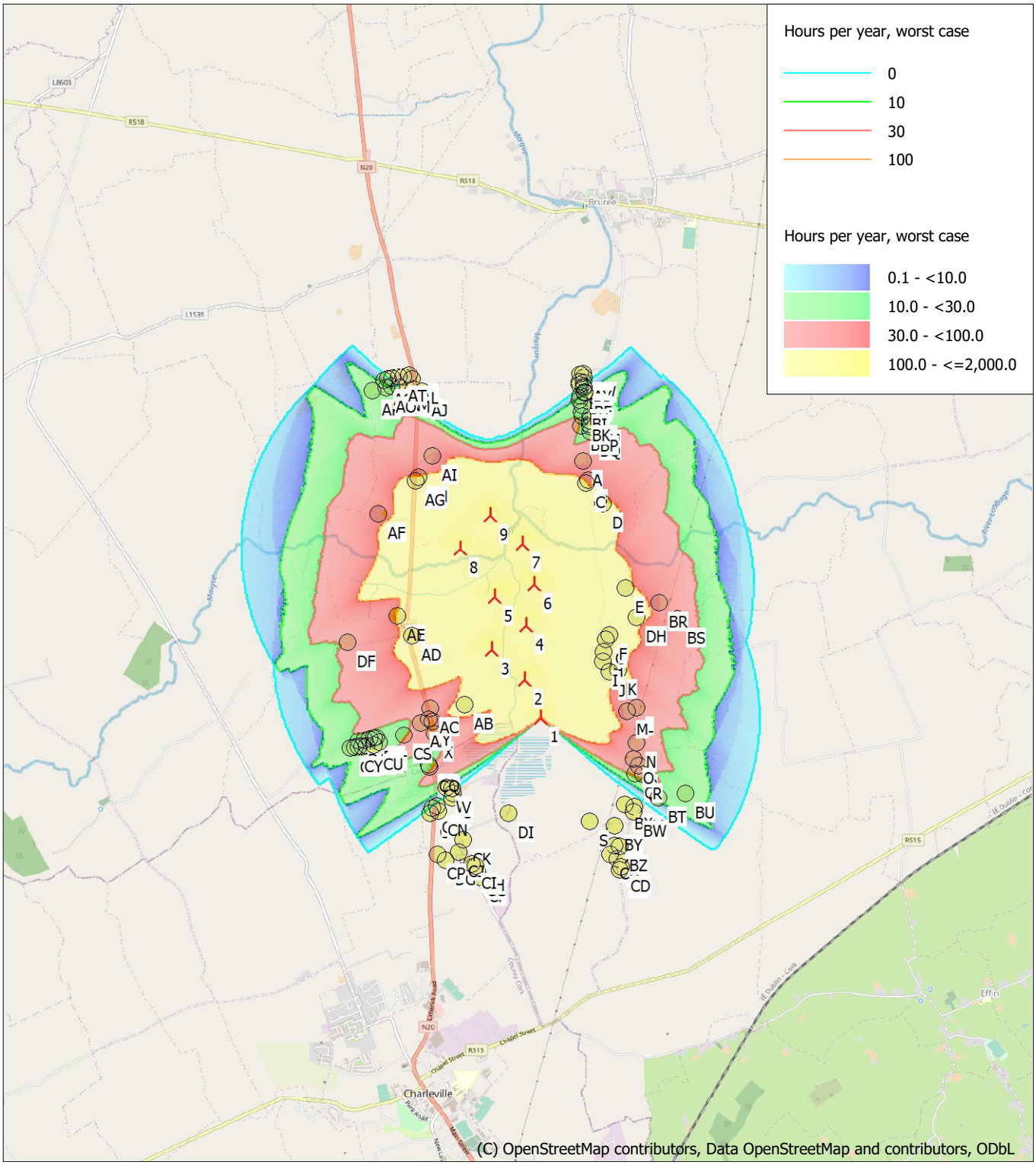
Shadow receptors

A: 1	E: 5	I: 9	AG: 33	AO: 41	BC: 68	BG: 72	BK: 76	BO: 80	BS: 84		
B: 2	F: 6	K: 11	AH: 34	AP: 42	BD: 69	BH: 73	BL: 77	BP: 81	DF: 177		
C: 3	G: 7	AE: 31	AI: 35	AQ: 46	BE: 70	BI: 74	BM: 78	BQ: 82	DH: 179		
D: 4	H: 8	AF: 32	AN: 40	AR: 47	BF: 71	BJ: 75	BN: 79	BR: 83			

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Calculated:
09/06/2025 13:54/4.0.552

SHADOW - Map

Calculation: 6839 Garrane WF Worst Case - V150



0 500 1000 1500 2000 m

Map: EMD OpenStreetMap , Print scale 1:50,000, Map center Irish ITM-IRENET95 (IE), geocentric, GRS80 East: 554,270 North: 627,200

New WTG Shadow receptor

Flicker map level: Height Contours: CONTOURLINE_6839_Garrane_WF_1.wpo (1)

Time step: 2 minutes, Day step: 3 days, Map resolution: 10 m, Visibility resolution: 5 m, Eye height: 1.5 m