Shadow Flicker Briefing

Subject:	Shadow-Flicker Modeling Cohocton, NY.
Customer:	Environmental Design & Research, P.C. 238 W. Division Street Syracuse, NY 13204
Project type:	Modeling
Prepared by:	Arne Nielsen, WEI
Distribution:	Benjamin Brazell, John Hecklau; EDRPC
Revision:	0
Date:	Mar. 06, 2006

1. Introduction

This Project Briefing provides a brief explanation of the shadow-flicker phenomenon, the modeling approach employed and relevant explanations and results.

2. Shadow-Flicker Background

Shadow-flicker from wind turbines is defined as alternating changes in light intensity caused by rotating blades casting shadows on the ground and stationary objects such as a window at a dwelling. No shadow will be cast when the sun is obscured by clouds/fog or when the turbine is not operating.

Shadow-flicker can occur in project area homes when the turbine is located near a home and is in a position where the blades interfere with very low-angle sunlight. The most typical effect is the visibility of an intermittent light reduction in the rooms of the home facing the wind turbines and subject to the shadow-flicker. Such locations are here referred to as shadow-flicker receptors. Obstacles such as terrain, trees, or buildings between the wind turbine and a potential shadow-flicker receptor significantly reduce or eliminate shadow-flicker effects.

The spatial relationships between a wind turbine and receptor, as well as wind direction are key factors related to shadow-flicker time (hours per year). General industry practices place turbines at least 1000 ft from receptors. At this distance shadow flicker usually only occurs at sunrise or sunset when the cast shadows are sufficiently long.

Shadow flicker intensity is defined as the difference in brightness at a given location in the presence and absence of a shadow. Shadow flicker intensity diminishes with greater receptor-to-turbine separation distance and low visibility weather conditions, such as haze or fog.

The analysis performed for this report does not evaluate the shadow flicker intensity, but rather focuses on the total amount of time (hours and minutes/year) that shadow flicker can potentially occur at receptors regardless of whether the shadow flicker is barely noticeable or

clearly distinct. Consequently, it is likely that receptors will experience less shadow-flicker impact than modeled and reported, especially those that are further away from turbines. It is very likely that marginally affected receptors may not be able to identify shadow-flicker at all.

The shadow-flicker frequency is related to the rotor speed and number of blades on the rotor. The modeling results presented are based on a wind turbine with a 3-bladed, 87 meter diameter rotor, 78 meter hub height and a nominal rotor speed of 16.7 RPM which translates to a blade pass frequency of 0.8 Hz (less than 1 alternation per second). Health wise, such low frequencies are harmless. Frequencies higher than 3 Hz but below 10 Hz are widely used in discotheques and the Epilepsy Foundation has made statements that frequencies below 10 Hz are not likely to trigger epileptic seizures.

3. Modeling Approach

A near worst case approach has been adopted for reporting the shadow-flicker results. Additional general site and receptor-specific assessments such as obstacles, diurnal and seasonal cloud and fog patterns may further reduce the reported shadow flicker impacts. The analysis assumes windows are situated in direct alignment with the turbine to sun line of sight. Even when windows are so aligned, the analysis does not account for the difference between windows in rooms with primary use and enjoyment (e.g. living rooms) and other less frequently occupied or un-occupied rooms or garages.

The shadow-flicker model uses the following input:

- Turbine locations (coordinates)
- Shadow Flicker receptor (residence) locations (coordinates)
- USGS 1:24,000 topographic and USGS DEM (height contours)
- Turbine rotor diameter
- Turbine hub height
- Joint wind speed and direction frequency distribution
- Sunshine hours (long term monthly reference data)

The model calculates detailed shadow-flicker results at each assessed receptor location and the amount of shadow-flicker time (hours/year) everywhere surrounding the project (on an iso-line plot). A receptor in the model is defined as a 1 m^2 area 1 meter above ground level. This omni-directional approach produces shadow-flicker results at a receptor regardless of the direction of windows and provides similar results as a model with windows on various sides of the receptor.

The sun's path with respect to each turbine location is calculated by the software to determine the cast shadow paths every 2 minutes, every day over a full year.

The turbine run-time and direction (seen from the receptor) are calculated from the site's long-term wind speed and direction distribution.

Finally, the effects of cloud cover are calculated using long term reference data (monthly average sunshine hours) to arrive at the projected annual flicker time at each receptor.

Output from the model includes the following information:

- Calculated shadow-flicker time at selected receptors
- Tabulated and plotted time of day with shadow flicker at selected receptors
- Map showing turbine locations, selected shadow-flicker receptors and iso-line contours indicating projected shadow-flicker time (hours per year).

4. Conclusion

The shadow-flicker model assumptions applied to this project are very conservative and as such, the analysis is expected to over-predict the impacts. Additionally, many of the modeled shadow flicker hours are expected to be of very low intensity.

The results are therefore prudent projections of the anticipated shadow flicker levels that would be experienced at the nearby residences. Of the 187 modeled receptors (187 receptors being within approximately 1,500 meter of a wind turbine), only one receptor (#673) potentially receive shadow flicker more than 25 hours per year. All other modeled receptors potentially receive little or no shadow flicker.
The overall statistics are outlined below:

Cumulative shadow-flicker time	Number of receptors
Total	187
>0 hours	130
>10 hours	24
>15 hours	8
>20 hours	4
>25 hours	1

Fig. 1. Overall statistics, all modeled receptors.

The number of shadow-flicker hours calculated and reported above in the table is common and significantly lower than at other wind power projects installed in the state of New York and around the USA.

For clarifications and eventual detailed analyses of expected influence at selected receptors please contact:

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Project:
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SHADOW - Main Result

Calculation: all main

Assumptions for shadow calculations

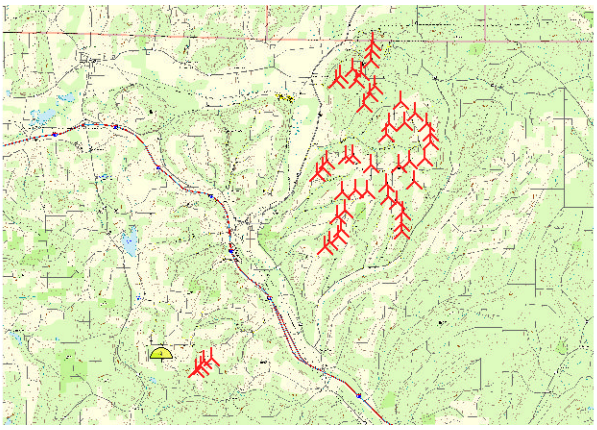
Maximum distance for influence	1,500	m
Minimum sun height over horizon for influence	3	°
Day step for calculation	1	days
Time step for calculation	2	minutes

Sun shine probabilities (part of time from sun rise to sun set with sun shine)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.45	0.45	0.50	0.55	0.55	0.55	0.58	0.55	0.55	0.45	0.35	0.35

Operational time

N	NE	E	SE	S	SW	W	NW	Sum
1,850	1,325	800	712	625	662	700	1,275	7,949



Scale 1:350,000

New WTG Shadow receptor

WTGs

	UTM NAD27 Zone: 18 East	North	Z [m]	Row data/Description	WTG type Valid	Manufact.	Type	Power [kW]	Diam. [m]	Height [m]	RPM [RPM]
01	300,550	4,716,386	580	01	Yes	GAMESA	G87/2000	2,000	87.0	78.0	16.7
02	300,470	4,716,031	580	02	Yes	GAMESA	G87/2000	2,000	87.0	78.0	16.7
03	300,446	4,715,621	580	03	Yes	GAMESA	G87/2000	2,000	87.0	78.0	16.7
04	299,551	4,715,218	600	04	Yes	GAMESA	G87/2000	2,000	87.0	78.0	16.7
05	298,976	4,714,941	591	05	Yes	GAMESA	G87/2000	2,000	87.0	78.0	16.7
06	298,790	4,714,710	580	06	Yes	GAMESA	G87/2000	2,000	87.0	78.0	16.7
07	299,958	4,715,025	613	07	Yes	GAMESA	G87/2000	2,000	87.0	78.0	16.7
08	299,718	4,714,674	600	08	Yes	GAMESA	G87/2000	2,000	87.0	78.0	16.7
09	300,562	4,714,399	615	09	Yes	GAMESA	G87/2000	2,000	87.0	78.0	16.7
10	300,358	4,714,050	606	10	Yes	GAMESA	G87/2000	2,000	87.0	78.0	16.7
11	300,047	4,713,553	598	11	Yes	GAMESA	G87/2000	2,000	87.0	78.0	16.7
12	301,753	4,713,638	600	12	Yes	GAMESA	G87/2000	2,000	87.0	78.0	16.7
13	301,182	4,712,667	620	13	Yes	GAMESA	G87/2000	2,000	87.0	78.0	16.7
14	301,043	4,712,151	600	14	Yes	GAMESA	G87/2000	2,000	87.0	78.0	16.7
15	302,394	4,713,102	600	15	Yes	GAMESA	G87/2000	2,000	87.0	78.0	16.7
16	301,911	4,712,694	600	16	Yes	GAMESA	G87/2000	2,000	87.0	78.0	16.7
17	302,937	4,712,598	620	17	Yes	GAMESA	G87/2000	2,000	87.0	78.0	16.7
18	303,106	4,712,133	603	18	Yes	GAMESA	G87/2000	2,000	87.0	78.0	16.7
19	303,097	4,711,744	620	19	Yes	GAMESA	G87/2000	2,000	87.0	78.0	16.7
20	302,805	4,710,989	625	20	Yes	GAMESA	G87/2000	2,000	87.0	78.0	16.7
21	302,087	4,710,891	638	21	Yes	GAMESA	G87/2000	2,000	87.0	78.0	16.7
22	301,582	4,710,750	628	22	Yes	GAMESA	G87/2000	2,000	87.0	78.0	16.7
23	300,296	4,710,749	599	23	Yes	GAMESA	G87/2000	2,000	87.0	78.0	16.7
24	299,474	4,711,242	580	24	Yes	GAMESA	G87/2000	2,000	87.0	78.0	16.7
25	299,142	4,711,180	580	25	Yes	GAMESA	G87/2000	2,000	87.0	78.0	16.7
26	298,246	4,711,001	560	26	Yes	GAMESA	G87/2000	2,000	87.0	78.0	16.7
27	298,043	4,710,702	560	27	Yes	GAMESA	G87/2000	2,000	87.0	78.0	16.7
28	297,794	4,710,451	560	28	Yes	GAMESA	G87/2000	2,000	87.0	78.0	16.7
29	298,935	4,709,555	580	29	Yes	GAMESA	G87/2000	2,000	87.0	78.0	16.7
30	299,525	4,709,635	599	30	Yes	GAMESA	G87/2000	2,000	87.0	78.0	16.7
31	300,072	4,709,586	600	31	Yes	GAMESA	G87/2000	2,000	87.0	78.0	16.7
32	300,993	4,709,880	600	32	Yes	GAMESA	G87/2000	2,000	87.0	78.0	16.7
33	302,266	4,709,967	614	33	Yes	GAMESA	G87/2000	2,000	87.0	78.0	16.7
34	301,050	4,709,272	580	34	Yes	GAMESA	G87/2000	2,000	87.0	78.0	16.7
35	301,430	4,709,068	587	35	Yes	GAMESA	G87/2000	2,000	87.0	78.0	16.7
36	301,723	4,708,552	575	36	Yes	GAMESA	G87/2000	2,000	87.0	78.0	16.7
37	301,626	4,708,006	580	37	Yes	GAMESA	G87/2000	2,000	87.0	78.0	16.7

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Project:
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SHADOW - Main Result

Calculation: all main

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	UTM NAD27 Zone: 18					WTG type						
	East	North	Z [m]	Row data/Description	Valid	Manufact.	Type	Power [kW]	Diam. [m]	Height [m]	RPM [RPM]
38	301,635	4,707,653	560	38	Yes	GAMESA	G87/2000	2,000	87.0	78.0	16.7
39	299,029	4,708,734	600	39	Yes	GAMESA	G87/2000	2,000	87.0	78.0	16.7
40	298,655	4,708,456	600	40	Yes	GAMESA	G87/2000	2,000	87.0	78.0	16.7
41	298,812	4,707,854	600	41	Yes	GAMESA	G87/2000	2,000	87.0	78.0	16.7
42	298,678	4,707,540	600	42	Yes	GAMESA	G87/2000	2,000	87.0	78.0	16.7
43	298,260	4,707,296	580	43	Yes	GAMESA	G87/2000	2,000	87.0	78.0	16.7
44	298,046	4,707,041	580	44	Yes	GAMESA	G87/2000	2,000	87.0	78.0	16.7
45	292,626	4,702,047	619	45	Yes	GAMESA	G87/2000	2,000	87.0	78.0	16.7
46	292,287	4,701,939	620	46	Yes	GAMESA	G87/2000	2,000	87.0	78.0	16.7
47	292,119	4,701,698	612	47	Yes	GAMESA	G87/2000	2,000	87.0	78.0	16.7
48	291,910	4,701,549	599	48	Yes	GAMESA	G87/2000	2,000	87.0	78.0	16.7

Shadow receptor-Input

		UTM NAD27 Zone: 18							
No.	Name	East	North	Z [m]	Width [m]	Height [m]	Height a.g.l. [m]	Degrees from south cw [°]	Slope of window [°]
514	514	290,307	4,702,099	602	1.0	1.0	1.0	0.0	0.0

Calculation Results

		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]
514	514	0:00	0	0:00	0:00

Project:
060226 Cohocton

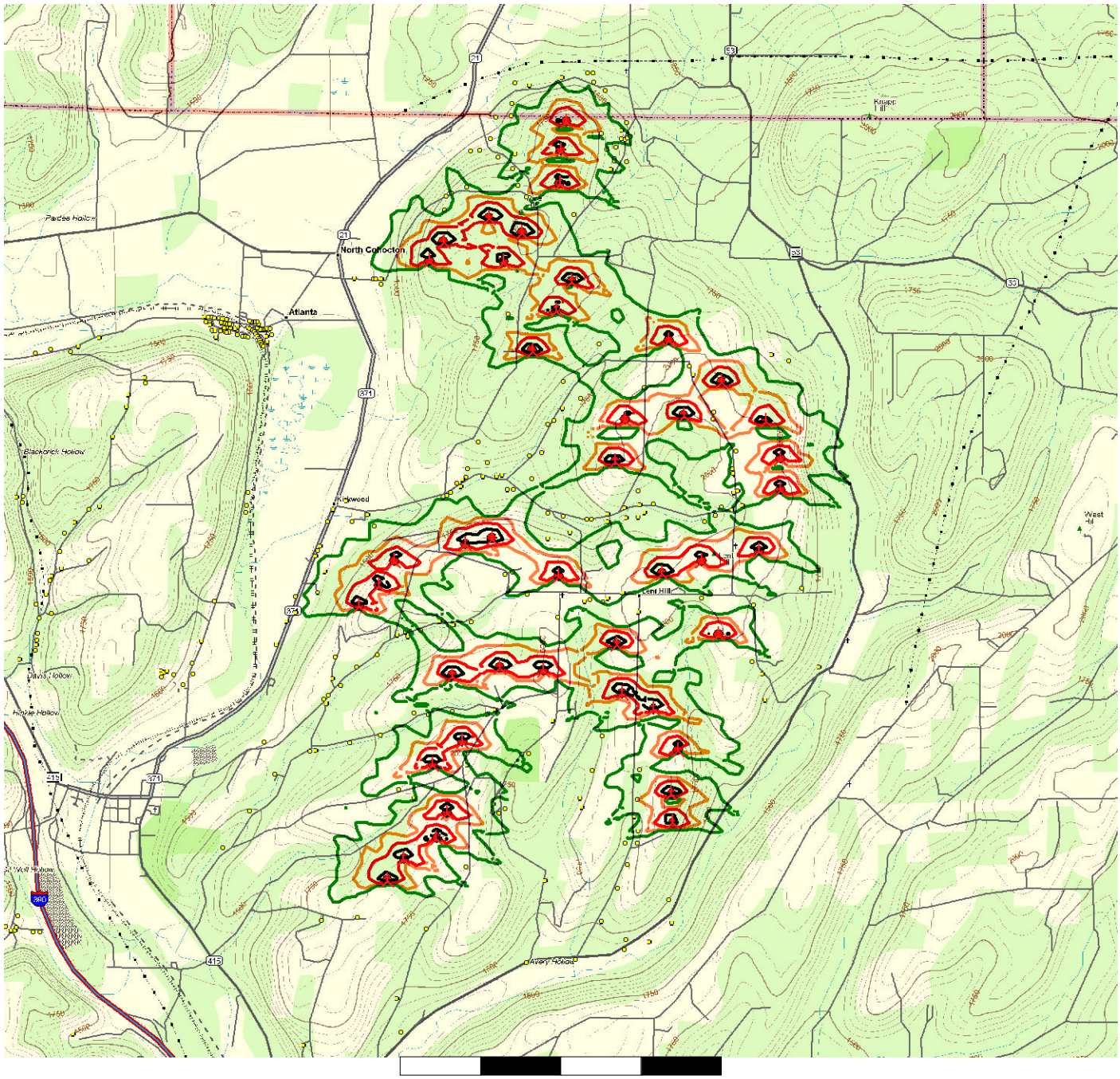
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SHADOW - 060226 Cohocton USGS z12 w, 37k5, 30x30

Calculation: all main **File:** 060226 Cohocton USGS z12 w, 37k5, 30x30.bmi



Map: 060226 Cohocton USGS z12 w, 37k5, 30x30 , Print scale 1:75,000, Map center UTM NAD27 Zone: 18 East: 300,500 North: 4,711,500

New WTG

Isolines showing shadow in Shadow hours|per year. Real value calculation.

10 25 50 100

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, Mid Western part
15 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
1000 meter max shadow distance applied along with default 3° inclination
Sunshine probabilities applied (pdf plots)
Directional run-hours applied from tab file (tower 1)
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SHADOW - Main Result

Calculation: Mid Eastern part

Assumptions for shadow calculations

Maximum distance for influence	1,000	m
Minimum sun height over horizon for influence	3	°
Day step for calculation	1	days
Time step for calculation	2	minutes

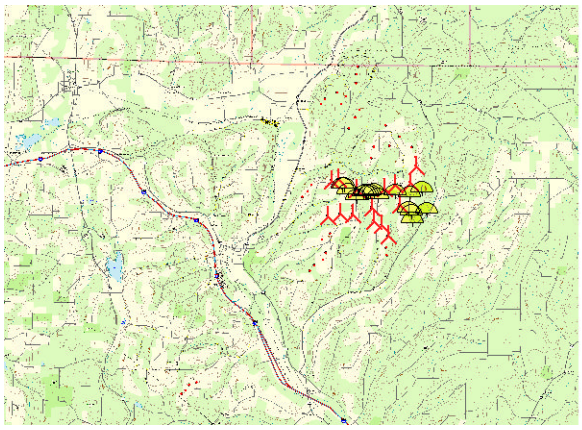
Sun shine probabilities (part of time from sun rise to sun set with sun shine)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.35	0.45	0.45	0.55	0.55	0.55	0.65	0.55	0.55	0.45	0.35	0.30

Operational hours are calculated from WTGs in calculation and wind distribution:
'Cohocton-1 80m LT projection'

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
475	585	238	199	220	474	1,184	813	840	1,246	803	479	7,555



Scale 1:350,000

New WTG Shadow receptor

WTGs

	UTM NAD27 Zone: 18 East	North	Z [m]	Row data/Description	WTG type Valid	Manufact.	Type	Power [kW]	Diam. [m]	Height [m]	RPM [RPM]
19	303,097	4,711,744	620	19	Yes	GAMESA	G87/2000	2,000	87.0	78.0	16.7
20	302,805	4,710,989	625	20	Yes	GAMESA	G87/2000	2,000	87.0	78.0	16.7
21	302,087	4,710,891	638	21	Yes	GAMESA	G87/2000	2,000	87.0	78.0	16.7
22	301,582	4,710,750	628	22	Yes	GAMESA	G87/2000	2,000	87.0	78.0	16.7
23	300,296	4,710,749	599	23	Yes	GAMESA	G87/2000	2,000	87.0	78.0	16.7
24	299,474	4,711,242	580	24	Yes	GAMESA	G87/2000	2,000	87.0	78.0	16.7
25	299,142	4,711,180	580	25	Yes	GAMESA	G87/2000	2,000	87.0	78.0	16.7
29	298,935	4,709,555	580	29	Yes	GAMESA	G87/2000	2,000	87.0	78.0	16.7
30	299,525	4,709,635	599	30	Yes	GAMESA	G87/2000	2,000	87.0	78.0	16.7
31	300,072	4,709,586	600	31	Yes	GAMESA	G87/2000	2,000	87.0	78.0	16.7
32	300,993	4,709,880	600	32	Yes	GAMESA	G87/2000	2,000	87.0	78.0	16.7
33	302,266	4,709,967	614	33	Yes	GAMESA	G87/2000	2,000	87.0	78.0	16.7
34	301,050	4,709,272	580	34	Yes	GAMESA	G87/2000	2,000	87.0	78.0	16.7
35	301,430	4,709,068	587	35	Yes	GAMESA	G87/2000	2,000	87.0	78.0	16.7
36	301,723	4,708,552	575	36	Yes	GAMESA	G87/2000	2,000	87.0	78.0	16.7

Shadow receptor-Input

No.	Name	UTM NAD27 Zone: 18 East	North	Z [m]	Width [m]	Height [m]	Height a.g.l. [m]	Degrees from south cw [°]	Slope of window [°]
719	719	303,326	4,710,510	557	1.0	1.0	1.0	0.0	0.0
720	720	302,722	4,710,317	605	1.0	1.0	1.0	0.0	0.0
721	721	302,069	4,710,422	606	1.0	1.0	1.0	0.0	0.0
812	812	302,833	4,709,131	517	1.0	1.0	1.0	0.0	0.0
813	813	302,808	4,709,456	553	1.0	1.0	1.0	0.0	0.0
814	814	302,684	4,709,612	574	1.0	1.0	1.0	0.0	0.0
815	815	303,514	4,709,522	453	1.0	1.0	1.0	0.0	0.0
816	816	301,280	4,710,268	621	1.0	1.0	1.0	0.0	0.0
817	817	300,902	4,710,450	608	1.0	1.0	1.0	0.0	0.0
818	818	300,834	4,710,409	601	1.0	1.0	1.0	0.0	0.0
819	819	300,677	4,710,442	585	1.0	1.0	1.0	0.0	0.0
820	820	300,609	4,710,420	580	1.0	1.0	1.0	0.0	0.0
821	821	301,095	4,710,511	623	1.0	1.0	1.0	0.0	0.0
822	822	299,899	4,710,527	589	1.0	1.0	1.0	0.0	0.0
823	823	299,726	4,710,813	580	1.0	1.0	1.0	0.0	0.0

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Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, Mid Western part
15 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
1000 meter max shadow distance applied along with default 3° inclination
Sunshine probabilities applied (pdf plots)
Directional run-hours applied from tab file (tower 1)
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SHADOW - Main Result

Calculation: Mid Eastern part

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UTM NAD27 Zone: 18

No.	Name	East	North	Z	Width	Height	Height a.g.l.	Degrees from south cw	Slope of window
				[m]	[m]	[m]	[m]	[°]	[°]
824	824	299,624	4,710,787	580	1.0	1.0	1.0	0.0	0.0
840	840	300,274	4,710,234	600	1.0	1.0	1.0	0.0	0.0

Calculation Results

		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]
719	719	0:00	0	0:00	0:00
720	720	46:02	86	0:38	8:32
721	721	0:00	0	0:00	0:00
812	812	0:00	0	0:00	0:00
813	813	0:00	0	0:00	0:00
814	814	0:00	0	0:00	0:00
815	815	0:00	0	0:00	0:00
816	816	0:00	0	0:00	0:00
817	817	30:06	79	0:30	9:27
818	818	25:12	55	0:42	7:49
819	819	15:04	53	0:24	4:40
820	820	0:00	0	0:00	0:00
821	821	29:00	82	0:34	8:51
822	822	0:00	0	0:00	0:00
823	823	25:06	71	0:36	6:56
824	824	14:48	40	0:30	4:05
840	840	20:24	72	0:26	4:13

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, Mid Western part
15 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
1000 meter max shadow distance applied along with default 3° inclination
Sunshine probabilities applied (pdf plots)
Directional run-hours applied from tab file (tower 1)
.

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SHADOW - Calendar

Calculation: Mid Eastern part **Shadow receptor:** 720 - 720

Assumptions for shadow calculations

Maximum distance for influence	1,000 m
Minimum sun height over horizon for influence	3 °
Day step for calculation	1 days
Time step for calculation	2 minutes

Sun shine probabilities (part of time from sun rise to sun set with sun shine)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.35	0.45	0.45	0.55	0.55	0.55	0.65	0.55	0.55	0.45	0.35	0.30

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
475	585	238	199	220	474	1,184	813	840	1,246	803	479	7,555

	January		February		March	April	May	June	July	August	September	October	November		December	
1	07:40	15:37 (4)	07:25	15:58 (4)	06:47	05:54	06:06	05:36	05:36	06:01	06:34	07:06	06:43		07:19	15:22 (4)
	16:47 32	16:09 (4)	17:23 14	16:12 (4)	17:59	18:35	20:08	20:40	20:52	20:32	19:46	18:53	17:04		16:38 36	15:58 (4)
2	07:40	15:37 (4)	07:24	16:03 (4)	06:45	05:52	06:05	05:35	05:37	06:02	06:35	07:08	06:44		07:20	15:21 (4)
	16:48 34	16:11 (4)	17:24 4	16:07 (4)	18:00	18:36	20:09	20:40	20:51	20:31	19:44	18:51	17:03		16:38 38	15:59 (4)
3	07:40	15:37 (4)	07:23		06:44	05:50	06:03	05:35	05:37	06:03	06:36	07:09	06:45		07:22	15:22 (4)
	16:49 34	16:11 (4)	17:26		18:01	18:38	20:10	20:41	20:51	20:30	19:42	18:49	17:02		16:38 36	15:58 (4)
4	07:40	15:37 (4)	07:22		06:42	05:49	06:02	05:34	05:38	06:04	06:37	07:10	06:47		07:23	15:23 (4)
	16:50 34	16:11 (4)	17:27		18:03	18:39	20:12	20:42	20:51	20:29	19:40	18:48	17:00		16:37 36	15:59 (4)
5	07:40	15:37 (4)	07:21		06:40	06:47	06:01	05:34	05:38	06:06	06:39	07:11	06:48		07:24	15:24 (4)
	16:51 36	16:13 (4)	17:28		18:04	19:40	20:13	20:43	20:51	20:27	19:39	18:46	16:59		16:37 34	15:58 (4)
6	07:40	15:37 (4)	07:19		06:39	06:45	05:59	05:34	05:39	06:07	06:40	07:12	06:49		07:25	15:23 (4)
	16:52 36	16:13 (4)	17:30		18:05	19:41	20:14	20:43	20:51	20:26	19:37	18:44	16:58		16:37 36	15:59 (4)
7	07:40	15:39 (4)	07:18		06:37	06:44	05:58	05:33	05:40	06:08	06:41	07:13	06:50		07:26	15:24 (4)
	16:53 34	16:13 (4)	17:31		18:06	19:42	20:15	20:44	20:50	20:25	19:35	18:42	16:57		16:37 36	16:00 (4)
8	07:40	15:38 (4)	07:17		06:35	06:42	05:57	05:33	05:40	06:09	06:42	07:14	06:52		07:26	15:25 (4)
	16:54 36	16:14 (4)	17:32		18:08	19:43	20:16	20:45	20:50	20:24	19:34	18:41	16:56		16:37 34	15:59 (4)
9	07:40	15:38 (4)	07:16		06:34	06:40	05:56	05:33	05:41	06:10	06:43	07:15	06:53	15:32 (4)	07:27	15:26 (4)
	16:55 36	16:14 (4)	17:34		18:09	19:44	20:17	20:45	20:50	20:22	19:32	18:39	16:54 6	15:38 (4)	16:37 34	16:00 (4)
10	07:39	15:38 (4)	07:15		06:32	06:39	05:55	05:33	05:42	06:11	06:44	07:17	06:54	15:29 (4)	07:28	15:27 (4)
	16:56 38	16:16 (4)	17:35		18:10	19:46	20:18	20:46	20:49	20:21	19:30	18:37	16:53 14	15:43 (4)	16:37 34	16:01 (4)
11	07:39	15:40 (4)	07:13		06:30	06:37	05:53	05:32	05:42	06:12	06:45	07:18	06:55	15:26 (4)	07:29	15:28 (4)
	16:57 36	16:16 (4)	17:36		18:11	19:47	20:19	20:47	20:49	20:20	19:28	18:36	16:52 18	15:44 (4)	16:37 32	16:00 (4)
12	07:39	15:39 (4)	07:12		06:29	06:35	05:52	05:32	05:43	06:13	06:46	07:19	06:57	15:24 (4)	07:30	15:26 (4)
	16:58 38	16:17 (4)	17:37		18:12	19:48	20:20	20:47	20:48	20:18	19:27	18:34	16:51 22	15:46 (4)	16:37 34	16:00 (4)
13	07:38	15:39 (4)	07:11		06:27	06:34	05:51	05:32	05:44	06:14	06:47	07:20	06:58	15:23 (4)	07:31	15:27 (4)
	16:59 38	16:17 (4)	17:39		18:13	19:49	20:21	20:48	20:48	20:17	19:25	18:32	16:50 24	15:47 (4)	16:37 34	16:01 (4)
14	07:38	15:40 (4)	07:09		06:25	06:32	05:50	05:32	05:45	06:15	06:48	07:21	06:59	15:22 (4)	07:32	15:28 (4)
	17:00 36	16:16 (4)	17:40		18:15	19:50	20:22	20:48	20:47	20:15	19:23	18:31	16:49 26	15:48 (4)	16:37 34	16:02 (4)
15	07:38	15:40 (4)	07:08		06:23	06:30	05:49	05:32	05:45	06:16	06:49	07:22	07:00	15:22 (4)	07:32	15:29 (4)
	17:02 38	16:18 (4)	17:41		18:16	19:51	20:24	20:49	20:47	20:14	19:21	18:29	16:48 28	15:50 (4)	16:38 32	16:01 (4)
16	07:37	15:41 (4)	07:07		06:22	06:29	05:48	05:32	05:46	06:17	06:50	07:23	07:02	15:21 (4)	07:33	15:29 (4)
	17:03 36	16:17 (4)	17:43		18:17	19:52	20:25	20:49	20:46	20:13	19:19	18:28	16:48 30	15:51 (4)	16:38 32	16:01 (4)
17	07:37	15:41 (4)	07:05		06:20	06:27	05:47	05:32	05:47	06:18	06:51	07:25	07:03	15:20 (4)	07:34	15:30 (4)
	17:04 38	16:19 (4)	17:44		18:18	19:53	20:26	20:49	20:45	20:11	19:18	18:26	16:47 32	15:52 (4)	16:38 32	16:02 (4)
18	07:36	15:42 (4)	07:04		06:18	06:25	05:46	05:32	05:48	06:19	06:52	07:26	07:04	15:20 (4)	07:34	15:31 (4)
	17:05 36	16:18 (4)	17:45		18:19	19:55	20:27	20:50	20:45	20:10	19:16	18:24	16:46 34	15:54 (4)	16:38 32	16:03 (4)
19	07:36	15:41 (4)	07:02		06:17	06:24	05:45	05:32	05:49	06:20	06:53	07:27	07:05	15:19 (4)	07:35	15:31 (4)
	17:06 38	16:19 (4)	17:46		18:20	19:56	20:28	20:50	20:44	20:08	19:14	18:23	16:45 34	15:53 (4)	16:39 32	16:03 (4)
20	07:35	15:43 (4)	07:01		06:15	06:22	05:44	05:32	05:50	06:21	06:54	07:28	07:07	15:18 (4)	07:36	15:32 (4)
	17:08 36	16:19 (4)	17:48		18:22	19:57	20:29	20:50	20:43	20:07	19:12	18:21	16:44 36	15:54 (4)	16:39 32	16:04 (4)
21	07:34	15:44 (4)	06:59		06:13	06:21	05:43	05:33	05:51	06:23	06:56	07:29	07:08	15:19 (4)	07:36	15:32 (4)
	17:09 34	16:18 (4)	17:49		18:23	19:58	20:30	20:51	20:43	20:05	19:11	18:20	16:44 34	15:53 (4)	16:40 32	16:04 (4)
22	07:34	15:43 (4)	06:58		06:11	06:19	05:42	05:33	05:52	06:24	06:57	07:31	07:09	15:19 (4)	07:37	15:33 (4)
	17:10 36	16:19 (4)	17:50		18:24	19:59	20:31	20:51	20:42	20:04	19:09	18:18	16:43 36	15:55 (4)	16:40 32	16:05 (4)
23	07:33	15:44 (4)	06:56		06:10	06:18	05:42	05:33	05:53	06:25	06:58	07:32	07:10	15:18 (4)	07:37	15:33 (4)
	17:11 34	16:18 (4)	17:52		18:25	20:00	20:32	20:51	20:41	20:02	19:07	18:17	16:42 38	15:56 (4)	16:41 32	16:05 (4)
24	07:32	15:46 (4)	06:55		06:08	06:16	05:41	05:33	05:53	06:26	06:59	07:33	07:11	15:19 (4)	07:38	15:34 (4)
	17:13 34	16:20 (4)	17:53		18:26	20:00	20:33	20:51	20:40	20:00	19:05	18:15	16:42 36	15:55 (4)	16:41 32	16:06 (4)
25	07:31	15:47 (4)	06:53		06:06	06:15	05:40	05:34	05:54	06:27	07:00	06:34	07:13	15:19 (4)	07:38	15:34 (4)
	17:14 32	16:19 (4)	17:54		18:27	20:01	20:33	20:51	20:39	19:57	19:03	17:14	16:41 38	15:57 (4)	16:42 32	16:06 (4)
26	07:31	15:48 (4)	06:52		06:04	06:13	05:39	05:34	05:55	06:28	07:01	06:35	07:14	15:20 (4)	07:38	15:34 (4)
	17:15 30	16:18 (4)	17:55		18:28	20:03	20:34	20:52	20:38	19:56	19:02	17:12	16:40 36	15:56 (4)	16:42 32	16:06 (4)
27	07:30	15:49 (4)	06:50		06:03	06:12	05:39	05:34	05:56	06:29	07:02	06:37	07:15	15:19 (4)	07:39	15:35 (4)
	17:16 28	16:17 (4)	17:57		18:30	20:04	20:35	20:52	20:37	19:54	19:00	17:11	16:40 38	15:57 (4)	16:43 32	16:07 (4)
28	07:29	15:50 (4)	06:49		06:01	06:10	05:38	05:35	05:57	06:30	07:03	06:38	07:16	15:20 (4)	07:39	15:35 (4)
	17:18 26	16:16 (4)	17:58		18:31	20:05	20:36	20:52	20:36	19:52	18:58	17:10	16:39 36	15:56 (4)	16:44 32	16:07 (4)
29	07:28	15:51 (4)			05:59	06:09	05:37	05:35	05:58	06:31	07:04	06:39	07:17	15:21 (4)	07:39	15:35 (4)
	17:19 24	16:15 (4)			18:32	20:06	20:37	20:52	20:35	19:51	18:56	17:08	16:39 36	15:57 (4)	16:45 32	16:07 (4)
30	07:27	15:52 (4)			05:57	06:07	05:37	05:36	05:59	06:32	07:05	06:40	07:18	15:20 (4)	07:40	15:35 (4)
	17:20 22	16:14 (4)			18:33	20:07	20:38	20:52	20:34	19:49	18:55	17:07	16:39 38	15:58 (4)	16:45 34	16:09 (4)
31	07:26	15:55 (4)			05:56		05:36		06:00	06:33		06:42			07:40	15:35 (4)
	17:22 18	16:13 (4)			18:34		20:39		20:33	19:47		17:05			16:46 34	16:09 (4)
Potential sun hours	293		295		370	209	-292	-263	-280	-145	375	343	294		283	
Total, worst case		1038		18										670		1036
Sun reduction		0.35		0.45										0.35		0.30
Oper. time red.		0.86		0.86										0.86		0.86
Wind dir. red.		0.65		0.65										0.65		0.65
Total reduction		0.20		0.25										0.20		0.17
Total, real		203		5										131		174

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	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, Mid Western part
15 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
1000 meter max shadow distance applied along with default 3° inclination
Sunshine probabilities applied (pdf plots)
Directional run-hours applied from tab file (tower 1)
.

Licensed user:
Wind Engineers, Inc.
7660 Whitegate Avenue
US-RIVERSIDE, CA 92506

Calculated:
03/02/06 01:13/2.4.0.67

SHADOW - Calendar

Calculation: Mid Eastern part **Shadow receptor:** 817 - 817

Assumptions for shadow calculations

Maximum distance for influence	1,000	m
Minimum sun height over horizon for influence	3	°
Day step for calculation	1	days
Time step for calculation	2	minutes

Sun shine probabilities (part of time from sun rise to sun set with sun shine)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.35	0.45	0.45	0.55	0.55	0.55	0.65	0.55	0.55	0.45	0.35	0.30

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
475	585	238	199	220	474	1,184	813	840	1,246	803	479	7,555

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:40	07:25	06:47	05:54	06:06	05:36	06:06 (5)	05:36	06:09 (5)	06:01	06:34	07:06	06:43	07:20
	16:47	17:23	17:59	18:35	20:08	20:40 24	06:30 (5)	20:52 28	06:37 (5)	20:32	19:46	18:53	17:04	16:38
2	07:40	07:24	06:45	05:52	06:05	05:35	06:06 (5)	05:37	06:10 (5)	06:03	06:35	07:08	06:44	07:21
	16:48	17:24	18:00	18:37	20:09	20:41 26	06:32 (5)	20:52 28	06:38 (5)	20:31	19:44	18:51	17:03	16:38
3	07:40	07:23	06:44	05:50	06:03	05:35	06:05 (5)	05:37	06:10 (5)	06:04	06:36	07:09	06:45	07:22
	16:49	17:26	18:02	18:38	20:11	20:41 26	06:31 (5)	20:51 28	06:38 (5)	20:30	19:42	18:49	17:02	16:38
4	07:40	07:22	06:42	05:49	06:02	05:34	06:05 (5)	05:38	06:11 (5)	06:05	06:38	07:10	06:47	07:23
	16:50	17:27	18:03	18:39	20:12	20:42 28	06:33 (5)	20:51 28	06:39 (5)	20:29	19:41	18:48	17:00	16:38
5	07:40	07:21	06:40	06:47	06:01	05:34	06:05 (5)	05:38	06:12 (5)	06:06	06:39	07:11	06:48	07:24
	16:51	17:28	18:04	19:40	20:13	20:43 28	06:33 (5)	20:51 28	06:40 (5)	20:27	19:39	18:46	16:59	16:37
6	07:40	07:20	06:39	06:45	06:00	05:34	06:04 (5)	05:39	06:10 (5)	06:07	06:40	07:12	06:49	07:25
	16:52	17:30	18:05	19:41	20:14	20:43 28	06:32 (5)	20:51 28	06:38 (5)	20:26	19:37	18:44	16:58	16:37
7	07:40	07:18	06:37	06:44	05:58	05:33	06:04 (5)	05:40	06:11 (5)	06:08	06:41	07:13	06:50	07:26
	16:53	17:31	18:06	19:42	20:15	20:44 30	06:34 (5)	20:50 28	06:39 (5)	20:25	19:35	18:43	16:57	16:37
8	07:40	07:17	06:35	06:42	05:57	05:33	06:06 (5)	05:40	06:11 (5)	06:09	06:42	07:14	06:52	07:27
	16:54	17:32	18:08	19:43	20:16	20:45 28	06:34 (5)	20:50 28	06:39 (5)	20:24	19:34	18:41	16:56	16:37
9	07:40	07:16	06:34	06:40	05:56	05:33	06:06 (5)	05:41	06:12 (5)	06:10	06:43	07:15	06:53	07:28
	16:55	17:34	18:09	19:44	20:17	20:45 28	06:34 (5)	20:50 26	06:38 (5)	20:22	19:32	18:39	16:55	16:37
10	07:39	07:15	06:32	06:39	05:55	05:33	06:05 (5)	05:42	06:13 (5)	06:11	06:44	07:17	06:54	07:28
	16:56	17:35	18:10	19:46	20:18	20:46 28	06:33 (5)	20:49 26	06:39 (5)	20:21	19:30	18:38	16:53	16:37
11	07:39	07:13	06:30	06:37	05:53	05:32	06:05 (5)	05:42	06:14 (5)	06:12	06:45	07:18	06:56	07:29
	16:57	17:36	18:11	19:47	20:19	20:47 28	06:33 (5)	20:49 26	06:40 (5)	20:20	19:28	18:36	16:52	16:37
12	07:39	07:12	06:29	06:35	05:52	05:32	06:05 (5)	05:43	06:14 (5)	06:13	06:46	07:19	06:57	07:30
	16:58	17:38	18:12	19:48	20:20	20:47 30	06:35 (5)	20:48 24	06:38 (5)	20:18	19:27	18:34	16:51	16:37
13	07:39	07:11	06:27	06:34	05:51	19:52 (12) 05:32	06:05 (5)	05:44	06:13 (5)	06:14	06:47	07:20	06:58	07:31
	16:59	17:39	18:14	19:49	20:21 6	19:58 (12) 20:48 30	06:35 (5)	20:48 26	06:39 (5)	20:17	19:25	18:33	16:50	16:37
14	07:38	07:09	06:25	06:32	05:50	19:49 (12) 05:32	06:05 (5)	05:45	06:14 (5)	06:15	06:48	07:21	06:59	07:32
	17:01	17:40	18:15	19:50	20:23 10	19:59 (12) 20:48 30	06:35 (5)	20:47 24	06:38 (5)	20:16	19:23	18:31	16:49	16:37
15	07:38	07:08	06:24	06:30	05:49	19:48 (12) 05:32	06:05 (5)	05:46	06:15 (5)	06:16	06:49	07:22	07:01	07:32
	17:02	17:41	18:16	19:51	20:24 12	20:00 (12) 20:49 30	06:35 (5)	20:47 24	06:39 (5)	20:14	19:21	18:29	16:49	16:38
16	07:37	07:07	06:22	06:29	05:48	19:45 (12) 05:32	06:07 (5)	05:46	06:15 (5)	06:17	06:50	07:24	07:02	07:33
	17:03	17:43	18:17	19:52	20:25 16	20:01 (12) 20:49 28	06:35 (5)	20:46 22	06:37 (5)	20:13	19:20	18:28	16:48	16:38
17	07:37	07:05	06:20	06:27	05:47	19:44 (12) 05:32	06:07 (5)	05:47	06:16 (5)	06:18	06:51	07:25	07:03	07:34
	17:04	17:44	18:18	19:54	20:26 18	20:02 (12) 20:50 28	06:35 (5)	20:46 20	06:36 (5)	20:11	19:18	18:26	16:47	16:38
18	07:36	07:04	06:18	06:26	05:46	19:43 (12) 05:32	06:07 (5)	05:48	06:17 (5)	06:19	06:52	07:26	07:04	07:35
	17:05	17:45	18:19	19:55	20:27 18	20:01 (12) 20:50 28	06:35 (5)	20:45 18	06:35 (5)	20:10	19:16	18:24	16:46	16:39
19	07:36	07:02	06:17	06:24	05:45	19:44 (12) 05:32	06:07 (5)	05:49	06:18 (5)	06:20	06:53	07:27	07:05	07:35
	17:06	17:47	18:21	19:56	20:28 18	20:02 (12) 20:50 28	06:35 (5)	20:44 18	06:36 (5)	20:08	19:14	18:23	16:45	16:39
20	07:35	07:01	06:15	06:22	05:44	19:44 (12) 05:32	06:08 (5)	05:50	06:21 (5)	06:22	06:55	07:28	07:07	07:36
	17:08	17:48	18:22	19:57	20:29 20	20:04 (12) 20:51 28	06:36 (5)	20:43 14	06:35 (5)	20:07	19:12	18:21	16:44	16:39
21	07:34	06:59	06:13	06:21	05:43	19:43 (12) 05:33	06:08 (5)	05:51	06:22 (5)	06:23	06:56	07:29	07:08	07:36
	17:09	17:49	18:23	19:58	20:30 22	20:05 (12) 20:51 28	06:36 (5)	20:43 10	06:32 (5)	20:05	19:11	18:20	16:44	16:40
22	07:34	06:58	06:11	06:19	05:43	06:14 (5) 05:33	06:08 (5)	05:52	06:25 (5)	06:24	06:57	07:31	07:09	07:37
	17:10	17:50	18:24	19:59	20:31 6	06:20 (5) 20:51 28	06:36 (5)	20:42 4	06:29 (5)	20:04	19:09	18:18	16:43	16:40
23	07:33	06:56	06:10	06:18	05:42	06:11 (5) 05:33	06:08 (5)	05:53	19:53 (12)	06:25	06:58	07:32	07:10	07:37
	17:11	17:52	18:25	20:00	20:32 12	06:23 (5) 20:51 28	06:36 (5)	20:41 22	20:15 (12)	20:02	19:07	18:17	16:42	16:41
24	07:32	06:55	06:08	06:16	05:41	06:09 (5) 05:33	06:09 (5)	05:54	19:54 (12)	06:26	06:59	07:33	07:12	07:38
	17:13	17:53	18:26	20:00	20:33 16	06:25 (5) 20:51 28	06:37 (5)	20:40 20	20:14 (12)	20:00	19:05	18:15	16:42	16:41
25	07:31	06:53	06:06	06:15	05:40	06:08 (5) 05:34	06:09 (5)	05:55	19:55 (12)	06:27	07:00	06:34	07:13	07:38
	17:14	17:54	18:27	20:01	20:34 18	06:26 (5) 20:52 28	06:37 (5)	20:39 18	20:13 (12)	19:57	19:04	17:14	16:41	16:42
26	07:31	06:52	06:04	06:13	05:39	06:07 (5) 05:34	06:09 (5)	05:55	19:54 (12)	06:28	07:01	06:36	07:14	07:39
	17:15	17:55	18:29	20:03	20:35 20	06:27 (5) 20:52 28	06:37 (5)	20:38 18	20:12 (12)	19:56	19:02	17:12	16:41	16:43
27	07:30	06:50	06:03	06:12	05:39	06:07 (5) 05:34	06:08 (5)	05:56	19:55 (12)	06:29	07:02	06:37	07:15	07:39
	17:17	17:57	18:30	20:04	20:35 22	06:29 (5) 20:52 30	06:38 (5)	20:37 16	20:11 (12)	19:54	19:00	17:11	16:40	16:43
28	07:29	06:49	06:01	06:10	05:38	06:06 (5) 05:35	06:08 (5)	05:57	19:56 (12)	06:30	07:03	06:38	07:16	07:39
	17:18	17:58	18:31	20:05	20:36 22	06:28 (5) 20:52 30	06:38 (5)	20:36 14	20:10 (12)	19:52	18:58	17:10	16:40	16:44
29	07:28		05:59	06:09	05:37	06:06 (5) 05:35	06:08 (5)	05:58		06:31	07:04	06:39	07:17	07:39
	17:19		18:32	20:06	20:37 24	06:30 (5) 20:52 30	06:38 (5)	20:35		19:51	18:56	17:08	16:39	16:45
30	07:27		05:57	06:08	05:37	06:05 (5) 05:36	06:09 (5)	05:59	20:00 (12)	06:32	07:05	06:40	07:18	07:40
	17:20		18:33	20:07	20:38 24	06:29 (5) 20:52 30	06:39 (5)	20:34 8	20:08 (12)	19:49	18:55	17:07	16:39	16:45
31	07:26		05:56		05:36	06:04 (5)	06:00	20:03 (12)	06:33		06:42		07:40
	17:22		18:34		20:39 26	06:30 (5)	20:33 4	20:07 (12)	19:47		17:06		16:46
Potential sun hours	293	295	370	209	-292	-263	-280	-145	375	343	294	283
Total, worst case					330	850	626					
Sun reduction					0.55	0.55	0.65					
Oper. time red.					0.86	0.86	0.86					
Wind dir. red.					0.62	0.62	0.62					
Total reduction					0.30	0.30	0.35					
Total, real					97	251	219					

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	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, Mid Western part
15 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
1000 meter max shadow distance applied along with default 3° inclination
Sunshine probabilities applied (pdf plots)
Directional run-hours applied from tab file (tower 1)
.

Licensed user:
Wind Engineers, Inc.
7660 Whitegate Avenue
US-RIVERSIDE, CA 92506

Calculated:
03/02/06 01:13/2.4.0.67

SHADOW - Calendar

Calculation: Mid Eastern part **Shadow receptor:** 818 - 818

Assumptions for shadow calculations

Maximum distance for influence	1,000	m
Minimum sun height over horizon for influence	3	°
Day step for calculation	1	days
Time step for calculation	2	minutes

Sun shine probabilities (part of time from sun rise to sun set with sun shine)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.35	0.45	0.45	0.55	0.55	0.55	0.65	0.55	0.55	0.45	0.35	0.30

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
475	585	238	199	220	474	1,184	813	840	1,246	803	479	7,555

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:40	07:25	06:47	05:54	06:06	05:36	06:06 (5)	05:36	20:13 (12)	06:01	06:34	07:06	06:43	07:20
	16:47	17:23	17:59	18:35	20:08	20:40 20	06:26 (5)	20:52 34	06:33 (5)	20:32	19:46	18:53	17:04	16:38
2	07:40	07:24	06:45	05:52	06:05	05:35	06:06 (5)	05:37	20:16 (12)	06:03	06:35	07:08	06:44	07:21
	16:48	17:24	18:00	18:37	20:09	20:41 20	06:26 (5)	20:52 34	06:34 (5)	20:31	19:44	18:51	17:03	16:38
3	07:40	07:23	06:44	05:50	06:03	05:35	06:05 (5)	05:37	20:16 (12)	06:04	06:36	07:09	06:45	07:22
	16:49	17:26	18:02	18:38	20:11	20:41 22	06:27 (5)	20:51 32	06:34 (5)	20:30	19:42	18:49	17:02	16:38
4	07:40	07:22	06:42	05:49	06:02	05:34	06:05 (5)	05:38	06:09 (5)	06:05	06:38	07:10	06:47	07:23
	16:50	17:27	18:03	18:39	20:12	20:42 22	06:27 (5)	20:51 26	06:35 (5)	20:29	19:41	18:48	17:00	16:38
5	07:40	07:21	06:40	06:47	06:01	05:34	06:05 (5)	05:38	06:10 (5)	06:06	06:39	07:11	06:48	07:24
	16:51	17:28	18:04	19:40	20:13	20:43 24	06:29 (5)	20:51 24	06:34 (5)	20:27	19:39	18:46	16:59	16:37
6	07:40	07:20	06:39	06:45	06:00	05:34	06:04 (5)	05:39	06:10 (5)	06:07	06:40	07:12	06:49	07:25
	16:52	17:30	18:05	19:41	20:14	20:43 24	06:28 (5)	20:51 24	06:34 (5)	20:26	19:37	18:44	16:58	16:37
7	07:40	07:18	06:37	06:44	05:58	05:33	06:04 (5)	05:40	06:11 (5)	06:08	06:41	07:13	06:50	07:26
	16:53	17:31	18:06	19:42	20:15	20:44 24	06:28 (5)	20:50 24	06:35 (5)	20:25	19:35	18:43	16:57	16:37
8	07:40	07:17	06:35	06:42	05:57	05:33	06:04 (5)	05:40	06:11 (5)	06:09	06:42	07:14	06:52	07:27
	16:54	17:32	18:08	19:43	20:16	20:45 24	06:28 (5)	20:50 22	06:33 (5)	20:24	19:34	18:41	16:56	16:37
9	07:40	07:16	06:34	06:40	05:56	05:33	06:04 (5)	05:41	06:12 (5)	06:10	06:43	07:15	06:53	07:28
	16:55	17:34	18:09	19:44	20:17	20:45 26	06:30 (5)	20:50 22	06:34 (5)	20:22	19:32	18:39	16:55	16:37
10	07:39	07:15	06:32	06:39	05:55	05:33	20:11 (12)	05:42	06:13 (5)	06:11	06:44	07:17	06:54	07:28
	16:56	17:35	18:10	19:46	20:18	20:46 32	06:29 (5)	20:49 20	06:33 (5)	20:21	19:30	18:38	16:53	16:37
11	07:39	07:13	06:30	06:37	05:53	05:32	20:09 (12)	05:42	06:14 (5)	06:12	06:45	07:18	06:56	07:29
	16:57	17:36	18:11	19:47	20:19	20:47 34	06:29 (5)	20:49 20	06:34 (5)	20:20	19:28	18:36	16:52	16:37
12	07:39	07:12	06:29	06:35	05:52	05:32	20:09 (12)	05:43	06:14 (5)	06:13	06:46	07:19	06:57	07:30
	16:58	17:38	18:12	19:48	20:20	20:47 36	06:29 (5)	20:48 18	06:32 (5)	20:18	19:27	18:34	16:51	16:37
13	07:39	07:11	06:27	06:34	05:51	05:32	20:09 (12)	05:44	06:15 (5)	06:14	06:47	07:20	06:58	07:31
	16:59	17:39	18:14	19:49	20:21	20:48 38	06:31 (5)	20:48 18	06:33 (5)	20:17	19:25	18:33	16:50	16:37
14	07:38	07:09	06:25	06:32	05:50	05:32	20:09 (12)	05:45	06:16 (5)	06:15	06:48	07:21	06:59	07:32
	17:01	17:40	18:15	19:50	20:23	20:48 38	06:31 (5)	20:47 16	06:32 (5)	20:16	19:23	18:31	16:49	16:37
15	07:38	07:08	06:24	06:30	05:49	05:32	20:09 (12)	05:46	06:17 (5)	06:16	06:49	07:22	07:01	07:32
	17:02	17:41	18:16	19:51	20:24	20:49 40	06:31 (5)	20:47 14	06:31 (5)	20:14	19:21	18:29	16:49	16:38
16	07:37	07:07	06:22	06:29	05:48	05:32	20:07 (12)	05:46	06:17 (5)	06:17	06:50	07:24	07:02	07:33
	17:03	17:43	18:17	19:52	20:25	20:49 42	06:31 (5)	20:46 14	06:31 (5)	20:13	19:20	18:28	16:48	16:38
17	07:37	07:05	06:20	06:27	05:47	05:32	20:07 (12)	05:47	06:18 (5)	06:18	06:51	07:25	07:03	07:34
	17:04	17:44	18:18	19:54	20:26	20:50 42	06:31 (5)	20:46 12	06:30 (5)	20:11	19:18	18:26	16:47	16:38
18	07:36	07:04	06:18	06:26	05:46	05:32	20:07 (12)	05:48	06:21 (5)	06:19	06:52	07:26	07:04	07:35
	17:05	17:45	18:19	19:55	20:27	20:50 42	06:31 (5)	20:45 6	06:27 (5)	20:10	19:16	18:24	16:46	16:39
19	07:36	07:02	06:17	06:24	05:45	05:32	20:07 (12)	05:49		06:20	06:53	07:27	07:05	07:35
	17:06	17:47	18:21	19:56	20:28	20:50 42	06:31 (5)	20:44		20:08	19:14	18:23	16:45	16:39
20	07:35	07:01	06:15	06:22	05:44	05:32	20:08 (12)	05:50		06:22	06:55	07:28	07:07	07:36
	17:08	17:48	18:22	19:57	20:29	20:51 42	06:32 (5)	20:43		20:07	19:12	18:21	16:44	16:39
21	07:34	06:59	06:13	06:21	05:43	05:33	20:08 (12)	05:51		06:23	06:56	07:29	07:08	07:36
	17:09	17:49	18:23	19:58	20:30	20:51 42	06:32 (5)	20:43		20:05	19:11	18:20	16:44	16:40
22	07:34	06:58	06:11	06:19	05:43	05:33	20:08 (12)	05:52		06:24	06:57	07:31	07:09	07:37
	17:10	17:50	18:24	19:59	20:31	20:51 42	06:32 (5)	20:42		20:04	19:09	18:18	16:43	16:40
23	07:33	06:56	06:10	06:18	05:42	05:33	20:08 (12)	05:53		06:25	06:58	07:32	07:10	07:37
	17:11	17:52	18:25	20:00	20:32	20:51 42	06:32 (5)	20:41		20:02	19:07	18:17	16:42	16:41
24	07:32	06:55	06:08	06:16	05:41	05:33	20:09 (12)	05:54		06:26	06:59	07:33	07:12	07:38
	17:13	17:53	18:26	20:00	20:33	20:51 42	06:33 (5)	20:40		20:00	19:05	18:15	16:42	16:41
25	07:31	06:53	06:06	06:15	05:40	06:14 (5)	05:34	20:09 (12)	05:55		06:27	07:00	06:34	07:13	07:38
	17:14	17:54	18:27	20:01	20:34 4	06:18 (5)	20:52 42	06:33 (5)	20:39		19:57	19:04	17:14	16:41	16:42
26	07:31	06:52	06:04	06:13	05:39	06:09 (5)	05:34	20:09 (12)	05:55		06:28	07:01	06:36	07:14	07:39
	17:15	17:55	18:29	20:03	20:35 10	06:19 (5)	20:52 42	06:33 (5)	20:38		19:56	19:02	17:12	16:41	16:43
27	07:30	06:50	06:03	06:12	05:39	06:09 (5)	05:34	20:12 (12)	05:56		06:29	07:02	06:37	07:15	07:39
	17:17	17:57	18:30	20:04	20:35 12	06:21 (5)	20:52 40	06:34 (5)	20:37		19:54	19:00	17:11	16:40	16:43
28	07:29	06:49	06:01	06:10	05:38	06:08 (5)	05:35	20:12 (12)	05:57		06:30	07:03	06:38	07:16	07:39
	17:18	17:58	18:31	20:05	20:36 14	06:22 (5)	20:52 40	06:34 (5)	20:36		19:52	18:58	17:10	16:40	16:44
29	07:28		05:59	06:09	05:37	06:08 (5)	05:35	20:12 (12)	05:58		06:31	07:04	06:39	07:17	07:39
	17:19		18:32	20:06	20:37 16	06:24 (5)	20:52 38	06:34 (5)	20:35		19:51	18:56	17:08	16:39	16:45
30	07:27		05:57	06:08	05:37	06:07 (5)	05:36	20:13 (12)	05:59		06:32	07:05	06:40	07:18	07:40
	17:20		18:33	20:07	20:38 18	06:25 (5)	20:52 36	06:33 (5)	20:34		19:49	18:55	17:07	16:39	16:45
31	07:26		05:56		05:36	06:06 (5)			06:00		06:33		06:42		07:40
	17:22		18:34		20:39 18	06:24 (5)			20:33		19:47		17:06		16:46
Potential sun hours	293	295	370	209	-292	-263			-280		-145	375	343	294	283
Total, worst case					92	1040			380						
Sun reduction					0.55	0.55			0.65						
Oper. time red.					0.86	0.86			0.86						
Wind dir. red.					0.62	0.63			0.63						
Total reduction					0.30	0.30			0.35						
Total, real					27	309			133						

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	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, Mid Western part
15 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
1000 meter max shadow distance applied along with default 3° inclination
Sunshine probabilities applied (pdf plots)
Directional run-hours applied from tab file (tower 1)
.

Printed/Page
03/05/06 22:47 / 6
Licensed user:
Wind Engineers, Inc.
7660 Whitegate Avenue
US-RIVERSIDE, CA 92506

Calculated:
03/02/06 01:13/2.4.0.67

SHADOW - Calendar

Calculation: Mid Eastern part **Shadow receptor:** 819 - 819

Assumptions for shadow calculations

Maximum distance for influence	1,000	m
Minimum sun height over horizon for influence	3	°
Day step for calculation	1	days
Time step for calculation	2	minutes

Sun shine probabilities (part of time from sun rise to sun set with sun shine)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.35	0.45	0.45	0.55	0.55	0.55	0.65	0.55	0.55	0.45	0.35	0.30

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
475	585	238	199	220	474	1,184	813	840	1,246	803	479	7,555

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:40	07:25	06:47	05:54	06:06	05:36	05:36	06:01	06:34	07:07	06:43	07:20
	16:47	17:23	17:59	18:35	20:08	20:40 12 06:38 (5)	20:52	20:32 16 06:50 (5)	19:46	18:53	17:04	16:38
2	07:40	07:24	06:45	05:52	06:05	05:35	05:37	06:03	06:35	07:08	06:44	07:21
	16:48	17:24	18:00	18:37	20:09	20:41 8 06:36 (5)	20:52	20:31 12 06:47 (5)	19:44	18:51	17:03	16:38
3	07:40	07:23	06:44	05:51	06:03	05:35	05:37	06:04	06:36	07:09	06:45	07:22
	16:49	17:26	18:02	18:38	20:11	20:41 6 06:35 (5)	20:51	20:30 10 06:46 (5)	19:42	18:49	17:02	16:38
4	07:40	07:22	06:42	05:49	06:02	05:34	05:38	06:05	06:38	07:10	06:47	07:23
	16:50	17:27	18:03	18:39	20:12	20:42	20:51	20:29 4 06:43 (5)	19:41	18:48	17:00	16:38
5	07:40	07:21	06:40	06:47	06:01	05:34	05:38	06:06	06:39	07:11	06:48	07:24
	16:51	17:28	18:04	19:40	20:13	20:43	20:51	20:27	19:39	18:46	16:59	16:37
6	07:40	07:20	06:39	06:45	06:00	05:34	05:39	06:07	06:40	07:12	06:49	07:25
	16:52	17:30	18:05	19:41	20:14	20:43	20:51	20:26	19:37	18:44	16:58	16:37
7	07:40	07:18	06:37	06:44	05:58	05:33	05:40	06:08	06:41	07:13	06:50	07:26
	16:53	17:31	18:06	19:42	20:15	20:44	20:50	20:25	19:35	18:43	16:57	16:37
8	07:40	07:17	06:36	06:42	05:57	05:33	05:40	06:09	06:42	07:14	06:52	07:27
	16:54	17:32	18:08	19:43	20:16	20:45	20:50	20:24	19:34	18:41	16:56	16:37
9	07:40	07:16	06:34	06:40	05:56 06:26 (5)	05:33	05:41 06:36 (5)	06:10	06:43	07:15	06:53	07:28
	16:55	17:34	18:09	19:45	20:17 8 06:34 (5)	20:45	20:50 6 06:42 (5)	20:22	19:32	18:39	16:55	16:37
10	07:39	07:15	06:32	06:39	05:55 06:25 (5)	05:33	05:42 06:35 (5)	06:11	06:44	07:17	06:54	07:28
	16:56	17:35	18:10	19:46	20:18 12 06:37 (5)	20:46	20:49 8 06:43 (5)	20:21	19:30	18:38	16:53	16:37
11	07:39	07:13	06:30	06:37	05:53 06:24 (5)	05:32	05:42 06:34 (5)	06:12	06:45	07:18	06:56	07:29
	16:57	17:36	18:11	19:47	20:19 14 06:38 (5)	20:47	20:49 10 06:44 (5)	20:20	19:28	18:36	16:52	16:37
12	07:39	07:12	06:29	06:35	05:52 06:23 (5)	05:32	05:43 06:34 (5)	06:13	06:46	07:19	06:57	07:30
	16:58	17:38	18:12	19:48	20:20 16 06:39 (5)	20:47	20:48 12 06:46 (5)	20:18	19:27	18:34	16:51	16:37
13	07:39	07:11	06:27	06:34	05:51 06:22 (5)	05:32	05:44 06:33 (5)	06:14	06:47	07:20	06:58	07:31
	16:59	17:39	18:14	19:49	20:21 18 06:40 (5)	20:48	20:48 14 06:47 (5)	20:17	19:25	18:33	16:50	16:37
14	07:38	07:09	06:25	06:32	05:50 06:21 (5)	05:32	05:45 06:32 (5)	06:15	06:48	07:21	06:59	07:32
	17:01	17:40	18:15	19:50	20:23 20 06:41 (5)	20:48	20:47 16 06:48 (5)	20:16	19:23	18:31	16:49	16:37
15	07:38	07:08	06:24	06:30	05:49 06:20 (5)	05:32	05:46 06:33 (5)	06:16	06:49	07:22	07:01	07:32
	17:02	17:41	18:16	19:51	20:24 20 06:40 (5)	20:49	20:47 16 06:49 (5)	20:14	19:21	18:29	16:49	16:38
16	07:37	07:07	06:22	06:29	05:48 06:19 (5)	05:32	05:46 06:31 (5)	06:17	06:50	07:24	07:02	07:33
	17:03	17:43	18:17	19:52	20:25 22 06:41 (5)	20:49	20:46 18 06:49 (5)	20:13	19:20	18:28	16:48	16:38
17	07:37	07:05	06:20	06:27	05:47 06:20 (5)	05:32	05:47 06:30 (5)	06:18	06:51	07:25	07:03	07:34
	17:04	17:44	18:18	19:54	20:26 22 06:42 (5)	20:50	20:46 20 06:50 (5)	20:11	19:18	18:26	16:47	16:38
18	07:36	07:04	06:18	06:26	05:46 06:19 (5)	05:32	05:48 06:31 (5)	06:19	06:52	07:26	07:04	07:35
	17:05	17:45	18:19	19:55	20:27 22 06:41 (5)	20:50	20:45 20 06:51 (5)	20:10	19:16	18:24	16:46	16:39
19	07:36	07:02	06:17	06:24	05:45 06:19 (5)	05:32	05:49 06:30 (5)	06:20	06:53	07:27	07:06	07:35
	17:06	17:47	18:21	19:56	20:28 24 06:43 (5)	20:50	20:44 20 06:50 (5)	20:08	19:14	18:23	16:45	16:39
20	07:35	07:01	06:15	06:22	05:44 06:20 (5)	05:32	05:50 06:31 (5)	06:22	06:55	07:28	07:07	07:36
	17:08	17:48	18:22	19:57	20:29 22 06:42 (5)	20:51	20:43 20 06:51 (5)	20:07	19:12	18:21	16:44	16:39
21	07:34	06:59	06:13	06:21	05:43 06:19 (5)	05:33	05:51 06:30 (5)	06:23	06:56	07:29	07:08	07:36
	17:09	17:49	18:23	19:58	20:30 22 06:41 (5)	20:51	20:43 22 06:52 (5)	20:05	19:11	18:20	16:44	16:40
22	07:34	06:58	06:11	06:19	05:43 06:20 (5)	05:33	05:52 06:31 (5)	06:24	06:57	07:31	07:09	07:37
	17:10	17:50	18:24	19:59	20:31 22 06:42 (5)	20:51	20:42 22 06:53 (5)	20:04	19:09	18:18	16:43	16:40
23	07:33	06:56	06:10	06:18	05:42 06:19 (5)	05:33	05:53 06:29 (5)	06:25	06:58	07:32	07:10	07:37
	17:11	17:52	18:25	20:00	20:32 22 06:41 (5)	20:51	20:41 22 06:51 (5)	20:02	19:07	18:17	16:42	16:41
24	07:32	06:55	06:08	06:16	05:41 06:21 (5)	05:33	05:54 06:30 (5)	06:26	06:59	07:33	07:12	07:38
	17:13	17:53	18:26	20:00	20:33 20 06:41 (5)	20:51	20:40 22 06:52 (5)	20:00	19:05	18:15	16:42	16:41
25	07:31	06:53	06:06	06:15	05:40 06:20 (5)	05:34	05:55 06:29 (5)	06:27	07:00	06:34	07:13	07:38
	17:14	17:54	18:27	20:01	20:34 20 06:40 (5)	20:52	20:39 22 06:51 (5)	19:57	19:04	17:14	16:41	16:42
26	07:31	06:52	06:04	06:13	05:39 06:21 (5)	05:34	05:55 06:30 (5)	06:28	07:01	06:36	07:14	07:39
	17:15	17:55	18:29	20:03	20:35 20 06:41 (5)	20:52	20:38 22 06:52 (5)	19:56	19:02	17:12	16:41	16:43
27	07:30	06:50	06:03	06:12	05:39 06:23 (5)	05:34	05:56 06:31 (5)	06:29	07:02	06:37	07:15	07:39
	17:17	17:57	18:30	20:04	20:35 18 06:41 (5)	20:52	20:37 20 06:51 (5)	19:54	19:00	17:11	16:40	16:43
28	07:29	06:49	06:01	06:10	05:38 06:22 (5)	05:35	05:57 06:30 (5)	06:30	07:03	06:38	07:16	07:39
	17:18	17:58	18:31	20:05	20:36 18 06:40 (5)	20:52	20:36 22 06:52 (5)	19:52	18:58	17:10	16:40	16:44
29	07:28		05:59	06:09	05:37 06:24 (5)	05:35	05:58 06:31 (5)	06:31	07:04	06:39	07:17	07:39
	17:19		18:32	20:06	20:37 16 06:40 (5)	20:52	20:35 20 06:51 (5)	19:51	18:56	17:08	16:39	16:45
30	07:27		05:57	06:08	05:37 06:23 (5)	05:36	05:59 06:32 (5)	06:32	07:05	06:40	07:18	07:40
	17:20		18:33	20:07	20:38 16 06:39 (5)	20:52	20:34 18 06:50 (5)	19:49	18:55	17:07	16:39	16:45
31	07:26		05:56		05:36 06:24 (5)		06:00 06:33 (5)	06:33		06:42		07:40
	17:22		18:34		20:39 14 06:38 (5)		20:33 16 06:49 (5)	19:47		17:06		16:46
Potential sun hours	293	295	370	209	-292	-263	-280	-145	375	343	294	283
Total, worst case					428	26	408	42				
Sun reduction					0.55	0.55	0.65	0.55				
Oper. time red.					0.86	0.86	0.86	0.86				
Wind dir. red.					0.60	0.60	0.60	0.60				
Total reduction					0.29	0.29	0.34	0.29				
Total, real					123	7	138	12				

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	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, Mid Western part
15 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
1000 meter max shadow distance applied along with default 3° inclination
Sunshine probabilities applied (pdf plots)
Directional run-hours applied from tab file (tower 1)
.

Printed/Page
03/05/06 22:47 / 7

Licensed user:
Wind Engineers, Inc.
7660 Whitegate Avenue
US-RIVERSIDE, CA 92506

Calculated:
03/02/06 01:13/2.4.0.67

SHADOW - Calendar

Calculation: Mid Eastern part **Shadow receptor:** 821 - 821

Assumptions for shadow calculations

Maximum distance for influence	1,000 m
Minimum sun height over horizon for influence	3 °
Day step for calculation	1 days
Time step for calculation	2 minutes

Sun shine probabilities (part of time from sun rise to sun set with sun shine)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.35	0.45	0.45	0.55	0.55	0.55	0.65	0.55	0.55	0.45	0.35	0.30

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
475	585	238	199	220	474	1,184	813	840	1,246	803	479	7,555

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:40 - 16:47	07:25 - 17:23	06:47 - 17:59	05:54 - 18:35	06:06 - 19:26 (12) 20:08 - 19:44 (12)	05:36 - 06:06 (5) 20:40 - 06:24 (5)	05:36 - 06:05 (5) 20:52 - 06:35 (5)	06:01 - 20:32	06:34 - 19:46	07:06 - 18:53	06:43 - 17:04	07:19 - 16:38
2	07:40 - 16:48	07:24 - 17:24	06:45 - 18:00	05:52 - 18:37	06:05 - 19:27 (12) 20:09 - 19:45 (12)	05:35 - 06:04 (5) 20:40 - 06:26 (5)	05:37 - 06:06 (5) 20:52 - 06:36 (5)	06:02 - 20:31	06:35 - 19:44	07:08 - 18:51	06:44 - 17:03	07:21 - 16:38
3	07:40 - 16:49	07:23 - 17:26	06:44 - 18:02	05:50 - 18:38	06:03 - 19:28 (12) 20:10 - 19:44 (12)	05:35 - 06:03 (5) 20:41 - 06:27 (5)	05:37 - 06:06 (5) 20:51 - 06:36 (5)	06:04 - 20:30	06:36 - 19:42	07:09 - 18:49	06:45 - 17:02	07:22 - 16:38
4	07:40 - 16:50	07:22 - 17:27	06:42 - 18:03	05:49 - 18:39	06:02 - 19:30 (12) 20:12 - 19:42 (12)	05:34 - 06:03 (5) 20:42 - 06:27 (5)	05:38 - 06:07 (5) 20:51 - 06:35 (5)	06:05 - 20:29	06:38 - 19:41	07:10 - 18:48	06:47 - 17:00	07:23 - 16:38
5	07:40 - 16:51	07:21 - 17:28	06:40 - 18:04	06:47 - 19:40	06:01 - 19:31 (12) 20:13 - 19:41 (12)	05:34 - 06:03 (5) 20:43 - 06:29 (5)	05:38 - 06:08 (5) 20:51 - 06:36 (5)	06:06 - 20:27	06:39 - 19:39	07:11 - 18:46	06:48 - 16:59	07:24 - 16:37
6	07:40 - 16:52	07:20 - 17:30	06:39 - 18:05	06:45 - 19:41	06:00 - 20:14	05:34 - 06:02 (5) 20:43 - 06:28 (5)	05:39 - 06:08 (5) 20:51 - 06:36 (5)	06:07 - 20:26	06:40 - 19:37	07:12 - 18:44	06:49 - 16:58	07:25 - 16:37
7	07:40 - 16:53	07:18 - 17:31	06:37 - 18:06	06:44 - 19:42	05:58 - 20:15	05:33 - 06:02 (5) 20:44 - 06:30 (5)	05:40 - 06:09 (5) 20:50 - 06:35 (5)	06:08 - 20:25	06:41 - 19:35	07:13 - 18:43	06:50 - 16:57	07:26 - 16:37
8	07:40 - 16:54	07:17 - 17:32	06:35 - 18:08	06:42 - 19:43	05:57 - 20:16	05:33 - 06:02 (5) 20:45 - 06:30 (5)	05:40 - 06:09 (5) 20:50 - 06:35 (5)	06:09 - 19:41 (12) 20:24 - 19:51 (12)	06:42 - 19:34	07:14 - 18:41	06:52 - 16:56	07:27 - 16:37
9	07:40 - 16:55	07:16 - 17:34	06:34 - 18:09	06:40 - 19:44	05:56 - 20:17	05:33 - 06:02 (5) 20:45 - 06:32 (5)	05:41 - 06:10 (5) 20:50 - 06:34 (5)	06:10 - 19:38 (12) 20:22 - 19:52 (12)	06:43 - 19:32	07:15 - 18:39	06:53 - 16:55	07:28 - 16:37
10	07:39 - 16:56	07:15 - 17:35	06:32 - 18:10	06:39 - 19:46	05:55 - 20:18	05:33 - 06:01 (5) 20:46 - 06:31 (5)	05:42 - 06:11 (5) 20:49 - 06:33 (5)	06:11 - 19:37 (12) 20:21 - 19:53 (12)	06:44 - 19:30	07:17 - 18:38	06:54 - 16:53	07:28 - 16:37
11	07:39 - 16:57	07:13 - 17:36	06:30 - 18:11	06:37 - 19:47	05:53 - 20:19	05:32 - 06:01 (5) 20:47 - 06:31 (5)	05:42 - 06:12 (5) 20:49 - 06:34 (5)	06:12 - 19:36 (12) 20:20 - 19:54 (12)	06:45 - 19:28	07:18 - 18:36	06:56 - 16:52	07:29 - 16:37
12	07:39 - 16:58	07:12 - 17:38	06:29 - 18:12	06:35 - 19:48	05:52 - 20:20	05:32 - 06:01 (5) 20:47 - 06:33 (5)	05:43 - 06:14 (5) 20:48 - 06:32 (5)	06:13 - 19:35 (12) 20:18 - 19:53 (12)	06:46 - 19:27	07:19 - 18:34	06:57 - 16:51	07:30 - 16:37
13	07:39 - 16:59	07:11 - 17:39	06:27 - 18:14	06:34 - 19:49	05:51 - 20:21	05:32 - 06:01 (5) 20:48 - 06:33 (5)	05:44 - 06:15 (5) 20:48 - 06:31 (5)	06:14 - 19:34 (12) 20:17 - 19:52 (12)	06:47 - 19:25	07:20 - 18:33	06:58 - 16:50	07:31 - 16:37
14	07:38 - 17:01	07:09 - 17:40	06:25 - 18:15	06:32 - 19:50	05:50 - 20:23	05:32 - 06:01 (5) 20:48 - 06:33 (5)	05:45 - 06:18 (5) 20:47 - 06:30 (5)	06:15 - 19:33 (12) 20:16 - 19:51 (12)	06:48 - 19:23	07:21 - 18:31	06:59 - 16:49	07:32 - 16:37
15	07:38 - 17:02	07:08 - 17:41	06:24 - 18:16	06:30 - 19:51	05:49 - 20:24	05:32 - 06:01 (5) 20:49 - 06:33 (5)	05:46 - 06:21 (5) 20:47 - 06:27 (5)	06:16 - 19:32 (12) 20:14 - 19:50 (12)	06:49 - 19:21	07:22 - 18:29	07:01 - 16:48	07:32 - 16:38
16	07:37 - 17:03	07:07 - 17:43	06:22 - 18:17	06:29 - 19:52	05:48 - 20:25	05:32 - 06:01 (5) 20:49 - 06:33 (5)	05:46 - 06:17 20:46 - 06:33 (5)	06:17 - 19:31 (12) 20:13 - 19:47 (12)	06:50 - 19:20	07:24 - 18:28	07:02 - 16:48	07:33 - 16:38
17	07:37 - 17:04	07:05 - 17:44	06:20 - 18:18	06:27 - 19:54	05:47 - 20:26	05:32 - 06:01 (5) 20:50 - 06:33 (5)	05:47 - 06:18 20:46 - 06:33 (5)	06:18 - 19:32 (12) 20:11 - 19:46 (12)	06:51 - 19:18	07:25 - 18:26	07:03 - 16:47	07:34 - 16:38
18	07:36 - 17:05	07:04 - 17:45	06:18 - 18:19	06:25 - 19:55	05:46 - 20:27	05:32 - 06:01 (5) 20:50 - 06:35 (5)	05:48 - 06:19 20:45 - 06:35 (5)	06:19 - 19:31 (12) 20:10 - 19:45 (12)	06:52 - 19:16	07:26 - 18:24	07:04 - 16:46	07:35 - 16:39
19	07:36 - 17:06	07:02 - 17:47	06:17 - 18:21	06:24 - 19:29 (12) 19:56 - 19:33 (12) 4	05:45 - 20:28	05:32 - 06:01 (5) 20:50 - 06:35 (5)	05:49 - 06:20 20:44 - 06:35 (5)	06:20 - 19:32 (12) 20:08 - 19:44 (12)	06:53 - 19:14	07:27 - 18:23	07:05 - 16:45	07:35 - 16:39
20	07:35 - 17:08	07:01 - 17:48	06:15 - 18:22	06:22 - 19:28 (12) 19:57 - 19:34 (12) 6	05:44 - 20:29	05:32 - 06:02 (5) 20:51 - 06:36 (5)	05:50 - 06:22 20:43 - 06:36 (5)	06:22 - 19:31 (12) 20:07 - 19:41 (12)	06:55 - 19:12	07:28 - 18:21	07:07 - 16:44	07:36 - 16:39
21	07:34 - 17:09	06:59 - 17:49	06:13 - 18:23	06:21 - 19:28 (12) 19:58 - 19:34 (12) 6	05:43 - 20:30	05:33 - 06:02 (5) 20:51 - 06:36 (5)	05:51 - 06:23 20:43 - 06:36 (5)	06:23 - 19:32 (12) 20:05 - 19:40 (12) 8	06:56 - 19:11	07:29 - 18:20	07:08 - 16:44	07:36 - 16:40
22	07:34 - 17:10	06:58 - 17:50	06:11 - 18:24	06:19 - 19:27 (12) 19:59 - 19:35 (12) 8	05:43 - 20:31	05:33 - 06:02 (5) 20:51 - 06:36 (5)	05:52 - 06:24 20:42 - 06:36 (5)	06:24 - 19:31 (12) 20:04 - 19:39 (12) 8	06:57 - 19:09	07:31 - 18:18	07:09 - 16:43	07:37 - 16:40
23	07:33 - 17:11	06:56 - 17:52	06:10 - 18:25	06:18 - 19:25 (12) 20:00 - 19:37 (12) 12	05:42 - 20:32	05:33 - 06:02 (5) 20:51 - 06:36 (5)	05:53 - 06:25 20:41 - 06:36 (5)	06:25 - 19:32 (12) 20:02 - 19:38 (12) 6	06:58 - 19:07	07:32 - 18:17	07:10 - 16:42	07:37 - 16:41
24	07:32 - 17:13	06:55 - 17:53	06:08 - 18:26	06:16 - 19:26 (12) 20:00 - 19:38 (12) 12	05:41 - 20:33	05:33 - 06:03 (5) 20:51 - 06:37 (5)	05:54 - 06:26 20:40 - 06:37 (5)	06:26 - 19:33 (12) 20:00 - 19:37 (12) 4	06:59 - 19:05	07:33 - 18:15	07:12 - 16:42	07:38 - 16:41
25	07:31 - 17:14	06:53 - 17:54	06:06 - 18:27	06:15 - 19:25 (12) 20:01 - 19:39 (12) 14	05:40 - 20:34	05:34 - 06:03 (5) 20:52 - 06:37 (5)	05:55 - 06:27 20:39 - 06:37 (5)	06:27 - 19:57	07:00 - 19:04	06:34 - 17:14	07:13 - 16:41	07:38 - 16:42
26	07:31 - 17:15	06:52 - 17:55	06:04 - 18:29	06:13 - 19:25 (12) 20:03 - 19:39 (12) 14	05:39 - 20:34	05:34 - 06:03 (5) 20:52 - 06:35 (5)	05:55 - 06:28 20:38 - 06:35 (5)	06:28 - 19:56	07:01 - 19:02	06:36 - 17:12	07:14 - 16:41	07:39 - 16:43
27	07:30 - 17:17	06:50 - 17:57	06:03 - 18:30	06:12 - 19:24 (12) 20:04 - 19:42 (12) 18	05:39 - 20:35	05:34 - 06:04 (5) 20:52 - 06:36 (5)	05:56 - 06:29 20:37 - 06:36 (5)	06:29 - 19:54	07:02 - 19:00	06:37 - 17:11	07:15 - 16:40	07:39 - 16:43
28	07:29 - 17:18	06:49 - 17:58	06:01 - 18:31	06:10 - 19:24 (12) 20:05 - 19:42 (12) 18	05:38 - 20:36	05:35 - 06:04 (5) 20:52 - 06:36 (5)	05:57 - 06:30 20:36 - 06:36 (5)	06:30 - 19:52	07:03 - 18:58	06:38 - 17:10	07:16 - 16:40	07:39 - 16:44
29	07:28		05:59 - 18:32	06:09 - 19:25 (12) 20:06 - 19:43 (12) 18	05:37 - 06:09 (5) 20:37 - 06:19 (5) 10	05:35 - 06:04 (5) 20:52 - 06:36 (5) 32	05:58 - 06:31 20:35 - 06:36 (5)	06:31 - 19:51	07:04 - 18:56	06:39 - 17:08	07:17 - 16:39	07:39 - 16:45
30	07:27 - 17:20		05:57 - 18:33	06:08 - 19:26 (12) 20:07 - 19:44 (12) 18	05:37 - 06:07 (5) 20:38 - 06:21 (5) 14	05:36 - 06:05 (5) 20:52 - 06:37 (5) 32	05:59 - 06:32 20:34 - 06:37 (5)	06:32 - 19:49	07:05 - 18:55	06:40 - 17:07	07:18 - 16:39	07:40 - 16:45
31	07:26 - 17:22		05:56 - 18:34		05:36 - 06:06 (5) 20:39 - 06:22 (5) 16		06:00 - 20:33	06:33 - 19:47		06:42 - 17:06		07:40 - 16:46
Potential sun hours	293	295	370	209	-292	-263	-280	-145	375	343	294	283
Total, worst case				148	114	910	346	222				
Sun reduction				0.55	0.55	0.55	0.65	0.55				
Oper. time red.				0.86	0.86	0.86	0.86	0.86				
Wind dir. red.				0.60	0.61	0.63	0.63	0.60				
Total reduction				0.28	0.29	0.30	0.35	0.28				
Total, real				42	33	272	122	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)

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, Mid Western part
15 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
1000 meter max shadow distance applied along with default 3° inclination
Sunshine probabilities applied (pdf plots)
Directional run-hours applied from tab file (tower 1)
.

Licensed user:
Wind Engineers, Inc.
7660 Whitegate Avenue
US-RIVERSIDE, CA 92506

Calculated:
03/02/06 01:13/2.4.0.67

SHADOW - Calendar

Calculation: Mid Eastern part **Shadow receptor:** 823 - 823

Assumptions for shadow calculations

Maximum distance for influence	1,000 m
Minimum sun height over horizon for influence	3 °
Day step for calculation	1 days
Time step for calculation	2 minutes

Sun shine probabilities (part of time from sun rise to sun set with sun shine)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.35	0.45	0.45	0.55	0.55	0.55	0.65	0.55	0.55	0.45	0.35	0.30

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
475	585	238	199	220	474	1,184	813	840	1,246	803	479	7,555

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:40	07:25	06:47	05:54 06:39 (12)	06:06	05:36	05:36 20:13 (7)	06:02	06:34	07:07	06:43	07:20
	16:47	17:23	17:59	18:35 30 07:09 (12)	20:08	20:40	20:52 12 20:25 (7)	20:32	19:46	18:53	17:04	16:38
2	07:40	07:24	06:45	05:52 06:40 (12)	06:05	05:35	05:37 20:16 (7)	06:03	06:35	07:08	06:44	07:21
	16:48	17:24	18:00	18:37 30 07:10 (12)	20:09	20:41	20:52 8 20:24 (7)	20:31	19:44	18:51	17:03	16:38
3	07:40	07:23	06:44	05:51 06:40 (12)	06:03	05:35	05:37 20:17 (7)	06:04	06:37	07:09	06:46	07:22
	16:49	17:26	18:02	18:38 28 07:08 (12)	20:11	20:41	20:51 6 20:23 (7)	20:30	19:42	18:50	17:02	16:38
4	07:40	07:22	06:42	05:49 06:40 (12)	06:02	05:34	05:38	06:05	06:38 07:48 (12)	07:10	06:47	07:23
	16:50	17:27	18:03	18:39 26 07:06 (12)	20:12	20:42	20:51	20:29	19:41 4 07:52 (12)	18:48	17:00	16:38
5	07:40	07:21	06:41	06:47 07:40 (12)	06:01	05:34	05:38	06:06	06:39 07:41 (12)	07:11	06:48	07:24
	16:51	17:28	18:04	19:40 24 08:04 (12)	20:13	20:43	20:51	20:28	19:39 14 07:55 (12)	18:46	16:59	16:37
6	07:40	07:20	06:39	06:45 07:43 (12)	06:00	05:34	05:39	06:07	06:40 07:39 (12)	07:12	06:49	07:25
	16:52	17:30	18:05	19:41 20 08:03 (12)	20:14	20:44	20:51	20:26	19:37 20 07:59 (12)	18:44	16:58	16:37
7	07:40	07:18	06:37	06:44 07:45 (12)	05:58	05:33	05:40	06:08	06:41 07:38 (12)	07:13	06:51	07:26
	16:53	17:31	18:06	19:42 14 07:59 (12)	20:15	20:44	20:51	20:25	19:35 22 08:00 (12)	18:43	16:57	16:37
8	07:40	07:17	06:36	06:42 07:51 (12)	05:57	05:33	05:40	06:09	06:42 07:35 (12)	07:14	06:52	07:27
	16:54	17:32	18:08	19:43 4 07:55 (12)	20:16	20:45	20:50	20:24	19:34 26 08:01 (12)	18:41	16:56	16:37
9	07:40	07:16	06:34	06:40	05:56	05:33	20:14 (7) 05:41	06:10	06:43 07:34 (12)	07:16	06:53	07:28
	16:55	17:34	18:09	19:45	20:17	20:46 4	20:18 (7) 20:50	20:22	19:32 28 08:02 (12)	18:39	16:55	16:37
10	07:40	07:15	06:32	06:39	05:55	05:33	20:11 (7) 05:42	06:11	06:44 07:33 (12)	07:17	06:54	07:28
	16:56	17:35	18:10	19:46	20:18	20:46 8	20:19 (7) 20:49	20:21	19:30 30 08:03 (12)	18:38	16:54	16:37
11	07:39	07:13	06:30	06:37	05:54	05:33	20:11 (7) 05:42	06:12	06:45 07:32 (12)	07:18	06:56	07:29
	16:57	17:36	18:11	19:47	20:19	20:47 10	20:21 (7) 20:49	20:20	19:28 30 08:02 (12)	18:36	16:52	16:37
12	07:39	07:12	06:29	06:35	05:52	05:32	20:09 (7) 05:43	06:13	06:46 07:31 (12)	07:19	06:57	07:30
	16:58	17:38	18:12	19:48	20:20	20:47 12	20:21 (7) 20:49	20:18	19:27 32 08:03 (12)	18:34	16:51	16:37
13	07:39	07:11	06:27	06:34	05:51	05:32	20:09 (7) 05:44	06:14	06:47 07:30 (12)	07:20	06:58	07:31
	16:59	17:39	18:14	19:49	20:22	20:48 12	20:21 (7) 20:48	20:17	19:25 34 08:04 (12)	18:33	16:50	16:37
14	07:38	07:09	06:25	06:32	05:50	05:32	20:09 (7) 05:45	06:15	06:48 07:29 (12)	07:21	06:59	07:32
	17:01	17:40	18:15	19:50	20:23	20:48 12	20:21 (7) 20:47	20:16	19:23 34 08:03 (12)	18:31	16:49	16:37
15	07:38	07:08	06:24	06:30	05:49	05:32	20:09 (7) 05:46	06:16	06:49 07:28 (12)	07:22	07:01	07:33
	17:02	17:42	18:16	19:51	20:24	20:49 14	20:23 (7) 20:47	20:14	19:21 34 08:02 (12)	18:29	16:49	16:38
16	07:37	07:07	06:22	06:29	05:48	05:32	20:09 (7) 05:46	06:17	06:50 07:29 (12)	07:24	07:02	07:33
	17:03	17:43	18:17	19:52	20:25	20:49 14	20:23 (7) 20:46	20:13	19:20 34 08:03 (12)	18:28	16:48	16:38
17	07:37	07:05	06:20 06:58 (12)	06:27	05:47	05:32	20:09 (7) 05:47	06:18	06:51 07:28 (12)	07:25	07:03	07:34
	17:04	17:44	18:18 4 07:02 (12)	19:54	20:26	20:50 14	20:23 (7) 20:46	20:11	19:18 34 08:02 (12)	18:26	16:47	16:38
18	07:36	07:04	06:18 06:52 (12)	06:26	05:46	05:32	20:09 (7) 05:48	06:19	06:52 07:27 (12)	07:26	07:04	07:35
	17:05	17:45	18:19 14 07:06 (12)	19:55	20:27	20:50 14	20:23 (7) 20:45	20:10	19:16 34 08:01 (12)	18:25	16:46	16:39
19	07:36	07:02	06:17 06:48 (12)	06:24	05:45	05:32	20:09 (7) 05:49	06:21	06:54 07:28 (12)	07:27	07:06	07:35
	17:07	17:47	18:21 22 07:10 (12)	19:56	20:28	20:50 14	20:23 (7) 20:44	20:08	19:14 32 08:00 (12)	18:23	16:45	16:39
20	07:35	07:01	06:15 06:46 (12)	06:22	05:44	05:33	20:10 (7) 05:50	06:22	06:55 07:29 (12)	07:28	07:07	07:36
	17:08	17:48	18:22 24 07:10 (12)	19:57	20:29	20:51 14	20:24 (7) 20:43	20:07	19:12 30 07:59 (12)	18:21	16:44	16:39
21	07:34	06:59	06:13 06:45 (12)	06:21	05:43	05:33	20:10 (7) 05:51	06:23	06:56 07:28 (12)	07:30	07:08	07:36
	17:09	17:49	18:23 28 07:13 (12)	19:58	20:30	20:51 14	20:24 (7) 20:43	20:05	19:11 30 07:58 (12)	18:20	16:44	16:40
22	07:34	06:58	06:11 06:43 (12)	06:19	05:43	05:33	20:10 (7) 05:52	06:24	06:57 07:29 (12)	07:31	07:09	07:37
	17:10	17:50	18:24 30 07:13 (12)	19:59	20:31	20:51 14	20:24 (7) 20:42	20:04	19:09 28 07:57 (12)	18:18	16:43	16:40
23	07:33	06:56	06:10 06:43 (12)	06:18	05:42	05:33	20:10 (7) 05:53	06:25	06:58 07:30 (12)	07:32	07:10	07:37
	17:12	17:52	18:25 30 07:13 (12)	20:00	20:32	20:51 14	20:24 (7) 20:41	20:02	19:07 26 07:56 (12)	18:17	16:42	16:41
24	07:32	06:55	06:08 06:41 (12)	06:16	05:41	05:33	20:11 (7) 05:54	06:26	06:59 07:31 (12)	07:33	07:12	07:38
	17:13	17:53	18:26 32 07:13 (12)	20:00	20:33	20:51 14	20:25 (7) 20:40	20:01	19:05 22 07:53 (12)	18:15	16:42	16:41
25	07:32	06:53	06:06 06:40 (12)	06:15	05:40	05:34	20:11 (7) 05:55	06:27	07:00 07:34 (12)	06:34	07:13	07:38
	17:14	17:54	18:27 34 07:14 (12)	20:02	20:34	20:52 14	20:25 (7) 20:39	19:57	19:04 16 07:50 (12)	17:14	16:41	16:42
26	07:31	06:52	06:04 06:40 (12)	06:13	05:39	05:34	20:11 (7) 05:56	06:28	07:01 07:37 (12)	06:36	07:14	07:39
	17:15	17:55	18:29 34 07:14 (12)	20:03	20:35	20:52 14	20:25 (7) 20:38	19:56	19:02 10 07:47 (12)	17:12	16:41	16:43
27	07:30	06:50	06:03 06:38 (12)	06:12	05:39	05:34	20:12 (7) 05:57	06:29	07:02	06:37	07:15	07:39
	17:17	17:57	18:30 36 07:14 (12)	20:04	20:35	20:52 14	20:26 (7) 20:37	19:54	19:00	17:11	16:40	16:43
28	07:29	06:49	06:01 06:38 (12)	06:10	05:38	05:35	20:12 (7) 05:57	06:30	07:03	06:38	07:16	07:39
	17:18	17:58	18:31 34 07:12 (12)	20:05	20:36	20:52 14	20:26 (7) 20:36	19:52	18:58	17:10	16:40	16:44
29	07:28		05:59 06:39 (12)	06:09	05:37	05:35	20:13 (7) 05:58	06:31	07:04	06:39	07:17	07:40
	17:19		18:32 34 07:13 (12)	20:06	20:37	20:52 12	20:25 (7) 20:35	19:51	18:57	17:08	16:39	16:45
30	07:27		05:57 06:39 (12)	06:08	05:37	05:36	20:13 (7) 05:59	06:32	07:05	06:41	07:18	07:40
	17:21		18:33 34 07:13 (12)	20:07	20:38	20:52 12	20:25 (7) 20:34	19:49	18:55	17:07	16:39	16:45
31	07:26		05:56 06:39 (12)		05:36		06:01	06:33		06:42		07:40
	17:22		18:34 32 07:11 (12)		20:39		20:33	19:47		17:06		16:46
Potential sun hours	293	295	370	209	-292	-263	-280	-145	375	343	294	283
Total, worst case			422	176		278	26		604			
Sun reduction			0.45	0.55		0.55	0.65		0.55			
Oper. time red.			0.86	0.86		0.86	0.86		0.86			
Wind dir. red.			0.61	0.61		0.63	0.63		0.61			
Total reduction			0.24	0.29		0.30	0.35		0.29			
Total, real			99	51		83	9		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)

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, Mid Western part
15 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
1000 meter max shadow distance applied along with default 3° inclination
Sunshine probabilities applied (pdf plots)
Directional run-hours applied from tab file (tower 1)
.

Licensed user:
Wind Engineers, Inc.
7660 Whitegate Avenue
US-RIVERSIDE, CA 92506

Calculated:
03/02/06 01:13/2.4.0.67

SHADOW - Calendar

Calculation: Mid Eastern part **Shadow receptor:** 824 - 824

Assumptions for shadow calculations

Maximum distance for influence	1,000	m
Minimum sun height over horizon for influence	3	°
Day step for calculation	1	days
Time step for calculation	2	minutes

Sun shine probabilities (part of time from sun rise to sun set with sun shine)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.35	0.45	0.45	0.55	0.55	0.55	0.65	0.55	0.55	0.45	0.35	0.30

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
475	585	238	199	220	474	1,184	813	840	1,246	803	479	7,555

	January	February	March		April		May	June	July	August	September		October	November	December
1	07:40	07:25	06:47		05:54	06:27 (12)	06:06	05:36	05:36	06:02	06:34		07:07	06:43	07:20
	16:47	17:23	17:59		18:35	30 06:57 (12)	20:08	20:40	20:52	20:32	19:46		18:53	17:04	16:38
2	07:40	07:24	06:45		05:52	06:28 (12)	06:05	05:35	05:37	06:03	06:35	07:34 (12)	07:08	06:44	07:21
	16:48	17:24	18:00		18:37	28 06:56 (12)	20:09	20:41	20:52	20:31	19:44	4 07:38 (12)	18:51	17:03	16:38
3	07:40	07:23	06:44		05:51	06:28 (12)	06:03	05:35	05:37	06:04	06:37	07:29 (12)	07:09	06:46	07:22
	16:49	17:26	18:02		18:38	28 06:56 (12)	20:11	20:41	20:51	20:30	19:42	14 07:43 (12)	18:50	17:02	16:38
4	07:40	07:22	06:42		05:49	06:28 (12)	06:02	05:34	05:38	06:05	06:38	07:28 (12)	07:10	06:47	07:23
	16:50	17:27	18:03		18:39	26 06:54 (12)	20:12	20:42	20:51	20:29	19:41	18 07:46 (12)	18:48	17:00	16:38
5	07:40	07:21	06:41		06:47	07:28 (12)	06:01	05:34	05:38	06:06	06:39	07:25 (12)	07:11	06:48	07:24
	16:51	17:28	18:04		19:40	24 07:52 (12)	20:13	20:43	20:51	20:28	19:39	22 07:47 (12)	18:46	16:59	16:37
6	07:40	07:20	06:39		06:45	07:29 (12)	06:00	05:34	05:39	06:07	06:40	07:25 (12)	07:12	06:49	07:25
	16:52	17:30	18:05		19:41	24 07:53 (12)	20:14	20:44	20:51	20:26	19:37	24 07:49 (12)	18:44	16:58	16:37
7	07:40	07:18	06:37		06:44	07:29 (12)	05:58	05:33	05:40	06:08	06:41	07:24 (12)	07:13	06:51	07:26
	16:53	17:31	18:06		19:42	22 07:51 (12)	20:15	20:44	20:51	20:25	19:35	26 07:50 (12)	18:43	16:57	16:37
8	07:40	07:17	06:36		06:42	07:31 (12)	05:57	05:33	05:40	06:09	06:42	07:23 (12)	07:14	06:52	07:27
	16:54	17:32	18:08		19:43	18 07:49 (12)	20:16	20:45	20:50	20:24	19:34	26 07:49 (12)	18:41	16:56	16:37
9	07:40	07:16	06:34		06:40	07:32 (12)	05:56	05:33	05:41	06:10	06:43	07:22 (12)	07:16	06:53	07:28
	16:55	17:34	18:09		19:45	14 07:46 (12)	20:17	20:46	20:50	20:22	19:32	28 07:50 (12)	18:39	16:55	16:37
10	07:40	07:15	06:32		06:39	07:36 (12)	05:55	05:33	05:42	06:11	06:44	07:21 (12)	07:17	06:54	07:28
	16:56	17:35	18:10		19:46	4 07:40 (12)	20:18	20:46	20:49	20:21	19:30	28 07:49 (12)	18:38	16:54	16:37
11	07:39	07:13	06:30		06:37		05:54	05:33	05:42	06:12	06:45	07:20 (12)	07:18	06:56	07:29
	16:57	17:36	18:11		19:47		20:19	20:47	20:49	20:20	19:28	30 07:50 (12)	18:36	16:52	16:37
12	07:39	07:12	06:29		06:35		05:52	05:32	05:43	06:13	06:46	07:19 (12)	07:19	06:57	07:30
	16:58	17:38	18:12		19:48		20:20	20:47	20:49	20:18	19:27	30 07:49 (12)	18:34	16:51	16:37
13	07:39	07:11	06:27		06:34		05:51	05:32	05:44	06:14	06:47	07:20 (12)	07:20	06:58	07:31
	16:59	17:39	18:14		19:49		20:22	20:48	20:48	20:17	19:25	28 07:48 (12)	18:33	16:50	16:37
14	07:38	07:09	06:25		06:32		05:50	05:32	05:45	06:15	06:48	07:19 (12)	07:21	06:59	07:32
	17:01	17:40	18:15		19:50		20:23	20:48	20:47	20:16	19:23	30 07:49 (12)	18:31	16:49	16:38
15	07:38	07:08	06:24		06:30		05:49	05:32	05:46	06:16	06:49	07:20 (12)	07:22	07:01	07:33
	17:02	17:42	18:16		19:51		20:24	20:49	20:47	20:14	19:21	28 07:48 (12)	18:29	16:49	16:38
16	07:37	07:07	06:22		06:29		05:48	05:32	05:46	06:17	06:50	07:19 (12)	07:24	07:02	07:33
	17:03	17:43	18:17		19:52		20:25	20:49	20:46	20:13	19:20	28 07:47 (12)	18:28	16:48	16:38
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	17:04	17:44	18:18		19:54		20:26	20:50	20:46	20:11	19:18	24 07:44 (12)	18:26	16:47	16:38
18	07:36	07:04	06:18		06:26		05:46	05:32	05:48	06:19	06:52	07:21 (12)	07:26	07:04	07:35
	17:05	17:45	18:19		19:55		20:27	20:50	20:45	20:10	19:16	22 07:43 (12)	18:25	16:46	16:39
19	07:36	07:02	06:17		06:24		05:45	05:32	05:49	06:21	06:54	07:22 (12)	07:27	07:06	07:35
	17:07	17:47	18:21		19:56		20:28	20:50	20:44	20:08	19:14	20 07:42 (12)	18:23	16:45	16:39
20	07:35	07:01	06:15		06:22		05:44	05:33	05:50	06:22	06:55	07:23 (12)	07:28	07:07	07:36
	17:08	17:48	18:22		19:57		20:29	20:51	20:44	20:07	19:12	16 07:39 (12)	18:21	16:44	16:39
21	07:34	06:59	06:13		06:21		05:43	05:33	05:51	06:23	06:56	07:28 (12)	07:30	07:08	07:36
	17:09	17:49	18:23		19:58		20:30	20:51	20:43	20:05	19:11	6 07:34 (12)	18:20	16:44	16:40
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	17:12	17:52	18:25	12 06:51 (12)	20:00		20:32	20:51	20:41	20:02	19:07		18:17	16:42	16:41
24	07:32	06:55	06:08	06:35 (12)	06:16		05:41	05:33	05:54	06:26	06:59		07:33	07:12	07:38
	17:13	17:53	18:26	18 06:53 (12)	20:00		20:33	20:51	20:40	20:01	19:05		18:15	16:42	16:41
25	07:32	06:53	06:06	06:34 (12)	06:15		05:40	05:34	05:55	06:27	07:00		06:34	07:13	07:38
	17:14	17:54	18:27	22 06:56 (12)	20:02		20:34	20:52	20:39	19:57	19:04		17:14	16:41	16:42
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	17:15	17:55	18:29	24 06:56 (12)	20:03		20:35	20:52	20:38	19:56	19:02		17:12	16:41	16:43
27	07:30	06:50	06:03	06:30 (12)	06:12		05:39	05:34	05:57	06:29	07:02		06:37	07:15	07:39
	17:17	17:57	18:30	26 06:56 (12)	20:04		20:35	20:52	20:37	19:54	19:00		17:11	16:40	16:43
28	07:29	06:49	06:01	06:30 (12)	06:10		05:38	05:35	05:58	06:30	07:03		06:38	07:16	07:39
	17:18	17:58	18:31	26 06:56 (12)	20:05		20:36	20:52	20:36	19:52	18:58		17:10	16:40	16:44
29	07:28		05:59	06:29 (12)	06:09		05:38	05:35	05:58	06:31	07:04		06:39	07:17	07:40
	17:19		18:32	28 06:57 (12)	20:06		20:37	20:52	20:35	19:51	18:57		17:08	16:39	16:45
30	07:27		05:57	06:29 (12)	06:08		05:37	05:36	06:00	06:32	07:05		06:41	07:18	07:40
	17:21		18:33	28 06:57 (12)	20:07		20:38	20:52	20:34	19:49	18:55		17:07	16:39	16:46
31	07:26		05:56	06:27 (12)			05:36		06:01	06:33			06:42		07:40
	17:22		18:34	30 06:57 (12)			20:39		20:33	19:47			17:06		16:46
Potential sun hours	293	295	370		209		-292	-263	-280	-145	375		343	294	283
Total, worst case				218		218						452			
Sun reduction				0.45		0.55						0.55			
Oper. time red.				0.86		0.86						0.86			
Wind dir. red.				0.61		0.61						0.61			
Total reduction				0.24		0.29						0.29			
Total, real				52		63						131			

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	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, Mid Western part
15 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
1000 meter max shadow distance applied along with default 3° inclination
Sunshine probabilities applied (pdf plots)
Directional run-hours applied from tab file (tower 1)
.

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US-RIVERSIDE, CA 92506

Calculated:
03/02/06 01:13/2.4.0.67

SHADOW - Calendar

Calculation: Mid Eastern part **Shadow receptor:** 840 - 840

Assumptions for shadow calculations

Maximum distance for influence	1,000 m
Minimum sun height over horizon for influence	3 °
Day step for calculation	1 days
Time step for calculation	2 minutes

Sun shine probabilities (part of time from sun rise to sun set with sun shine)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.35	0.45	0.45	0.55	0.55	0.55	0.65	0.55	0.55	0.45	0.35	0.30

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
475	585	238	199	220	474	1,184	813	840	1,246	803	479	7,555

	January		February		March	April	May	June	July	August	September	October		November		December	
1	07:40	15:53 (13)	07:25		06:47	05:54	06:06	05:36	05:36	06:02	06:34	07:07		06:43	07:05 (3)	07:20	
	16:47	14 16:07 (13)	17:23		17:59	18:35	20:08	20:40	20:52	20:32	19:46	18:53		17:04	26 07:31 (3)	16:38	
2	07:40	15:53 (13)	07:24	07:45 (3)	06:45	05:52	06:05	05:35	05:37	06:03	06:35	07:08		06:44	07:06 (3)	07:21	
	16:48	14 16:07 (13)	17:24	8 07:53 (3)	18:00	18:37	20:09	20:41	20:52	20:31	19:44	18:51		17:03	24 07:30 (3)	16:38	
3	07:40	15:55 (13)	07:23	07:44 (3)	06:44	05:51	06:03	05:35	05:37	06:04	06:37	07:09		06:45	07:08 (3)	07:22	
	16:49	12 16:07 (13)	17:26	12 07:56 (3)	18:02	18:38	20:11	20:41	20:51	20:30	19:42	18:49		17:02	22 07:30 (3)	16:38	
4	07:40	15:55 (13)	07:22	07:43 (3)	06:42	05:49	06:02	05:34	05:38	06:05	06:38	07:10		06:47	07:09 (3)	07:23	
	16:50	12 16:07 (13)	17:27	14 07:57 (3)	18:03	18:39	20:12	20:42	20:51	20:29	19:41	18:48		17:00	20 07:29 (3)	16:38	
5	07:40	15:57 (13)	07:21	07:41 (3)	06:41	06:47	06:01	05:34	05:38	06:06	06:39	07:11		06:48	07:10 (3)	07:24	15:46 (13)
	16:51	10 16:07 (13)	17:28	16 07:57 (3)	18:04	19:40	20:13	20:43	20:51	20:27	19:39	18:46		16:59	18 07:28 (3)	16:37	4 15:50 (13)
6	07:40	15:59 (13)	07:20	07:40 (3)	06:39	06:45	06:00	05:34	05:39	06:07	06:40	07:12		06:49	07:12 (3)	07:25	15:45 (13)
	16:52	8 16:07 (13)	17:30	18 07:58 (3)	18:05	19:41	20:14	20:44	20:51	20:26	19:37	18:44		16:58	16 07:28 (3)	16:37	8 15:53 (13)
7	07:40	16:01 (13)	07:18	07:39 (3)	06:37	06:44	05:58	05:33	05:40	06:08	06:41	07:13		06:51	07:13 (3)	07:26	15:44 (13)
	16:53	4 16:05 (13)	17:31	20 07:59 (3)	18:06	19:42	20:15	20:44	20:50	20:25	19:35	18:43		16:57	14 07:27 (3)	16:37	10 15:54 (13)
8	07:40		07:17	07:38 (3)	06:36	06:42	05:57	05:33	05:40	06:09	06:42	07:14		06:52	07:14 (3)	07:27	15:43 (13)
	16:54		17:32	22 08:00 (3)	18:08	19:43	20:16	20:45	20:50	20:24	19:34	18:41		16:56	10 07:24 (3)	16:37	12 15:55 (13)
9	07:40		07:16	07:36 (3)	06:34	06:40	05:56	05:33	05:41	06:10	06:43	07:15		06:53	07:16 (3)	07:28	15:44 (13)
	16:55		17:34	24 08:00 (3)	18:09	19:45	20:17	20:45	20:50	20:22	19:32	18:39		16:55	8 07:24 (3)	16:37	12 15:56 (13)
10	07:39		07:15	07:35 (3)	06:32	06:39	05:55	05:33	05:42	06:11	06:44	07:17		06:54		07:28	15:43 (13)
	16:56		17:35	26 08:01 (3)	18:10	19:46	20:18	20:46	20:49	20:21	19:30	18:38		16:54		16:37	14 15:57 (13)
11	07:39		07:13	07:36 (3)	06:30	06:37	05:54	05:33	05:42	06:12	06:45	07:18		06:56		07:29	15:44 (13)
	16:57		17:36	26 08:02 (3)	18:11	19:47	20:19	20:47	20:49	20:20	19:28	18:36		16:52		16:37	14 15:58 (13)
12	07:39		07:12	07:34 (3)	06:29	06:35	05:52	05:32	05:43	06:13	06:46	07:19		06:57		07:30	15:43 (13)
	16:58		17:38	26 08:00 (3)	18:12	19:48	20:20	20:47	20:48	20:18	19:27	18:34		16:51		16:37	16 15:59 (13)
13	07:39		07:11	07:35 (3)	06:27	06:34	05:51	05:32	05:44	06:14	06:47	07:20		06:58		07:31	15:43 (13)
	16:59		17:39	26 08:01 (3)	18:14	19:49	20:22	20:48	20:48	20:17	19:25	18:33		16:50		16:37	16 15:59 (13)
14	07:38		07:09	07:36 (3)	06:25	06:32	05:50	05:32	05:45	06:15	06:48	07:21		06:59		07:32	15:44 (13)
	17:01		17:40	24 08:00 (3)	18:15	19:50	20:23	20:48	20:47	20:16	19:23	18:31		16:49		16:37	16 16:00 (13)
15	07:38		07:08	07:36 (3)	06:24	06:30	05:49	05:32	05:46	06:16	06:49	07:22		07:01		07:32	15:43 (13)
	17:02		17:41	24 08:00 (3)	18:16	19:51	20:24	20:49	20:47	20:14	19:21	18:29		16:49		16:38	18 16:01 (13)
16	07:37		07:07	07:37 (3)	06:22	06:29	05:48	05:32	05:46	06:17	06:50	07:24		07:02		07:33	15:44 (13)
	17:03		17:43	22 07:59 (3)	18:17	19:52	20:25	20:49	20:46	20:13	19:20	18:28		16:48		16:38	18 16:02 (13)
17	07:37		07:05	07:37 (3)	06:20	06:27	05:47	05:32	05:47	06:18	06:51	07:25		07:03		07:34	15:44 (13)
	17:04		17:44	20 07:57 (3)	18:18	19:54	20:26	20:50	20:46	20:11	19:18	18:26		16:47		16:38	18 16:02 (13)
18	07:36		07:04	07:40 (3)	06:18	06:26	05:46	05:32	05:48	06:19	06:52	07:26		07:04		07:35	15:45 (13)
	17:05		17:45	16 07:56 (3)	18:19	19:55	20:27	20:50	20:45	20:10	19:16	18:25		16:46		16:39	18 16:03 (13)
19	07:36		07:02	07:41 (3)	06:17	06:24	05:45	05:32	05:49	06:20	06:54	07:27		07:06		07:35	15:45 (13)
	17:07		17:47	14 07:55 (3)	18:21	19:56	20:28	20:50	20:44	20:08	19:14	18:23		16:45		16:39	18 16:03 (13)
20	07:35		07:01	07:45 (3)	06:15	06:22	05:44	05:33	05:50	06:22	06:55	07:28		07:07		07:36	15:46 (13)
	17:08		17:48	6 07:51 (3)	18:22	19:57	20:29	20:51	20:43	20:07	19:12	18:21		16:44		16:39	18 16:04 (13)
21	07:34		06:59		06:13	06:21	05:43	05:33	05:51	06:23	06:56	07:29		07:08		07:36	15:46 (13)
	17:09		17:49		18:23	19:58	20:30	20:51	20:43	20:05	19:11	18:20		16:44		16:40	18 16:04 (13)
22	07:34		06:58		06:11	06:19	05:43	05:33	05:52	06:24	06:57	07:31	08:14 (3)	07:09		07:37	15:47 (13)
	17:10		17:50		18:24	19:59	20:31	20:51	20:42	20:04	19:09	18:18	8 08:22 (3)	16:43		16:40	18 16:05 (13)
23	07:33		06:56		06:10	06:18	05:42	05:33	05:53	06:25	06:58	07:32	08:11 (3)	07:10		07:37	15:47 (13)
	17:12		17:52		18:25	20:00	20:32	20:51	20:41	20:02	19:07	18:17	14 08:25 (3)	16:42		16:41	18 16:05 (13)
24	07:32		06:55		06:08	06:16	05:41	05:33	05:54	06:26	06:59	07:33	08:08 (3)	07:12		07:38	15:48 (13)
	17:13		17:53		18:26	20:00	20:33	20:51	20:40	20:00	19:05	18:15	18 08:26 (3)	16:42		16:41	18 16:06 (13)
25	07:31		06:53		06:06	06:15	05:40	05:34	05:55	06:27	07:00	06:34	07:08 (3)	07:13		07:38	15:48 (13)
	17:14		17:54		18:27	20:02	20:34	20:52	20:39	19:57	19:04	17:14	20 07:28 (3)	16:41		16:42	18 16:06 (13)
26	07:31		06:52		06:04	06:13	05:39	05:34	05:56	06:28	07:01	06:36	07:07 (3)	07:14		07:39	15:48 (13)
	17:15		17:55		18:29	20:03	20:35	20:52	20:38	19:56	19:02	17:12	22 07:29 (3)	16:41		16:43	18 16:06 (13)
27	07:30		06:50		06:03	06:12	05:39	05:34	05:56	06:29	07:02	06:37	07:06 (3)	07:15		07:39	15:49 (13)
	17:17		17:57		18:30	20:04	20:35	20:52	20:37	19:54	19:00	17:11	24 07:30 (3)	16:40		16:43	18 16:07 (13)
28	07:29		06:49		06:01	06:10	05:38	05:35	05:57	06:30	07:03	06:38	07:06 (3)	07:16		07:39	15:49 (13)
	17:18		17:58		18:31	20:05	20:36	20:52	20:36	19:52	18:58	17:10	24 07:30 (3)	16:40		16:44	18 16:07 (13)
29	07:28				05:59	06:09	05:37	05:35	05:58	06:31	07:04	06:39	07:05 (3)	07:17		07:39	15:51 (13)
	17:19				18:32	20:06	20:37	20:52	20:35	19:51	18:56	17:08	26 07:31 (3)	16:39		16:45	16 16:07 (13)
30	07:27				05:57	06:08	05:37	05:36	05:59	06:32	07:05	06:40	07:04 (3)	07:18		07:40	15:51 (13)
	17:21				18:33	20:07	20:38	20:52	20:34	19:49	18:55	17:07	26 07:30 (3)	16:39		16:45	16 16:07 (13)
31	07:26				05:56		05:36		06:00	06:33		06:42	07:06 (3)			07:40	15:51 (13)
	17:22				18:34		20:39		20:33	19:47		17:06	24 07:30 (3)			16:46	16 16:07 (13)
Potential sun hours	293		295		370	209	-292	-263	-280	-145	375	343		294		283	
Total, worst case		74		364									206		158		422
Sun reduction		0.35		0.45									0.45		0.35		0.30
Oper. time red.		0.86		0.86									0.86		0.86		0.86
Wind dir. red.		0.65		0.62									0.62		0.62		0.65
Total reduction		0.20		0.24									0.24		0.19		0.17
Total, real		15		88									50		30		71

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	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, Mid Western part
15 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
1000 meter max shadow distance applied along with default 3° inclination
Sunshine probabilities applied (pdf plots)
Directional run-hours applied from tab file (tower 1)
.

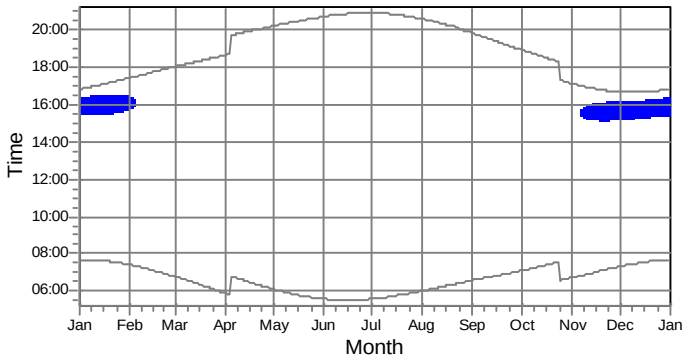
Printed/Page
03/05/06 22:47 / 11
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7660 Whitegate Avenue
US-RIVERSIDE, CA 92506

Calculated:
03/02/06 01:13/2.4.0.67

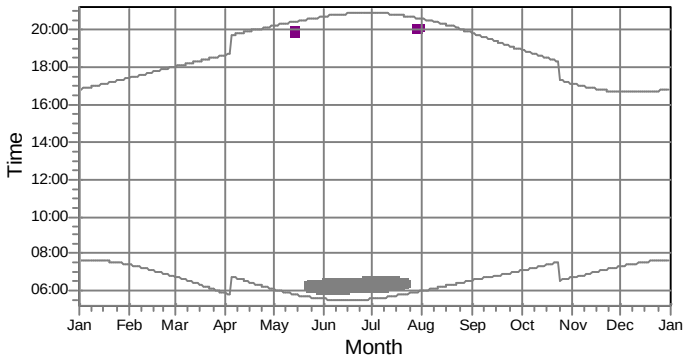
SHADOW - Calendar, graphical

Calculation: Mid Eastern part

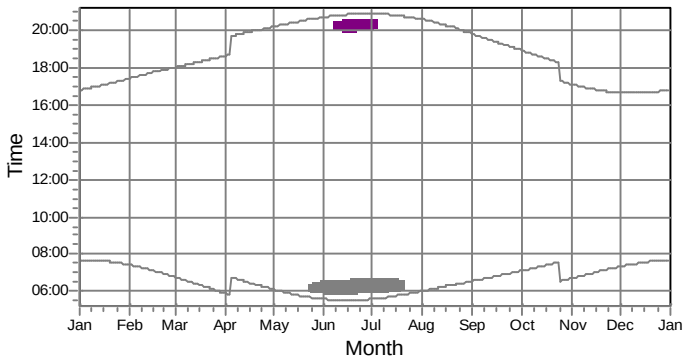
720: 720



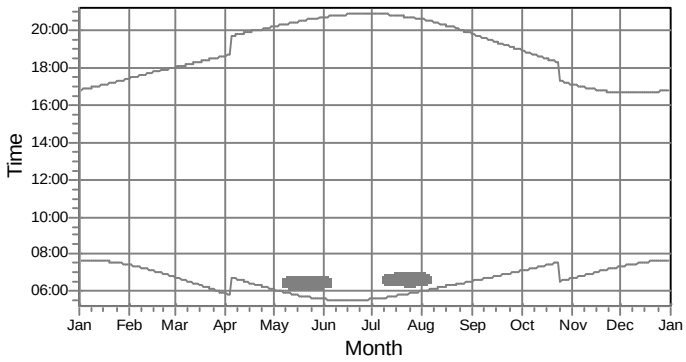
817: 817



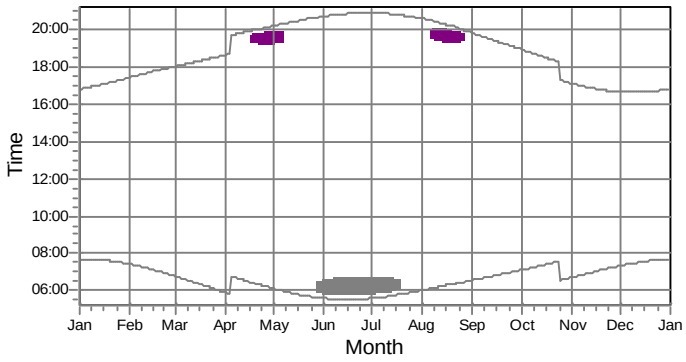
818: 818



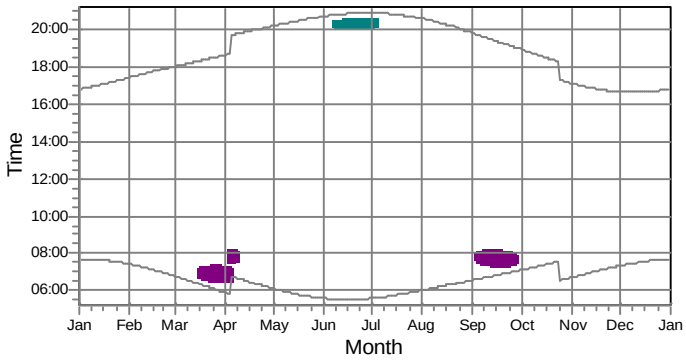
819: 819



821: 821



823: 823



WTGs

33 22 25 23

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, Mid Western part
15 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
1000 meter max shadow distance applied along with default 3° inclination
Sunshine probabilities applied (pdf plots)
Directional run-hours applied from tab file (tower 1)
.

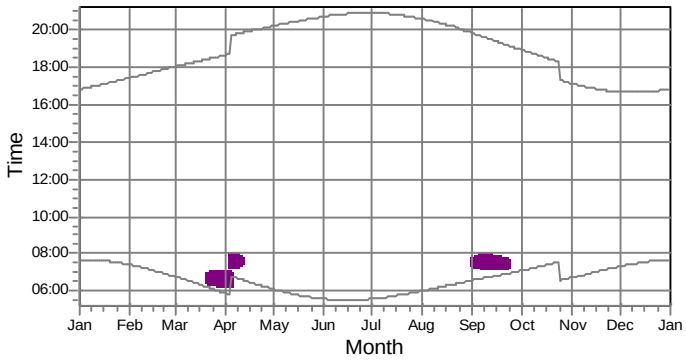
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03/05/06 22:47 / 12
Licensed user:
Wind Engineers, Inc.
7660 Whitegate Avenue
US-RIVERSIDE, CA 92506

Calculated:
03/02/06 01:13/2.4.0.67

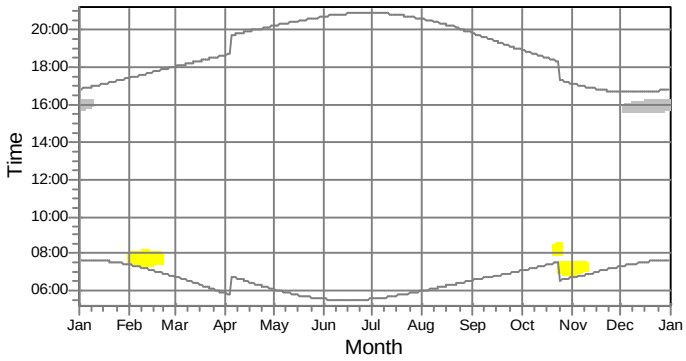
SHADOW - Calendar, graphical

Calculation: Mid Eastern part

824: 824



840: 840



WTGs

32 23 30

Project:
060226 Cohocton

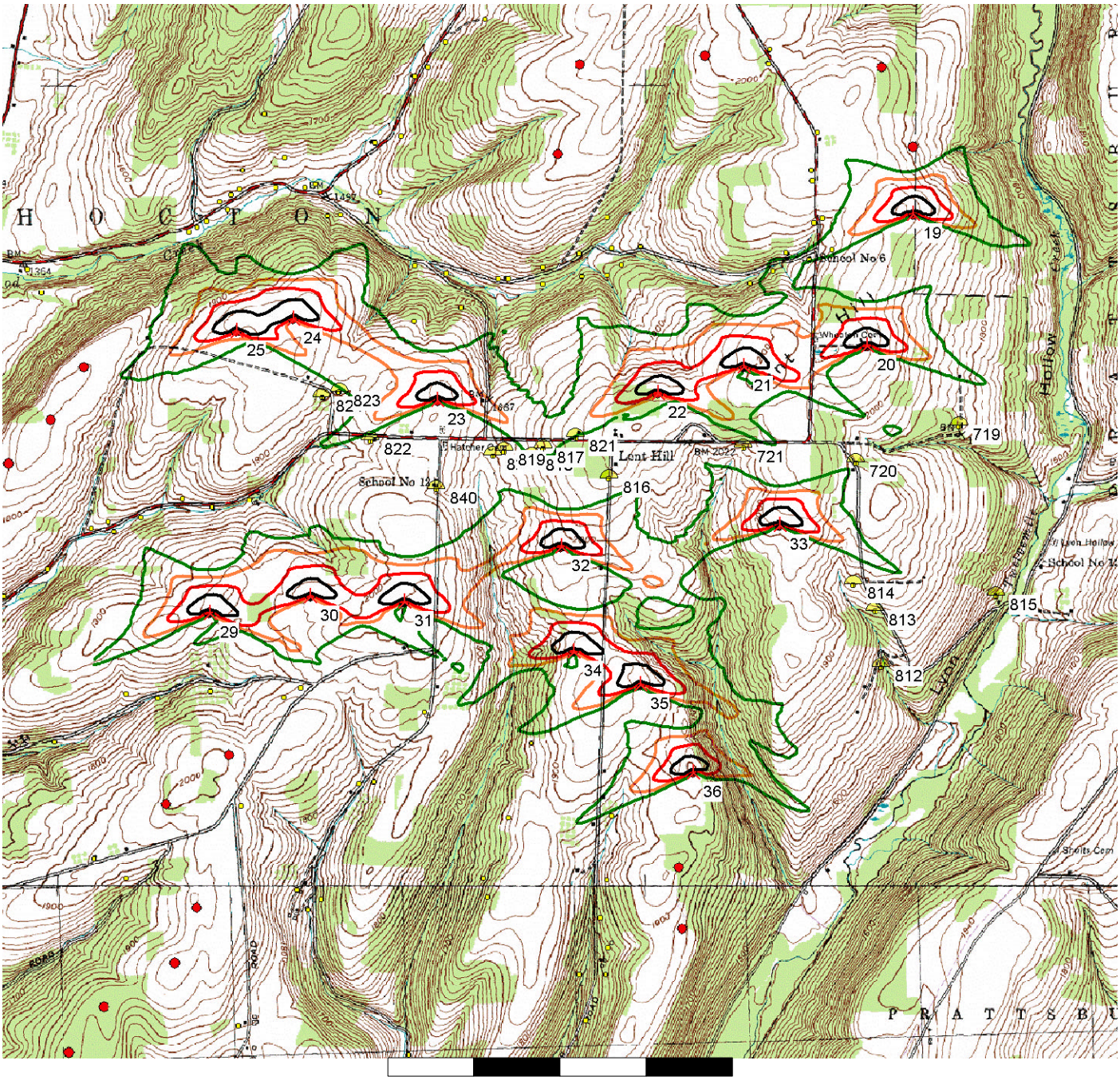
Description:
Cohocton Project
Shadow-Flicker, Mid Western part
15 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
1000 meter max shadow distance applied along with default 3° inclination
Sunshine probabilities applied (pdf plots)
Directional run-hours applied from tab file (tower 1)
.

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03/05/06 22:47 / 13
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Calculated:
03/02/06 01:13/2.4.0.67

SHADOW - 060226 Cohocton USGS z13 w, 50k, 30x30

Calculation: Mid Eastern part **File:** 060226 Cohocton USGS z13 w, 50k, 30x30.bmi



Map: 060226 Cohocton USGS z13 w, 50k, 30x30 , Print scale 1:35,000, Map center UTM NAD27 Zone: 18 East: 301,067 North: 4,710,054

New WTG Shadow receptor

Isolines showing shadow in Shadow hours|per year. Real value calculation.

10 25 50 100

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, Mid / Northeast part
20 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
1000 meter max shadow distance applied along with default 3° inclination
Sunshine probabilities applied (pdf plots)
Directional run-hours applied from tab file (tower 1)
.

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03/06/06 12:26 / 1
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US-RIVERSIDE, CA 92506

Calculated:
03/01/06 21:02/2.4.0.67

SHADOW - Main Result

Calculation: Mid / Northeast part

Assumptions for shadow calculations

Maximum distance for influence	1,000	m
Minimum sun height over horizon for influence	3	°
Day step for calculation	1	days
Time step for calculation	2	minutes

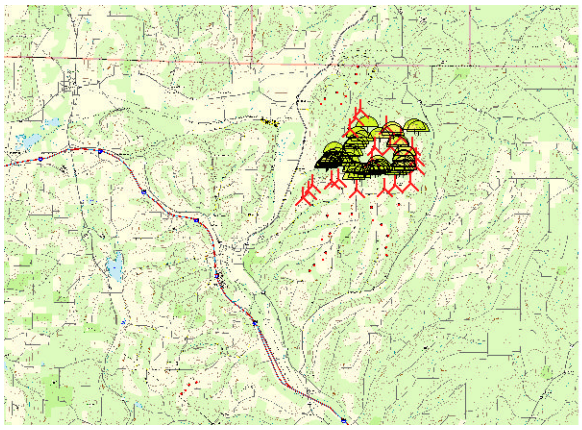
Sun shine probabilities (part of time from sun rise to sun set with sun shine)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.35	0.45	0.45	0.55	0.55	0.55	0.65	0.55	0.55	0.45	0.35	0.30

Operational hours are calculated from WTGs in calculation and wind distribution:
'Cohocton-1 80m LT projection'

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
475	585	238	199	220	474	1,184	813	840	1,246	803	479	7,555



Scale 1:350,000

New WTG Shadow receptor

WTGs

	UTM NAD27 Zone: 18					WTG type						
	East	North	Z [m]	Row data/Description	Valid	Manufact.	Type	Power [kW]	Diam. [m]	Height [m]	RPM [RPM]
09	300,562	4,714,399	615	09	Yes	GAMESA	G87/2000	2,000	87.0	78.0	16.7
10	300,358	4,714,050	606	10	Yes	GAMESA	G87/2000	2,000	87.0	78.0	16.7
11	300,047	4,713,553	598	11	Yes	GAMESA	G87/2000	2,000	87.0	78.0	16.7
12	301,753	4,713,638	600	12	Yes	GAMESA	G87/2000	2,000	87.0	78.0	16.7
13	301,182	4,712,667	620	13	Yes	GAMESA	G87/2000	2,000	87.0	78.0	16.7
14	301,043	4,712,151	600	14	Yes	GAMESA	G87/2000	2,000	87.0	78.0	16.7
15	302,394	4,713,102	600	15	Yes	GAMESA	G87/2000	2,000	87.0	78.0	16.7
16	301,911	4,712,694	600	16	Yes	GAMESA	G87/2000	2,000	87.0	78.0	16.7
17	302,937	4,712,598	620	17	Yes	GAMESA	G87/2000	2,000	87.0	78.0	16.7
18	303,106	4,712,133	603	18	Yes	GAMESA	G87/2000	2,000	87.0	78.0	16.7
19	303,097	4,711,744	620	19	Yes	GAMESA	G87/2000	2,000	87.0	78.0	16.7
20	302,805	4,710,989	625	20	Yes	GAMESA	G87/2000	2,000	87.0	78.0	16.7
21	302,087	4,710,891	638	21	Yes	GAMESA	G87/2000	2,000	87.0	78.0	16.7
22	301,582	4,710,750	628	22	Yes	GAMESA	G87/2000	2,000	87.0	78.0	16.7
23	300,296	4,710,749	599	23	Yes	GAMESA	G87/2000	2,000	87.0	78.0	16.7
24	299,474	4,711,242	580	24	Yes	GAMESA	G87/2000	2,000	87.0	78.0	16.7
25	299,142	4,711,180	580	25	Yes	GAMESA	G87/2000	2,000	87.0	78.0	16.7
26	298,246	4,711,001	560	26	Yes	GAMESA	G87/2000	2,000	87.0	78.0	16.7
27	298,043	4,710,702	560	27	Yes	GAMESA	G87/2000	2,000	87.0	78.0	16.7
28	297,794	4,710,451	560	28	Yes	GAMESA	G87/2000	2,000	87.0	78.0	16.7

Shadow receptor-Input

		UTM NAD27 Zone: 18							
No.	Name	East	North	Z [m]	Width [m]	Height [m]	Height a.g.l. [m]	Degrees from south cw [°]	Slope of window [°]
686	686	300,886	4,713,608	531	1.0	1.0	1.0	0.0	0.0
687	687	303,035	4,713,413	512	1.0	1.0	1.0	0.0	0.0
688	688	303,248	4,713,331	484	1.0	1.0	1.0	0.0	0.0
689	689	300,419	4,713,154	519	1.0	1.0	1.0	0.0	0.0
690	690	300,638	4,712,943	534	1.0	1.0	1.0	0.0	0.0
691	691	301,431	4,713,053	620	1.0	1.0	1.0	0.0	0.0
692	692	300,404	4,712,821	509	1.0	1.0	1.0	0.0	0.0
693	693	300,295	4,712,676	500	1.0	1.0	1.0	0.0	0.0
694	694	300,217	4,712,626	487	1.0	1.0	1.0	0.0	0.0
695	695	300,126	4,712,285	490	1.0	1.0	1.0	0.0	0.0

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Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, Mid / Northeast part
20 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
1000 meter max shadow distance applied along with default 3° inclination
Sunshine probabilities applied (pdf plots)
Directional run-hours applied from tab file (tower 1)
.

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03/05/06 23:23 / 2
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7660 Whitegate Avenue
US-RIVERSIDE, CA 92506

Calculated:
03/01/06 21:02/2.4.0.67

SHADOW - Main Result

Calculation: Mid / Northeast part

...continued from previous page

UTM NAD27 Zone: 18

No.	Name	East	North	Z	Width	Height	Height a.g.l.	Degrees from south cw	Slope of window
				[m]	[m]	[m]	[m]	[°]	[°]
696	696	299,976	4,712,246	471	1.0	1.0	1.0	0.0	0.0
697	697	299,997	4,711,964	479	1.0	1.0	1.0	0.0	0.0
698	698	299,763	4,711,837	475	1.0	1.0	1.0	0.0	0.0
699	699	299,687	4,711,835	484	1.0	1.0	1.0	0.0	0.0
700	700	299,620	4,712,018	460	1.0	1.0	1.0	0.0	0.0
701	701	299,557	4,712,001	460	1.0	1.0	1.0	0.0	0.0
702	702	299,390	4,712,006	460	1.0	1.0	1.0	0.0	0.0
703	703	299,447	4,712,176	472	1.0	1.0	1.0	0.0	0.0
704	704	299,340	4,712,436	537	1.0	1.0	1.0	0.0	0.0
705	705	302,002	4,713,299	614	1.0	1.0	1.0	0.0	0.0
706	706	302,042	4,713,193	612	1.0	1.0	1.0	0.0	0.0
707	707	302,288	4,712,724	600	1.0	1.0	1.0	0.0	0.0
708	708	302,276	4,712,638	600	1.0	1.0	1.0	0.0	0.0
709	709	302,551	4,712,235	620	1.0	1.0	1.0	0.0	0.0
710	710	302,507	4,712,016	620	1.0	1.0	1.0	0.0	0.0
711	711	302,510	4,711,959	620	1.0	1.0	1.0	0.0	0.0
712	712	302,566	4,711,738	620	1.0	1.0	1.0	0.0	0.0
713	713	302,517	4,711,716	612	1.0	1.0	1.0	0.0	0.0
714	714	302,618	4,711,555	620	1.0	1.0	1.0	0.0	0.0
715	715	302,483	4,711,502	601	1.0	1.0	1.0	0.0	0.0
716	716	302,350	4,711,544	587	1.0	1.0	1.0	0.0	0.0
717	717	302,270	4,711,441	580	1.0	1.0	1.0	0.0	0.0
718	718	302,134	4,711,374	579	1.0	1.0	1.0	0.0	0.0
722	722	301,313	4,711,779	544	1.0	1.0	1.0	0.0	0.0
723	723	301,144	4,711,574	520	1.0	1.0	1.0	0.0	0.0
724	724	301,337	4,711,601	520	1.0	1.0	1.0	0.0	0.0
725	725	301,504	4,711,606	528	1.0	1.0	1.0	0.0	0.0
726	726	301,391	4,711,500	525	1.0	1.0	1.0	0.0	0.0
727	727	301,303	4,711,445	521	1.0	1.0	1.0	0.0	0.0
728	728	301,160	4,711,444	517	1.0	1.0	1.0	0.0	0.0
729	729	300,932	4,711,499	518	1.0	1.0	1.0	0.0	0.0
730	730	300,929	4,711,403	500	1.0	1.0	1.0	0.0	0.0
731	731	300,729	4,711,438	503	1.0	1.0	1.0	0.0	0.0
732	732	300,667	4,711,439	497	1.0	1.0	1.0	0.0	0.0
733	733	300,371	4,711,486	480	1.0	1.0	1.0	0.0	0.0
734	734	300,186	4,711,530	483	1.0	1.0	1.0	0.0	0.0
735	735	300,451	4,711,279	537	1.0	1.0	1.0	0.0	0.0
736	736	300,172	4,711,210	564	1.0	1.0	1.0	0.0	0.0
737	737	299,202	4,712,111	473	1.0	1.0	1.0	0.0	0.0
738	738	299,180	4,712,002	456	1.0	1.0	1.0	0.0	0.0
739	739	299,131	4,711,975	453	1.0	1.0	1.0	0.0	0.0
740	740	299,109	4,711,890	442	1.0	1.0	1.0	0.0	0.0
741	741	299,063	4,711,934	450	1.0	1.0	1.0	0.0	0.0
742	742	298,983	4,711,826	440	1.0	1.0	1.0	0.0	0.0
743	743	298,929	4,711,790	440	1.0	1.0	1.0	0.0	0.0
744	744	298,881	4,711,763	440	1.0	1.0	1.0	0.0	0.0

Calculation Results

		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]
686	686	18:50	62	0:24	5:14
687	687	13:46	38	0:28	3:21
688	688	8:04	29	0:22	1:54
689	689	9:44	34	0:24	2:15
690	690	17:22	42	0:32	4:12
691	691	41:20	109	0:36	8:01

Continued on next page...

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, Mid / Northeast part
20 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
1000 meter max shadow distance applied along with default 3° inclination
Sunshine probabilities applied (pdf plots)
Directional run-hours applied from tab file (tower 1)
.

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7660 Whitegate Avenue
US-RIVERSIDE, CA 92506

Calculated:
03/01/06 21:02/2.4.0.67

SHADOW - Main Result

Calculation: Mid / Northeast part

...continued from previous page

No.	Name	Shadow, worst case: Shadow hours per year [h/year]	Shadow, worst case: Shadow days per year [days/year]	Shadow, worst case: Max shadow hours per day [h/day]	Shadow, expected values: Shadow hours per year [h/year]
692	692	29:42	89	0:26	6:02
693	693	18:54	67	0:24	4:44
694	694	15:56	58	0:22	4:13
695	695	7:30	28	0:22	1:59
696	696	0:00	0	0:00	0:00
697	697	0:00	0	0:00	0:00
698	698	15:26	48	0:24	2:43
699	699	5:00	24	0:16	0:51
700	700	0:00	0	0:00	0:00
701	701	0:00	0	0:00	0:00
702	702	0:00	0	0:00	0:00
703	703	0:00	0	0:00	0:00
704	704	0:00	0	0:00	0:00
705	705	40:10	68	0:48	9:20
706	706	49:32	71	0:54	12:04
707	707	60:30	77	1:14	16:12
708	708	84:34	156	0:54	23:23
709	709	42:26	101	0:36	8:48
710	710	38:16	96	0:34	10:00
711	711	41:58	105	0:34	11:14
712	712	24:46	52	0:38	7:05
713	713	21:14	47	0:34	6:08
714	714	50:28	82	0:42	15:43
715	715	36:02	75	0:34	11:12
716	716	23:52	75	0:28	6:15
717	717	52:28	154	0:30	13:01
718	718	13:24	39	0:28	3:06
722	722	0:00	0	0:00	0:00
723	723	0:00	0	0:00	0:00
724	724	0:00	0	0:00	0:00
725	725	12:26	42	0:22	2:07
726	726	13:08	44	0:24	2:31
727	727	9:10	34	0:22	2:00
728	728	0:00	0	0:00	0:00
729	729	12:28	43	0:22	2:07
730	730	31:44	78	0:36	5:42
731	731	0:00	0	0:00	0:00
732	732	0:00	0	0:00	0:00
733	733	7:32	27	0:22	1:44
734	734	11:24	34	0:26	2:43
735	735	7:02	26	0:22	1:50
736	736	13:52	37	0:30	3:55
737	737	0:00	0	0:00	0:00
738	738	0:00	0	0:00	0:00
739	739	0:00	0	0:00	0:00
740	740	14:46	42	0:26	2:33
741	741	5:14	24	0:16	0:52
742	742	22:54	70	0:28	4:17
743	743	25:14	77	0:28	4:42
744	744	36:34	92	0:32	6:56

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, Mid / Northeast part
20 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
1000 meter max shadow distance applied along with default 3° inclination
Sunshine probabilities applied (pdf plots)
Directional run-hours applied from tab file (tower 1)
.

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Calculated:
03/01/06 21:02/2.4.0.67

SHADOW - Calendar

Calculation: Mid / Northeast part **Shadow receptor:** 686 - 686

Assumptions for shadow calculations

Maximum distance for influence	1,000 m
Minimum sun height over horizon for influence	3 °
Day step for calculation	1 days
Time step for calculation	2 minutes

Sun shine probabilities (part of time from sun rise to sun set with sun shine)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.35	0.45	0.45	0.55	0.55	0.55	0.65	0.55	0.55	0.45	0.35	0.30

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
475	585	238	199	220	474	1,184	813	840	1,246	803	479	7,555

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:40	07:25	06:47	05:54 17:21 (16)	06:06	05:36	05:36	06:01	06:34 07:17 (13)	07:07	06:43	07:20
	16:47	17:23	17:59	18:35 18 17:39 (16)	20:08	20:40	20:52	20:32	19:46 22 07:39 (13)	18:53	17:04	16:38
2	07:40	07:24	06:45	05:52 17:24 (16)	06:05	05:35	05:37	06:02	06:35 07:18 (13)	07:08	06:44	07:21
	16:48	17:24	18:00	18:37 14 17:38 (16)	20:09	20:41	20:52	20:31	19:44 20 07:38 (13)	18:51	17:03	16:38
3	07:40	07:23	06:44	05:50 17:26 (16)	06:03	05:35	05:37	06:03	06:36 07:17 (13)	07:09	06:46	07:22
	16:49	17:26	18:02	18:38 10 17:36 (16)	20:11	20:41	20:51	20:30	19:42 20 07:37 (13)	18:49	17:02	16:38
4	07:40	07:22	06:42	05:49	06:02	05:34	05:38	06:05	06:38 07:18 (13)	07:10	06:47	07:23
	16:50	17:27	18:03	18:39	20:12	20:42	20:51	20:29	19:41 18 07:36 (13)	18:48	17:00	16:37
5	07:40	07:21	06:41	06:47	06:01	05:34	05:38	06:06	06:39 07:19 (13)	07:11	06:48	07:24
	16:51	17:28	18:04	19:40	20:13	20:43	20:51	20:28	19:39 14 07:33 (13)	18:46	16:59	16:37
6	07:40	07:20	06:39	06:45 07:27 (13)	05:59	05:34	05:39	06:07	06:40 07:22 (13)	07:12	06:49	07:25
	16:52	17:30	18:05	19:41 8 07:35 (13)	20:14	20:44	20:51	20:26	19:37 8 07:30 (13)	18:44	16:58	16:37
7	07:40	07:18	06:37	06:44 07:23 (13)	05:58	05:33	05:40	06:08	06:41	07:13	06:51	07:26
	16:53	17:31	18:06	19:42 14 07:37 (13)	20:15	20:44	20:51	20:25	19:35	18:43	16:57	16:37
8	07:40	07:17	06:36	06:42 07:21 (13)	05:57	05:33	05:40	06:09	06:42	07:14	06:52	07:27
	16:54	17:32	18:08	19:43 18 07:39 (13)	20:16	20:45	20:50	20:24	19:34	18:41	16:56	16:37
9	07:40	07:16	06:34	06:40 07:20 (13)	05:56	05:33	05:41	06:10	06:43 18:20 (16)	07:15	06:53	07:28
	16:55	17:34	18:09	19:45 20 07:40 (13)	20:17	20:46	20:50	20:22	19:32 10 18:30 (16)	18:39	16:54	16:37
10	07:40	07:15	06:32	06:39 07:20 (13)	05:55	05:33	05:42	06:11	06:44 18:17 (16)	07:17	06:54	07:29
	16:56	17:35	18:10	19:46 20 07:40 (13)	20:18	20:46	20:49	20:21	19:30 14 18:31 (16)	18:37	16:53	16:37
11	07:39	07:13	06:30	06:37 07:18 (13)	05:53	05:32	05:42	06:12	06:45 18:14 (16)	07:18	06:56	07:29
	16:57	17:36	18:11	19:47 22 07:40 (13)	20:19	20:47	20:49	20:20	19:28 18 18:32 (16)	18:36	16:52	16:37
12	07:39	07:12	06:29	06:35 07:19 (13)	05:52	05:32	05:43	06:13	06:46 18:13 (16)	07:19	06:57	07:30
	16:58	17:38	18:12	19:48 22 07:41 (13)	20:20	20:47	20:49	20:18	19:27 20 18:33 (16)	18:34	16:51	16:37
13	07:39	07:11	06:27	06:34 07:17 (13)	05:51	05:32	05:44	06:14	06:47 18:12 (16)	07:20	06:58	07:31
	16:59	17:39	18:14	19:49 24 07:41 (13)	20:22	20:48	20:48	20:17	19:25 22 18:34 (16)	18:33	16:50	16:37
14	07:38	07:09	06:25	06:32 07:17 (13)	05:50	05:32	05:45	06:15	06:48 18:11 (16)	07:21	06:59	07:32
	17:00	17:40	18:15	19:50 22 07:39 (13)	20:23	20:48	20:47	20:16	19:23 22 18:33 (16)	18:31	16:49	16:37
15	07:38	07:08	06:24	06:30 07:18 (13)	05:49	05:32	05:45	06:16	06:49 18:10 (16)	07:22	07:01	07:33
	17:02	17:41	18:16	19:51 22 07:40 (13)	20:24	20:49	20:47	20:14	19:21 24 18:34 (16)	18:29	16:48	16:38
16	07:37	07:07	06:22	06:29 07:16 (13)	05:48	05:32	05:46	06:17	06:50 18:09 (16)	07:24	07:02	07:33
	17:03	17:43	18:17	19:52 22 07:38 (13)	20:25	20:49	20:46	20:13	19:20 24 18:33 (16)	18:28	16:48	16:38
17	07:37	07:05	06:20	06:27 07:17 (13)	05:47	05:32	05:47	06:18	06:51 18:10 (16)	07:25	07:03	07:34
	17:04	17:44	18:18	19:54 20 07:37 (13)	20:26	20:50	20:46	20:11	19:18 22 18:32 (16)	18:26	16:47	16:38
18	07:36	07:04	06:18	06:25 07:19 (13)	05:46	05:32	05:48	06:19	06:52 18:09 (16)	07:26	07:04	07:35
	17:05	17:45	18:19	19:55 18 07:37 (13)	20:27	20:50	20:45	20:10	19:16 22 18:31 (16)	18:24	16:46	16:38
19	07:36	07:02	06:17	06:24 07:19 (13)	05:45	05:32	05:49	06:20	06:53 18:10 (16)	07:27	07:06	07:35
	17:06	17:47	18:21	19:56 16 07:35 (13)	20:28	20:50	20:44	20:08	19:14 20 18:30 (16)	18:23	16:45	16:39
20	07:35	07:01	06:15 17:30 (16)	06:22 07:20 (13)	05:44	05:32	05:50	06:21	06:55 18:09 (16)	07:28	07:07	07:36
	17:08	17:48	18:22 6 17:36 (16)	19:57 12 07:32 (13)	20:29	20:51	20:44	20:07	19:12 20 18:29 (16)	18:21	16:44	16:39
21	07:34	06:59	06:13 17:27 (16)	06:21 07:24 (13)	05:43	05:33	05:51	06:23	06:56 18:10 (16)	07:29	07:08	07:36
	17:09	17:49	18:23 14 17:41 (16)	19:58 6 07:30 (13)	20:30	20:51	20:43	20:05	19:11 18 18:28 (16)	18:20	16:44	16:40
22	07:34	06:58	06:11 17:25 (16)	06:19	05:42	05:33	05:52	06:24 07:27 (13)	06:57 18:11 (16)	07:31	07:09	07:37
	17:10	17:50	18:24 18 17:43 (16)	19:59	20:31	20:51	20:42	20:04 8 07:35 (13)	19:09 14 18:25 (16)	18:18	16:43	16:40
23	07:33	06:56	06:10 17:23 (16)	06:18	05:42	05:33	05:53	06:25	07:24 (13) 06:58	18:14 (16)	07:32	07:10	07:37
	17:11	17:52	18:25 20 17:43 (16)	20:00	20:32	20:51	20:41	20:02 12 07:36 (13)	19:07 8 18:22 (16)	18:17	16:42	16:41
24	07:32	06:55	06:08 17:23 (16)	06:16	05:41	05:33	05:53	06:26	07:23 (13) 06:59	07:33	07:12	07:38
	17:13	17:53	18:26 20 17:43 (16)	20:00	20:33	20:52	20:40	20:01 16 07:39 (13)	19:05	18:15	16:42	16:41
25	07:32	06:53	06:06 17:21 (16)	06:15	05:40	05:34	05:54	06:27 07:20 (13)	07:00	06:34	07:13	07:38
	17:14	17:54	18:27 22 17:43 (16)	20:02	20:34	20:52	20:39	19:57 20 07:40 (13)	19:04	17:14	16:41	16:42
26	07:31	06:52	06:04 17:22 (16)	06:13	05:39	05:34	05:55	06:28 07:19 (13)	07:01	06:36	07:14	07:39
	17:15	17:55	18:29 22 17:44 (16)	20:03	20:35	20:52	20:38	19:56 20 07:39 (13)	19:02	17:12	16:40	16:42
27	07:30	06:50	06:03 17:20 (16)	06:12	05:39	05:34	05:56	06:29 07:18 (13)	07:02	06:37	07:15	07:39
	17:17	17:57	18:30 24 17:44 (16)	20:04	20:36	20:52	20:37	19:54 22 07:40 (13)	19:00	17:11	16:40	16:43
28	07:29	06:49	06:01 17:20 (16)	06:10	05:38	05:35	05:57	06:30 07:19 (13)	07:03	06:38	07:16	07:39
	17:18	17:58	18:31 24 17:44 (16)	20:05	20:36	20:52	20:36	19:52 22 07:41 (13)	18:58	17:10	16:39	16:44
29	07:28		05:59 17:20 (16)	06:09	05:37	05:35	05:58	06:31 07:18 (13)	07:04	06:39	07:17	07:40
	17:19		18:32 22 17:42 (16)	20:06	20:37	20:52	20:35	19:51 22 07:40 (13)	18:56	17:08	16:39	16:45
30	07:27		05:57 17:21 (16)	06:07	05:37	05:36	05:59	06:32 07:17 (13)	07:05	06:41	07:19	07:40
	17:20		18:33 22 17:43 (16)	20:07	20:38	20:52	20:34	19:49 24 07:41 (13)	18:55	17:07	16:39	16:45
31	07:26		05:56 17:21 (16)		05:36		06:00	06:33 07:18 (13)		06:42		07:40
	17:22		18:34 20 17:41 (16)		20:39		20:33	19:47 22 07:40 (13)		17:05		16:46
Potential sun hours	293	295	370	209	-292	-263	-280	-145	375	343	294	283
Total, worst case			234	328				188	380			
Sun reduction			0.45	0.55				0.55	0.55			
Oper. time red.			0.86	0.86				0.86	0.86			
Wind dir. red.			0.61	0.61				0.61	0.61			
Total reduction			0.24	0.29				0.29	0.29			
Total, real			55	95				54	110			

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	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, Mid / Northeast part
20 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
1000 meter max shadow distance applied along with default 3° inclination
Sunshine probabilities applied (pdf plots)
Directional run-hours applied from tab file (tower 1)
.

Printed/Page
03/05/06 23:23 / 5
Licensed user:
Wind Engineers, Inc.
7660 Whitegate Avenue
US-RIVERSIDE, CA 92506

Calculated:
03/01/06 21:02/2.4.0.67

SHADOW - Calendar

Calculation: Mid / Northeast part **Shadow receptor:** 687 - 687

Assumptions for shadow calculations

Maximum distance for influence	1,000	m
Minimum sun height over horizon for influence	3	°
Day step for calculation	1	days
Time step for calculation	2	minutes

Sun shine probabilities (part of time from sun rise to sun set with sun shine)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.35	0.45	0.45	0.55	0.55	0.55	0.65	0.55	0.55	0.45	0.35	0.30

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
475	585	238	199	220	474	1,184	813	840	1,246	803	479	7,555

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:40	07:25	06:47	16:21 (12)	05:54	06:06	05:36	05:36	06:01	06:34	07:06	06:43	07:19
	16:47	17:23	17:59 16	16:37 (12)	18:35	20:08	20:40	20:52	20:32	19:46	18:53	17:04	16:38
2	07:40	07:24	06:45	16:23 (12)	05:52	06:05	05:35	05:36	06:02	06:35	07:08	06:44	07:21
	16:48	17:24	18:00 10	16:33 (12)	18:36	20:09	20:40	20:52	20:31	19:44	18:51	17:03	16:38
3	07:40	07:23	06:44		05:50	06:03	05:35	05:37	06:03	06:36	07:09	06:45	07:22
	16:49	17:26	18:01		18:38	20:10	20:41	20:51	20:30	19:42	18:49	17:01	16:38
4	07:40	07:22	06:42		05:49	06:02	05:34	05:38	06:04	06:37	07:10	06:47	07:23
	16:50	17:27	18:03		18:39	20:12	20:42	20:51	20:29	19:40	18:48	17:00	16:37
5	07:40	07:21	06:40		06:47	06:01	05:34	05:38	06:05	06:38	07:11	06:48	07:24
	16:51	17:28	18:04		19:40	20:13	20:43	20:51	20:27	19:39	18:46	16:59	16:37
6	07:40	07:19	06:39		06:45	05:59	05:33	05:39	06:06	06:40	07:12	06:49	07:25
	16:52	17:30	18:05		19:41	20:14	20:43	20:51	20:26	19:37	18:44	16:58	16:37
7	07:40	07:18	06:37		06:44	05:58	05:33	05:39	06:08	06:41	07:13	06:50	07:26
	16:53	17:31	18:06		19:42	20:15	20:44	20:50	20:25	19:35	18:42	16:57	16:37
8	07:40	07:17	06:35		06:42	05:57	05:33	05:40	06:09	06:42	07:14	06:52	07:27
	16:54	17:32	18:07		19:43	20:16	20:45	20:50	20:24	19:34	18:41	16:56	16:37
9	07:40	07:16	06:34		06:40	05:56	05:33	05:41	06:10	06:43	07:15	06:53	07:27
	16:55	17:33	18:09		19:44	20:17	20:45	20:50	20:22	19:32	18:39	16:54	16:37
10	07:39	07:15	06:32		06:38	05:54	05:32	05:42	06:11	06:44	07:17	06:54	07:28
	16:56	17:35	18:10		19:46	20:18	20:46	20:49	20:21	19:30	18:37	16:53	16:37
11	07:39	07:13	06:30		06:37	05:53	05:32	05:42	06:12	06:45	07:18	17:00 (12)	06:55	07:29
	16:57	17:36	18:11		19:47	20:19	20:47	20:49	20:20	19:28	18:36 4	17:04 (12)	16:52	16:37
12	07:39	07:12	16:26 (12)	06:29	06:35	05:52	05:32	05:43	06:13	06:46	07:19	16:55 (12)	06:57	07:30
	16:58	17:37 4	16:30 (12)	18:12	19:48	20:20	20:47	20:48	20:18	19:27	18:34 14	17:09 (12)	16:51	16:37
13	07:39	07:11	16:23 (12)	06:27	06:33	05:51	05:32	05:44	06:14	06:47	07:20	16:53 (12)	06:58	07:31
	16:59	17:39 12	16:35 (12)	18:13	19:49	20:21	20:48	20:48	20:17	19:25	18:32 18	17:11 (12)	16:50	16:37
14	07:38	07:09	16:20 (12)	06:25	06:32	05:50	05:32	05:45	06:15	06:48	07:21	16:52 (12)	06:59	07:32
	17:00	17:40 18	16:38 (12)	18:15	19:50	20:23	20:48	20:47	20:15	19:23	18:31 20	17:12 (12)	16:49	16:37
15	07:38	07:08	16:18 (12)	06:23	06:30	05:49	05:32	05:45	06:16	06:49	07:22	16:49 (12)	07:01	07:32
	17:02	17:41 20	16:38 (12)	18:16	19:51	20:24	20:49	20:47	20:14	19:21	18:29 24	17:13 (12)	16:48	16:37
16	07:37	07:07	16:17 (12)	06:22	06:29	05:48	05:32	05:46	06:17	06:50	07:23	16:48 (12)	07:02	07:33
	17:03	17:43 24	16:41 (12)	18:17	19:52	20:25	20:49	20:46	20:13	19:19	18:28 24	17:12 (12)	16:47	16:38
17	07:37	07:05	16:17 (12)	06:20	06:27	05:47	05:32	05:47	06:18	06:51	07:25	16:47 (12)	07:03	07:34
	17:04	17:44 24	16:41 (12)	18:18	19:54	20:26	20:50	20:46	20:11	19:18	18:26 26	17:13 (12)	16:47	16:38
18	07:36	07:04	16:16 (12)	06:18	06:25	05:46	05:32	05:48	06:19	06:52	07:26	16:47 (12)	07:04	07:35
	17:05	17:45 26	16:42 (12)	18:19	19:55	20:27	20:50	20:45	20:10	19:16	18:24 26	17:13 (12)	16:46	16:38
19	07:36	07:02	16:16 (12)	06:17	06:24	05:45	05:32	05:49	06:20	06:53	07:27	16:46 (12)	07:05	07:35
	17:06	17:46 26	16:42 (12)	18:20	19:56	20:28	20:50	20:44	20:08	19:14	18:23 28	17:14 (12)	16:45	16:39
20	07:35	07:01	16:15 (12)	06:15	06:22	05:44	05:32	05:50	06:21	06:54	07:28	16:45 (12)	07:07	07:36
	17:08	17:48 28	16:43 (12)	18:22	19:57	20:29	20:51	20:43	20:07	19:12	18:21 28	17:13 (12)	16:44	16:39
21	07:34	06:59	16:15 (12)	06:13	06:21	05:43	05:32	05:51	06:22	06:56	07:29	16:46 (12)	07:08	07:36
	17:09	17:49 28	16:43 (12)	18:23	19:58	20:30	20:51	20:43	20:05	19:11	18:20 26	17:12 (12)	16:43	16:40
22	07:34	06:58	16:16 (12)	06:11	06:19	05:42	05:33	05:51	06:24	06:57	07:31	16:46 (12)	07:09	07:37
	17:10	17:50 26	16:42 (12)	18:24	19:59	20:31	20:51	20:42	20:04	19:09	18:18 28	17:14 (12)	16:43	16:40
23	07:33	06:56	16:14 (12)	06:10	06:18	05:42	05:33	05:52	06:25	06:58	07:32	16:45 (12)	07:10	07:37
	17:11	17:52 28	16:42 (12)	18:25	20:00	20:32	20:51	20:41	20:02	19:07	18:17 28	17:13 (12)	16:42	16:41
24	07:32	06:55	16:15 (12)	06:08	06:16	05:41	05:33	05:53	06:26	06:59	07:33	16:46 (12)	07:12	07:38
	17:13	17:53 28	16:43 (12)	18:26	20:00	20:33	20:51	20:40	20:00	19:05	18:15 26	17:12 (12)	16:41	16:41
25	07:31	06:53	16:15 (12)	06:06	06:15	05:40	05:33	05:54	06:27	07:00	06:34	15:48 (12)	07:13	07:38
	17:14	17:54 26	16:41 (12)	18:27	20:01	20:34	20:52	20:39	19:57	19:03	17:14 24	16:12 (12)	16:41	16:42
26	07:31	06:52	16:16 (12)	06:04	06:13	05:39	05:34	05:55	06:28	07:01	06:35	15:47 (12)	07:14	07:39
	17:15	17:55 26	16:42 (12)	18:28	20:03	20:34	20:52	20:38	19:56	19:02	17:12 22	16:09 (12)	16:40	16:42
27	07:30	06:50	16:18 (12)	06:03	06:12	05:39	05:34	05:56	06:29	07:02	06:37	15:48 (12)	07:15	07:39
	17:16	17:57 22	16:40 (12)	18:30	20:04	20:35	20:52	20:37	19:54	19:00	17:11 20	16:08 (12)	16:40	16:43
28	07:29	06:49	16:18 (12)	06:01	06:10	05:38	05:35	05:57	06:30	07:03	06:38	15:49 (12)	07:16	07:39
	17:18	17:58 20	16:38 (12)	18:31	20:05	20:36	20:52	20:36	19:52	18:58	17:09 16	16:05 (12)	16:39	16:44
29	07:28			05:59	06:09	05:37	05:35	05:58	06:31	07:04	06:39	15:53 (12)	07:17	07:39
	17:19			18:32	20:06	20:37	20:52	20:35	19:51	18:56	17:08 12	16:05 (12)	16:39	16:44
30	07:27			05:57	06:07	05:37	05:35	05:59	06:32	07:05	06:40		07:18	07:40
	17:20			18:33	20:07	20:38	20:52	20:34	19:49	18:55	17:07		16:39	16:45
31	07:26			05:56		05:36		06:00	06:33		06:42			07:40
	17:22			18:34		20:39		20:33	19:47		17:05			16:46
Potential sun hours	293	295	370		209	-292	-263	-280	-145	375	343	294	283
Total, worst case		386	26								414		
Sun reduction		0.45	0.45								0.45		
Oper. time red.		0.86	0.86								0.86		
Wind dir. red.		0.63	0.63								0.63		
Total reduction		0.24	0.24								0.24		
Total, real		94	6								101		

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	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, Mid / Northeast part
20 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
1000 meter max shadow distance applied along with default 3° inclination
Sunshine probabilities applied (pdf plots)
Directional run-hours applied from tab file (tower 1)
.

Printed/Page
03/05/06 23:23 / 6
Licensed user:
Wind Engineers, Inc.
7660 Whitegate Avenue
US-RIVERSIDE, CA 92506

Calculated:
03/01/06 21:02/2.4.0.67

SHADOW - Calendar

Calculation: Mid / Northeast part **Shadow receptor:** 688 - 688

Assumptions for shadow calculations

Maximum distance for influence	1,000	m
Minimum sun height over horizon for influence	3	°
Day step for calculation	1	days
Time step for calculation	2	minutes

Sun shine probabilities (part of time from sun rise to sun set with sun shine)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.35	0.45	0.45	0.55	0.55	0.55	0.65	0.55	0.55	0.45	0.35	0.30

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
475	585	238	199	220	474	1,184	813	840	1,246	803	479	7,555

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:40	07:25	06:47	05:54	06:06	05:36	05:36	06:01	06:34	07:06	17:27 (12)	06:43	07:19
	16:47	17:23	17:59	18:35	20:08	20:40	20:52	20:32	19:46	18:53 22	17:49 (12)	17:04	16:38
2	07:40	07:24	06:45	05:52	06:05	05:35	05:36	06:02	06:35	07:08	17:26 (12)	06:44	07:21
	16:48	17:24	18:00	18:36	20:09	20:40	20:52	20:31	19:44	18:51 22	17:48 (12)	17:03	16:38
3	07:40	07:23	06:44	05:50	06:03	05:35	05:37	06:03	06:36	07:09	17:25 (12)	06:45	07:22
	16:49	17:26	18:01	18:38	20:10	20:41	20:51	20:30	19:42	18:49 22	17:47 (12)	17:01	16:38
4	07:40	07:22	06:42	05:49	06:02	05:34	05:38	06:04	06:37	07:10	17:26 (12)	06:47	07:23
	16:50	17:27	18:03	18:39	20:12	20:42	20:51	20:29	19:40	18:48 20	17:46 (12)	17:00	16:37
5	07:40	07:21	06:40 16:56 (12)	06:47	06:01	05:34	05:38	06:05	06:38	07:11	17:25 (12)	06:48	07:24
	16:51	17:28	18:04 8 17:04 (12)	19:40	20:13	20:43	20:51	20:27	19:39	18:46 20	17:45 (12)	16:59	16:37
6	07:40	07:19	06:39 16:52 (12)	06:45	05:59	05:33	05:39	06:06	06:40	07:12	17:26 (12)	06:49	07:25
	16:52	17:30	18:05 14 17:06 (12)	19:41	20:14	20:43	20:51	20:26	19:37	18:44 18	17:44 (12)	16:58	16:37
7	07:40	07:18	06:37 16:51 (12)	06:44	05:58	05:33	05:39	06:08	06:41	07:13	17:27 (12)	06:50	07:26
	16:53	17:31	18:06 18 17:09 (12)	19:42	20:15	20:44	20:50	20:25	19:35	18:42 16	17:43 (12)	16:57	16:37
8	07:40	07:17	06:35 16:49 (12)	06:42	05:57	05:33	05:40	06:09	06:42	07:14	17:29 (12)	06:52	07:27
	16:54	17:32	18:07 20 17:09 (12)	19:43	20:16	20:45	20:50	20:24	19:34	18:41 12	17:41 (12)	16:56	16:37
9	07:40	07:16	06:34 16:49 (12)	06:40	05:56	05:33	05:41	06:10	06:43	07:15	17:32 (12)	06:53	07:27
	16:55	17:33	18:09 20 17:09 (12)	19:44	20:17	20:45	20:50	20:22	19:32	18:39 4	17:36 (12)	16:54	16:37
10	07:39	07:15	06:32 16:48 (12)	06:38	05:54	05:32	05:41	06:11	06:44	07:17		06:54	07:28
	16:56	17:35	18:10 22 17:10 (12)	19:46	20:18	20:46	20:49	20:21	19:30	18:37		16:53	16:37
11	07:39	07:13	06:30 16:48 (12)	06:37	05:53	05:32	05:42	06:12	06:45	07:18		06:55	07:29
	16:57	17:36	18:11 22 17:10 (12)	19:47	20:19	20:47	20:49	20:20	19:28	18:36		16:52	16:37
12	07:39	07:12	06:29 16:48 (12)	06:35	05:52	05:32	05:43	06:13	06:46	07:19		06:57	07:30
	16:58	17:37	18:12 22 17:10 (12)	19:48	20:20	20:47	20:48	20:18	19:27	18:34		16:51	16:37
13	07:39	07:11	06:27 16:48 (12)	06:33	05:51	05:32	05:44	06:14	06:47	07:20		06:58	07:31
	16:59	17:39	18:13 20 17:08 (12)	19:49	20:21	20:48	20:48	20:17	19:25	18:32		16:50	16:37
14	07:38	07:09	06:25 16:49 (12)	06:32	05:50	05:32	05:45	06:15	06:48	07:21		06:59	07:32
	17:00	17:40	18:15 20 17:09 (12)	19:50	20:23	20:48	20:47	20:15	19:23	18:31		16:49	16:37
15	07:38	07:08	06:23 16:49 (12)	06:30	05:49	05:32	05:45	06:16	06:49	07:22		07:00	07:32
	17:02	17:41	18:16 18 17:07 (12)	19:51	20:24	20:49	20:47	20:14	19:21	18:29		16:48	16:37
16	07:37	07:07	06:22 16:49 (12)	06:29	05:48	05:32	05:46	06:17	06:50	07:23		07:02	07:33
	17:03	17:43	18:17 16 17:05 (12)	19:52	20:25	20:49	20:46	20:13	19:19	18:28		16:47	16:38
17	07:37	07:05	06:20 16:51 (12)	06:27	05:47	05:32	05:47	06:18	06:51	07:25		07:03	07:34
	17:04	17:44	18:18 12 17:03 (12)	19:53	20:26	20:49	20:46	20:11	19:18	18:26		16:47	16:38
18	07:36	07:04	06:18 16:54 (12)	06:25	05:46	05:32	05:48	06:19	06:52	07:26		07:04	07:35
	17:05	17:45	18:19 8 17:02 (12)	19:55	20:27	20:50	20:45	20:10	19:16	18:24		16:46	16:38
19	07:36	07:02	06:17	06:24	05:45	05:32	05:49	06:20	06:53	07:27		07:05	07:35
	17:06	17:46	18:20	19:56	20:28	20:50	20:44	20:08	19:14	18:23		16:45	16:39
20	07:35	07:01	06:15	06:22	05:44	05:32	05:50	06:21	06:54	07:28		07:07	07:36
	17:08	17:48	18:22	19:57	20:29	20:51	20:43	20:07	19:12	18:21		16:44	16:39
21	07:34	06:59	06:13	06:21	05:43	05:32	05:51	06:22	06:56	07:29		07:08	07:36
	17:09	17:49	18:23	19:58	20:30	20:51	20:43	20:05	19:11	18:20		16:43	16:40
22	07:34	06:58	06:11	06:19	05:42	05:33	05:51	06:24	06:57	07:31		07:09	07:37
	17:10	17:50	18:24	19:59	20:31	20:51	20:42	20:04	19:09	18:18		16:43	16:40
23	07:33	06:56	06:10	06:18	05:42	05:33	05:52	06:25	06:58	07:32		07:10	07:37
	17:11	17:52	18:25	20:00	20:32	20:51	20:41	20:02	19:07	18:17		16:42	16:41
24	07:32	06:55	06:08	06:16	05:41	05:33	05:53	06:26	06:59	07:33		07:11	07:38
	17:13	17:53	18:26	20:00	20:33	20:51	20:40	20:00	19:05	18:15		16:41	16:41
25	07:31	06:53	06:06	06:15	05:40	05:33	05:54	06:27	07:00 17:38 (12)	06:34		07:13	07:38
	17:14	17:54	18:27	20:01	20:34	20:52	20:39	19:57	19:03 4 17:42 (12)	17:14		16:41	16:42
26	07:31	06:52	06:04	06:13	05:39	05:34	05:55	06:28	07:01 17:33 (12)	06:35		07:14	07:39
	17:15	17:55	18:28	20:03	20:34	20:52	20:38	19:56	19:02 12 17:45 (12)	17:12		16:40	16:42
27	07:30	06:50	06:03	06:12	05:39	05:34	05:56	06:29	07:02 17:32 (12)	06:37		07:15	07:39
	17:16	17:57	18:30	20:04	20:35	20:52	20:37	19:54	19:00 14 17:46 (12)	17:11		16:40	16:43
28	07:29	06:49	06:01	06:10	05:38	05:35	05:57	06:30	07:03 17:29 (12)	06:38		07:16	07:39
	17:18	17:58	18:31	20:05	20:36	20:52	20:36	19:52	18:58 18 17:47 (12)	17:09		16:39	16:44
29	07:28		05:59	06:09	05:37	05:35	05:58	06:31	07:04 17:28 (12)	06:39		07:17	07:39
	17:19		18:32	20:06	20:37	20:52	20:35	19:51	18:56 20 17:48 (12)	17:08		16:39	16:44
30	07:27		05:57	06:07	05:37	05:35	05:59	06:32	07:05 17:28 (12)	06:40		07:18	07:40
	17:20		18:33	20:07	20:38	20:52	20:34	19:49	18:55 20 17:48 (12)	17:07		16:39	16:45
31	07:26		05:56		05:36		06:00	06:33		06:42			07:40
	17:22		18:34		20:39		20:33	19:47		17:05			16:46
Potential sun hours	293	295	370	209	-292	-263	-280	-145	375	343		294	283
Total, worst case			240						88	156			
Sun reduction			0.45						0.55	0.45			
Oper. time red.			0.86						0.86	0.86			
Wind dir. red.			0.59						0.59	0.59			
Total reduction			0.23						0.28	0.23			
Total, real			55						25	36			

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	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, Mid / Northeast part
20 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
1000 meter max shadow distance applied along with default 3° inclination
Sunshine probabilities applied (pdf plots)
Directional run-hours applied from tab file (tower 1)
.

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03/05/06 23:23 / 7
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Wind Engineers, Inc.
7660 Whitegate Avenue
US-RIVERSIDE, CA 92506

Calculated:
03/01/06 21:02/2.4.0.67

SHADOW - Calendar

Calculation: Mid / Northeast part **Shadow receptor:** 689 - 689

Assumptions for shadow calculations

Maximum distance for influence	1,000	m
Minimum sun height over horizon for influence	3	°
Day step for calculation	1	days
Time step for calculation	2	minutes

Sun shine probabilities (part of time from sun rise to sun set with sun shine)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.35	0.45	0.45	0.55	0.55	0.55	0.65	0.55	0.55	0.45	0.35	0.30

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
475	585	238	199	220	474	1,184	813	840	1,246	803	479	7,555

	January	February		March	April	May	June	July	August	September	October		November		December
1	07:40	07:25		06:47	05:54	06:06	05:36	05:36	06:01	06:34	07:07		06:43	07:41 (14)	07:20
	16:47	17:23		17:59	18:35	20:08	20:40	20:52	20:32	19:46	18:53		17:04 22	08:03 (14)	16:38
2	07:40	07:24		06:45	05:52	06:05	05:35	05:37	06:02	06:35	07:08		06:44	07:42 (14)	07:21
	16:48	17:24		18:00	18:37	20:09	20:41	20:52	20:31	19:44	18:51		17:03 20	08:02 (14)	16:38
3	07:40	07:23	08:20 (14)	06:44	05:51	06:03	05:35	05:37	06:04	06:36	07:09		06:46	07:42 (14)	07:22
	16:49	17:26 6	08:26 (14)	18:02	18:38	20:11	20:41	20:51	20:30	19:42	18:49		17:02 22	08:04 (14)	16:38
4	07:40	07:22	08:17 (14)	06:42	05:49	06:02	05:34	05:38	06:05	06:38	07:10		06:47	07:43 (14)	07:23
	16:50	17:27 12	08:29 (14)	18:03	18:39	20:12	20:42	20:51	20:29	19:41	18:48		17:00 20	08:03 (14)	16:38
5	07:40	07:21	08:15 (14)	06:41	06:47	06:01	05:34	05:38	06:06	06:39	07:11		06:48	07:44 (14)	07:24
	16:51	17:28 14	08:29 (14)	18:04	19:40	20:13	20:43	20:51	20:28	19:39	18:46		16:59 16	08:00 (14)	16:37
6	07:40	07:20	08:14 (14)	06:39	06:45	05:59	05:34	05:39	06:07	06:40	07:12		06:49	07:46 (14)	07:25
	16:52	17:30 18	08:32 (14)	18:05	19:41	20:14	20:44	20:51	20:26	19:37	18:44		16:58 14	08:00 (14)	16:37
7	07:40	07:18	08:13 (14)	06:37	06:44	05:58	05:33	05:40	06:08	06:41	07:13		06:51	07:47 (14)	07:26
	16:53	17:31 20	08:33 (14)	18:06	19:42	20:15	20:44	20:51	20:25	19:35	18:43		16:57 12	07:59 (14)	16:37
8	07:40	07:17	08:12 (14)	06:36	06:42	05:57	05:33	05:40	06:09	06:42	07:14		06:52	07:50 (14)	07:27
	16:54	17:32 22	08:34 (14)	18:08	19:43	20:16	20:45	20:50	20:24	19:34	18:41		16:56 4	07:54 (14)	16:37
9	07:40	07:16	08:13 (14)	06:34	06:40	05:56	05:33	05:41	06:10	06:43	07:15		06:53		07:28
	16:55	17:34 22	08:35 (14)	18:09	19:45	20:17	20:46	20:50	20:22	19:32	18:39		16:55		16:37
10	07:40	07:15	08:11 (14)	06:32	06:39	05:55	05:33	05:42	06:11	06:44	07:17		06:54		07:29
	16:56	17:35 22	08:33 (14)	18:10	19:46	20:18	20:46	20:49	20:21	19:30	18:38		16:53		16:37
11	07:39	07:13	08:12 (14)	06:30	06:37	05:53	05:32	05:42	06:12	06:45	07:18		06:56		07:29
	16:57	17:36 22	08:34 (14)	18:11	19:47	20:19	20:47	20:49	20:20	19:28	18:36		16:52		16:37
12	07:39	07:12	08:13 (14)	06:29	06:35	05:52	05:32	05:43	06:13	06:46	07:19		06:57		07:30
	16:58	17:38 22	08:35 (14)	18:12	19:48	20:21	20:47	20:49	20:18	19:27	18:34		16:51		16:37
13	07:39	07:11	08:11 (14)	06:27	06:34	05:51	05:32	05:44	06:14	06:47	07:20		06:58		07:31
	16:59	17:39 22	08:33 (14)	18:14	19:49	20:22	20:48	20:48	20:17	19:25	18:33		16:50		16:37
14	07:38	07:09	08:12 (14)	06:25	06:32	05:50	05:32	05:45	06:15	06:48	07:21		06:59		07:32
	17:00	17:40 22	08:34 (14)	18:15	19:50	20:23	20:48	20:48	20:16	19:23	18:31		16:49		16:37
15	07:38	07:08	08:12 (14)	06:24	06:30	05:49	05:32	05:46	06:16	06:49	07:22		07:01		07:33
	17:02	17:41 20	08:32 (14)	18:16	19:51	20:24	20:49	20:47	20:14	19:21	18:29		16:48		16:38
16	07:37	07:07	08:13 (14)	06:22	06:29	05:48	05:32	05:46	06:17	06:50	07:24		07:02		07:33
	17:03	17:43 18	08:31 (14)	18:17	19:52	20:25	20:49	20:46	20:13	19:20	18:28		16:48		16:38
17	07:37	07:05	08:16 (14)	06:20	06:27	05:47	05:32	05:47	06:18	06:51	07:25		07:03		07:34
	17:04	17:44 14	08:30 (14)	18:18	19:54	20:26	20:50	20:46	20:11	19:18	18:26		16:47		16:38
18	07:36	07:04	08:16 (14)	06:18	06:25	05:46	05:32	05:48	06:19	06:52	07:26		07:04		07:35
	17:05	17:45 12	08:28 (14)	18:19	19:55	20:27	20:50	20:45	20:10	19:16	18:24		16:46		16:38
19	07:36	07:02	08:21 (14)	06:17	06:24	05:45	05:32	05:49	06:20	06:53	07:27		07:06		07:35
	17:06	17:47 4	08:25 (14)	18:21	19:56	20:28	20:50	20:44	20:08	19:14	18:23		16:45		16:39
20	07:35	07:01		06:15	06:22	05:44	05:32	05:50	06:22	06:55	07:28		07:07		07:36
	17:08	17:48		18:22	19:57	20:29	20:51	20:44	20:07	19:12	18:21		16:44		16:39
21	07:34	06:59		06:13	06:21	05:43	05:33	05:51	06:23	06:56	07:30		07:08		07:36
	17:09	17:49		18:23	19:58	20:30	20:51	20:43	20:05	19:11	18:20		16:44		16:40
22	07:34	06:58		06:11	06:19	05:42	05:33	05:52	06:24	06:57	07:31		07:09		07:37
	17:10	17:50		18:24	19:59	20:31	20:51	20:42	20:04	19:09	18:18		16:43		16:40
23	07:33	06:56		06:10	06:18	05:42	05:33	05:53	06:25	06:58	07:32	08:49 (14)	07:10		07:37
	17:11	17:52		18:25	20:00	20:32	20:51	20:41	20:02	19:07	18:17 6	08:55 (14)	16:42		16:41
24	07:32	06:55		06:08	06:16	05:41	05:33	05:54	06:26	06:59	07:33	08:46 (14)	07:12		07:38
	17:13	17:53		18:26	20:00	20:33	20:52	20:40	20:01	19:05	18:15 12	08:58 (14)	16:42		16:41
25	07:32	06:53		06:06	06:15	05:40	05:34	05:54	06:27	07:00	06:34	07:44 (14)	07:13		07:38
	17:14	17:54		18:27	20:02	20:34	20:52	20:39	19:57	19:04	17:14 16	08:00 (14)	16:41		16:42
26	07:31	06:52		06:04	06:13	05:39	05:34	05:55	06:28	07:01	06:36	07:43 (14)	07:14		07:39
	17:15	17:55		18:29	20:03	20:35	20:52	20:38	19:56	19:02	17:12 18	08:01 (14)	16:40		16:43
27	07:30	06:50		06:03	06:12	05:39	05:34	05:56	06:29	07:02	06:37	07:42 (14)	07:15		07:39
	17:17	17:57		18:30	20:04	20:36	20:52	20:37	19:54	19:00	17:11 20	08:02 (14)	16:40		16:43
28	07:29	06:49		06:01	06:10	05:38	05:35	05:57	06:30	07:03	06:38	07:42 (14)	07:16		07:39
	17:18	17:58		18:31	20:05	20:36	20:52	20:36	19:52	18:58	17:10 22	08:04 (14)	16:39		16:44
29	07:28			05:59	06:09	05:37	05:35	05:58	06:31	07:04	06:39	07:41 (14)	07:17		07:40
	17:19			18:32	20:06	20:37	20:52	20:35	19:51	18:56	17:08 22	08:03 (14)	16:39		16:45
30	07:27			05:57	06:07	05:37	05:36	05:59	06:32	07:05	06:41	07:40 (14)	07:19		07:40
	17:20			18:33	20:07	20:38	20:52	20:34	19:49	18:55	17:07 24	08:04 (14)	16:39		16:45
31	07:26			05:56		05:36		06:00	06:33		06:42	07:42 (14)			07:40
	17:22			18:34		20:39		20:33	19:47		17:05 22	08:04 (14)			16:46
Potential sun hours	293	295		370	209	-292	-263	-280	-145	375	343		294		283
Total, worst case			292									162		130	
Sun reduction			0.45									0.45		0.35	
Oper. time red.			0.86									0.86		0.86	
Wind dir. red.			0.63									0.63		0.63	
Total reduction			0.24									0.24		0.19	
Total, real			71									40		25	

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	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, Mid / Northeast part
20 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
1000 meter max shadow distance applied along with default 3° inclination
Sunshine probabilities applied (pdf plots)
Directional run-hours applied from tab file (tower 1)
.

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03/05/06 23:23 / 8
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7660 Whitegate Avenue
US-RIVERSIDE, CA 92506

Calculated:
03/01/06 21:02/2.4.0.67

SHADOW - Calendar

Calculation: Mid / Northeast part **Shadow receptor:** 690 - 690

Assumptions for shadow calculations

Maximum distance for influence	1,000	m
Minimum sun height over horizon for influence	3	°
Day step for calculation	1	days
Time step for calculation	2	minutes

Sun shine probabilities (part of time from sun rise to sun set with sun shine)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.35	0.45	0.45	0.55	0.55	0.55	0.65	0.55	0.55	0.45	0.35	0.30

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
475	585	238	199	220	474	1,184	813	840	1,246	803	479	7,555

	January	February		March		April	May	June	July	August	September	October		November	December
1	07:40	07:25		06:47	07:59 (14)	05:54	06:06	05:36	05:36	06:01	06:34	07:07		06:43	07:20
	16:47	17:23		17:59 32	08:31 (14)	18:35	20:08	20:40	20:52	20:32	19:46	18:53		17:04	16:38
2	07:40	07:24		06:45	07:59 (14)	05:52	06:05	05:35	05:37	06:02	06:35	07:08		06:44	07:21
	16:48	17:24		18:00 32	08:31 (14)	18:37	20:09	20:41	20:52	20:31	19:44	18:51		17:03	16:38
3	07:40	07:23		06:44	08:00 (14)	05:50	06:03	05:35	05:37	06:03	06:36	07:09	08:43 (14)	06:46	07:22
	16:49	17:26		18:02 30	08:30 (14)	18:38	20:11	20:41	20:51	20:30	19:42	18:49 14	08:57 (14)	17:02	16:38
4	07:40	07:22		06:42	07:58 (14)	05:49	06:02	05:34	05:38	06:05	06:38	07:10	08:40 (14)	06:47	07:23
	16:50	17:27		18:03 32	08:30 (14)	18:39	20:12	20:42	20:51	20:29	19:41	18:48 18	08:58 (14)	17:00	16:37
5	07:40	07:21		06:41	07:58 (14)	06:47	06:01	05:34	05:38	06:06	06:39	07:11	08:39 (14)	06:48	07:24
	16:51	17:28		18:04 30	08:28 (14)	19:40	20:13	20:43	20:51	20:28	19:39	18:46 22	09:01 (14)	16:59	16:37
6	07:40	07:20		06:39	07:59 (14)	06:45	05:59	05:34	05:39	06:07	06:40	07:12	08:36 (14)	06:49	07:25
	16:52	17:30		18:05 28	08:27 (14)	19:41	20:14	20:44	20:51	20:26	19:37	18:44 26	09:02 (14)	16:58	16:37
7	07:40	07:18		06:37	08:01 (14)	06:44	05:58	05:33	05:40	06:08	06:41	07:13	08:36 (14)	06:51	07:26
	16:53	17:31		18:06 26	08:27 (14)	19:42	20:15	20:44	20:51	20:25	19:35	18:43 28	09:04 (14)	16:57	16:37
8	07:40	07:17		06:36	08:01 (14)	06:42	05:57	05:33	05:40	06:09	06:42	07:14	08:35 (14)	06:52	07:27
	16:54	17:32		18:08 24	08:25 (14)	19:43	20:16	20:45	20:50	20:24	19:34	18:41 28	09:03 (14)	16:56	16:37
9	07:40	07:16		06:34	08:01 (14)	06:40	05:56	05:33	05:41	06:10	06:43	07:15	08:34 (14)	06:53	07:28
	16:55	17:34		18:09 22	08:23 (14)	19:45	20:17	20:46	20:50	20:22	19:32	18:39 30	09:04 (14)	16:55	16:37
10	07:40	07:15		06:32	08:04 (14)	06:39	05:55	05:33	05:42	06:11	06:44	07:17	08:33 (14)	06:54	07:28
	16:56	17:35		18:10 16	08:20 (14)	19:46	20:18	20:46	20:49	20:21	19:30	18:38 30	09:03 (14)	16:53	16:37
11	07:39	07:13		06:30	08:08 (14)	06:37	05:53	05:32	05:42	06:12	06:45	07:18	08:32 (14)	06:56	07:29
	16:57	17:36		18:11 8	08:16 (14)	19:47	20:19	20:47	20:49	20:20	19:28	18:36 32	09:04 (14)	16:52	16:37
12	07:39	07:12		06:29		06:35	05:52	05:32	05:43	06:13	06:46	07:19	08:31 (14)	06:57	07:30
	16:58	17:38		18:12		19:48	20:20	20:47	20:49	20:18	19:27	18:34 32	09:03 (14)	16:51	16:37
13	07:39	07:11		06:27		06:34	05:51	05:32	05:44	06:14	06:47	07:20	08:33 (14)	06:58	07:31
	16:59	17:39		18:14		19:49	20:22	20:48	20:48	20:17	19:25	18:33 32	09:05 (14)	16:50	16:37
14	07:38	07:09		06:25		06:32	05:50	05:32	05:45	06:15	06:48	07:21	08:32 (14)	06:59	07:32
	17:00	17:40		18:15		19:50	20:23	20:48	20:47	20:16	19:23	18:31 32	09:04 (14)	16:49	16:37
15	07:38	07:08		06:24		06:30	05:49	05:32	05:45	06:16	06:49	07:22	08:33 (14)	07:01	07:33
	17:02	17:41		18:16		19:51	20:24	20:49	20:47	20:14	19:21	18:29 30	09:03 (14)	16:48	16:38
16	07:37	07:07		06:22		06:29	05:48	05:32	05:46	06:17	06:50	07:24	08:32 (14)	07:02	07:33
	17:03	17:43		18:17		19:52	20:25	20:49	20:46	20:13	19:20	18:28 30	09:02 (14)	16:48	16:38
17	07:37	07:05		06:20		06:27	05:47	05:32	05:47	06:18	06:51	07:25	08:34 (14)	07:03	07:34
	17:04	17:44		18:18		19:54	20:26	20:50	20:46	20:11	19:18	18:26 28	09:02 (14)	16:47	16:38
18	07:36	07:04		06:18		06:25	05:46	05:32	05:48	06:19	06:52	07:26	08:35 (14)	07:04	07:35
	17:05	17:45		18:19		19:55	20:27	20:50	20:45	20:10	19:16	18:24 26	09:01 (14)	16:46	16:38
19	07:36	07:02	08:13 (14)	06:17		06:24	05:45	05:32	05:49	06:20	06:53	07:27	08:34 (14)	07:06	07:35
	17:06	17:47 8	08:21 (14)	18:21		19:56	20:28	20:50	20:44	20:08	19:14	18:23 26	09:00 (14)	16:45	16:39
20	07:35	07:01	08:09 (14)	06:15		06:22	05:44	05:32	05:50	06:22	06:55	07:28	08:35 (14)	07:07	07:36
	17:08	17:48 16	08:25 (14)	18:22		19:57	20:29	20:51	20:44	20:07	19:12	18:21 22	08:57 (14)	16:44	16:39
21	07:34	06:59	08:06 (14)	06:13		06:21	05:43	05:33	05:51	06:23	06:56	07:29	08:39 (14)	07:08	07:36
	17:09	17:49 20	08:26 (14)	18:23		19:58	20:30	20:51	20:43	20:05	19:11	18:20 18	08:57 (14)	16:44	16:40
22	07:34	06:58	08:04 (14)	06:11		06:19	05:42	05:33	05:52	06:24	06:57	07:31	08:40 (14)	07:09	07:37
	17:10	17:50 24	08:28 (14)	18:24		19:59	20:31	20:51	20:42	20:04	19:09	18:18 14	08:54 (14)	16:43	16:40
23	07:33	06:56	08:02 (14)	06:10		06:18	05:42	05:33	05:53	06:25	06:58	07:32	08:45 (14)	07:10	07:37
	17:11	17:52 26	08:28 (14)	18:25		20:00	20:32	20:51	20:41	20:02	19:07	18:17 4	08:49 (14)	16:42	16:41
24	07:32	06:55	08:03 (14)	06:08		06:16	05:41	05:33	05:54	06:26	06:59	07:33		07:12	07:38
	17:13	17:53 26	08:29 (14)	18:26		20:00	20:33	20:52	20:40	20:01	19:05	18:15		16:42	16:41
25	07:32	06:53	08:01 (14)	06:06		06:15	05:40	05:34	05:54	06:27	07:00	06:34		07:13	07:38
	17:14	17:54 28	08:29 (14)	18:27		20:02	20:34	20:52	20:39	19:57	19:04	17:14		16:41	16:42
26	07:31	06:52	08:00 (14)	06:04		06:13	05:39	05:34	05:55	06:28	07:01	06:36		07:14	07:39
	17:15	17:55 30	08:30 (14)	18:29		20:03	20:35	20:52	20:38	19:56	19:02	17:12		16:40	16:43
27	07:30	06:50	08:00 (14)	06:03		06:12	05:39	05:34	05:56	06:29	07:02	06:37		07:15	07:39
	17:17	17:57 30	08:30 (14)	18:30		20:04	20:36	20:52	20:37	19:54	19:00	17:11		16:40	16:43
28	07:29	06:49	07:59 (14)	06:01		06:10	05:38	05:35	05:57	06:30	07:03	06:38		07:16	07:39
	17:18	17:58 32	08:31 (14)	18:31		20:05	20:36	20:52	20:36	19:52	18:58	17:10		16:39	16:44
29	07:28			05:59		06:09	05:37	05:35	05:58	06:31	07:04	06:39		07:17	07:40
	17:19			18:32		20:06	20:37	20:52	20:35	19:51	18:56	17:08		16:39	16:45
30	07:27			05:57		06:07	05:37	05:36	05:59	06:32	07:05	06:41		07:18	07:40
	17:20			18:33		20:07	20:38	20:52	20:34	19:49	18:55	17:07		16:39	16:45
31	07:26			05:56			05:36		06:00	06:33		06:42			07:40
	17:22			18:34			20:39		20:33	19:47		17:05			16:46
Potential sun hours	293	295		370		209	-292	-263	-280	-145	375	343		294	283
Total, worst case			240		280								522		
Sun reduction			0.45		0.45								0.45		
Oper. time red.			0.86		0.86								0.86		
Wind dir. red.			0.62		0.62								0.62		
Total reduction			0.24		0.24								0.24		
Total, real			58		68								126		

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	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, Mid / Northeast part
20 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
1000 meter max shadow distance applied along with default 3° inclination
Sunshine probabilities applied (pdf plots)
Directional run-hours applied from tab file (tower 1)
.

Printed/Page
03/05/06 23:23 / 9
Licensed user:
Wind Engineers, Inc.
7660 Whitegate Avenue
US-RIVERSIDE, CA 92506

Calculated:
03/01/06 21:02/2.4.0.67

SHADOW - Calendar

Calculation: Mid / Northeast part **Shadow receptor:** 691 - 691

Assumptions for shadow calculations

Maximum distance for influence	1,000	m
Minimum sun height over horizon for influence	3	°
Day step for calculation	1	days
Time step for calculation	2	minutes

Sun shine probabilities (part of time from sun rise to sun set with sun shine)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.35	0.45	0.45	0.55	0.55	0.55	0.65	0.55	0.55	0.45	0.35	0.30

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
475	585	238	199	220	474	1,184	813	840	1,246	803	479	7,555

	January			February			March			April			May		June
1	07:40		08:03 (19)	07:25		08:12 (19)	06:47			05:54		06:13 (12)	06:06		05:36
	16:47	22	08:25 (19)	17:23	14	08:26 (19)	17:59			18:35	8	06:21 (12)	20:08		20:40
2	07:40		08:03 (19)	07:24			06:45			05:52		06:11 (12)	06:05		05:35
	16:48	22	08:25 (19)	17:24			18:00			18:37	10	06:21 (12)	20:09		20:41
3	07:40		08:03 (19)	07:23			06:44			05:50		06:10 (12)	06:03		05:35
	16:49	24	08:27 (19)	17:26			18:02			18:38	12	06:22 (12)	20:11		20:41
4	07:40		08:03 (19)	07:22			06:42			05:49		06:08 (12)	06:02		05:34
	16:50	24	08:27 (19)	17:27			18:03			18:39	12	06:20 (12)	20:12		20:42
5	07:40		08:03 (19)	07:21			06:40			06:47		07:06 (12)	06:01		05:34
	16:51	24	08:27 (19)	17:28			18:04			19:40	14	07:20 (12)	20:13		20:43
6	07:40		08:03 (19)	07:20			06:39			06:45		07:05 (12)	05:59		05:34
	16:52	26	08:29 (19)	17:30			18:05			19:41	14	07:19 (12)	20:14		20:44
7	07:40		08:03 (19)	07:18			06:37			06:44		07:03 (12)	05:58		05:33
	16:53	26	08:29 (19)	17:31			18:06			19:42	16	07:19 (12)	20:15		20:44
8	07:40		08:03 (19)	07:17			06:35			06:42		07:01 (12)	05:57		05:33
	16:54	26	08:29 (19)	17:32			18:08			19:43	16	07:17 (12)	20:16		20:45
9	07:40		08:02 (19)	07:16			06:34			06:40		07:02 (12)	05:56		05:33
	16:55	28	08:30 (19)	17:34			18:09			19:44	14	07:16 (12)	20:17		20:46
10	07:40		08:02 (19)	07:15			06:32			06:39		07:04 (12)	05:55		05:33
	16:56	28	08:30 (19)	17:35			18:10			19:46	10	07:14 (12)	20:18		20:46
11	07:39		08:02 (19)	07:13			06:30			06:37			05:53		05:32
	16:57	30	08:32 (19)	17:36			18:11			19:47			20:19		20:47
12	07:39		08:01 (19)	07:12			06:29			06:35			05:52		05:32
	16:58	30	08:31 (19)	17:37			18:12			19:48			20:20		20:47
13	07:39		08:01 (19)	07:11			06:27			06:34			05:51		05:32
	16:59	32	08:33 (19)	17:39			18:14			19:49			20:22		20:48
14	07:38		08:00 (19)	07:09			06:25			06:32			05:50		05:32
	17:00	32	08:32 (19)	17:40			18:15			19:50			20:23		20:48
15	07:38		08:00 (19)	07:08			06:24			06:30			05:49		05:32
	17:02	34	08:34 (19)	17:41			18:16			19:51			20:24		20:49
16	07:37		07:59 (19)	07:07			06:22			06:29			05:48		05:32
	17:03	34	08:33 (19)	17:43			18:17			19:52			20:25		20:49
17	07:37		07:59 (19)	07:05			06:20			06:27			05:47		05:32
	17:04	34	08:33 (19)	17:44			18:18			19:54			20:26		20:50
18	07:36		07:58 (19)	07:04			06:18			06:25			05:46		05:32
	17:05	36	08:34 (19)	17:45			18:19			19:55			20:27		20:50
19	07:36		07:59 (19)	07:02			06:17			06:24			05:45		05:32
	17:06	34	08:33 (19)	17:47			18:21			19:56			20:28		20:50
20	07:35		07:59 (19)	07:01			06:15			06:22			05:44		05:32
	17:08	36	08:35 (19)	17:48			18:22			19:57			20:29		20:51
21	07:34		08:00 (19)	06:59			06:13			06:21			05:43		05:33
	17:09	34	08:34 (19)	17:49			18:23			19:58			20:30		20:51
22	07:34		07:59 (19)	06:58			06:11			06:19			05:42		05:33
	17:10	34	08:33 (19)	17:50			18:24			19:59			20:31		20:51
23	07:33		08:01 (19)	06:56			06:10			06:18			05:42		05:33
	17:11	34	08:35 (19)	17:52			18:25			20:00			20:32		20:51
24	07:32		08:02 (19)	06:55			06:08			06:16			05:41		05:33
	17:13	32	08:34 (19)	17:53			18:26			20:00			20:33		20:51
25	07:31		08:03 (19)	06:53			06:06			06:15			05:40		05:34
	17:14	30	08:33 (19)	17:54			18:27			20:02			20:34		20:52
26	07:31		08:04 (19)	06:52			06:04			06:13			05:39		05:34
	17:15	30	08:34 (19)	17:55			18:29			20:03			20:35		20:52
27	07:30		08:05 (19)	06:50			06:03			06:12			05:39		05:34
	17:17	28	08:33 (19)	17:57			18:30			20:04			20:35		20:52
28	07:29		08:06 (19)	06:49			06:01			06:10			05:38		05:35
	17:18	26	08:32 (19)	17:58			18:31			20:05			20:36		20:52
29	07:28		08:07 (19)				05:59			06:09			05:37		05:35
	17:19	24	08:31 (19)				18:32			20:06			20:37		20:52
30	07:27		08:08 (19)				05:57		06:17 (12)	06:07			05:37		05:36
	17:20	22	08:30 (19)				18:33	4	06:21 (12)	20:07			20:38		20:52
31	07:26		08:11 (19)				05:56		06:15 (12)				05:36		
	17:22	16	08:27 (19)				18:34	6	06:21 (12)				20:39		
Potential sun hours	293			295			370			209			-292		-263
Total, worst case		892			14			10			126				
Sun reduction		0.35			0.45			0.45			0.55				
Oper. time red.		0.86			0.86			0.86			0.86				
Wind dir. red.		0.63			0.63			0.61			0.61				
Total reduction		0.19			0.25			0.24			0.29				
Total, real		170			3			2			36				

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	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, Mid / Northeast part
20 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
1000 meter max shadow distance applied along with default 3° inclination
Sunshine probabilities applied (pdf plots)
Directional run-hours applied from tab file (tower 1)
.

Printed/Page
03/05/06 23:23 / 10
Licensed user:
Wind Engineers, Inc.
7660 Whitegate Avenue
US-RIVERSIDE, CA 92506

Calculated:
03/01/06 21:02/2.4.0.67

SHADOW - Calendar

Calculation: Mid / Northeast part **Shadow receptor:** 691 - 691

Assumptions for shadow calculations

Maximum distance for influence	1,000	m
Minimum sun height over horizon for influence	3	°
Day step for calculation	1	days
Time step for calculation	2	minutes

Sun shine probabilities (part of time from sun rise to sun set with sun shine)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.35	0.45	0.45	0.55	0.55	0.55	0.65	0.55	0.55	0.45	0.35	0.30

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
475	585	238	199	220	474	1,184	813	840	1,246	803	479	7,555

	July		August		September			October			November			December		
1	05:36		06:01		06:34			07:06			06:43			07:20		07:44 (19)
	20:52		20:32		19:46			18:53			17:04			16:38	30	08:14 (19)
2	05:37		06:02		06:35		07:02 (12)	07:08			06:44			07:21		07:45 (19)
	20:52		20:31		19:44	10	07:12 (12)	18:51			17:03			16:38	28	08:13 (19)
3	05:37		06:03		06:36		06:59 (12)	07:09			06:45			07:22		07:46 (19)
	20:51		20:30		19:42	14	07:13 (12)	18:49			17:02			16:38	28	08:14 (19)
4	05:38		06:04		06:37		06:58 (12)	07:10			06:47			07:23		07:47 (19)
	20:51		20:29		19:41	16	07:14 (12)	18:48			17:00			16:37	28	08:15 (19)
5	05:38		06:06		06:39		06:59 (12)	07:11			06:48			07:24		07:48 (19)
	20:51		20:27		19:39	16	07:15 (12)	18:46			16:59			16:37	26	08:14 (19)
6	05:39		06:07		06:40		07:00 (12)	07:12			06:49			07:25		07:49 (19)
	20:51		20:26		19:37	14	07:14 (12)	18:44			16:58			16:37	26	08:15 (19)
7	05:40		06:08		06:41		07:01 (12)	07:13			06:51			07:26		07:50 (19)
	20:50		20:25		19:35	14	07:15 (12)	18:43			16:57			16:37	24	08:14 (19)
8	05:40		06:09		06:42		07:02 (12)	07:14			06:52			07:27		07:51 (19)
	20:50		20:24		19:34	12	07:14 (12)	18:41			16:56			16:37	24	08:15 (19)
9	05:41		06:10		06:43		07:03 (12)	07:15			06:53		07:48 (19)	07:28		07:52 (19)
	20:50		20:22		19:32	12	07:15 (12)	18:39			16:54	4	07:52 (19)	16:37	24	08:16 (19)
10	05:42		06:11		06:44		07:05 (12)	07:17			06:54		07:43 (19)	07:28		07:53 (19)
	20:49		20:21		19:30	10	07:15 (12)	18:37			16:53	14	07:57 (19)	16:37	22	08:15 (19)
11	05:42		06:12		06:45		07:06 (12)	07:18			06:56		07:40 (19)	07:29		07:54 (19)
	20:49		20:20		19:28	8	07:14 (12)	18:36			16:52	18	07:58 (19)	16:37	22	08:16 (19)
12	05:43		06:13		06:46		07:07 (12)	07:19			06:57		07:40 (19)	07:30		07:55 (19)
	20:48		20:18		19:27	6	07:13 (12)	18:34			16:51	22	08:02 (19)	16:37	22	08:17 (19)
13	05:44		06:14		06:47		07:08 (12)	07:20			06:58		07:39 (19)	07:31		07:55 (19)
	20:48		20:17		19:25	4	07:12 (12)	18:32			16:50	24	08:03 (19)	16:37	20	08:15 (19)
14	05:45		06:15		06:48			07:21			06:59		07:38 (19)	07:32		07:56 (19)
	20:47		20:16		19:23			18:31			16:49	26	08:04 (19)	16:37	20	08:16 (19)
15	05:45		06:16		06:49			07:22			07:01		07:38 (19)	07:33		07:57 (19)
	20:47		20:14		19:21			18:29			16:48	28	08:06 (19)	16:38	20	08:17 (19)
16	05:46		06:17		06:50			07:24			07:02		07:37 (19)	07:33		07:58 (19)
	20:46		20:13		19:19			18:28			16:48	30	08:07 (19)	16:38	20	08:18 (19)
17	05:47		06:18		06:51			07:25			07:03		07:36 (19)	07:34		07:58 (19)
	20:46		20:11		19:18			18:26			16:47	30	08:06 (19)	16:38	20	08:18 (19)
18	05:48		06:19		06:52			07:26			07:04		07:36 (19)	07:35		07:59 (19)
	20:45		20:10		19:16			18:24			16:46	32	08:08 (19)	16:38	18	08:17 (19)
19	05:49		06:20		06:53			07:27			07:06		07:35 (19)	07:35		07:59 (19)
	20:44		20:08		19:14			18:23			16:45	34	08:09 (19)	16:39	18	08:17 (19)
20	05:50		06:21		06:55			07:28			07:07		07:34 (19)	07:36		08:00 (19)
	20:43		20:07		19:12			18:21			16:44	34	08:08 (19)	16:39	18	08:18 (19)
21	05:51		06:23		06:56			07:29			07:08		07:36 (19)	07:36		08:01 (19)
	20:43		20:05		19:11			18:20			16:44	34	08:10 (19)	16:40	18	08:19 (19)
22	05:52		06:24		06:57			07:31			07:09		07:35 (19)	07:37		08:01 (19)
	20:42		20:04		19:09			18:18			16:43	36	08:11 (19)	16:40	18	08:19 (19)
23	05:53		06:25		06:58			07:32			07:10		07:36 (19)	07:37		08:01 (19)
	20:41		20:02		19:07			18:17			16:42	34	08:10 (19)	16:41	18	08:19 (19)
24	05:53		06:26		06:59			07:33			07:12		07:35 (19)	07:38		08:02 (19)
	20:40		20:00		19:05			18:15			16:42	36	08:11 (19)	16:41	18	08:20 (19)
25	05:54		06:27		07:00			06:34			07:13		07:37 (19)	07:38		08:02 (19)
	20:39		19:57		19:03			17:14			16:41	34	08:11 (19)	16:42	18	08:20 (19)
26	05:55		06:28		07:01			06:36			07:14		07:38 (19)	07:39		08:02 (19)
	20:38		19:56		19:02			17:12			16:40	34	08:12 (19)	16:42	20	08:22 (19)
27	05:56		06:29		07:02			06:37			07:15		07:39 (19)	07:39		08:03 (19)
	20:37		19:54		19:00			17:11			16:40	34	08:13 (19)	16:43	20	08:23 (19)
28	05:57		06:30		07:03			06:38			07:16		07:40 (19)	07:39		08:03 (19)
	20:36		19:52		18:58			17:10			16:39	32	08:12 (19)	16:44	20	08:23 (19)
29	05:58		06:31		07:04			06:39			07:17		07:41 (19)	07:40		08:03 (19)
	20:35		19:51		18:56			17:08			16:39	32	08:13 (19)	16:45	20	08:23 (19)
30	05:59		06:32		07:05			06:40			07:18		07:43 (19)	07:40		08:03 (19)
	20:34		19:49		18:55			17:07			16:39	30	08:13 (19)	16:45	20	08:23 (19)
31	06:00		06:33					06:42						07:40		08:03 (19)
	20:33		19:47					17:05						16:46	22	08:25 (19)
Potential sun hours	-280		-145		375			343			294			283		
Total, worst case						136						632				670
Sun reduction						0.55						0.35				0.30
Oper. time red.						0.86						0.86				0.86
Wind dir. red.						0.61						0.63				0.63
Total reduction						0.29						0.19				0.16
Total, real						39						121				109

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	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, Mid / Northeast part
20 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
1000 meter max shadow distance applied along with default 3° inclination
Sunshine probabilities applied (pdf plots)
Directional run-hours applied from tab file (tower 1)
.

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03/05/06 23:23 / 11
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Wind Engineers, Inc.
7660 Whitegate Avenue
US-RIVERSIDE, CA 92506

Calculated:
03/01/06 21:02/2.4.0.67

SHADOW - Calendar

Calculation: Mid / Northeast part **Shadow receptor:** 692 - 692

Assumptions for shadow calculations

Maximum distance for influence	1,000	m
Minimum sun height over horizon for influence	3	°
Day step for calculation	1	days
Time step for calculation	2	minutes

Sun shine probabilities (part of time from sun rise to sun set with sun shine)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.35	0.45	0.45	0.55	0.55	0.55	0.65	0.55	0.55	0.45	0.35	0.30

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
475	585	238	199	220	474	1,184	813	840	1,246	803	479	7,555

	January		February	March		April		May	June	July	August	September		October	November		December	
1	07:40	08:43 (15)	07:25	06:47		05:54	07:11 (14)	06:06	05:36	05:36	06:01	06:34		07:07	06:43		07:20	08:30 (15)
	16:47 22	09:05 (15)	17:23	17:59		18:35 14	07:25 (14)	20:08	20:40	20:52	20:32	19:46		18:53	17:04		16:38 22	08:52 (15)
2	07:40	08:43 (15)	07:24	06:45		05:52	07:14 (14)	06:05	05:35	05:37	06:02	06:35		07:08	06:44		07:21	08:31 (15)
	16:48 24	09:07 (15)	17:24	18:00		18:37 8	07:22 (14)	20:09	20:41	20:52	20:31	19:44		18:51	17:03		16:38 20	08:51 (15)
3	07:40	08:43 (15)	07:23	06:44		05:51		06:03	05:35	05:37	06:04	06:36		07:09	06:46		07:22	08:30 (15)
	16:49 24	09:07 (15)	17:26	18:02		18:38		20:11	20:41	20:51	20:30	19:42		18:49	17:02		16:38 22	08:52 (15)
4	07:40	08:43 (15)	07:22	06:42		05:49		06:02	05:34	05:38	06:05	06:38		07:10	06:47		07:23	08:31 (15)
	16:50 24	09:07 (15)	17:27	18:03		18:39		20:12	20:42	20:51	20:29	19:41		18:48	17:00		16:38 22	08:53 (15)
5	07:40	08:45 (15)	07:21	06:41		06:47		06:01	05:34	05:38	06:06	06:39		07:11	06:48		07:24	08:30 (15)
	16:51 22	09:07 (15)	17:28	18:04		19:40		20:13	20:43	20:51	20:28	19:39		18:46	16:59		16:37 24	08:54 (15)
6	07:40	08:45 (15)	07:20	06:39		06:45		05:59	05:34	05:39	06:07	06:40		07:12	06:49		07:25	08:31 (15)
	16:52 24	09:09 (15)	17:30	18:05		19:41		20:14	20:44	20:51	20:26	19:37		18:44	16:58		16:37 24	08:55 (15)
7	07:40	08:45 (15)	07:18	06:37		06:44		05:58	05:33	05:40	06:08	06:41		07:13	06:51		07:26	08:32 (15)
	16:53 24	09:09 (15)	17:31	18:06		19:42		20:15	20:44	20:51	20:25	19:35		18:43	16:57		16:37 22	08:54 (15)
8	07:40	08:47 (15)	07:17	06:36		06:42		05:57	05:33	05:40	06:09	06:42		07:14	06:52		07:27	08:33 (15)
	16:54 22	09:09 (15)	17:32	18:08		19:43		20:16	20:45	20:50	20:24	19:34		18:41	16:56		16:37 22	08:55 (15)
9	07:40	08:46 (15)	07:16	06:34		06:40		05:56	05:33	05:41	06:10	06:43		07:15	06:53		07:28	08:32 (15)
	16:55 22	09:08 (15)	17:34	18:09		19:45		20:17	20:46	20:50	20:22	19:32		18:39	16:55		16:37 24	08:56 (15)
10	07:40	08:48 (15)	07:15	06:32		06:39		05:55	05:33	05:42	06:11	06:44	08:07 (14)	07:17	06:54		07:29	08:33 (15)
	16:56 20	09:08 (15)	17:35	18:10		19:46		20:18	20:46	20:49	20:21	19:30 8	08:15 (14)	18:38	16:53		16:37 24	08:57 (15)
11	07:39	08:48 (15)	07:13	06:30		06:37		05:53	05:32	05:42	06:12	06:45	08:04 (14)	07:18	06:56		07:29	08:34 (15)
	16:57 22	09:10 (15)	17:36	18:11		19:47		20:19	20:47	20:49	20:20	19:28 14	08:18 (14)	18:36	16:52		16:37 22	08:56 (15)
12	07:39	08:49 (15)	07:12	06:29		06:35		05:52	05:32	05:43	06:13	06:46	08:01 (14)	07:19	06:57		07:30	08:35 (15)
	16:58 20	09:09 (15)	17:38	18:12		19:48		20:20	20:47	20:49	20:18	19:27 18	08:19 (14)	18:34	16:51		16:37 22	08:57 (15)
13	07:39	08:49 (15)	07:11	06:27		06:34		05:51	05:32	05:44	06:14	06:47	08:00 (14)	07:20	06:58		07:31	08:33 (15)
	16:59 20	09:09 (15)	17:39	18:14		19:49		20:22	20:48	20:48	20:17	19:25 20	08:20 (14)	18:33	16:50		16:37 24	08:57 (15)
14	07:38	08:50 (15)	07:09	06:25		06:32		05:50	05:32	05:45	06:15	06:48	07:59 (14)	07:21	06:59		07:32	08:34 (15)
	17:01 18	09:08 (15)	17:40	18:15		19:50		20:23	20:48	20:47	20:16	19:23 22	08:21 (14)	18:31	16:49		16:37 24	08:58 (15)
15	07:38	08:52 (15)	07:08	06:24		06:30		05:49	05:32	05:46	06:16	06:49	07:58 (14)	07:22	07:01		07:33	08:35 (15)
	17:02 16	09:08 (15)	17:41	18:16		19:51		20:24	20:49	20:47	20:14	19:21 24	08:22 (14)	18:29	16:48		16:38 24	08:59 (15)
16	07:37	08:53 (15)	07:07	06:22		06:29		05:48	05:32	05:46	06:17	06:50	07:57 (14)	07:24	07:02		07:33	08:36 (15)
	17:03 14	09:07 (15)	17:43	18:17		19:52		20:25	20:49	20:46	20:13	19:20 24	08:21 (14)	18:28	16:48		16:38 24	09:00 (15)
17	07:37	08:55 (15)	07:05	06:20		06:27		05:47	05:32	05:47	06:18	06:51	07:56 (14)	07:25	07:03		07:34	08:36 (15)
	17:04 12	09:07 (15)	17:44	18:18		19:54		20:26	20:50	20:46	20:11	19:18 26	08:22 (14)	18:26	16:47		16:38 22	08:58 (15)
18	07:36	08:56 (15)	07:04	06:18		06:26		05:46	05:32	05:48	06:19	06:52	07:57 (14)	07:26	07:04		07:35	08:37 (15)
	17:05 10	09:06 (15)	17:45	18:19		19:55		20:27	20:50	20:45	20:10	19:16 24	08:21 (14)	18:24	16:46		16:38 22	08:59 (15)
19	07:36	09:00 (15)	07:02	06:17	07:16 (14)	06:24		05:45	05:32	05:49	06:20	06:53	07:56 (14)	07:27	07:06		07:35	08:38 (15)
	17:06 4	09:04 (15)	17:47	18:21 12	07:28 (14)	19:56		20:28	20:50	20:44	20:08	19:14 24	08:20 (14)	18:23	16:45		16:39 22	09:00 (15)
20	07:35		07:01	06:15	07:14 (14)	06:22		05:44	05:32	05:50	06:22	06:55	07:57 (14)	07:28	07:07		07:36	08:38 (15)
	17:08		17:48	18:22 16	07:30 (14)	19:57		20:29	20:51	20:44	20:07	19:12 22	08:19 (14)	18:21	16:44		16:39 22	09:00 (15)
21	07:34		06:59	06:13	07:13 (14)	06:21		05:43	05:33	05:51	06:23	06:56	07:56 (14)	07:30	07:08		07:36	08:39 (15)
	17:09		17:49	18:23 20	07:33 (14)	19:58		20:30	20:51	20:43	20:05	19:11 22	08:18 (14)	18:20	16:44		16:40 22	09:01 (15)
22	07:34		06:58	06:11	07:11 (14)	06:19		05:42	05:33	05:52	06:24	06:57	07:57 (14)	07:31	07:09		07:37	08:39 (15)
	17:10		17:50	18:24 22	07:33 (14)	19:59		20:31	20:51	20:42	20:04	19:09 20	08:17 (14)	18:18	16:43		16:40 22	09:01 (15)
23	07:33		06:56	06:10	07:11 (14)	06:18		05:42	05:33	05:53	06:25	06:58	07:58 (14)	07:32	07:10	08:36 (15)	07:37	08:39 (15)
	17:11		17:52	18:25 22	07:33 (14)	20:00		20:32	20:51	20:41	20:02	19:07 18	08:16 (14)	18:17	16:42 4	08:40 (15)	16:41 22	09:01 (15)
24	07:32		06:55	06:08	07:09 (14)	06:16		05:41	05:33	05:54	06:26	06:59	07:59 (14)	07:33	07:12	08:33 (15)	07:38	08:40 (15)
	17:13		17:53	18:26 24	07:33 (14)	20:00		20:33	20:52	20:40	20:01	19:05 14	08:13 (14)	18:15	16:42 10	08:43 (15)	16:41 22	09:02 (15)
25	07:32		06:53	06:06	07:10 (14)	06:15		05:40	05:34	05:54	06:27	07:00	08:02 (14)	06:34	07:13	08:33 (15)	07:38	08:40 (15)
	17:14		17:54	18:27 24	07:34 (14)	20:02		20:34	20:52	20:39	19:57	19:04 8	08:10 (14)	17:14	16:41 12	08:45 (15)	16:42 22	09:02 (15)
26	07:31		06:52	06:04	07:08 (14)	06:13		05:39	05:34	05:55	06:28	07:01		06:36	07:14	08:32 (15)	07:39	08:41 (15)
	17:15		17:55	18:29 24	07:32 (14)	20:03		20:35	20:52	20:38	19:56	19:02		17:12	16:40 14	08:46 (15)	16:43 22	09:03 (15)
27	07:30		06:50	06:03	07:08 (14)	06:12		05:39	05:34	05:56	06:29	07:02		06:37	07:15	08:31 (15)	07:39	08:41 (15)
	17:17		17:57	18:30 24	07:32 (14)	20:04		20:36	20:52	20:37	19:54	19:00		17:11	16:40 16	08:47 (15)	16:43 24	09:05 (15)
28	07:29		06:49	06:01	07:08 (14)	06:10		05:38	05:35	05:57	06:30	07:03		06:38	07:16	08:30 (15)	07:39	08:41 (15)
	17:18		17:58	18:31 22	07:30 (14)	20:05		20:36	20:52	20:36	19:52	18:58		17:10	16:40 18	08:48 (15)	16:44 24	09:05 (15)
29	07:28			05:59	07:09 (14)	06:09		05:37	05:35	05:58	06:31	07:04		06:39	07:17	08:30 (15)	07:40	08:41 (15)
	17:19			18:32 22	07:31 (14)	20:06		20:37	20:52	20:35	19:51	18:56		17:08	16:39 20	08:50 (15)	16:45 24	09:05 (15)
30	07:27			05:57	07:09 (14)	06:07		05:37	05:36	05:59	06:32	07:05		06:41	07:19	08:31 (15)	07:40	08:41 (15)
	17:20			18:33 20	07:29 (14)	20:07		20:38	20:52	20:34	19:49	18:55		17:07	16:39 20	08:51 (15)	16:45 24	09:05 (15)
31	07:26			05:56	07:09 (14)			05:36		06:00	06:33			06:42			07:40	08:43 (15)
	17:22			18:34 18	07:27 (14)			20:39		20:33	19:47			17:06			16:46 22	09:05 (15)
Potential sun hours	293		295	370		209		-292	-263	-280	-145	375		343	294		283	
Total, worst case		364			270		22						308			114		704
Sun reduction		0.35			0.45		0.55						0.55			0.35		0.30
Oper. time red.		0.86			0.86		0.86						0.86			0.86		0.86
Wind dir. red.		0.63			0.60		0.60						0.60			0.63		0.63
Total reduction		0.19			0.23		0.29						0.29			0.19		0.16
Total, real		69			63		6						88			22		114

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	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, Mid / Northeast part
20 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
1000 meter max shadow distance applied along with default 3° inclination
Sunshine probabilities applied (pdf plots)
Directional run-hours applied from tab file (tower 1)
.

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03/05/06 23:23 / 12
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Wind Engineers, Inc.
7660 Whitegate Avenue
US-RIVERSIDE, CA 92506

Calculated:
03/01/06 21:02/2.4.0.67

SHADOW - Calendar

Calculation: Mid / Northeast part **Shadow receptor:** 693 - 693

Assumptions for shadow calculations

Maximum distance for influence	1,000	m
Minimum sun height over horizon for influence	3	°
Day step for calculation	1	days
Time step for calculation	2	minutes

Sun shine probabilities (part of time from sun rise to sun set with sun shine)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.35	0.45	0.45	0.55	0.55	0.55	0.65	0.55	0.55	0.45	0.35	0.30

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
475	585	238	199	220	474	1,184	813	840	1,246	803	479	7,555

	January		February		March	April		May	June
1	07:40		07:25		08:20 (15)	06:47		05:54		06:06	05:36
	16:47		17:23	18	08:38 (15)	17:59		18:35		20:08	20:40
2	07:40		07:24		08:19 (15)	06:45		05:52		06:05	05:35
	16:48		17:24	20	08:39 (15)	18:00		18:37		20:09	20:41
3	07:40		07:23		08:20 (15)	06:44		05:51		06:03	05:35
	16:49		17:26	20	08:40 (15)	18:02		18:38		20:11	20:41
4	07:40		07:22		08:19 (15)	06:42		05:49		06:02	05:34
	16:50		17:27	22	08:41 (15)	18:03		18:39		20:12	20:42
5	07:40		07:21		08:19 (15)	06:41		06:47		06:01	05:34
	16:51		17:28	22	08:41 (15)	18:04		19:40		20:13	20:43
6	07:40		07:20		08:18 (15)	06:39		06:45		06:00	05:34
	16:52		17:30	22	08:40 (15)	18:05		19:41		20:14	20:44
7	07:40		07:18		08:19 (15)	06:37		06:44	07:41 (14)	05:58	05:33
	16:53		17:31	22	08:41 (15)	18:06		19:42	10	07:51 (14)	20:15	20:44
8	07:40		07:17		08:20 (15)	06:36		06:42		07:39 (14)	05:57	05:33
	16:54		17:32	20	08:40 (15)	18:08		19:43	14	07:53 (14)	20:16	20:45
9	07:40		07:16		08:21 (15)	06:34		06:40		07:38 (14)	05:56	05:33
	16:55		17:34	20	08:41 (15)	18:09		19:45	18	07:56 (14)	20:17	20:46
10	07:40		07:15		08:21 (15)	06:32		06:39		07:36 (14)	05:55	05:33
	16:56		17:35	18	08:39 (15)	18:10		19:46	20	07:56 (14)	20:18	20:46
11	07:39		07:13		08:22 (15)	06:30		06:37		07:34 (14)	05:53	05:32
	16:57		17:36	16	08:38 (15)	18:11		19:47	22	07:56 (14)	20:19	20:47
12	07:39		07:12		08:23 (15)	06:29		06:35		07:35 (14)	05:52	05:32
	16:58		17:38	14	08:37 (15)	18:12		19:48	20	07:55 (14)	20:20	20:47
13	07:39		07:11		08:25 (15)	06:27		06:34		07:33 (14)	05:51	05:32
	16:59		17:39	10	08:35 (15)	18:14		19:49	22	07:55 (14)	20:22	20:48
14	07:38		07:09		08:28 (15)	06:25		06:32		07:33 (14)	05:50	05:32
	17:01		17:40	4	08:32 (15)	18:15		19:50	22	07:55 (14)	20:23	20:48
15	07:38		07:08			06:24		06:30		07:34 (14)	05:49	05:32
	17:02		17:41			18:16		19:51	20	07:54 (14)	20:24	20:49
16	07:37		07:07			06:22		06:29		07:32 (14)	05:48	05:32
	17:03		17:43			18:17		19:52	22	07:54 (14)	20:25	20:49
17	07:37		07:05			06:20		06:27		07:33 (14)	05:47	05:32
	17:04		17:44			18:18		19:54	20	07:53 (14)	20:26	20:50
18	07:36		07:04			06:18		06:26		07:33 (14)	05:46	05:32
	17:05		17:45			18:19		19:55	18	07:51 (14)	20:27	20:50
19	07:36		07:02			06:17		06:24		07:36 (14)	05:45	05:32
	17:06		17:47			18:21		19:56	14	07:50 (14)	20:28	20:50
20	07:35		07:01			06:15		06:22		07:36 (14)	05:44	05:32
	17:08		17:48			18:22		19:57	12	07:48 (14)	20:29	20:51
21	07:34		06:59			06:13		06:21		07:38 (14)	05:43	05:33
	17:09		17:49			18:23		19:58	6	07:44 (14)	20:30	20:51
22	07:34		06:58			06:11		06:19			05:42	05:33
	17:10		17:50			18:24		19:59			20:31	20:51
23	07:33		06:56			06:10		06:18			05:42	05:33
	17:11		17:52			18:25		20:00			20:32	20:51
24	07:32		06:55			06:08		06:16			05:41	05:33
	17:13		17:53			18:26		20:00			20:33	20:52
25	07:32		06:53			06:06		06:15			05:40	05:34
	17:14		17:54			18:27		20:02			20:34	20:52
26	07:31		06:52			06:04		06:13			05:39	05:34
	17:15		17:55			18:29		20:03			20:35	20:52
27	07:30		06:50			06:03		06:12			05:39	05:34
	17:17		17:57			18:30		20:04			20:36	20:52
28	07:29	08:24 (15)	06:49			06:01		06:10			05:38	05:35
	17:18	8 08:32 (15)	17:58			18:31		20:05			20:36	20:52
29	07:28	08:23 (15)				05:59		06:09			05:37	05:35
	17:19	12 08:35 (15)				18:32		20:06			20:37	20:52
30	07:27	08:22 (15)				05:57		06:08			05:37	05:36
	17:20	14 08:36 (15)				18:33		20:07			20:38	20:52
31	07:26	08:21 (15)				05:56					05:36	
	17:22	16 08:37 (15)				18:34					20:39	
Potential sun hours	293		295			370		209			-292	-263
Total, worst case		50		248					260			
Sun reduction		0.35		0.45					0.55			
Oper. time red.		0.86		0.86					0.86			
Wind dir. red.		0.63		0.63					0.61			
Total reduction		0.19		0.25					0.29			
Total, real		10		61					75			

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	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, Mid / Northeast part
20 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
1000 meter max shadow distance applied along with default 3° inclination
Sunshine probabilities applied (pdf plots)
Directional run-hours applied from tab file (tower 1)
.

Printed/Page
03/05/06 23:23 / 13
Licensed user:
Wind Engineers, Inc.
7660 Whitegate Avenue
US-RIVERSIDE, CA 92506

Calculated:
03/01/06 21:02/2.4.0.67

SHADOW - Calendar

Calculation: Mid / Northeast part **Shadow receptor:** 693 - 693

Assumptions for shadow calculations

Maximum distance for influence	1,000	m
Minimum sun height over horizon for influence	3	°
Day step for calculation	1	days
Time step for calculation	2	minutes

Sun shine probabilities (part of time from sun rise to sun set with sun shine)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.35	0.45	0.45	0.55	0.55	0.55	0.65	0.55	0.55	0.45	0.35	0.30

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
475	585	238	199	220	474	1,184	813	840	1,246	803	479	7,555

	July		August		September		October		November		December
1	05:36		06:01		06:34	07:33 (14)	07:07		06:43	07:49 (15)	07:20
	20:52		20:32		19:46 22	07:55 (14)	18:53		17:04 20	08:09 (15)	16:38
2	05:37		06:02		06:35	07:34 (14)	07:08		06:44	07:48 (15)	07:21
	20:52		20:31		19:44 20	07:54 (14)	18:51		17:03 22	08:10 (15)	16:38
3	05:37		06:04		06:36	07:35 (14)	07:09		06:46	07:50 (15)	07:22
	20:51		20:30		19:42 18	07:53 (14)	18:49		17:02 20	08:10 (15)	16:38
4	05:38		06:05		06:38	07:36 (14)	07:10		06:47	07:49 (15)	07:23
	20:51		20:29		19:41 14	07:50 (14)	18:48		17:00 22	08:11 (15)	16:38
5	05:38		06:06		06:39	07:37 (14)	07:11		06:48	07:48 (15)	07:24
	20:51		20:28		19:39 12	07:49 (14)	18:46		16:59 22	08:10 (15)	16:37
6	05:39		06:07		06:40	07:40 (14)	07:12		06:49	07:48 (15)	07:25
	20:51		20:26		19:37 4	07:44 (14)	18:44		16:58 24	08:12 (15)	16:37
7	05:40		06:08		06:41		07:13		06:51	07:49 (15)	07:26
	20:51		20:25		19:35		18:43		16:57 22	08:11 (15)	16:37
8	05:40		06:09		06:42		07:14		06:52	07:50 (15)	07:27
	20:50		20:24		19:34		18:41		16:56 20	08:10 (15)	16:37
9	05:41		06:10		06:43		07:16		06:53	07:50 (15)	07:28
	20:50		20:22		19:32		18:39		16:55 20	08:10 (15)	16:37
10	05:42		06:11		06:44		07:17		06:54	07:51 (15)	07:29
	20:49		20:21		19:30		18:38		16:53 18	08:09 (15)	16:37
11	05:42		06:12		06:45		07:18		06:56	07:52 (15)	07:29
	20:49		20:20		19:28		18:36		16:52 16	08:08 (15)	16:37
12	05:43		06:13		06:46		07:19		06:57	07:54 (15)	07:30
	20:49		20:18		19:27		18:34		16:51 14	08:08 (15)	16:37
13	05:44		06:14		06:47		07:20		06:58	07:55 (15)	07:31
	20:48		20:17		19:25		18:33		16:50 12	08:07 (15)	16:37
14	05:45		06:15		06:48		07:21		06:59	07:56 (15)	07:32
	20:47		20:16		19:23		18:31		16:49 8	08:04 (15)	16:37
15	05:46		06:16		06:49		07:22		07:01		07:33
	20:47		20:14		19:21		18:29		16:48		16:38
16	05:46		06:17		06:50		07:24		07:02		07:33
	20:46		20:13		19:20		18:28		16:48		16:38
17	05:47		06:18		06:51		07:25		07:03		07:34
	20:46		20:11		19:18		18:26		16:47		16:38
18	05:48		06:19		06:52		07:26		07:04		07:35
	20:45		20:10		19:16		18:24		16:46		16:39
19	05:49		06:20		06:54		07:27		07:06		07:35
	20:44		20:08		19:14		18:23		16:45		16:39
20	05:50		06:22		06:55		07:28		07:07		07:36
	20:44		20:07		19:12		18:21		16:44		16:39
21	05:51		06:23		06:56		07:30		07:08		07:36
	20:43		20:05		19:11		18:20		16:44		16:40
22	05:52		06:24	07:43 (14)	06:57		07:31		07:09		07:37
	20:42		20:04 6	07:49 (14)	19:09		18:18		16:43		16:40
23	05:53		06:25	07:40 (14)	06:58		07:32		07:10		07:37
	20:41		20:02 12	07:52 (14)	19:07		18:17		16:42		16:41
24	05:54		06:26	07:39 (14)	06:59		07:33		07:12		07:38
	20:40		20:01 14	07:53 (14)	19:05		18:15		16:42		16:41
25	05:54		06:27	07:36 (14)	07:00		06:34		07:13		07:38
	20:39		19:57 18	07:54 (14)	19:04		17:14		16:41		16:42
26	05:55		06:28	07:35 (14)	07:01		06:36		07:14		07:39
	20:38		19:56 20	07:55 (14)	19:02		17:12		16:40		16:43
27	05:56		06:29	07:34 (14)	07:02		06:37		07:15		07:39
	20:37		19:54 22	07:56 (14)	19:00		17:11		16:40		16:43
28	05:57		06:30	07:35 (14)	07:03		06:38	07:56 (15)	07:16		07:39
	20:36		19:52 20	07:55 (14)	18:58		17:10 6	08:02 (15)	16:40		16:44
29	05:58		06:31	07:34 (14)	07:04		06:39	07:53 (15)	07:17		07:40
	20:35		19:51 22	07:56 (14)	18:56		17:08 12	08:05 (15)	16:39		16:45
30	05:59		06:32	07:33 (14)	07:05		06:41	07:52 (15)	07:19		07:40
	20:34		19:49 22	07:55 (14)	18:55		17:07 14	08:06 (15)	16:39		16:45
31	06:00		06:33	07:34 (14)			06:42	07:50 (15)			07:40
	20:33		19:47 20	07:54 (14)			17:06 18	08:08 (15)			16:46
Potential sun hours	-280		-145		375		343		294		283
Total, worst case			176		90		50		260		
Sun reduction			0.55		0.55		0.45		0.35		
Oper. time red.			0.86		0.86		0.86		0.86		
Wind dir. red.			0.61		0.61		0.63		0.63		
Total reduction			0.29		0.29		0.25		0.19		
Total, real			51		26		12		50		

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	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, Mid / Northeast part
20 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
1000 meter max shadow distance applied along with default 3° inclination
Sunshine probabilities applied (pdf plots)
Directional run-hours applied from tab file (tower 1)
.

Licensed user:
Wind Engineers, Inc.
7660 Whitegate Avenue
US-RIVERSIDE, CA 92506

Calculated:
03/01/06 21:02/2.4.0.67

SHADOW - Calendar

Calculation: Mid / Northeast part **Shadow receptor:** 694 - 694

Assumptions for shadow calculations

Maximum distance for influence	1,000 m
Minimum sun height over horizon for influence	3 °
Day step for calculation	1 days
Time step for calculation	2 minutes

Sun shine probabilities (part of time from sun rise to sun set with sun shine)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.35	0.45	0.45	0.55	0.55	0.55	0.65	0.55	0.55	0.45	0.35	0.30

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
475	585	238	199	220	474	1,184	813	840	1,246	803	479	7,555

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:40 / 16:47	07:25 / 17:23	06:47 / 17:59	05:54 / 18:35	06:06 / 20:08	05:36 / 20:40	05:36 / 20:52	06:01 / 20:32	06:34 / 19:46	07:07 / 18:53	06:43 / 17:04	07:20 / 16:38
2	07:40 / 16:48	07:24 / 17:24	06:45 / 18:00	05:52 / 18:37	06:05 / 20:09	05:35 / 20:41	05:37 / 20:52	06:02 / 20:31	06:35 / 19:44	07:08 / 18:51	06:44 / 17:03	07:21 / 16:38
3	07:40 / 16:49	07:23 / 17:26	06:44 / 18:02	05:51 / 18:38	06:03 / 20:11	05:35 / 20:41	05:37 / 20:51	06:04 / 20:30	06:36 / 19:42	07:09 / 18:49	06:46 / 17:02	07:22 / 16:38
4	07:40 / 16:50	07:22 / 17:27	06:42 / 18:03	05:49 / 18:39	06:02 / 20:12	05:34 / 20:42	05:38 / 20:51	06:05 / 20:29	06:38 / 19:41	07:10 / 18:48	06:47 / 17:00	07:23 / 16:38
5	07:40 / 16:51	07:21 / 17:28	06:41 / 18:04	06:47 / 19:40	06:01 / 20:13	05:34 / 20:43	05:38 / 20:51	06:06 / 20:28	06:39 / 19:39	07:11 / 18:46	06:48 / 16:59	07:24 / 16:37
6	07:40 / 16:52	07:20 / 17:30	06:39 / 18:05	06:45 / 19:41	06:00 / 20:14	05:34 / 20:44	05:39 / 20:51	06:07 / 20:26	06:40 / 19:37	07:12 / 18:44	06:49 / 16:58	07:25 / 16:37
7	07:40 / 16:53	07:18 / 17:31	06:37 / 18:06	06:44 / 19:42	05:58 / 20:15	05:33 / 20:44	05:40 / 20:51	06:08 / 20:25	06:41 / 19:35	07:13 / 18:43	06:51 / 16:57	07:26 / 16:37
8	07:40 / 16:54	07:17 / 17:32	06:36 / 18:08	06:42 / 19:43	05:57 / 20:16	05:33 / 20:45	05:40 / 20:50	06:09 / 20:24	06:42 / 19:34	07:14 / 18:41	06:52 / 16:56	07:27 / 16:37
9	07:40 / 16:55	07:16 / 17:34 4	08:15 (15) / 08:19 (15)	06:34 / 18:09 / 19:45	05:56 / 20:17	05:33 / 20:46	05:41 / 20:50	06:10 / 20:22	06:43 / 19:32	07:16 / 18:39	06:53 / 16:55	07:28 / 16:37
10	07:40 / 16:56	07:15 / 17:35 12	08:09 (15) / 08:21 (15)	06:32 / 18:10 / 19:46	05:55 / 20:18	05:33 / 20:46	05:42 / 20:49	06:11 / 20:21	06:44 / 19:30	07:17 / 18:38	06:54 / 16:53	07:29 / 16:37
11	07:39 / 16:57	07:13 / 17:36 14	08:08 (15) / 08:22 (15)	06:30 / 18:11 / 19:47	05:53 / 20:19	05:32 / 20:47	05:42 / 20:49	06:12 / 20:20	06:45 / 19:28	07:18 / 18:36	06:56 / 16:52	07:29 / 16:37
12	07:39 / 16:58	07:12 / 17:38 18	08:07 (15) / 08:25 (15)	06:29 / 18:12 / 19:48	05:52 / 20:21	05:32 / 20:47	05:43 / 20:49	06:13 / 20:18	06:46 / 19:27	07:19 / 18:34	06:57 / 16:51	07:30 / 16:37
13	07:39 / 16:59	07:11 / 17:39 20	08:05 (15) / 08:25 (15)	06:27 / 18:14 / 19:49 10	07:31 (14) / 20:22	05:51 / 20:48	05:32 / 20:48	05:44 / 20:17	06:14 / 19:25	07:20 / 18:33	06:58 / 16:50	07:31 / 16:37
14	07:38 / 17:01	07:09 / 17:40 20	08:06 (15) / 08:26 (15)	06:25 / 18:15 / 19:50 14	07:29 (14) / 20:23	05:50 / 20:48	05:32 / 20:47	05:45 / 20:16	06:15 / 19:23	07:21 / 18:31	06:59 / 16:49	07:32 / 16:37
15	07:38 / 17:02	07:08 / 17:41 22	08:04 (15) / 08:26 (15)	06:24 / 18:16 / 19:51 16	07:28 (14) / 20:24	05:49 / 20:49	05:32 / 20:47	05:46 / 20:14	06:16 / 19:21	07:22 / 18:29	07:01 / 16:48	07:33 / 16:38
16	07:37 / 17:03	07:07 / 17:43 20	08:05 (15) / 08:25 (15)	06:22 / 18:17 / 19:52 18	07:26 (14) / 20:25	05:48 / 20:49	05:32 / 20:46	05:46 / 20:13	06:17 / 19:20	07:24 / 18:28	07:02 / 16:48	07:33 / 16:38
17	07:37 / 17:04	07:05 / 17:44 20	08:06 (15) / 08:26 (15)	06:27 / 18:18 / 19:54 20	07:25 (14) / 20:26	05:47 / 20:50	05:32 / 20:46	05:47 / 20:11 10	06:18 / 07:34 (14) / 07:44 (14)	06:51 / 19:18	07:25 / 18:26	07:03 / 16:47	07:34 / 16:38
18	07:36 / 17:05	07:04 / 17:45 22	08:04 (15) / 08:26 (15)	06:26 / 18:19 / 19:55 20	07:25 (14) / 20:27	05:46 / 20:50	05:32 / 20:45	05:48 / 20:10 12	06:19 / 07:33 (14) / 07:45 (14)	06:52 / 19:16	07:26 / 18:24 4	08:45 (15) / 08:49 (15)	07:04 / 16:46	07:35 / 16:39
19	07:36 / 17:06	07:02 / 17:47 20	08:05 (15) / 08:25 (15)	06:17 / 18:21 / 19:56 20	07:24 (14) / 20:28	05:45 / 20:50	05:32 / 20:44	05:49 / 20:08 16	06:20 / 07:30 (14) / 07:46 (14)	06:54 / 19:14	07:27 / 18:23 10	08:40 (15) / 08:50 (15)	07:06 / 16:45	07:35 / 16:39
20	07:35 / 17:08	07:01 / 17:48 18	08:05 (15) / 08:23 (15)	06:15 / 18:22 / 19:57 20	07:24 (14) / 20:29	05:44 / 20:51	05:32 / 20:44	05:50 / 20:07 18	06:22 / 07:29 (14) / 07:47 (14)	06:55 / 19:12	07:28 / 18:21 16	08:37 (15) / 08:53 (15)	07:07 / 16:44	07:36 / 16:39
21	07:34 / 17:09	06:59 / 17:49 18	08:06 (15) / 08:24 (15)	06:13 / 18:23 / 19:58 18	07:24 (14) / 20:30	05:43 / 20:51	05:33 / 20:43	05:51 / 20:05 20	06:23 / 07:28 (14) / 07:48 (14)	06:56 / 19:11	07:30 / 18:20 18	08:37 (15) / 08:55 (15)	07:08 / 16:44	07:36 / 16:40
22	07:34 / 17:10	06:58 / 17:50 14	08:08 (15) / 08:22 (15)	06:11 / 18:24 / 19:59 20	07:23 (14) / 20:31	05:42 / 20:51	05:33 / 20:42	05:52 / 20:04 20	06:24 / 07:27 (14) / 07:47 (14)	06:57 / 19:09	07:31 / 18:18 18	08:36 (15) / 08:54 (15)	07:09 / 16:43	07:37 / 16:40
23	07:33 / 17:11	06:56 / 17:52 8	08:10 (15) / 08:18 (15)	06:10 / 18:25 / 20:00 18	07:23 (14) / 20:32	05:42 / 20:51	05:33 / 20:41	05:53 / 20:02 20	06:25 / 07:28 (14) / 07:48 (14)	06:58 / 19:07	07:32 / 18:17 20	08:35 (15) / 08:55 (15)	07:10 / 16:42	07:37 / 16:41
24	07:32 / 17:13	06:55 / 17:53	06:08 / 18:26	06:16 / 20:00 14	07:26 (14) / 20:33	05:41 / 20:52	05:33 / 20:40	05:54 / 20:01 20	06:26 / 07:27 (14) / 07:47 (14)	06:59 / 19:05	07:33 / 18:15 20	08:34 (15) / 08:54 (15)	07:12 / 16:42	07:38 / 16:41
25	07:32 / 17:14	06:53 / 17:54	06:06 / 18:27	06:15 / 20:02 12	07:27 (14) / 20:34	05:40 / 20:52	05:34 / 20:39	05:54 / 19:57 20	06:27 / 07:28 (14) / 07:48 (14)	07:00 / 19:04	06:34 / 17:14 22	07:34 (15) / 07:56 (15)	07:13 / 16:41	07:38 / 16:42
26	07:31 / 17:15	06:52 / 17:55	06:04 / 18:29	06:13 / 20:03 10	07:27 (14) / 20:35	05:39 / 20:52	05:34 / 20:38	05:55 / 19:56 20	06:28 / 07:27 (14) / 07:47 (14)	07:01 / 19:02	06:36 / 17:12 20	07:35 (15) / 07:55 (15)	07:14 / 16:40	07:39 / 16:43
27	07:30 / 17:17	06:50 / 17:57	06:03 / 18:30	06:12 / 20:04	05:39 / 20:36	05:34 / 20:52	05:56 / 20:37	06:29 / 19:54 18	07:28 (14) / 07:46 (14)	07:02 / 19:00	06:37 / 17:11 20	07:34 (15) / 07:54 (15)	07:15 / 16:40	07:39 / 16:43
28	07:29 / 17:18	06:49 / 17:58	06:01 / 18:31	06:10 / 20:05	05:38 / 20:36	05:35 / 20:52	05:57 / 20:36	06:30 / 19:52 16	07:29 (14) / 07:45 (14)	07:03 / 18:58	06:38 / 17:10 18	07:36 (15) / 07:54 (15)	07:16 / 16:40	07:39 / 16:44
29	07:28 / 17:19		05:59 / 18:32	06:09 / 20:06	05:37 / 20:37	05:35 / 20:52	05:58 / 20:35	06:31 / 19:51 14	07:30 (14) / 07:44 (14)	07:04 / 18:56	06:39 / 17:08 18	07:35 (15) / 07:53 (15)	07:17 / 16:39	07:40 / 16:45
30	07:27 / 17:20		05:57 / 18:33	06:08 / 20:07	05:37 / 20:38	05:36 / 20:52	05:59 / 20:34	06:32 / 19:49 10	07:31 (14) / 07:41 (14)	07:05 / 18:55	06:41 / 17:07 16	07:36 (15) / 07:52 (15)	07:19 / 16:39	07:40 / 16:45
31	07:26 / 17:22		05:56 / 18:34		05:36 / 20:39		06:00 / 20:33	06:33 / 19:47			06:42 / 17:06 14	07:38 (15) / 07:52 (15)		07:40 / 16:46
Potential sun hours	293	295	370	209	-292	-263	-280	-145	375	343	294	283
Total, worst case		250		230				234		234	8	
Sun reduction		0.45		0.55				0.55		0.45	0.35	
Oper. time red.		0.86		0.86				0.86		0.86	0.86	
Wind dir. red.		0.63		0.61				0.61		0.63	0.63	
Total reduction		0.24		0.29				0.29		0.24	0.19	
Total, real		61		67				68		57	2	

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	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, Mid / Northeast part
20 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
1000 meter max shadow distance applied along with default 3° inclination
Sunshine probabilities applied (pdf plots)
Directional run-hours applied from tab file (tower 1)
.

Licensed user:
Wind Engineers, Inc.
7660 Whitegate Avenue
US-RIVERSIDE, CA 92506

Calculated:
03/01/06 21:02/2.4.0.67

SHADOW - Calendar

Calculation: Mid / Northeast part **Shadow receptor:** 695 - 695

Assumptions for shadow calculations

Maximum distance for influence	1,000 m
Minimum sun height over horizon for influence	3 °
Day step for calculation	1 days
Time step for calculation	2 minutes

Sun shine probabilities (part of time from sun rise to sun set with sun shine)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.35	0.45	0.45	0.55	0.55	0.55	0.65	0.55	0.55	0.45	0.35	0.30

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
475	585	238	199	220	474	1,184	813	840	1,246	803	479	7,555

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:40 - 16:47	07:25 - 17:23	06:47 - 17:59	05:54 - 18:35 (16) 06:57 (15) - 07:13 (15)	06:06 - 20:08	05:36 - 20:40	05:36 - 20:52	06:01 - 20:32	06:34 - 19:46	07:07 - 18:53	06:43 - 17:04	07:20 - 16:38
2	07:40 - 16:48	07:24 - 17:24	06:45 - 18:00	05:52 - 18:37 (14) 06:58 (15) - 07:12 (15)	06:05 - 20:09	05:35 - 20:41	05:37 - 20:52	06:03 - 20:31	06:35 - 19:44	07:08 - 18:51	06:44 - 17:03	07:21 - 16:38
3	07:40 - 16:49	07:23 - 17:26	06:44 - 18:02	05:51 - 18:38 (8) 07:00 (15) - 07:08 (15)	06:03 - 20:11	05:35 - 20:41	05:37 - 20:51	06:04 - 20:30	06:36 - 19:42	07:09 - 18:49	06:46 - 17:02	07:22 - 16:38
4	07:40 - 16:50	07:22 - 17:27	06:42 - 18:03	05:49 - 18:39	06:02 - 20:12	05:34 - 20:42	05:38 - 20:51	06:05 - 20:29	06:38 - 19:41	07:10 - 18:48	06:47 - 17:00	07:23 - 16:38
5	07:40 - 16:51	07:21 - 17:28	06:41 - 18:04	06:47 - 19:40	06:01 - 20:13	05:34 - 20:43	05:38 - 20:51	06:06 - 20:28	06:39 - 19:39	07:11 - 18:46	06:48 - 16:59	07:24 - 16:37
6	07:40 - 16:52	07:20 - 17:30	06:39 - 18:05	06:45 - 19:41	06:00 - 20:14	05:34 - 20:44	05:39 - 20:51	06:07 - 20:26	06:40 - 19:37	07:12 - 18:44	06:49 - 16:58	07:25 - 16:37
7	07:40 - 16:53	07:18 - 17:31	06:37 - 18:06	06:44 - 19:42	05:58 - 20:15	05:33 - 20:44	05:40 - 20:51	06:08 - 20:25	06:41 - 19:35	07:13 - 18:43	06:51 - 16:57	07:26 - 16:37
8	07:40 - 16:54	07:17 - 17:32	06:36 - 18:08	06:42 - 19:43	05:57 - 20:16	05:33 - 20:45	05:40 - 20:50	06:09 - 20:24	06:42 - 19:34	07:14 - 18:41	06:52 - 16:56	07:27 - 16:37
9	07:40 - 16:55	07:16 - 17:34	06:34 - 18:09	06:40 - 19:45	05:56 - 20:17	05:33 - 20:46	05:41 - 20:50	06:10 - 20:22	06:43 - 19:32 (6) 07:56 (15) - 08:02 (15)	07:16 - 18:39	06:53 - 16:55	07:28 - 16:37
10	07:40 - 16:56	07:15 - 17:35	06:32 - 18:10	06:39 - 19:46	05:55 - 20:18	05:33 - 20:46	05:42 - 20:49	06:11 - 20:21	06:44 - 19:30 (14) 07:51 (15) - 08:05 (15)	07:17 - 18:38	06:54 - 16:53	07:28 - 16:37
11	07:39 - 16:57	07:13 - 17:36	06:30 - 18:11	06:37 - 19:47	05:53 - 20:19	05:32 - 20:47	05:42 - 20:49	06:12 - 20:20	06:45 - 19:28 (16) 07:50 (15) - 08:06 (15)	07:18 - 18:36	06:56 - 16:52	07:29 - 16:37
12	07:39 - 16:58	07:12 - 17:38	06:29 - 18:12	06:35 - 19:48	05:52 - 20:20	05:32 - 20:47	05:43 - 20:49	06:13 - 20:18	06:46 - 19:27 (18) 07:49 (15) - 08:07 (15)	07:19 - 18:34	06:57 - 16:51	07:30 - 16:37
13	07:39 - 16:59	07:11 - 17:39	06:27 - 18:14	06:34 - 19:49	05:51 - 20:22	05:32 - 20:48	05:44 - 20:48	06:14 - 20:17	06:47 - 19:25 (18) 07:48 (15) - 08:06 (15)	07:20 - 18:33	06:58 - 16:50	07:31 - 16:37
14	07:38 - 17:01	07:09 - 17:40	06:25 - 18:15	06:32 - 19:50	05:50 - 20:23	05:32 - 20:48	05:45 - 20:47	06:15 - 20:16	06:48 - 19:23 (20) 07:47 (15) - 08:07 (15)	07:21 - 18:31	06:59 - 16:49	07:32 - 16:37
15	07:38 - 17:02	07:08 - 17:41	06:24 - 18:16	06:30 - 19:51	05:49 - 20:24	05:32 - 20:49	05:46 - 20:47	06:16 - 20:14	06:49 - 19:21 (20) 07:46 (15) - 08:06 (15)	07:22 - 18:29	07:01 - 16:49	07:33 - 16:38
16	07:37 - 17:03	07:07 - 17:43	06:22 - 18:17	06:29 - 19:52	05:48 - 20:25	05:32 - 20:49	05:46 - 20:46	06:17 - 20:13	06:50 - 19:20 (22) 07:45 (15) - 08:07 (15)	07:24 - 18:28	07:02 - 16:48	07:33 - 16:38
17	07:37 - 17:04	07:05 - 17:44	06:20 - 18:18	06:27 - 19:54	05:47 - 20:26	05:32 - 20:50	05:47 - 20:46	06:18 - 20:11	06:51 - 19:18 (20) 07:46 (15) - 08:06 (15)	07:25 - 18:26	07:03 - 16:47	07:34 - 16:38
18	07:36 - 17:05	07:04 - 17:45	06:18 - 18:19	06:26 - 19:55	05:46 - 20:27	05:32 - 20:50	05:48 - 20:45	06:19 - 20:10	06:52 - 19:16 (20) 07:45 (15) - 08:05 (15)	07:26 - 18:25	07:04 - 16:46	07:35 - 16:39
19	07:36 - 17:06	07:02 - 17:47	06:17 - 18:21	06:24 - 19:56	05:45 - 20:28	05:32 - 20:50	05:49 - 20:44	06:20 - 20:08	06:54 - 19:14 (18) 07:46 (15) - 08:04 (15)	07:27 - 18:23	07:06 - 16:45	07:35 - 16:39
20	07:35 - 17:08	07:01 - 17:48	06:15 - 18:22	06:22 - 19:57	05:44 - 20:29	05:32 - 20:51	05:50 - 20:44	06:22 - 20:07	06:55 - 19:12 (16) 07:47 (15) - 08:03 (15)	07:28 - 18:21	07:07 - 16:44	07:36 - 16:39
21	07:34 - 17:09	06:59 - 17:49	06:13 - 18:23 (4) 07:09 (15) - 07:13 (15)	06:21 - 19:58	05:43 - 20:30	05:33 - 20:51	05:51 - 20:43	06:23 - 20:05	06:56 - 19:11 (12) 07:48 (15) - 08:00 (15)	07:30 - 18:20	07:08 - 16:44	07:36 - 16:40
22	07:34 - 17:10	06:58 - 17:50	06:11 - 18:24 (12) 07:03 (15) - 07:15 (15)	06:19 - 19:59	05:43 - 20:31	05:33 - 20:51	05:52 - 20:42	06:24 - 20:04	06:57 - 19:09 (6) 07:51 (15) - 07:57 (15)	07:31 - 18:18	07:09 - 16:43	07:37 - 16:40
23	07:33 - 17:11	06:56 - 17:52	06:10 - 18:25 (14) 07:01 (15) - 07:15 (15)	06:18 - 20:00	05:42 - 20:32	05:33 - 20:51	05:53 - 20:41	06:25 - 20:02	06:58 - 19:07	07:32 - 18:17	07:10 - 16:42	07:37 - 16:41
24	07:32 - 17:13	06:55 - 17:53	06:08 - 18:26 (18) 06:59 (15) - 07:17 (15)	06:16 - 20:00	05:41 - 20:33	05:33 - 20:52	05:54 - 20:40	06:26 - 20:01	06:59 - 19:05	07:33 - 18:15	07:12 - 16:42	07:38 - 16:41
25	07:32 - 17:14	06:53 - 17:54	06:06 - 18:27 (20) 06:58 (15) - 07:18 (15)	06:15 - 20:02	05:40 - 20:34	05:34 - 20:52	05:55 - 20:39	06:27 - 19:57	07:00 - 19:04	06:34 - 17:14	07:13 - 16:41	07:38 - 16:42
26	07:31 - 17:15	06:52 - 17:55	06:04 - 18:29 (20) 06:58 (15) - 07:18 (15)	06:13 - 20:03	05:39 - 20:35	05:34 - 20:52	05:55 - 20:38	06:28 - 19:56	07:01 - 19:02	06:36 - 17:12	07:14 - 16:41	07:39 - 16:43
27	07:30 - 17:17	06:50 - 17:57	06:03 - 18:30 (22) 06:56 (15) - 07:18 (15)	06:12 - 20:04	05:39 - 20:36	05:34 - 20:52	05:56 - 20:37	06:29 - 19:54	07:02 - 19:00	06:37 - 17:11	07:15 - 16:40	07:39 - 16:43
28	07:29 - 17:18	06:49 - 17:58	06:01 - 18:31 (20) 06:56 (15) - 07:16 (15)	06:10 - 20:05	05:38 - 20:36	05:35 - 20:52	05:57 - 20:36	06:30 - 19:52	07:03 - 18:58	06:38 - 17:10	07:16 - 16:40	07:39 - 16:44
29	07:28 - 17:19		05:59 - 18:32 (20) 06:57 (15) - 07:17 (15)	06:09 - 20:06	05:37 - 20:37	05:35 - 20:52	05:58 - 20:35	06:31 - 19:51	07:04 - 18:56	06:39 - 17:08	07:17 - 16:39	07:40 - 16:45
30	07:27 - 17:20		05:57 - 18:33 (18) 06:57 (15) - 07:15 (15)	06:08 - 20:07	05:37 - 20:38	05:36 - 20:52	05:59 - 20:34	06:32 - 19:49	07:05 - 18:55	06:41 - 17:07	07:18 - 16:39	07:40 - 16:45
31	07:26 - 17:22		05:56 - 18:34 (18) 06:57 (15) - 07:15 (15)		05:36 - 20:39		06:00 - 20:33	06:33 - 19:47		06:42 - 17:06		07:40 - 16:46
Potential sun hours	293	295	370	209	-292	-263	-280	-145	375	343	294	283
Total, worst case			186	38					226			
Sun reduction			0.45	0.55					0.55			
Oper. time red.			0.86	0.86					0.86			
Wind dir. red.			0.60	0.60					0.60			
Total reduction			0.23	0.29					0.29			
Total, real			44	11					65			

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	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, Mid / Northeast part
20 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
1000 meter max shadow distance applied along with default 3° inclination
Sunshine probabilities applied (pdf plots)
Directional run-hours applied from tab file (tower 1)
.

Licensed user:
Wind Engineers, Inc.
7660 Whitegate Avenue
US-RIVERSIDE, CA 92506

Calculated:
03/01/06 21:02/2.4.0.67

SHADOW - Calendar

Calculation: Mid / Northeast part **Shadow receptor:** 698 - 698

Assumptions for shadow calculations

Maximum distance for influence	1,000 m
Minimum sun height over horizon for influence	3 °
Day step for calculation	1 days
Time step for calculation	2 minutes

Sun shine probabilities (part of time from sun rise to sun set with sun shine)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.35	0.45	0.45	0.55	0.55	0.55	0.65	0.55	0.55	0.45	0.35	0.30

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
475	585	238	199	220	474	1,184	813	840	1,246	803	479	7,555

	January		February	March	April	May	June	July	August	September	October	November		December	
1	07:40	15:03 (3)	07:25	06:47	05:54	06:06	05:36	05:36	06:02	06:34	07:07	06:43		07:20	14:54 (3)
	16:47 22	15:25 (3)	17:23	17:59	18:35	20:08	20:40	20:52	20:32	19:46	18:53	17:04		16:38 14	15:08 (3)
2	07:40	15:03 (3)	07:24	06:45	05:52	06:05	05:35	05:37	06:03	06:35	07:08	06:44		07:21	14:53 (3)
	16:48 22	15:25 (3)	17:24	18:00	18:37	20:09	20:41	20:52	20:31	19:44	18:51	17:03		16:38 16	15:09 (3)
3	07:40	15:05 (3)	07:23	06:44	05:51	06:03	05:35	05:37	06:04	06:37	07:09	06:46		07:22	14:54 (3)
	16:49 20	15:25 (3)	17:26	18:02	18:38	20:11	20:41	20:51	20:30	19:42	18:50	17:02		16:38 16	15:10 (3)
4	07:40	15:05 (3)	07:22	06:42	05:49	06:02	05:34	05:38	06:05	06:38	07:10	06:47		07:23	14:53 (3)
	16:50 22	15:27 (3)	17:27	18:03	18:39	20:12	20:42	20:51	20:29	19:41	18:48	17:00		16:38 18	15:11 (3)
5	07:40	15:07 (3)	07:21	06:41	06:47	06:01	05:34	05:38	06:06	06:39	07:11	06:48		07:24	14:54 (3)
	16:51 20	15:27 (3)	17:28	18:04	19:40	20:13	20:43	20:51	20:28	19:39	18:46	16:59		16:37 18	15:12 (3)
6	07:40	15:07 (3)	07:20	06:39	06:45	06:00	05:34	05:39	06:07	06:40	07:12	06:49		07:25	14:53 (3)
	16:52 20	15:27 (3)	17:30	18:05	19:41	20:14	20:44	20:51	20:26	19:37	18:44	16:58		16:37 20	15:13 (3)
7	07:40	15:07 (3)	07:18	06:37	06:44	05:58	05:33	05:40	06:08	06:41	07:13	06:51		07:26	14:54 (3)
	16:53 20	15:27 (3)	17:31	18:06	19:42	20:15	20:44	20:51	20:25	19:35	18:43	16:57		16:37 20	15:14 (3)
8	07:40	15:09 (3)	07:17	06:36	06:42	05:57	05:33	05:40	06:09	06:42	07:14	06:52		07:27	14:53 (3)
	16:54 18	15:27 (3)	17:32	18:08	19:43	20:16	20:45	20:50	20:24	19:34	18:41	16:56		16:37 22	15:15 (3)
9	07:40	15:10 (3)	07:16	06:34	06:40	05:56	05:33	05:41	06:10	06:43	07:16	06:53		07:28	14:54 (3)
	16:55 16	15:26 (3)	17:34	18:09	19:45	20:17	20:46	20:50	20:22	19:32	18:39	16:55		16:37 22	15:16 (3)
10	07:40	15:10 (3)	07:15	06:32	06:39	05:55	05:33	05:42	06:11	06:44	07:17	06:54		07:29	14:53 (3)
	16:56 16	15:26 (3)	17:35	18:10	19:46	20:18	20:46	20:49	20:21	19:30	18:38	16:54		16:37 22	15:15 (3)
11	07:39	15:12 (3)	07:13	06:30	06:37	05:54	05:32	05:42	06:12	06:45	07:18	06:56		07:29	14:54 (3)
	16:57 14	15:26 (3)	17:36	18:11	19:47	20:19	20:47	20:49	20:20	19:28	18:36	16:52		16:37 22	15:16 (3)
12	07:39	15:13 (3)	07:12	06:29	06:35	05:52	05:32	05:43	06:13	06:46	07:19	06:57		07:30	14:55 (3)
	16:58 12	15:25 (3)	17:38	18:12	19:48	20:21	20:47	20:49	20:18	19:27	18:34	16:51		16:37 22	15:17 (3)
13	07:39	15:15 (3)	07:11	06:27	06:34	05:51	05:32	05:44	06:14	06:47	07:20	06:58		07:31	14:55 (3)
	16:59 10	15:25 (3)	17:39	18:14	19:49	20:22	20:48	20:48	20:17	19:25	18:33	16:50		16:37 22	15:17 (3)
14	07:38	15:18 (3)	07:09	06:25	06:32	05:50	05:32	05:45	06:15	06:48	07:21	06:59		07:32	14:54 (3)
	17:01 4	15:22 (3)	17:40	18:15	19:50	20:23	20:48	20:47	20:16	19:23	18:31	16:49		16:37 24	15:18 (3)
15	07:38		07:08	06:24	06:30	05:49	05:32	05:46	06:16	06:49	07:22	07:01		07:33	14:55 (3)
	17:02		17:41	18:16	19:51	20:24	20:49	20:47	20:14	19:21	18:29	16:49		16:38 24	15:19 (3)
16	07:37		07:07	06:22	06:29	05:48	05:32	05:46	06:17	06:50	07:24	07:02		07:33	14:56 (3)
	17:03		17:43	18:17	19:53	20:25	20:49	20:46	20:13	19:20	18:28	16:48		16:38 24	15:20 (3)
17	07:37		07:05	06:20	06:27	05:47	05:32	05:47	06:18	06:51	07:25	07:03		07:34	14:56 (3)
	17:04		17:44	18:18	19:54	20:26	20:50	20:46	20:11	19:18	18:26	16:47		16:38 24	15:20 (3)
18	07:36		07:04	06:18	06:26	05:46	05:32	05:48	06:19	06:52	07:26	07:04		07:35	14:57 (3)
	17:05		17:45	18:19	19:55	20:27	20:50	20:45	20:10	19:16	18:25	16:46		16:39 22	15:19 (3)
19	07:36		07:02	06:17	06:24	05:45	05:32	05:49	06:20	06:54	07:27	07:06		07:35	14:58 (3)
	17:07		17:47	18:21	19:56	20:28	20:50	20:44	20:08	19:14	18:23	16:45		16:39 22	15:20 (3)
20	07:35		07:01	06:15	06:22	05:44	05:33	05:50	06:22	06:55	07:28	07:07		07:36	14:58 (3)
	17:08		17:48	18:22	19:57	20:29	20:51	20:44	20:07	19:12	18:21	16:44		16:39 22	15:20 (3)
21	07:34		07:00	06:13	06:21	05:43	05:33	05:51	06:23	06:56	07:30	07:08		07:36	14:59 (3)
	17:09		17:49	18:23	19:58	20:30	20:51	20:43	20:05	19:11	18:20	16:44		16:40 22	15:21 (3)
22	07:34		06:58	06:11	06:19	05:43	05:33	05:52	06:24	06:57	07:31	07:09		07:37	14:59 (3)
	17:10		17:50	18:24	19:59	20:31	20:51	20:42	20:04	19:09	18:18	16:43		16:40 22	15:21 (3)
23	07:33		06:56	06:10	06:18	05:42	05:33	05:53	06:25	06:58	07:32	07:10		07:37	14:59 (3)
	17:11		17:52	18:25	20:00	20:32	20:51	20:41	20:02	19:07	18:17	16:42		16:41 22	15:21 (3)
24	07:32		06:55	06:08	06:16	05:41	05:33	05:54	06:26	06:59	07:33	07:12		07:38	15:00 (3)
	17:13		17:53	18:26	20:00	20:33	20:52	20:40	20:01	19:05	18:15	16:42		16:41 22	15:22 (3)
25	07:32		06:53	06:06	06:15	05:40	05:34	05:55	06:27	07:00	06:34	07:13		07:38	15:00 (3)
	17:14		17:54	18:27	20:02	20:34	20:52	20:39	19:57	19:04	17:14	16:41		16:42 22	15:22 (3)
26	07:31		06:52	06:04	06:13	05:39	05:34	05:56	06:28	07:01	06:36	07:14		07:39	15:01 (3)
	17:15		17:55	18:29	20:03	20:35	20:52	20:38	19:56	19:02	17:12	16:41		16:43 22	15:23 (3)
27	07:30		06:50	06:03	06:12	05:39	05:34	05:56	06:29	07:02	06:37	07:15		07:39	15:01 (3)
	17:17		17:57	18:30	20:04	20:36	20:52	20:37	19:54	19:00	17:11	16:40		16:43 24	15:25 (3)
28	07:29		06:49	06:01	06:10	05:38	05:35	05:57	06:30	07:03	06:38	07:16	14:58 (3)	07:39	15:01 (3)
	17:18		17:58	18:31	20:05	20:36	20:52	20:36	19:52	18:58	17:10	16:40 4	15:02 (3)	16:44 24	15:25 (3)
29	07:28			05:59	06:09	05:37	05:35	05:58	06:31	07:04	06:39	07:17	14:56 (3)	07:40	15:01 (3)
	17:19			18:32	20:06	20:37	20:52	20:35	19:51	18:57	17:08	16:39 10	15:06 (3)	16:45 24	15:25 (3)
30	07:27			05:57	06:08	05:37	05:36	05:59	06:32	07:05	06:41	07:19	14:55 (3)	07:40	15:03 (3)
	17:21			18:33	20:07	20:38	20:52	20:34	19:49	18:55	17:07	16:39 12	15:07 (3)	16:45 22	15:25 (3)
31	07:26			05:56		05:36		06:00	06:33		06:42			07:40	15:03 (3)
	17:22			18:34		20:39		20:33	19:47		17:06			16:46 22	15:25 (3)
Potential sun hours	293		295	370	209	-292	-263	-280	-145	375	343	294		283	
Total, worst case		236											26		664
Sun reduction		0.35											0.35		0.30
Oper. time red.		0.86											0.86		0.86
Wind dir. red.		0.65											0.65		0.65
Total reduction		0.20											0.20		0.17
Total, real		46											5		112

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	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, Mid / Northeast part
20 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
1000 meter max shadow distance applied along with default 3° inclination
Sunshine probabilities applied (pdf plots)
Directional run-hours applied from tab file (tower 1)
.

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Wind Engineers, Inc.
7660 Whitegate Avenue
US-RIVERSIDE, CA 92506

Calculated:
03/01/06 21:02/2.4.0.67

SHADOW - Calendar

Calculation: Mid / Northeast part **Shadow receptor:** 699 - 699

Assumptions for shadow calculations

Maximum distance for influence	1,000 m
Minimum sun height over horizon for influence	3 °
Day step for calculation	1 days
Time step for calculation	2 minutes

Sun shine probabilities (part of time from sun rise to sun set with sun shine)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.35	0.45	0.45	0.55	0.55	0.55	0.65	0.55	0.55	0.45	0.35	0.30

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
475	585	238	199	220	474	1,184	813	840	1,246	803	479	7,555

	January		February	March	April	May	June	July	August	September	October	November	December		
1	07:40		07:25	06:47	05:54	06:06	05:36	05:36	06:02	06:34	07:07	06:43	07:20		
	16:47	8	17:23	17:59	18:35	20:08	20:40	20:52	20:32	19:46	18:53	17:04	16:38		
2	07:40		07:24	06:45	05:52	06:05	05:35	05:37	06:03	06:35	07:08	06:44	07:21		
	16:48	4	17:24	18:00	18:37	20:09	20:41	20:52	20:31	19:44	18:51	17:03	16:38		
3	07:40		07:23	06:44	05:51	06:03	05:35	05:37	06:04	06:37	07:09	06:46	07:22		
	16:49		17:26	18:02	18:38	20:11	20:41	20:51	20:30	19:42	18:50	17:02	16:38		
4	07:40		07:22	06:42	05:49	06:02	05:34	05:38	06:05	06:38	07:10	06:47	07:23		
	16:50		17:27	18:03	18:39	20:12	20:42	20:51	20:29	19:41	18:48	17:00	16:38		
5	07:40		07:21	06:41	06:47	06:01	05:34	05:38	06:06	06:39	07:11	06:48	07:24		
	16:51		17:28	18:04	19:40	20:13	20:43	20:51	20:28	19:39	18:46	16:59	16:37		
6	07:40		07:20	06:39	06:45	06:00	05:34	05:39	06:07	06:40	07:12	06:49	07:25		
	16:52		17:30	18:05	19:41	20:14	20:44	20:51	20:26	19:37	18:44	16:58	16:37		
7	07:40		07:18	06:37	06:44	05:58	05:33	05:40	06:08	06:41	07:13	06:51	07:26		
	16:53		17:31	18:06	19:42	20:15	20:44	20:51	20:25	19:35	18:43	16:57	16:37		
8	07:40		07:17	06:36	06:42	05:57	05:33	05:40	06:09	06:42	07:14	06:52	07:27		
	16:54		17:32	18:08	19:43	20:16	20:45	20:50	20:24	19:34	18:41	16:56	16:37		
9	07:40		07:16	06:34	06:40	05:56	05:33	05:41	06:10	06:43	07:16	06:53	07:28		
	16:55		17:34	18:09	19:45	20:17	20:46	20:50	20:22	19:32	18:39	16:55	16:37		
10	07:40		07:15	06:32	06:39	05:55	05:33	05:42	06:11	06:44	07:17	06:54	07:29		14:49 (3)
	16:56		17:35	18:10	19:46	20:18	20:46	20:49	20:21	19:30	18:38	16:54	16:37	4	14:53 (3)
11	07:39		07:13	06:30	06:37	05:54	05:32	05:42	06:12	06:45	07:18	06:56	07:29		14:48 (3)
	16:57		17:36	18:11	19:47	20:19	20:47	20:49	20:20	19:28	18:36	16:52	16:37	8	14:56 (3)
12	07:39		07:12	06:29	06:35	05:52	05:32	05:43	06:13	06:46	07:19	06:57	07:30		14:49 (3)
	16:58		17:38	18:12	19:48	20:21	20:47	20:49	20:18	19:27	18:34	16:51	16:37	8	14:57 (3)
13	07:39		07:11	06:27	06:34	05:51	05:32	05:44	06:14	06:47	07:20	06:58	07:31		14:47 (3)
	16:59		17:39	18:14	19:49	20:22	20:48	20:48	20:17	19:25	18:33	16:50	16:37	10	14:57 (3)
14	07:38		07:09	06:25	06:32	05:50	05:32	05:45	06:15	06:48	07:21	06:59	07:32		14:48 (3)
	17:01		17:40	18:15	19:50	20:23	20:48	20:47	20:16	19:23	18:31	16:49	16:37	10	14:58 (3)
15	07:38		07:08	06:24	06:30	05:49	05:32	05:46	06:16	06:49	07:22	07:01	07:33		14:47 (3)
	17:02		17:41	18:16	19:51	20:24	20:49	20:47	20:14	19:21	18:29	16:49	16:38	14	15:01 (3)
16	07:37		07:07	06:22	06:29	05:48	05:32	05:46	06:17	06:50	07:24	07:02	07:33		14:48 (3)
	17:03		17:43	18:17	19:53	20:25	20:49	20:46	20:13	19:20	18:28	16:48	16:38	14	15:02 (3)
17	07:37		07:05	06:20	06:27	05:47	05:32	05:47	06:18	06:51	07:25	07:03	07:34		14:48 (3)
	17:04		17:44	18:18	19:54	20:26	20:50	20:46	20:11	19:18	18:26	16:47	16:38	14	15:02 (3)
18	07:36		07:04	06:18	06:26	05:46	05:32	05:48	06:19	06:52	07:26	07:04	07:35		14:47 (3)
	17:05		17:45	18:19	19:55	20:27	20:50	20:45	20:10	19:16	18:25	16:46	16:39	16	15:03 (3)
19	07:36		07:02	06:17	06:24	05:45	05:32	05:49	06:20	06:54	07:27	07:06	07:35		14:48 (3)
	17:07		17:47	18:21	19:56	20:28	20:50	20:44	20:08	19:14	18:23	16:45	16:39	16	15:04 (3)
20	07:35		07:01	06:15	06:22	05:44	05:33	05:50	06:22	06:55	07:28	07:07	07:36		14:48 (3)
	17:08		17:48	18:22	19:57	20:29	20:51	20:44	20:07	19:12	18:21	16:44	16:39	16	15:04 (3)
21	07:34		07:00	06:13	06:21	05:43	05:33	05:51	06:23	06:56	07:30	07:08	07:36		14:49 (3)
	17:09		17:49	18:23	19:58	20:30	20:51	20:43	20:05	19:11	18:20	16:44	16:40	16	15:05 (3)
22	07:34		06:58	06:11	06:19	05:43	05:33	05:52	06:24	06:57	07:31	07:09	07:37		14:49 (3)
	17:10		17:50	18:24	19:59	20:31	20:51	20:42	20:04	19:09	18:18	16:43	16:40	16	15:05 (3)
23	07:33		06:56	06:10	06:18	05:42	05:33	05:53	06:25	06:58	07:32	07:10	07:37		14:49 (3)
	17:11		17:52	18:25	20:00	20:32	20:51	20:41	20:02	19:07	18:17	16:42	16:41	16	15:05 (3)
24	07:32		06:55	06:08	06:16	05:41	05:33	05:54	06:26	06:59	07:33	07:12	07:38		14:50 (3)
	17:13		17:53	18:26	20:00	20:33	20:52	20:40	20:01	19:05	18:15	16:42	16:41	16	15:06 (3)
25	07:32		06:53	06:06	06:15	05:40	05:34	05:55	06:27	07:00	06:34	07:13	07:38		14:50 (3)
	17:14		17:54	18:27	20:02	20:34	20:52	20:39	19:57	19:04	17:14	16:41	16:42	16	15:06 (3)
26	07:31		06:52	06:04	06:13	05:39	05:34	05:56	06:28	07:01	06:36	07:14	07:39		14:51 (3)
	17:15		17:55	18:29	20:03	20:35	20:52	20:38	19:56	19:02	17:12	16:41	16:43	16	15:07 (3)
27	07:30		06:50	06:03	06:12	05:39	05:34	05:56	06:29	07:02	06:37	07:15	07:39		14:53 (3)
	17:17		17:57	18:30	20:04	20:36	20:52	20:37	19:54	19:00	17:11	16:40	16:43	14	15:07 (3)
28	07:29		06:49	06:01	06:10	05:38	05:35	05:57	06:30	07:03	06:38	07:16	07:39		14:53 (3)
	17:18		17:58	18:31	20:05	20:36	20:52	20:36	19:52	18:58	17:10	16:40	16:44	14	15:07 (3)
29	07:28			05:59	06:09	05:37	05:35	05:58	06:31	07:04	06:39	07:17	07:40		14:53 (3)
	17:19			18:32	20:06	20:37	20:52	20:35	19:51	18:57	17:08	16:39	16:45	14	15:07 (3)
30	07:27			05:57	06:08	05:37	05:36	05:59	06:32	07:05	06:41	07:19	07:40		14:55 (3)
	17:21			18:33	20:07	20:38	20:52	20:34	19:49	18:55	17:07	16:39	16:45	10	15:05 (3)
31	07:26			05:56		05:36		06:00	06:33		06:42		07:40		14:55 (3)
	17:22			18:34		20:39		20:33	19:47		17:06		16:46	10	15:05 (3)
Potential sun hours	293		295	370	209	-292	-263	-280	-145	375	343	294	283		
Total, worst case		12												288	
Sun reduction		0.35												0.30	
Oper. time red.		0.86												0.86	
Wind dir. red.		0.66												0.66	
Total reduction		0.20												0.17	
Total, real		2												49	

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	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, Mid / Northeast part
20 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
1000 meter max shadow distance applied along with default 3° inclination
Sunshine probabilities applied (pdf plots)
Directional run-hours applied from tab file (tower 1)
.

Printed/Page
03/05/06 23:23 / 18
Licensed user:
Wind Engineers, Inc.
7660 Whitegate Avenue
US-RIVERSIDE, CA 92506

Calculated:
03/01/06 21:02/2.4.0.67

SHADOW - Calendar

Calculation: Mid / Northeast part **Shadow receptor:** 705 - 705

Assumptions for shadow calculations

Maximum distance for influence	1,000 m
Minimum sun height over horizon for influence	3 °
Day step for calculation	1 days
Time step for calculation	2 minutes

Sun shine probabilities (part of time from sun rise to sun set with sun shine)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.35	0.45	0.45	0.55	0.55	0.55	0.65	0.55	0.55	0.45	0.35	0.30

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
475	585	238	199	220	474	1,184	813	840	1,246	803	479	7,555

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:40	07:25 07:46 (12)	06:47 07:43 (12)	05:54	06:06	05:36	05:36	06:01	06:34	07:06	06:43 07:05 (12)	07:20
	16:47	17:23 22 08:08 (12)	17:59 24 08:07 (12)	18:35	20:08	20:40	20:52	20:32	19:46	18:53	17:04 44 07:49 (12)	16:38
2	07:40	07:24 07:45 (12)	06:45 07:45 (12)	05:52	06:05	05:35	05:37	06:02	06:35	07:08	06:44 07:06 (12)	07:21
	16:48	17:24 26 08:11 (12)	18:00 20 08:05 (12)	18:37	20:09	20:41	20:52	20:31	19:44	18:51	17:03 42 07:48 (12)	16:38
3	07:40	07:23 07:44 (12)	06:44 07:50 (12)	05:50	06:03	05:35	05:37	06:03	06:36	07:09	06:45 07:08 (12)	07:22
	16:49	17:26 28 08:12 (12)	18:01 10 08:00 (12)	18:38	20:11	20:41	20:51	20:30	19:42	18:49	17:02 40 07:48 (12)	16:38
4	07:40	07:22 07:43 (12)	06:42	05:49	06:02	05:34	05:38	06:04	06:37	07:10	06:47 07:09 (12)	07:23
	16:50	17:27 30 08:13 (12)	18:03	18:39	20:12	20:42	20:51	20:29	19:41	18:48	17:00 38 07:47 (12)	16:37
5	07:40	07:21 07:41 (12)	06:40	06:47	06:01	05:34	05:38	06:06	06:39	07:11	06:48 07:10 (12)	07:24
	16:51	17:28 34 08:15 (12)	18:04	19:40	20:13	20:43	20:51	20:27	19:39	18:46	16:59 36 07:46 (12)	16:37
6	07:40	07:20 07:40 (12)	06:39	06:45	05:59	05:34	05:39	06:07	06:40	07:12	06:49 07:12 (12)	07:25
	16:52	17:30 36 08:16 (12)	18:05	19:41	20:14	20:44	20:51	20:26	19:37	18:44	16:58 34 07:46 (12)	16:37
7	07:40	07:18 07:39 (12)	06:37	06:44	05:58	05:33	05:39	06:08	06:41	07:13	06:50 07:13 (12)	07:26
	16:53	17:31 38 08:17 (12)	18:06	19:42	20:15	20:44	20:50	20:25	19:35	18:43	16:57 30 07:43 (12)	16:37
8	07:40	07:17 07:38 (12)	06:35	06:42	05:57	05:33	05:40	06:09	06:42	07:14	06:52 07:14 (12)	07:27
	16:54	17:32 40 08:18 (12)	18:08	19:43	20:16	20:45	20:50	20:24	19:34	18:41	16:56 28 07:42 (12)	16:37
9	07:40	07:16 07:36 (12)	06:34	06:40	05:56	05:33	05:41	06:10	06:43	07:15	06:53 07:16 (12)	07:28
	16:55	17:34 42 08:18 (12)	18:09	19:44	20:17	20:46	20:50	20:22	19:32	18:39	16:54 26 07:42 (12)	16:37
10	07:39	07:15 07:35 (12)	06:32	06:39	05:55	05:33	05:42	06:11	06:44	07:17	06:54 07:17 (12)	07:28
	16:56	17:35 44 08:19 (12)	18:10	19:46	20:18	20:46	20:49	20:21	19:30	18:37	16:53 22 07:39 (12)	16:37
11	07:39	07:13 07:34 (12)	06:30	06:37	05:53	05:32	05:42	06:12	06:45	07:18 08:20 (12)	06:56 07:18 (12)	07:29
	16:57	17:36 46 08:20 (12)	18:11	19:47	20:19	20:47	20:49	20:20	19:28	18:36 16 08:36 (12)	16:52 20 07:38 (12)	16:37
12	07:39	07:12 07:34 (12)	06:29	06:35	05:52	05:32	05:43	06:13	06:46	07:19 08:17 (12)	06:57 07:20 (12)	07:30
	16:58	17:37 46 08:20 (12)	18:12	19:48	20:20	20:47	20:48	20:18	19:27	18:34 22 08:39 (12)	16:51 16 07:36 (12)	16:37
13	07:39	07:11 07:33 (12)	06:27	06:34	05:51	05:32	05:44	06:14	06:47	07:20 08:15 (12)	06:58 07:25 (12)	07:31
	16:59	17:39 46 08:19 (12)	18:13	19:49	20:22	20:48	20:48	20:17	19:25	18:32 26 08:41 (12)	16:50 4 07:29 (12)	16:37
14	07:38	07:09 07:34 (12)	06:25	06:32	05:50	05:32	05:45	06:15	06:48	07:21 08:12 (12)	06:59	07:32
	17:00	17:40 46 08:20 (12)	18:15	19:50	20:23	20:48	20:47	20:16	19:23	18:31 32 08:44 (12)	16:49	16:37
15	07:38	07:08 07:34 (12)	06:24	06:30	05:49	05:32	05:45	06:16	06:49	07:22 08:11 (12)	07:01	07:32
	17:02	17:41 46 08:20 (12)	18:16	19:51	20:24	20:49	20:47	20:14	19:21	18:29 34 08:45 (12)	16:48	16:38
16	07:37	07:07 07:33 (12)	06:22	06:29	05:48	05:32	05:46	06:17	06:50	07:24 08:10 (12)	07:02	07:33
	17:03	17:43 48 08:21 (12)	18:17	19:52	20:25	20:49	20:46	20:13	19:19	18:28 36 08:46 (12)	16:47	16:38
17	07:37	07:05 07:33 (12)	06:20	06:27	05:47	05:32	05:47	06:18	06:51	07:25 08:07 (12)	07:03	07:34
	17:04	17:44 46 08:19 (12)	18:18	19:54	20:26	20:50	20:46	20:11	19:18	18:26 40 08:47 (12)	16:47	16:38
18	07:36	07:04 07:34 (12)	06:18	06:25	05:46	05:32	05:48	06:19	06:52	07:26 08:07 (12)	07:04	07:35
	17:05	17:45 46 08:20 (12)	18:19	19:55	20:27	20:50	20:45	20:10	19:16	18:24 40 08:47 (12)	16:46	16:38
19	07:36	07:02 07:34 (12)	06:17	06:24	05:45	05:32	05:49	06:20	06:53	07:27 08:06 (12)	07:06	07:35
	17:06	17:46 44 08:18 (12)	18:20	19:56	20:28	20:50	20:44	20:08	19:14	18:23 42 08:48 (12)	16:45	16:39
20	07:35	07:01 07:35 (12)	06:15	06:22	05:44	05:32	05:50	06:21	06:54	07:28 08:05 (12)	07:07	07:36
	17:08	17:48 44 08:19 (12)	18:22	19:57	20:29	20:51	20:43	20:07	19:12	18:21 44 08:49 (12)	16:44	16:39
21	07:34	06:59 07:33 (12)	06:13	06:21	05:43	05:33	05:51	06:22	06:56	07:29 08:04 (12)	07:08	07:36
	17:09	17:49 44 08:17 (12)	18:23	19:58	20:30	20:51	20:43	20:05	19:11	18:20 44 08:48 (12)	16:43	16:40
22	07:34	06:58 07:34 (12)	06:11	06:19	05:42	05:33	05:52	06:24	06:57	07:31 08:04 (12)	07:09	07:37
	17:10	17:50 44 08:18 (12)	18:24	19:59	20:31	20:51	20:42	20:04	19:09	18:18 46 08:50 (12)	16:43	16:40
23	07:33	06:56 07:36 (12)	06:10	06:18	05:42	05:33	05:52	06:25	06:58	07:32 08:03 (12)	07:10	07:37
	17:11	17:52 40 08:16 (12)	18:25	20:00	20:32	20:51	20:41	20:02	19:07	18:17 46 08:49 (12)	16:42	16:41
24	07:32	06:55 07:37 (12)	06:08	06:16	05:41	05:33	05:53	06:26	06:59	07:33 08:04 (12)	07:12	07:38
	17:13	17:53 38 08:15 (12)	18:26	20:00	20:33	20:51	20:40	20:00	19:05	18:15 46 08:50 (12)	16:42	16:41
25	07:31	06:53 07:37 (12)	06:06	06:15	05:40	05:34	05:54	06:27	07:00	06:34 07:04 (12)	07:13	07:38
	17:14	17:54 38 08:15 (12)	18:27	20:01	20:34	20:52	20:39	19:57	19:03	17:14 46 07:50 (12)	16:41	16:42
26	07:31	06:52 07:38 (12)	06:04	06:13	05:39	05:34	05:55	06:28	07:01	06:36 07:03 (12)	07:14	07:39
	17:15	17:55 36 08:14 (12)	18:29	20:03	20:35	20:52	20:38	19:56	19:02	17:12 46 07:49 (12)	16:40	16:42
27	07:30	06:50 07:40 (12)	06:03	06:12	05:39	05:34	05:56	06:29	07:02	06:37 07:04 (12)	07:15	07:39
	17:16	17:57 32 08:12 (12)	18:30	20:04	20:35	20:52	20:37	19:54	19:00	17:11 46 07:50 (12)	16:40	16:43
28	07:29	06:49 07:40 (12)	06:01	06:10	05:38	05:35	05:57	06:30	07:03	06:38 07:04 (12)	07:16	07:39
	17:18	17:58 30 08:10 (12)	18:31	20:05	20:36	20:52	20:36	19:52	18:58	17:10 46 07:50 (12)	16:39	16:44
29	07:28 07:53 (12)		05:59	06:09	05:37	05:35	05:58	06:31	07:04	06:39 07:03 (12)	07:17	07:39
	17:19 6 07:59 (12)		18:32	20:06	20:37	20:52	20:35	19:51	18:56	17:08 46 07:49 (12)	16:39	16:45
30	07:27 07:48 (12)		05:57	06:07	05:37	05:36	05:59	06:32	07:05	06:40 07:04 (12)	07:18	07:40
	17:20 16 08:04 (12)		18:33	20:07	20:38	20:52	20:34	19:49	18:55	17:07 44 07:48 (12)	16:39	16:45
31	07:26 07:47 (12)		05:56		05:36		06:00	06:33		06:42 07:03 (12)		07:40
	17:22 20 08:07 (12)		18:34		20:39		20:33	19:47		17:05 46 07:49 (12)		16:46
Potential sun hours	293	295	370	209	-292	-263	-280	-145	375	343	294	283
Total, worst case	42	1100	54							834	380	
Sun reduction	0.35	0.45	0.45							0.45	0.35	
Oper. time red.	0.86	0.86	0.86							0.86	0.86	
Wind dir. red.	0.62	0.62	0.62							0.62	0.62	
Total reduction	0.19	0.24	0.24							0.24	0.19	
Total, real	8	266	13							202	72	

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	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, Mid / Northeast part
20 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
1000 meter max shadow distance applied along with default 3° inclination
Sunshine probabilities applied (pdf plots)
Directional run-hours applied from tab file (tower 1)
.

Licensed user:
Wind Engineers, Inc.
7660 Whitegate Avenue
US-RIVERSIDE, CA 92506

Calculated:
03/01/06 21:02/2.4.0.67

SHADOW - Calendar

Calculation: Mid / Northeast part **Shadow receptor:** 706 - 706

Assumptions for shadow calculations

Maximum distance for influence	1,000 m
Minimum sun height over horizon for influence	3 °
Day step for calculation	1 days
Time step for calculation	2 minutes

Sun shine probabilities (part of time from sun rise to sun set with sun shine)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.35	0.45	0.45	0.55	0.55	0.55	0.65	0.55	0.55	0.45	0.35	0.30

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
475	585	238	199	220	474	1,184	813	840	1,246	803	479	7,555

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:40	07:25	06:47	07:09 (12)	05:54	06:06	05:36	05:36	06:01	06:34	07:06	07:37 (12)	06:43	07:20
	16:47	17:23	17:59 36	07:45 (12)	18:35	20:08	20:40	20:52	20:32	19:46	18:53 54	08:31 (12)	17:04	16:38
2	07:40	07:24	06:45	07:07 (12)	05:52	06:05	05:35	05:37	06:02	06:35	07:08	07:36 (12)	06:44	07:21
	16:48	17:24	18:00 40	07:47 (12)	18:37	20:09	20:41	20:52	20:31	19:44	18:51 54	08:30 (12)	17:03	16:38
3	07:40	07:23	06:44	07:06 (12)	05:50	06:03	05:35	05:37	06:03	06:36	07:09	07:37 (12)	06:45	07:22
	16:49	17:26	18:01 42	07:48 (12)	18:38	20:11	20:41	20:51	20:30	19:42	18:49 52	08:29 (12)	17:02	16:38
4	07:40	07:22	06:42	07:04 (12)	05:49	06:02	05:34	05:38	06:04	06:37	07:10	07:36 (12)	06:47	07:23
	16:50	17:27	18:03 44	07:48 (12)	18:39	20:12	20:42	20:51	20:29	19:41	18:48 52	08:28 (12)	17:00	16:37
5	07:40	07:21	06:40	07:02 (12)	06:47	06:01	05:34	05:38	06:06	06:39	07:11	07:37 (12)	06:48	07:24
	16:51	17:28	18:04 48	07:50 (12)	19:40	20:13	20:43	20:51	20:27	19:39	18:46 50	08:27 (12)	16:59	16:37
6	07:40	07:20	06:39	07:03 (12)	06:45	05:59	05:34	05:39	06:07	06:40	07:12	07:36 (12)	06:49	07:25
	16:52	17:30	18:05 48	07:51 (12)	19:41	20:14	20:44	20:51	20:26	19:37	18:44 50	08:26 (12)	16:58	16:37
7	07:40	07:18	06:37	07:01 (12)	06:44	05:58	05:33	05:39	06:08	06:41	07:13	07:37 (12)	06:50	07:26
	16:53	17:31	18:06 50	07:51 (12)	19:42	20:15	20:44	20:50	20:25	19:35	18:43 48	08:25 (12)	16:57	16:37
8	07:40	07:17	06:35	06:59 (12)	06:42	05:57	05:33	05:40	06:09	06:42	07:14	07:37 (12)	06:52	07:27
	16:54	17:32	18:08 52	07:51 (12)	19:43	20:16	20:45	20:50	20:24	19:34	18:41 48	08:25 (12)	16:56	16:37
9	07:40	07:16	06:34	06:59 (12)	06:40	05:56	05:33	05:41	06:10	06:43	07:15	07:38 (12)	06:53	07:28
	16:55	17:34	18:09 52	07:51 (12)	19:44	20:17	20:45	20:50	20:22	19:32	18:39 46	08:24 (12)	16:54	16:37
10	07:39	07:15	06:32	06:58 (12)	06:39	05:55	05:33	05:42	06:11	06:44	07:17	07:39 (12)	06:54	07:28
	16:56	17:35	18:10 54	07:52 (12)	19:46	20:18	20:46	20:49	20:21	19:30	18:37 44	08:23 (12)	16:53	16:37
11	07:39	07:13	06:30	06:58 (12)	06:37	05:53	05:32	05:42	06:12	06:45	07:18	07:40 (12)	06:56	07:29
	16:57	17:36	18:11 54	07:52 (12)	19:47	20:19	20:47	20:49	20:20	19:28	18:36 40	08:20 (12)	16:52	16:37
12	07:39	07:12	06:29	06:56 (12)	06:35	05:52	05:32	05:43	06:13	06:46	08:05 (12)	07:19	07:41 (12)	06:57	07:30
	16:58	17:37	18:12 54	07:50 (12)	19:48	20:20	20:47	20:48	20:18	19:27 8	08:13 (12)	18:34 38	08:19 (12)	16:51	16:37
13	07:39	07:11	06:27	06:56 (12)	06:34	05:51	05:32	05:44	06:14	06:47	08:00 (12)	07:20	07:43 (12)	06:58	07:31
	16:59	17:39	18:13 54	07:50 (12)	19:49	20:22	20:48	20:48	20:17	19:25 18	08:18 (12)	18:32 34	08:17 (12)	16:50	16:37
14	07:38	07:09	06:25	06:57 (12)	06:32	05:50	05:32	05:45	06:15	06:48	07:55 (12)	07:21	07:44 (12)	06:59	07:32
	17:00	17:40	18:15 54	07:51 (12)	19:50	20:23	20:48	20:47	20:16	19:23 26	08:21 (12)	18:31 32	08:16 (12)	16:49	16:37
15	07:38	07:08	06:24	06:57 (12)	06:30	05:49	05:32	05:45	06:16	06:49	07:54 (12)	07:22	07:47 (12)	07:01	07:32
	17:02	17:41	18:16 54	07:51 (12)	19:51	20:24	20:49	20:47	20:14	19:21 30	08:24 (12)	18:29 26	08:13 (12)	16:48	16:38
16	07:37	07:07	06:22	06:55 (12)	06:29	05:48	05:32	05:46	06:17	06:50	07:51 (12)	07:24	07:50 (12)	07:02	07:33
	17:03	17:43	18:17 54	07:49 (12)	19:52	20:25	20:49	20:46	20:13	19:19 34	08:25 (12)	18:28 18	08:08 (12)	16:47	16:38
17	07:37	07:05	06:20	06:56 (12)	06:27	05:47	05:32	05:47	06:18	06:51	07:48 (12)	07:25	07:57 (12)	07:03	07:34
	17:04	17:44	18:18 54	07:50 (12)	19:54	20:26	20:50	20:46	20:11	19:18 38	08:26 (12)	18:26 4	08:01 (12)	16:47	16:38
18	07:36	07:04	06:18	06:56 (12)	06:25	05:46	05:32	05:48	06:19	06:52	07:47 (12)	07:26		07:04	07:35
	17:05	17:45	18:19 52	07:48 (12)	19:55	20:27	20:50	20:45	20:10	19:16 40	08:27 (12)	18:24		16:46	16:38
19	07:36	07:02	06:17	06:56 (12)	06:24	05:45	05:32	05:49	06:20	06:53	07:46 (12)	07:27		07:06	07:35
	17:06	17:46	18:20 52	07:48 (12)	19:56	20:28	20:50	20:44	20:08	19:14 42	08:28 (12)	18:23		16:45	16:39
20	07:35	07:01	06:15	06:56 (12)	06:22	05:44	05:32	05:50	06:21	06:54	07:43 (12)	07:28		07:07	07:36
	17:08	17:48	18:22 50	07:46 (12)	19:57	20:29	20:51	20:43	20:07	19:12 46	08:29 (12)	18:21		16:44	16:39
21	07:34	06:59	06:13	06:56 (12)	06:21	05:43	05:33	05:51	06:22	06:56	07:42 (12)	07:29		07:08	07:36
	17:09	17:49	18:23 50	07:46 (12)	19:58	20:30	20:51	20:43	20:05	19:11 48	08:30 (12)	18:20		16:43	16:40
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	17:10	17:50	18:24 48	07:45 (12)	19:59	20:31	20:51	20:42	20:04	19:09 50	08:31 (12)	18:18		16:43	16:40
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	17:11	17:52	18:25 46	07:43 (12)	20:00	20:32	20:51	20:41	20:02	19:07 50	08:30 (12)	18:17		16:42	16:41
24	07:32	06:55	06:08	06:57 (12)	06:16	05:41	05:33	05:53	06:26	06:59	07:39 (12)	07:33		07:12	07:38
	17:13	17:53	18:26 44	07:41 (12)	20:00	20:33	20:51	20:40	20:00	19:05 52	08:31 (12)	18:15		16:42	16:41
25	07:31	06:53 07:21 (12)	06:06	06:59 (12)	06:15	05:40	05:34	05:54	06:27	07:00	07:38 (12)	06:34		07:13	07:38
	17:14	17:54 12 07:33 (12)	18:27 40	07:39 (12)	20:01	20:34	20:52	20:39	19:57	19:03 52	08:30 (12)	17:14		16:41	16:42
26	07:31	06:52 07:18 (12)	06:04	07:00 (12)	06:13	05:39	05:34	05:55	06:28	07:01	07:37 (12)	06:36		07:14	07:39
	17:15	17:55 20 07:38 (12)	18:29 38	07:38 (12)	20:03	20:35	20:52	20:38	19:56	19:02 54	08:31 (12)	17:12		16:40	16:42
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	17:16	17:57 26 07:40 (12)	18:30 34	07:36 (12)	20:04	20:35	20:52	20:37	19:54	19:00 52	08:30 (12)	17:11		16:40	16:43
28	07:29	06:49 07:10 (12)	06:01	07:02 (12)	06:10	05:38	05:35	05:57	06:30	07:03	07:37 (12)	06:38		07:16	07:39
	17:18	17:58 32 07:42 (12)	18:31 32	07:34 (12)	20:05	20:36	20:52	20:36	19:52	18:58 54	08:31 (12)	17:10		16:39	16:44
29	07:28		05:59	07:04 (12)	06:09	05:37	05:35	05:58	06:31	07:04	07:36 (12)	06:39		07:17	07:39
	17:19		18:32 26	07:30 (12)	20:06	20:37	20:52	20:35	19:51	18:56 54	08:30 (12)	17:08		16:39	16:45
30	07:27		05:57	07:07 (12)	06:07	05:37	05:36	05:59	06:32	07:05	07:36 (12)	06:40		07:18	07:40
	17:20		18:33 22	07:29 (12)	20:07	20:38	20:52	20:34	19:49	18:55 54	08:30 (12)	17:07		16:39	16:45
31	07:26		05:56	07:11 (12)		05:36		06:00	06:33			06:42			07:40
	17:22		18:34 12	07:23 (12)		20:39		20:33	19:47			17:05			16:46
Potential sun hours	293	295	370		209	-292	-263	-280	-145	375		343		294	283
Total, worst case		90	1390							802		690			
Sun reduction		0.45	0.45							0.55		0.45			
Oper. time red.		0.86	0.86							0.86		0.86			
Wind dir. red.		0.59	0.59							0.59		0.59			
Total reduction		0.23	0.23							0.28		0.23			
Total, real		21	320							225		159			

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	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, Mid / Northeast part
20 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
1000 meter max shadow distance applied along with default 3° inclination
Sunshine probabilities applied (pdf plots)
Directional run-hours applied from tab file (tower 1)
.

Printed/Page
03/05/06 23:23 / 20
Licensed user:
Wind Engineers, Inc.
7660 Whitegate Avenue
US-RIVERSIDE, CA 92506

Calculated:
03/01/06 21:02/2.4.0.67

SHADOW - Calendar

Calculation: Mid / Northeast part **Shadow receptor:** 707 - 707

Assumptions for shadow calculations

Maximum distance for influence	1,000	m
Minimum sun height over horizon for influence	3	°
Day step for calculation	1	days
Time step for calculation	2	minutes

Sun shine probabilities (part of time from sun rise to sun set with sun shine)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.35	0.45	0.45	0.55	0.55	0.55	0.65	0.55	0.55	0.45	0.35	0.30

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
475	585	238	199	220	474	1,184	813	840	1,246	803	479	7,555

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:40	07:25	06:47	05:54	16:59 (19)	06:06	05:36	06:01	06:34	18:03 (19)	07:06	07:37 (11)	06:43	07:20
	16:47	17:23	17:59	18:35	50 17:49 (19)	20:08	20:40	20:52	20:32	19:46	32 18:35 (19)	18:53	28 18:11 (19)	17:04	16:38
2	07:40	07:24	06:45	05:52	16:57 (19)	06:05	05:35	05:37	06:02	06:35	18:02 (19)	07:08	07:36 (11)	06:44	07:21
	16:48	17:24	18:00	18:36	50 17:47 (19)	20:09	20:41	20:52	20:31	19:44	36 18:38 (19)	18:51	24 08:00 (11)	17:03	16:38
3	07:40	07:23	06:44	05:50	16:58 (19)	06:03	05:35	05:37	06:03	06:36	18:01 (19)	07:09	07:37 (11)	06:45	07:22
	16:49	17:26	18:01	18:38	50 17:48 (19)	20:10	20:41	20:51	20:30	19:42	38 18:39 (19)	18:49	22 07:59 (11)	17:02	16:38
4	07:40	07:22	06:42	05:49	16:58 (19)	06:02	05:34	05:38	06:04	06:37	17:58 (19)	07:10	07:40 (11)	06:47	07:23
	16:50	17:27	18:03	18:39	48 17:46 (19)	20:12	20:42	20:51	20:29	19:41	40 18:38 (19)	18:48	16 07:56 (11)	17:00	16:37
5	07:40	07:21	06:40	06:47	18:00 (19)	06:01	05:34	05:38	06:05	06:39	17:57 (19)	07:11	07:43 (11)	06:48	07:24
	16:51	17:28	18:04	19:40	46 18:46 (19)	20:13	20:43	20:51	20:27	19:39	42 18:39 (19)	18:46	10 07:53 (11)	16:59	16:37
6	07:40	07:20	06:39	06:45	18:01 (19)	05:59	05:34	05:39	06:07	06:40	17:56 (19)	07:12		06:49	07:25
	16:52	17:30	18:05	19:41	44 18:45 (19)	20:14	20:43	20:51	20:26	19:37	44 18:40 (19)	18:44		16:58	16:37
7	07:40	07:18	06:37	06:44	18:01 (19)	05:58	05:33	05:39	06:08	06:41	17:55 (19)	07:13		06:50	07:26
	16:53	17:31	18:06	19:42	42 18:43 (19)	20:15	20:44	20:50	20:25	19:35	46 18:41 (19)	18:43		16:57	16:37
8	07:40	07:17	06:35	07:09 (11)	06:42	18:01 (19)	05:57	05:33	05:40	06:09	06:42	17:54 (19)	07:14		06:52	07:27
	16:54	17:32	18:08	4 07:13 (11)	19:43	40 18:41 (19)	20:16	20:45	20:50	20:24	19:34	46 18:40 (19)	18:41		16:56	16:37
9	07:40	07:16	06:34	07:03 (11)	06:40	18:04 (19)	05:56	05:33	05:41	06:10	06:43	17:53 (19)	07:15		06:53	07:28
	16:55	17:34	18:09	14 07:17 (11)	19:44	38 18:42 (19)	20:17	20:45	20:50	20:22	19:32	48 18:41 (19)	18:39		16:54	16:37
10	07:39	07:15	06:32	07:02 (11)	06:39	18:04 (19)	05:55	05:33	05:42	06:11	06:44	17:52 (19)	07:17		06:54	07:28
	16:56	17:35	18:10	18 07:20 (11)	19:46	36 18:40 (19)	20:18	20:46	20:49	20:21	19:30	48 18:40 (19)	18:37		16:53	16:37
11	07:39	07:13	06:30	06:58 (11)	06:37	18:04 (19)	05:53	05:32	05:42	06:12	06:45	17:51 (19)	07:18		06:56	07:29
	16:57	17:36	18:11	24 07:22 (11)	19:47	32 18:36 (19)	20:19	20:47	20:49	20:20	19:28	50 18:41 (19)	18:36		16:52	16:37
12	07:39	07:12	06:29	06:58 (11)	06:35	18:07 (19)	05:52	05:32	05:43	06:13	06:46	17:51 (19)	07:19		06:57	07:30
	16:58	17:37	18:12	24 07:22 (11)	19:48	28 18:35 (19)	20:20	20:47	20:48	20:18	19:27	50 18:41 (19)	18:34		16:51	16:37
13	07:39	07:11	06:27	06:56 (11)	06:34	18:09 (19)	05:51	05:32	05:44	06:14	06:47	17:50 (19)	07:20		06:58	07:31
	16:59	17:39	18:13	42 17:36 (19)	19:49	24 18:33 (19)	20:21	20:48	20:48	20:17	19:25	52 18:42 (19)	18:32		16:50	16:37
14	07:38	07:09	06:25	06:55 (11)	06:32	18:11 (19)	05:50	05:32	05:45	06:15	06:48	17:49 (19)	07:21		06:59	07:32
	17:00	17:40	18:15	50 17:39 (19)	19:50	18 18:29 (19)	20:23	20:48	20:47	20:16	19:23	52 18:41 (19)	18:31		16:49	16:37
15	07:38	07:08	06:23	06:55 (11)	06:30		05:49	05:32	05:45	06:16	06:49	17:48 (19)	07:22		07:01	07:32
	17:02	17:41	18:16	58 17:43 (19)	19:51		20:24	20:49	20:47	20:14	19:21	52 18:40 (19)	18:29		16:48	16:38
16	07:37	07:07	06:22	06:53 (11)	06:29		05:48	05:32	05:46	06:17	06:50	17:49 (19)	07:23		07:02	07:33
	17:03	17:43	18:17	62 17:43 (19)	19:52		20:25	20:49	20:46	20:13	19:19	50 18:39 (19)	18:28		16:47	16:38
17	07:37	07:05	06:20	06:53 (11)	06:27		05:47	05:32	05:47	06:18	06:51	07:48 (11)	07:25		07:03	07:34
	17:04	17:44	18:18	66 17:45 (19)	19:54		20:26	20:50	20:46	20:11	19:18	64 18:40 (19)	18:26		16:47	16:38
18	07:36	07:04	06:18	06:54 (11)	06:25		05:46	05:32	05:48	06:19	06:52	07:45 (11)	07:26		07:04	07:35
	17:05	17:45	18:19	68 17:48 (19)	19:55		20:27	20:50	20:45	20:10	19:16	68 18:39 (19)	18:24		16:46	16:38
19	07:36	07:02	06:17	06:52 (11)	06:24		05:45	05:32	05:49	06:20	06:53	07:42 (11)	07:27		07:05	07:35
	17:06	17:46	18:20	72 17:48 (19)	19:56		20:28	20:50	20:44	20:08	19:14	72 18:38 (19)	18:23		16:45	16:39
20	07:35	07:01	06:15	06:52 (11)	06:22		05:44	05:32	05:50	06:21	06:54	07:41 (11)	07:28		07:07	07:36
	17:08	17:48	18:22	74 17:48 (19)	19:57		20:29	20:51	20:43	20:07	19:12	74 18:37 (19)	18:21		16:44	16:39
21	07:34	06:59	06:13	06:52 (11)	06:21		05:43	05:33	05:51	06:22	06:56	07:40 (11)	07:29		07:08	07:36
	17:09	17:49	18:23	72 17:48 (19)	19:58		20:30	20:51	20:43	20:05	19:11	72 18:36 (19)	18:20		16:43	16:40
22	07:34	06:58	06:11	06:53 (11)	06:19		05:42	05:33	05:52	06:24	06:57	07:39 (11)	07:31		07:09	07:37
	17:10	17:50	18:24	74 17:51 (19)	19:59		20:31	20:51	20:42	20:04	19:09	72 18:35 (19)	18:18		16:43	16:40
23	07:33	06:56	06:10	06:55 (11)	06:18		05:42	05:33	05:52	06:25	06:58	07:38 (11)	07:32		07:10	07:37
	17:11	17:52	18:25	74 17:51 (19)	20:00		20:32	20:51	20:41	20:02	19:07	74 18:34 (19)	18:17		16:42	16:41
24	07:32	06:55	06:08	06:55 (11)	06:16		05:41	05:33	05:53	06:26	06:59	07:37 (11)	07:33		07:12	07:38
	17:13	17:53	18:26	72 17:51 (19)	20:00		20:33	20:51	20:40	20:00	19:05	70 18:31 (19)	18:15		16:42	16:41
25	07:31	06:53	06:06	06:55 (11)	06:15		05:40	05:34	05:54	06:27	07:00	07:36 (11)	06:34		07:13	07:38
	17:14	17:54	18:27	70 17:51 (19)	20:01		20:34	20:52	20:39	19:57	19:03	70 18:30 (19)	17:14		16:41	16:42
26	07:31	06:52	06:04	06:58 (11)	06:13		05:39	05:34	05:55	06:28	07:01	07:35 (11)	06:35		07:14	07:39
	17:15	17:55	18:29	64 17:50 (19)	20:03		20:35	20:52	20:38	19:56	19:02	68 18:29 (19)	17:12		16:40	16:42
27	07:30	06:50	06:03	17:00 (19)	06:12		05:39	05:34	05:56	06:29	07:02	07:34 (11)	06:37		07:15	07:39
	17:16	17:57	18:30	50 17:50 (19)	20:04		20:35	20:52	20:37	19:54	19:00	64 18:26 (19)	17:11		16:40	16:43
28	07:29	06:49	06:01	16:58 (19)	06:10		05:38	05:35	05:57	06:30	18:19 (19)	07:03	07:35 (11)	06:38	07:16	07:39
	17:18	17:58	18:31	52 17:50 (19)	20:05		20:36	20:52	20:36	19:52	4 18:23 (19)	18:58	58 18:23 (19)	17:10	16:39	16:44
29	07:28		05:59	16:58 (19)	06:09		05:37	05:35	05:58	06:31	18:12 (19)	07:04	07:34 (11)	06:39	07:17	07:39
	17:19		18:32	52 17:50 (19)	20:06		20:37	20:52	20:35	19:51	18 18:30 (19)	18:56	54 18:20 (19)	17:08	16:39	16:45
30	07:27		05:57	16:59 (19)	06:07		05:37	05:36	05:59	06:32	18:09 (19)	07:05	07:36 (11)	06:40	07:18	07:40
	17:20		18:33	52 17:51 (19)	20:07		20:38	20:52	20:34	19:49	24 18:33 (19)	18:55	46 18:18 (19)	17:07	16:39	16:45
31	07:26		05:56	16:59 (19)			05:36		06:00	06:33	18:06 (19)			06:42		07:40
	17:22		18:34	50 17:49 (19)			20:39		20:33	19:47	28 18:34 (19)			17:05		16:46
Potential sun hours	293	295	370	209	-292	-263	-280	-145	375	343	294	283
Total, worst case			1258	546				74	1652	100		
Sun reduction			0.45	0.55				0.55	0.55	0.45		
Oper. time red.			0.86	0.86				0.86	0.86	0.86		
Wind dir. red.			0.61	0.61				0.61	0.61	0.60		
Total reduction			0.23	0.29				0.29	0.29	0.23		
Total, real			295	157				21	475	23		

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	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, Mid / Northeast part
20 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
1000 meter max shadow distance applied along with default 3° inclination
Sunshine probabilities applied (pdf plots)
Directional run-hours applied from tab file (tower 1)
.

Licensed user:
Wind Engineers, Inc.
7660 Whitegate Avenue
US-RIVERSIDE, CA 92506

Calculated:
03/01/06 21:02/2.4.0.67

SHADOW - Calendar

Calculation: Mid / Northeast part **Shadow receptor:** 708 - 708

Assumptions for shadow calculations

Maximum distance for influence	1,000 m
Minimum sun height over horizon for influence	3 °
Day step for calculation	1 days
Time step for calculation	2 minutes

Sun shine probabilities (part of time from sun rise to sun set with sun shine)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.35	0.45	0.45	0.55	0.55	0.55	0.65	0.55	0.55	0.45	0.35	0.30

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
475	585	238	199	220	474	1,184	813	840	1,246	803	479	7,555

	January		February		March		April		May		June	
1	07:40		07:25	07:50 (10)	06:47		05:54	06:27 (11)	06:06	18:24 (19)	05:36	
	16:47		17:23	20 08:10 (10)	17:59		18:35	30 06:57 (11)	20:08	52 19:16 (19)	20:40	
2	07:40		07:24	07:51 (10)	06:45		05:52	06:27 (11)	06:05	18:25 (19)	05:35	
	16:48		17:24	20 08:11 (10)	18:00		18:36	30 06:57 (11)	20:09	52 19:17 (19)	20:41	
3	07:40		07:23	07:52 (10)	06:44		05:50	06:28 (11)	06:03	18:26 (19)	05:35	
	16:49		17:26	18 08:10 (10)	18:01		18:38	28 06:56 (11)	20:10	50 19:16 (19)	20:41	
4	07:40		07:22	07:53 (10)	06:42		05:49	06:28 (11)	06:02	18:26 (19)	05:34	
	16:50		17:27	16 08:09 (10)	18:03		18:39	28 06:56 (11)	20:12	48 19:14 (19)	20:42	
5	07:40		07:21	07:53 (10)	06:40		06:47	07:28 (11)	06:01	18:27 (19)	05:34	
	16:51		17:28	14 08:07 (10)	18:04		19:40	26 07:54 (11)	20:13	48 19:15 (19)	20:43	
6	07:40		07:20	07:56 (10)	06:39		06:45	07:29 (11)	05:59	18:28 (19)	05:34	
	16:52		17:30	8 08:04 (10)	18:05		19:41	24 07:53 (11)	20:14	46 19:14 (19)	20:43	
7	07:40		07:18		06:37		06:44	07:31 (11)	05:58	18:29 (19)	05:33	
	16:53		17:31		18:06		19:42	36 19:03 (19)	20:15	44 19:13 (19)	20:44	
8	07:40		07:17		06:35		06:42	07:31 (11)	05:57	18:29 (19)	05:33	
	16:54		17:32		18:08		19:43	42 19:07 (19)	20:16	42 19:11 (19)	20:45	
9	07:40		07:16		06:34		06:40	07:34 (11)	05:56	18:30 (19)	05:33	
	16:55		17:34		18:09		19:44	44 19:10 (19)	20:17	40 19:10 (19)	20:45	
10	07:39		07:15		06:32		06:39	07:38 (11)	05:55	18:31 (19)	05:33	
	16:56		17:35		18:10		19:46	38 19:12 (19)	20:18	38 19:09 (19)	20:46	
11	07:39		07:13		06:30		06:37	18:36 (19)	05:53	18:32 (19)	05:32	
	16:57		17:36		18:11		19:47	36 19:12 (19)	20:19	36 19:08 (19)	20:47	
12	07:39		07:12		06:29		06:35	18:35 (19)	05:52	18:33 (19)	05:32	
	16:58		17:37		18:12		19:48	40 19:15 (19)	20:20	34 19:07 (19)	20:47	
13	07:39		07:11		06:27		06:34	18:33 (19)	05:51	18:34 (19)	05:32	
	16:59		17:39		18:13		19:49	42 19:15 (19)	20:21	32 19:06 (19)	20:48	
14	07:38		07:09		06:25		06:32	18:31 (19)	05:50	18:35 (19)	05:32	
	17:00		17:40		18:15		19:50	44 19:15 (19)	20:23	30 19:05 (19)	20:48	
15	07:38		07:08		06:23		06:30	18:30 (19)	05:49	18:36 (19)	05:32	
	17:02		17:41		18:16		19:51	46 19:16 (19)	20:24	28 19:04 (19)	20:49	
16	07:37		07:07		06:22		06:29	18:28 (19)	05:48	18:39 (19)	05:32	
	17:03		17:43		18:17		19:52	48 19:16 (19)	20:25	24 19:03 (19)	20:49	
17	07:37		07:05		06:20		06:27	18:29 (19)	05:47	18:40 (19)	05:32	
	17:04		17:44		18:18		19:54	48 19:17 (19)	20:26	20 19:00 (19)	20:50	
18	07:36		07:04		06:18		06:25	18:27 (19)	05:46	18:43 (19)	05:32	
	17:05		17:45		18:19		19:55	50 19:17 (19)	20:27	14 18:57 (19)	20:50	
19	07:36	07:57 (10)	07:02		06:17		06:24	18:27 (19)	05:45	18:50 (19)	05:32	
	17:06	4 08:01 (10)	17:46		18:20		19:56	50 19:17 (19)	20:28	4 18:54 (19)	20:50	
20	07:35	07:57 (10)	07:01		06:15		06:22	18:26 (19)	05:44		05:32	
	17:08	6 08:03 (10)	17:48		18:22		19:57	52 19:18 (19)	20:29		20:51	
21	07:34	07:56 (10)	06:59		06:13		06:21	18:26 (19)	05:43		05:33	
	17:09	10 08:06 (10)	17:49		18:23		19:58	52 19:18 (19)	20:30		20:51	
22	07:34	07:55 (10)	06:58		06:11	06:43 (11)	06:19	18:25 (19)	05:42		05:33	
	17:10	10 08:05 (10)	17:50		18:24	8 06:51 (11)	19:59	54 19:19 (19)	20:31		20:51	
23	07:33	07:54 (10)	06:56		06:10	06:39 (11)	06:18	18:25 (19)	05:42		05:33	
	17:11	12 08:06 (10)	17:52		18:25	14 06:53 (11)	20:00	54 19:19 (19)	20:32		20:51	
24	07:32	07:54 (10)	06:55		06:08	06:35 (11)	06:16	18:24 (19)	05:41		05:33	
	17:13	14 08:08 (10)	17:53		18:26	20 06:55 (11)	20:00	54 19:18 (19)	20:33		20:51	
25	07:31	07:53 (10)	06:53		06:06	06:33 (11)	06:15	18:24 (19)	05:40		05:34	
	17:14	16 08:09 (10)	17:54		18:27	24 06:57 (11)	20:01	54 19:18 (19)	20:34		20:52	
26	07:31	07:52 (10)	06:52		06:04	06:32 (11)	06:13	18:25 (19)	05:39		05:34	
	17:15	18 08:10 (10)	17:55		18:29	26 06:58 (11)	20:03	54 19:19 (19)	20:35		20:52	
27	07:30	07:51 (10)	06:50		06:03	06:32 (11)	06:12	18:24 (19)	05:39		05:34	
	17:16	18 08:09 (10)	17:57		18:30	26 06:58 (11)	20:04	54 19:18 (19)	20:35		20:52	
28	07:29	07:50 (10)	06:49		06:01	06:30 (11)	06:10	18:24 (19)	05:38		05:35	
	17:18	20 08:10 (10)	17:58		18:31	28 06:58 (11)	20:05	54 19:18 (19)	20:36		20:52	
29	07:28	07:49 (10)			05:59	06:30 (11)	06:09	18:25 (19)	05:37		05:35	
	17:19	22 08:11 (10)			18:32	28 06:58 (11)	20:06	52 19:17 (19)	20:37		20:52	
30	07:27	07:50 (10)			05:57	06:29 (11)	06:07	18:25 (19)	05:37		05:36	
	17:20	20 08:10 (10)			18:33	30 06:59 (11)	20:07	52 19:17 (19)	20:38		20:52	
31	07:26	07:49 (10)			05:56	06:29 (11)			05:36			
	17:22	22 08:11 (10)			18:34	30 06:59 (11)			20:39			
Potential sun hours	293		295		370		209		-292		-263	
Total, worst case		192		96		234		1316		682		
Sun reduction		0.35		0.45		0.45		0.55		0.55		
Oper. time red.		0.86		0.86		0.86		0.86		0.86		
Wind dir. red.		0.63		0.63		0.61		0.61		0.60		
Total reduction		0.19		0.24		0.24		0.29		0.29		
Total, real		37		23		55		378		196		

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	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, Mid / Northeast part
20 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
1000 meter max shadow distance applied along with default 3° inclination
Sunshine probabilities applied (pdf plots)
Directional run-hours applied from tab file (tower 1)
.

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03/05/06 23:23 / 22
Licensed user:
Wind Engineers, Inc.
7660 Whitegate Avenue
US-RIVERSIDE, CA 92506

Calculated:
03/01/06 21:02/2.4.0.67

SHADOW - Calendar

Calculation: Mid / Northeast part **Shadow receptor:** 708 - 708

Assumptions for shadow calculations

Maximum distance for influence	1,000 m
Minimum sun height over horizon for influence	3 °
Day step for calculation	1 days
Time step for calculation	2 minutes

Sun shine probabilities (part of time from sun rise to sun set with sun shine)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.35	0.45	0.45	0.55	0.55	0.55	0.65	0.55	0.55	0.45	0.35	0.30

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
475	585	238	199	220	474	1,184	813	840	1,246	803	479	7,555

	July			August			September			October	November			December
1	05:36			06:01		18:42 (19)	06:34		18:35 (19)	07:06	06:43			07:19
	20:52			20:32	36	19:18 (19)	19:46	36	19:11 (19)	18:53	17:04			16:38
2	05:37			06:02		18:41 (19)	06:35		07:36 (11)	07:08	06:44			07:21
	20:52			20:31	38	19:19 (19)	19:44	38	19:10 (19)	18:51	17:03			16:38
3	05:37			06:03		18:40 (19)	06:36		07:31 (11)	07:09	06:45			07:22
	20:51			20:30	40	19:20 (19)	19:42	44	19:07 (19)	18:49	17:02			16:38
4	05:38			06:04		18:39 (19)	06:37		07:28 (11)	07:10	06:47			07:23
	20:51			20:29	42	19:21 (19)	19:41	42	19:04 (19)	18:48	17:00			16:37
5	05:38			06:06		18:38 (19)	06:39		07:27 (11)	07:11	06:48		07:26 (10)	07:24
	20:51			20:27	44	19:22 (19)	19:39	36	18:59 (19)	18:46	16:59	10	07:36 (10)	16:37
6	05:39			06:07		18:37 (19)	06:40		07:24 (11)	07:12	06:49		07:24 (10)	07:25
	20:51			20:26	46	19:23 (19)	19:37	24	07:48 (11)	18:44	16:58	14	07:38 (10)	16:37
7	05:39			06:08		18:36 (19)	06:41		07:23 (11)	07:13	06:50		07:23 (10)	07:26
	20:50			20:25	48	19:24 (19)	19:35	26	07:49 (11)	18:43	16:57	16	07:39 (10)	16:37
8	05:40			06:09		18:37 (19)	06:42		07:22 (11)	07:14	06:52		07:22 (10)	07:27
	20:50			20:24	46	19:23 (19)	19:34	28	07:50 (11)	18:41	16:56	18	07:40 (10)	16:37
9	05:41			06:10		18:36 (19)	06:43		07:21 (11)	07:15	06:53		07:22 (10)	07:28
	20:50			20:22	48	19:24 (19)	19:32	30	07:51 (11)	18:39	16:54	20	07:42 (10)	16:37
10	05:42			06:11		18:35 (19)	06:44		07:20 (11)	07:17	06:54		07:21 (10)	07:28
	20:49			20:21	50	19:25 (19)	19:30	30	07:50 (11)	18:37	16:53	20	07:41 (10)	16:37
11	05:42			06:12		18:34 (19)	06:45		07:21 (11)	07:18	06:56		07:20 (10)	07:29
	20:49			20:20	50	19:24 (19)	19:28	28	07:49 (11)	18:36	16:52	22	07:42 (10)	16:37
12	05:43			06:13		18:33 (19)	06:46		07:21 (11)	07:19	06:57		07:20 (10)	07:30
	20:48			20:18	52	19:25 (19)	19:27	30	07:51 (11)	18:34	16:51	22	07:42 (10)	16:37
13	05:44			06:14		18:32 (19)	06:47		07:20 (11)	07:20	06:58		07:21 (10)	07:31
	20:48			20:17	54	19:26 (19)	19:25	30	07:50 (11)	18:32	16:50	22	07:43 (10)	16:37
14	05:45			06:15		18:33 (19)	06:48		07:21 (11)	07:21	06:59		07:22 (10)	07:32
	20:47			20:16	52	19:25 (19)	19:23	28	07:49 (11)	18:31	16:49	20	07:42 (10)	16:37
15	05:45			06:16		18:32 (19)	06:49		07:20 (11)	07:22	07:01		07:24 (10)	07:32
	20:47			20:14	54	19:26 (19)	19:21	28	07:48 (11)	18:29	16:48	18	07:42 (10)	16:38
16	05:46			06:17		18:31 (19)	06:50		07:21 (11)	07:23	07:02		07:25 (10)	07:33
	20:46			20:13	54	19:25 (19)	19:19	26	07:47 (11)	18:28	16:47	18	07:43 (10)	16:38
17	05:47			06:18		18:30 (19)	06:51		07:22 (11)	07:25	07:03		07:26 (10)	07:34
	20:46			20:11	54	19:24 (19)	19:18	24	07:46 (11)	18:26	16:47	16	07:42 (10)	16:38
18	05:48			06:19		18:31 (19)	06:52		07:21 (11)	07:26	07:04		07:28 (10)	07:35
	20:45			20:10	54	19:25 (19)	19:16	24	07:45 (11)	18:24	16:46	14	07:42 (10)	16:38
19	05:49			06:20		18:30 (19)	06:53		07:22 (11)	07:27	07:05		07:29 (10)	07:35
	20:44			20:08	54	19:24 (19)	19:14	22	07:44 (11)	18:23	16:45	12	07:41 (10)	16:39
20	05:50			06:21		18:31 (19)	06:54		07:25 (11)	07:28	07:07		07:30 (10)	07:36
	20:43			20:07	52	19:23 (19)	19:12	16	07:41 (11)	18:21	16:44	12	07:42 (10)	16:39
21	05:51			06:22		18:30 (19)	06:56		07:28 (11)	07:29	07:08		07:32 (10)	07:36
	20:43			20:05	54	19:24 (19)	19:11	10	07:38 (11)	18:20	16:43	10	07:42 (10)	16:40
22	05:52			06:24		18:29 (19)	06:57			07:31	07:09		07:33 (10)	07:37
	20:42			20:04	54	19:23 (19)	19:09			18:18	16:43	6	07:39 (10)	16:40
23	05:52			06:25		18:30 (19)	06:58			07:32	07:10		07:34 (10)	07:37
	20:41			20:02	52	19:22 (19)	19:07			18:17	16:42	4	07:38 (10)	16:41
24	05:53			06:26		18:29 (19)	06:59			07:33	07:12			07:38
	20:40			20:00	52	19:21 (19)	19:05			18:15	16:42			16:41
25	05:54		18:57 (19)	06:27		18:30 (19)	07:00			06:34	07:13			07:38
	20:39	8	19:05 (19)	19:57	50	19:20 (19)	19:03			17:14	16:41			16:42
26	05:55		18:52 (19)	06:28		18:31 (19)	07:01			06:35	07:14			07:39
	20:38	18	19:10 (19)	19:56	48	19:19 (19)	19:02			17:12	16:40			16:42
27	05:56		18:51 (19)	06:29		18:30 (19)	07:02			06:37	07:15			07:39
	20:37	20	19:11 (19)	19:54	48	19:18 (19)	19:00			17:11	16:40			16:43
28	05:57		18:48 (19)	06:30		18:31 (19)	07:03			06:38	07:16			07:39
	20:36	26	19:14 (19)	19:52	46	19:17 (19)	18:58			17:10	16:39			16:44
29	05:58		18:47 (19)	06:31		18:32 (19)	07:04			06:39	07:17			07:39
	20:35	28	19:15 (19)	19:51	44	19:16 (19)	18:56			17:08	16:39			16:45
30	05:59		18:46 (19)	06:32		18:33 (19)	07:05			06:40	07:18			07:40
	20:34	30	19:16 (19)	19:49	42	19:15 (19)	18:55			17:07	16:39			16:45
31	06:00		18:45 (19)	06:33		18:34 (19)				06:42				07:40
	20:33	32	19:17 (19)	19:47	40	19:14 (19)				17:05				16:46
Potential sun hours	-280			-145			375			343	294			283
Total, worst case		162			1498			600				294		
Sun reduction		0.65			0.55			0.55				0.35		
Oper. time red.		0.86			0.86			0.86				0.86		
Wind dir. red.		0.60			0.60			0.61				0.63		
Total reduction		0.34			0.29			0.29				0.19		
Total, real		55			430			173				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	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, Mid / Northeast part
20 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
1000 meter max shadow distance applied along with default 3° inclination
Sunshine probabilities applied (pdf plots)
Directional run-hours applied from tab file (tower 1)
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03/05/06 23:23 / 23

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7660 Whitegate Avenue
US-RIVERSIDE, CA 92506

Calculated:
03/01/06 21:02/2.4.0.67

SHADOW - Calendar

Calculation: Mid / Northeast part **Shadow receptor:** 709 - 709

Assumptions for shadow calculations

Maximum distance for influence	1,000 m
Minimum sun height over horizon for influence	3 °
Day step for calculation	1 days
Time step for calculation	2 minutes

Sun shine probabilities (part of time from sun rise to sun set with sun shine)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.35	0.45	0.45	0.55	0.55	0.55	0.65	0.55	0.55	0.45	0.35	0.30

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
475	585	238	199	220	474	1,184	813	840	1,246	803	479	7,555

	January		February	March	April	May	June	July	August	September	October	November	December
1	07:40	08:13 (9)	07:25	06:47	05:54	06:06	05:36	05:36	06:01	06:34	07:06	07:27 (10) 06:43	07:19 08:02 (9)
	16:47 30	08:43 (9)	17:23	17:59	18:35	20:08	20:40	20:52	20:32	19:46	18:53 32	07:59 (10) 17:04	16:38 24 08:26 (9)
2	07:40	08:13 (9)	07:24	06:45	05:52	06:05	05:35	05:37	06:02	06:35	07:08	07:28 (10) 06:44	07:21 08:03 (9)
	16:48 30	08:43 (9)	17:24	18:00	18:36	20:09	20:40	20:52	20:31	19:44	18:51 30	07:58 (10) 17:03	16:38 24 08:27 (9)
3	07:40	08:15 (9)	07:23	06:44	05:50	06:03	05:35	05:37	06:03	06:36	07:09	07:29 (10) 06:45	07:22 08:02 (9)
	16:49 28	08:43 (9)	17:26	18:01	18:38	20:10	20:41	20:51	20:30	19:42	18:49 28	07:57 (10) 17:02	16:38 26 08:28 (9)
4	07:40	08:15 (9)	07:22	06:42	07:02 (10) 05:49	06:02	05:34	05:38	06:04	06:37	07:10	07:30 (10) 06:47	07:23 08:03 (9)
	16:50 28	08:43 (9)	17:27	18:03 8	07:10 (10) 18:39	20:12	20:42	20:51	20:29	19:40	18:48 26	07:56 (10) 17:00	16:37 26 08:29 (9)
5	07:40	08:15 (9)	07:21	06:40	07:00 (10) 06:47	06:01	05:34	05:38	06:05	06:39	07:11	07:31 (10) 06:48	07:24 08:02 (9)
	16:51 28	08:43 (9)	17:28	18:04 12	07:12 (10) 19:40	20:13	20:43	20:51	20:27	19:39	18:46 24	07:55 (10) 16:59	16:37 28 08:30 (9)
6	07:40	08:17 (9)	07:19	06:39	06:58 (10) 06:45	05:59	05:34	05:39	06:07	06:40	07:12	07:32 (10) 06:49	07:25 08:03 (9)
	16:52 26	08:43 (9)	17:30	18:05 16	07:14 (10) 19:41	20:14	20:43	20:51	20:26	19:37	18:44 20	07:52 (10) 16:58	16:37 26 08:29 (9)
7	07:40	08:17 (9)	07:18	06:37	06:57 (10) 06:44	05:58	05:33	05:39	06:08	06:41	07:13	07:33 (10) 06:50	07:26 08:02 (9)
	16:53 28	08:45 (9)	17:31	18:06 20	07:17 (10) 19:42	20:15	20:44	20:50	20:25	19:35	18:42 18	07:51 (10) 16:57	16:37 28 08:30 (9)
8	07:40	08:19 (9)	07:17	06:35	06:55 (10) 06:42	05:57	05:33	05:40	06:09	06:42	07:14	07:35 (10) 06:52	07:27 08:03 (9)
	16:54 26	08:45 (9)	17:32	18:08 22	07:17 (10) 19:43	20:16	20:45	20:50	20:24	19:34	18:41 14	07:49 (10) 16:56	16:37 28 08:31 (9)
9	07:40	08:18 (9)	07:16	06:34	06:53 (10) 06:40	05:56	05:33	05:41	06:10	06:43	07:15	07:36 (10) 06:53	07:27 08:04 (9)
	16:55 26	08:44 (9)	17:34	18:09 24	07:17 (10) 19:44	20:17	20:45	20:50	20:22	19:32	18:39 10	07:46 (10) 16:54	16:37 28 08:32 (9)
10	07:39	08:20 (9)	07:15	06:32	06:52 (10) 06:38	05:55	05:33	05:42	06:11	06:44	07:17	07:37 (10) 06:54	07:28 08:03 (9)
	16:56 24	08:44 (9)	17:35	18:10 26	07:18 (10) 19:46	20:18	20:46	20:49	20:21	19:30	18:37 6	07:43 (10) 16:53	16:37 30 08:33 (9)
11	07:39	08:20 (9)	07:13	06:30	06:50 (10) 06:37	05:53	05:32	05:42	06:12	06:45	07:18	06:55	07:29 08:04 (9)
	16:57 24	08:44 (9)	17:36	18:11 28	07:18 (10) 19:47	20:19	20:47	20:49	20:20	19:28	18:36	16:52	16:37 30 08:34 (9)
12	07:39	08:21 (9)	07:12	06:29	06:48 (10) 06:35	05:52	05:32	05:43	06:13	06:46	07:19	06:57	07:30 08:04 (9)
	16:58 22	08:43 (9)	17:37	18:12 30	07:18 (10) 19:48	20:20	20:47	20:48	20:18	19:27	18:34	16:51	16:37 28 08:32 (9)
13	07:39	08:23 (9)	07:11	06:27	06:46 (10) 06:34	05:51	05:32	05:44	06:14	06:47	07:20	06:58	07:31 08:05 (9)
	16:59 20	08:43 (9)	17:39	18:13 32	07:18 (10) 19:49	20:21	20:48	20:48	20:17	19:25	18:32	16:50	16:37 28 08:33 (9)
14	07:38	08:22 (9)	07:09	06:25	06:45 (10) 06:32	05:50	05:32	05:45	06:15	06:48	07:21	06:59	07:32 08:06 (9)
	17:00 20	08:42 (9)	17:40	18:15 34	07:19 (10) 19:50	20:23	20:48	20:47	20:15	19:23	18:31	16:49	16:37 28 08:34 (9)
15	07:38	08:24 (9)	07:08	06:23	06:43 (10) 06:30	05:49	05:32	05:45	06:16	06:49	07:22	07:01	07:32 08:05 (9)
	17:02 18	08:42 (9)	17:41	18:16 36	07:19 (10) 19:51	20:24	20:49	20:47	20:14	19:21	18:29	16:48	16:38 30 08:35 (9)
16	07:37	08:25 (9)	07:07	06:22	06:43 (10) 06:29	05:48	05:32	05:46	06:17	06:50	07:23	07:02	07:33 08:06 (9)
	17:03 16	08:41 (9)	17:43	18:17 34	07:17 (10) 19:52	20:25	20:49	20:46	20:13	19:19	18:28	16:47	16:38 30 08:36 (9)
17	07:37	08:29 (9)	07:05	06:20	06:43 (10) 06:27	05:47	05:32	05:47	06:18	06:51	07:25	07:03	07:34 08:06 (9)
	17:04 12	08:41 (9)	17:44	18:18 34	07:17 (10) 19:54	20:26	20:49	20:46	20:11	19:18	18:26	16:47	16:38 30 08:36 (9)
18	07:36	08:30 (9)	07:04	06:18	06:42 (10) 06:25	05:46	05:32	05:48	06:19	06:52 07:41 (10)	07:26	07:04	07:35 08:07 (9)
	17:05 8	08:38 (9)	17:45	18:19 34	07:16 (10) 19:55	20:27	20:50	20:45	20:10	19:16 8 07:49 (10)	18:24	16:46	16:38 30 08:37 (9)
19	07:36		07:02	06:17	06:42 (10) 06:24	05:45	05:32	05:49	06:20	06:53 07:36 (10)	07:27	07:05	07:35 08:07 (9)
	17:06		17:46	18:20 34	07:16 (10) 19:56	20:28	20:50	20:44	20:08	19:14 16 07:52 (10)	18:23	16:45	16:39 30 08:37 (9)
20	07:35		07:01	06:15	06:44 (10) 06:22	05:44	05:32	05:50	06:21	06:54 07:33 (10)	07:28	07:07	07:36 08:08 (9)
	17:08		17:48	18:22 30	07:14 (10) 19:57	20:29	20:51	20:43	20:07	19:12 22 07:55 (10)	18:21	16:44	16:39 30 08:38 (9)
21	07:34		06:59	06:13	06:44 (10) 06:21	05:43	05:33	05:51	06:22	06:56 07:32 (10)	07:29	07:08	07:36 08:08 (9)
	17:09		17:49	18:23 28	07:12 (10) 19:58	20:30	20:51	20:43	20:05	19:11 24 07:56 (10)	18:20	16:43	16:40 30 08:38 (9)
22	07:34		06:58	06:11	06:45 (10) 06:19	05:42	05:33	05:52	06:24	06:57 07:29 (10)	07:31	07:09	07:37 08:09 (9)
	17:10		17:50	18:24 26	07:11 (10) 19:59	20:31	20:51	20:42	20:04	19:09 28 07:57 (10)	18:18	16:43	16:40 30 08:39 (9)
23	07:33		06:56	06:10	06:47 (10) 06:18	05:42	05:33	05:52	06:25	06:58 07:28 (10)	07:32	07:10	07:37 08:09 (9)
	17:11		17:52	18:25 22	07:09 (10) 20:00	20:32	20:51	20:41	20:02	19:07 30 07:58 (10)	18:17	16:42	16:41 30 08:39 (9)
24	07:32		06:55	06:08	06:49 (10) 06:16	05:41	05:33	05:53	06:26	06:59 07:27 (10)	07:33	07:12 08:07 (9)	07:38 08:10 (9)
	17:13		17:53	18:26 18	07:07 (10) 20:00	20:33	20:51	20:40	20:00	19:05 32 07:59 (10)	18:15	16:42 8 08:15 (9)	16:41 30 08:40 (9)
25	07:31		06:53	06:06	06:51 (10) 06:15	05:40	05:34	05:54	06:27	07:00 07:26 (10)	06:34	07:13 08:07 (9)	07:38 08:10 (9)
	17:14		17:54	18:27 12	07:03 (10) 20:01	20:34	20:52	20:39	19:57	19:03 32 07:58 (10)	17:14	16:41 12 08:19 (9)	16:42 30 08:40 (9)
26	07:31		06:52	06:04	06:13	05:39	05:34	05:55	06:28	07:01 07:25 (10)	06:35	07:14 08:04 (9)	07:39 08:10 (9)
	17:15		17:55	18:29	20:03	20:34	20:52	20:38	19:56	19:02 34 07:59 (10)	17:12	16:40 16 08:20 (9)	16:42 30 08:40 (9)
27	07:30		06:50	06:03	06:12	05:39	05:34	05:56	06:29	07:02 07:24 (10)	06:37	07:15 08:03 (9)	07:39 08:11 (9)
	17:16		17:57	18:30	20:04	20:35	20:52	20:37	19:54	19:00 34 07:58 (10)	17:11	16:40 18 08:21 (9)	16:43 30 08:41 (9)
28	07:29		06:49	06:01	06:10	05:38	05:35	05:57	06:30	07:03 07:23 (10)	06:38	07:16 08:04 (9)	07:39 08:11 (9)
	17:18		17:58	18:31	20:05	20:36	20:52	20:36	19:52	18:58 36 07:59 (10)	17:09	16:39 18 08:22 (9)	16:44 30 08:41 (9)
29	07:28			05:59	06:09	05:37	05:35	05:58	06:31	07:04 07:24 (10)	06:39	07:17 08:03 (9)	07:39 08:11 (9)
	17:19			18:32	20:06	20:37	20:52	20:35	19:51	18:56 34 07:58 (10)	17:08	16:39 20 08:23 (9)	16:45 30 08:41 (9)
30	07:27			05:57	06:07	05:37	05:36	05:59	06:32	07:05 07:26 (10)	06:40	07:18 08:03 (9)	07:40 08:13 (9)
	17:20			18:33	20:07	20:38	20:52	20:34	19:49	18:55 32 07:58 (10)	17:07	16:39 22 08:25 (9)	16:45 28 08:41 (9)
31	07:26			05:56		05:36		06:00	06:33		06:42		07:40 08:13 (9)
	17:22			18:34		20:39		20:33	19:47		17:05		16:46 28 08:41 (9)
Potential sun hours	293		295	370	209	-292	-263	-280	-145	375	343	294	283
Total, worst case		414		560						362	208	114	888
Sun reduction		0.35		0.45						0.55	0.45	0.35	0.30
Oper. time red.		0.86		0.86						0.86	0.86	0.86	0.86
Wind dir. red.		0.63		0.60						0.60	0.60	0.63	0.63
Total reduction		0.19		0.23						0.29	0.23	0.19	0.16
Total, real		79		131						104	49	22	145

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	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, Mid / Northeast part
20 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
1000 meter max shadow distance applied along with default 3° inclination
Sunshine probabilities applied (pdf plots)
Directional run-hours applied from tab file (tower 1)
.

Printed/Page
03/05/06 23:23 / 24

Licensed user:
Wind Engineers, Inc.
7660 Whitegate Avenue
US-RIVERSIDE, CA 92506

Calculated:
03/01/06 21:02/2.4.0.67

SHADOW - Calendar

Calculation: Mid / Northeast part **Shadow receptor:** 710 - 710

Assumptions for shadow calculations

Maximum distance for influence	1,000	m
Minimum sun height over horizon for influence	3	°
Day step for calculation	1	days
Time step for calculation	2	minutes

Sun shine probabilities (part of time from sun rise to sun set with sun shine)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.35	0.45	0.45	0.55	0.55	0.55	0.65	0.55	0.55	0.45	0.35	0.30

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
475	585	238	199	220	474	1,184	813	840	1,246	803	479	7,555

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:40 / 16:47	07:25 / 17:23	06:47 / 17:59	05:54 / 18:35	06:06 / 20:08	06:34 (10) / 07:02 (10)	05:36 / 20:40	06:01 / 20:32	06:34 / 19:46	07:06 / 18:53	06:43 / 17:04	07:05 (9) / 07:19 / 16:38
2	07:40 / 16:48	07:24 / 17:24	06:45 / 18:00	05:52 / 18:36	06:05 / 20:09	06:35 (10) / 07:01 (10)	05:37 / 20:40	06:02 / 20:31	06:35 / 19:44	07:08 / 18:51	06:44 / 17:03	07:06 (9) / 07:21 / 16:38
3	07:40 / 16:49	07:23 / 17:26	06:44 / 18:01	05:50 / 18:38	06:03 / 20:10	06:36 (10) / 07:02 (10)	05:37 / 20:41	06:03 / 20:30	06:36 / 19:42	07:09 / 18:49	06:45 / 17:02	07:07 (9) / 07:22 / 16:38
4	07:40 / 16:50	07:22 / 17:27	06:42 / 18:03	05:49 / 18:39	06:02 / 20:12	06:36 (10) / 07:00 (10)	05:38 / 20:42	06:04 / 20:29	06:37 / 19:40	07:10 / 18:48	06:47 / 17:00	07:09 (9) / 07:23 / 16:37
5	07:40 / 16:51	07:21 / 17:28	06:40 / 18:04	06:47 / 19:40	06:01 / 20:13	06:37 (10) / 06:59 (10)	05:38 / 20:43	06:06 / 20:27	06:52 (10) / 07:02 (10)	07:11 / 18:46	06:48 / 16:59	07:12 (9) / 07:24 / 16:37
6	07:40 / 16:52	07:19 / 17:30	07:42 (9) / 06:39 / 07:52 (9)	06:45 / 18:05	05:59 / 20:14	06:38 (10) / 06:56 (10)	05:39 / 20:43	06:07 / 20:26	06:49 (10) / 07:05 (10)	07:12 / 18:44	06:49 / 16:58	07:25 / 16:37
7	07:40 / 16:53	07:18 / 17:31	07:39 (9) / 06:37 / 07:55 (9)	06:44 / 18:06	05:58 / 20:15	06:41 (10) / 06:55 (10)	05:40 / 20:44	06:08 / 20:25	06:48 (10) / 07:06 (10)	07:13 / 18:42	06:50 / 16:57	07:26 / 16:37
8	07:40 / 16:54	07:17 / 17:32	07:38 (9) / 06:35 / 07:58 (9)	06:42 / 18:08	05:57 / 20:16	06:43 (10) / 06:51 (10)	05:40 / 20:45	06:09 / 20:24	06:47 (10) / 07:09 (10)	07:14 / 18:41	06:52 / 16:56	07:27 / 16:37
9	07:40 / 16:55	07:16 / 17:34	07:36 (9) / 06:34 / 07:58 (9)	06:40 / 18:09	05:56 / 20:17	05:33 / 20:45	05:41 / 20:50	06:10 / 20:22	06:44 (10) / 07:10 (10)	07:15 / 18:39	06:53 / 16:54	07:27 / 16:37
10	07:39 / 16:56	07:15 / 17:35	07:35 (9) / 06:32 / 07:59 (9)	06:38 / 18:10	05:55 / 20:18	05:33 / 20:46	05:42 / 20:49	06:11 / 20:21	06:43 (10) / 07:11 (10)	07:17 / 18:37	06:54 / 16:53	07:28 / 16:37
11	07:39 / 16:57	07:13 / 17:36	07:34 (9) / 06:30 / 08:00 (9)	06:37 / 18:11	05:53 / 20:19	05:32 / 20:47	05:42 / 20:49	06:12 / 20:20	06:42 (10) / 07:10 (10)	07:18 / 18:36	06:55 / 16:52	07:29 / 16:37
12	07:39 / 16:58	07:12 / 17:37	07:32 (9) / 06:29 / 08:02 (9)	06:35 / 18:12	05:52 / 20:20	05:32 / 20:47	05:43 / 20:48	06:13 / 20:18	06:41 (10) / 07:11 (10)	07:19 / 18:34	06:57 / 16:51	07:30 / 16:37
13	07:39 / 16:59	07:11 / 17:39	07:33 (9) / 06:27 / 08:01 (9)	06:34 / 18:13	06:53 (10) / 05:51 / 20:21	05:32 / 20:48	05:44 / 20:48	06:14 / 20:17	06:40 (10) / 07:12 (10)	06:47 / 19:25	07:20 / 18:32	07:31 / 16:37
14	07:38 / 17:00	07:09 / 17:40	07:32 (9) / 06:25 / 08:02 (9)	06:32 / 18:15	06:51 (10) / 05:50 / 20:23	05:32 / 20:48	05:45 / 20:47	06:15 / 20:15	06:41 (10) / 07:13 (10)	06:48 / 19:23	07:21 / 18:31	07:32 / 16:37
15	07:38 / 17:02	07:08 / 17:41	07:32 (9) / 06:23 / 08:02 (9)	06:30 / 18:16	06:50 (10) / 05:49 / 20:24	05:32 / 20:49	05:45 / 20:47	06:16 / 20:14	06:40 (10) / 07:12 (10)	06:49 / 19:21	07:22 / 18:29	08:11 (9) / 07:00 / 16:48
16	07:37 / 17:03	07:07 / 17:43	07:31 (9) / 06:22 / 08:03 (9)	06:29 / 18:17	06:48 (10) / 05:48 / 20:25	05:32 / 20:49	05:46 / 20:46	06:17 / 20:13	06:39 (10) / 07:13 (10)	06:50 / 19:19	07:23 / 18:28	08:25 (9) / 07:02 / 16:38
17	07:37 / 17:04	07:05 / 17:44	07:31 (9) / 06:20 / 08:03 (9)	06:27 / 18:18	06:47 (10) / 05:47 / 20:26	05:32 / 20:49	05:47 / 20:46	06:18 / 20:11	06:40 (10) / 07:12 (10)	06:51 / 19:18	07:25 / 18:26	08:26 (9) / 07:03 / 16:47
18	07:36 / 17:05	07:04 / 17:45	07:32 (9) / 06:18 / 08:02 (9)	06:25 / 18:19	06:45 (10) / 05:46 / 20:27	05:32 / 20:50	05:48 / 20:45	06:19 / 20:10	06:41 (10) / 07:13 (10)	06:52 / 19:16	07:26 / 18:24	08:29 (9) / 07:04 / 16:47
19	07:36 / 17:06	07:02 / 17:46	07:32 (9) / 06:17 / 08:02 (9)	06:24 / 18:20	06:43 (10) / 05:45 / 20:28	05:32 / 20:50	05:49 / 20:44	06:20 / 20:08	06:42 (10) / 07:12 (10)	06:53 / 19:14	07:27 / 18:23	08:05 (9) / 07:05 / 16:48
20	07:35 / 17:08	07:01 / 17:48	07:31 (9) / 06:15 / 08:01 (9)	06:22 / 18:22	06:42 (10) / 05:44 / 20:29	05:32 / 20:50	05:50 / 20:43	06:21 / 20:07	06:43 (10) / 07:11 (10)	06:54 / 19:12	07:28 / 18:21	08:03 (9) / 07:07 / 16:45
21	07:34 / 17:09	06:59 / 17:49	07:31 (9) / 06:13 / 08:01 (9)	06:21 / 18:23	06:40 (10) / 05:43 / 20:30	05:33 / 20:51	05:51 / 20:43	06:22 / 20:05	06:44 (10) / 07:12 (10)	06:56 / 19:11	07:29 / 18:20	08:02 (9) / 07:08 / 16:39
22	07:34 / 17:10	06:58 / 17:50	07:32 (9) / 06:11 / 08:00 (9)	06:19 / 18:24	06:39 (10) / 05:42 / 20:31	05:33 / 20:51	05:52 / 20:42	06:24 / 20:04	06:45 (10) / 07:11 (10)	06:57 / 19:09	07:31 / 18:18	08:02 (9) / 07:09 / 16:43
23	07:33 / 17:11	06:56 / 17:52	07:34 (9) / 06:10 / 08:00 (9)	06:18 / 18:25	06:37 (10) / 05:42 / 20:32	05:33 / 20:51	05:52 / 20:41	06:25 / 20:02	06:46 (10) / 07:10 (10)	06:58 / 19:07	07:32 / 18:17	08:01 (9) / 07:10 / 16:42
24	07:32 / 17:13	06:55 / 17:53	07:35 (9) / 06:08 / 07:59 (9)	06:16 / 18:26	06:36 (10) / 05:41 / 20:33	05:33 / 20:51	05:53 / 20:40	06:26 / 20:00	06:47 (10) / 07:09 (10)	06:59 / 19:05	07:33 / 18:15	08:02 (9) / 07:11 / 16:41
25	07:31 / 17:14	06:53 / 17:54	07:35 (9) / 06:06 / 07:57 (9)	06:15 / 18:27	06:34 (10) / 05:40 / 20:34	05:34 / 20:52	05:54 / 20:39	06:27 / 19:57	06:48 (10) / 07:08 (10)	07:00 / 19:03	06:34 / 17:14	07:02 (9) / 07:13 / 16:41
26	07:31 / 17:15	06:52 / 17:55	07:38 (9) / 06:04 / 07:54 (9)	06:13 / 18:29	06:33 (10) / 05:39 / 20:34	05:34 / 20:52	05:55 / 20:38	06:28 / 19:56	06:49 (10) / 07:07 (10)	07:01 / 19:02	06:35 / 17:12	07:01 (9) / 07:14 / 16:42
27	07:30 / 17:16	06:50 / 17:57	07:40 (9) / 06:03 / 07:50 (9)	06:12 / 18:30	06:32 (10) / 05:39 / 20:35	05:34 / 20:52	05:56 / 20:37	06:29 / 19:54	06:50 (10) / 07:04 (10)	07:02 / 19:00	06:37 / 17:11	07:02 (9) / 07:15 / 16:40
28	07:29 / 17:18	06:49 / 17:58	06:01 / 18:31	06:10 / 20:05	06:32 (10) / 05:38 / 20:36	05:35 / 20:52	05:57 / 20:36	06:30 / 19:52	06:51 (10) / 07:03 (10)	07:03 / 18:58	06:38 / 17:09	07:01 (9) / 07:16 / 16:39
29	07:28 / 17:19		05:59 / 18:32	06:09 / 20:06	06:33 (10) / 05:37 / 20:37	05:35 / 20:52	05:58 / 20:35	06:31 / 19:51	06:52 (10) / 07:00 (10)	07:04 / 18:56	06:39 / 17:08	07:03 (9) / 07:17 / 16:39
30	07:27 / 17:20		05:57 / 18:33	06:07 / 20:07	06:33 (10) / 05:37 / 20:38	05:36 / 20:52	05:59 / 20:34	06:32 / 19:49	06:53 (10) / 07:05 (10)	07:05 / 18:55	06:40 / 17:07	07:02 (9) / 07:18 / 16:39
31	07:26 / 17:22		05:56 / 18:34		05:36 / 20:39		06:00 / 20:33	06:33 / 19:47			06:42 / 17:05	07:03 (9) / 07:29 (9) / 07:40 / 16:46
Potential sun hours	293	295	370	209	-292	-263	-280	-145	375	343	294	283
Total, worst case		546		426	166			606		462	90	
Sun reduction		0.45		0.55	0.55			0.55		0.45	0.35	
Oper. time red.		0.86		0.86	0.86			0.86		0.86	0.86	
Wind dir. red.		0.62		0.60	0.60			0.60		0.62	0.62	
Total reduction		0.24		0.28	0.28			0.28		0.24	0.19	
Total, real		132		121	47			172		111	17	

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	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, Mid / Northeast part
20 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
1000 meter max shadow distance applied along with default 3° inclination
Sunshine probabilities applied (pdf plots)
Directional run-hours applied from tab file (tower 1)
.

Printed/Page
03/05/06 23:23 / 25
Licensed user:
Wind Engineers, Inc.
7660 Whitegate Avenue
US-RIVERSIDE, CA 92506

Calculated:
03/01/06 21:02/2.4.0.67

SHADOW - Calendar

Calculation: Mid / Northeast part **Shadow receptor:** 711 - 711

Assumptions for shadow calculations

Maximum distance for influence	1,000	m
Minimum sun height over horizon for influence	3	°
Day step for calculation	1	days
Time step for calculation	2	minutes

Sun shine probabilities (part of time from sun rise to sun set with sun shine)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.35	0.45	0.45	0.55	0.55	0.55	0.65	0.55	0.55	0.45	0.35	0.30

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
475	585	238	199	220	474	1,184	813	840	1,246	803	479	7,555

	January		February		March		April		May		June	
1	07:40		07:25		06:47		07:17 (9)		05:54		06:06	
	16:47		17:23		17:59	32	07:49 (9)		18:35		20:08	22
2	07:40		07:24		06:45		07:17 (9)		05:52		06:05	
	16:48		17:24		18:00	30	07:47 (9)		18:36		20:09	24
3	07:40		07:23		06:44		07:17 (9)		05:50		06:03	
	16:49		17:26		18:01	30	07:47 (9)		18:38		20:10	26
4	07:40		07:22		06:42		07:20 (9)		05:49		06:02	
	16:50		17:27		18:03	26	07:46 (9)		18:39		20:12	28
5	07:40		07:21		06:40		07:20 (9)		06:47		06:01	
	16:51		17:28		18:04	24	07:44 (9)		19:40		20:13	28
6	07:40		07:19		06:39		07:20 (9)		06:45		05:59	
	16:52		17:30		18:05	22	07:42 (9)		19:41		20:14	30
7	07:40		07:18		06:37		07:23 (9)		06:44		05:58	
	16:53		17:31		18:06	18	07:41 (9)		19:42		20:15	30
8	07:40		07:17		06:35		07:25 (9)		06:42		05:57	
	16:54		17:32		18:08	12	07:37 (9)		19:43		20:16	32
9	07:40		07:16		06:34				06:40		05:56	
	16:55		17:34		18:09				19:44		20:17	32
10	07:39		07:15		06:32				06:38		05:55	
	16:56		17:35		18:10				19:46		20:18	34
11	07:39		07:13		06:30				06:37		05:53	
	16:57		17:36		18:11				19:47		20:19	32
12	07:39		07:12		06:29				06:35		05:52	
	16:58		17:37		18:12				19:48		20:20	32
13	07:39		07:11		06:27				06:34		05:51	
	16:59		17:39		18:13				19:49		20:21	32
14	07:38		07:09		06:25				06:32		05:50	
	17:00		17:40		18:15				19:50		20:23	30
15	07:38		07:08		06:23				06:30		05:49	
	17:02		17:41		18:16				19:51		20:24	28
16	07:37		07:07		06:22				06:29		05:48	
	17:03		17:43	12	07:41 (9)		18:17		19:52		20:25	28
17	07:37		07:05		07:27 (9)		06:20		06:27		05:47	
	17:04		17:44	16	07:43 (9)		18:18		19:54		20:26	28
18	07:36		07:04		07:24 (9)		06:18		06:25		05:46	
	17:05		17:45	22	07:46 (9)		18:19		19:55		20:27	26
19	07:36		07:02		07:22 (9)		06:17		06:24		05:45	
	17:06		17:46	24	07:46 (9)		18:20		19:56		20:28	24
20	07:35		07:01		07:21 (9)		06:15		06:22		05:44	
	17:08		17:48	26	07:47 (9)		18:22		19:57		20:29	22
21	07:34		06:59		07:21 (9)		06:13		06:21		05:43	
	17:09		17:49	28	07:49 (9)		18:23		19:58		20:30	18
22	07:34		06:58		07:20 (9)		06:11		06:19		05:42	
	17:10		17:50	30	07:50 (9)		18:24		19:59		20:31	16
23	07:33		06:56		07:18 (9)		06:10		06:18		05:42	
	17:11		17:52	32	07:50 (9)		18:25		20:00		20:32	14
24	07:32		06:55		07:19 (9)		06:08		06:16		06:36 (10)	
	17:13		17:53	32	07:51 (9)		18:26		20:00	4	06:40 (10)	
25	07:31		06:53		07:17 (9)		06:06		06:15		06:34 (10)	
	17:14		17:54	32	07:49 (9)		18:27		20:01	8	06:42 (10)	
26	07:31		06:52		07:18 (9)		06:04		06:13		06:33 (10)	
	17:15		17:55	32	07:50 (9)		18:29		20:03	10	06:43 (10)	
27	07:30		06:50		07:18 (9)		06:03		06:12		06:32 (10)	
	17:16		17:57	32	07:50 (9)		18:30		20:04	14	06:46 (10)	
28	07:29		06:49		07:18 (9)		06:01		06:10		06:30 (10)	
	17:18		17:58	30	07:48 (9)		18:31		20:05	16	06:46 (10)	
29	07:28						05:59		06:09		06:29 (10)	
	17:19						18:32		20:06	18	06:47 (10)	
30	07:27						05:57		06:07		06:27 (10)	
	17:20						18:33		20:07	20	06:47 (10)	
31	07:26						05:56					
	17:22						18:34					
Potential sun hours	293		295		370		209		-292		-263	
Total, worst case			348		194		90		624			
Sun reduction			0.45		0.45		0.55		0.55			
Oper. time red.			0.86		0.86		0.86		0.86			
Wind dir. red.			0.61		0.61		0.59		0.59			
Total reduction			0.24		0.24		0.28		0.28			
Total, real			82		46		25		176			

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	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, Mid / Northeast part
20 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
1000 meter max shadow distance applied along with default 3° inclination
Sunshine probabilities applied (pdf plots)
Directional run-hours applied from tab file (tower 1)
.

Printed/Page
03/05/06 23:23 / 26
Licensed user:
Wind Engineers, Inc.
7660 Whitegate Avenue
US-RIVERSIDE, CA 92506

Calculated:
03/01/06 21:02/2.4.0.67

SHADOW - Calendar

Calculation: Mid / Northeast part **Shadow receptor:** 711 - 711

Assumptions for shadow calculations

Maximum distance for influence	1,000	m
Minimum sun height over horizon for influence	3	°
Day step for calculation	1	days
Time step for calculation	2	minutes

Sun shine probabilities (part of time from sun rise to sun set with sun shine)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.35	0.45	0.45	0.55	0.55	0.55	0.65	0.55	0.55	0.45	0.35	0.30

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
475	585	238	199	220	474	1,184	813	840	1,246	803	479	7,555

	July		August		September	October		November	December
1	05:36		06:01	06:26 (10)	06:34	07:06		06:43	07:19
	20:52	32	20:32	06:58 (10)	19:46	18:53		17:04	16:38
2	05:37		06:02	06:27 (10)	06:35	07:08		06:44	07:21
	20:51	32	20:31	06:59 (10)	19:44	18:51		17:03	16:38
3	05:37		06:03	06:26 (10)	06:36	07:09		06:45	07:22
	20:51	34	20:30	07:00 (10)	19:42	18:49		17:02	16:38
4	05:38		06:04	06:27 (10)	06:37	07:10		06:47	07:23
	20:51	32	20:29	06:59 (10)	19:40	18:48		17:00	16:37
5	05:38		06:06	06:28 (10)	06:39	07:11	08:05 (9)	06:48	07:24
	20:51	32	20:27	07:00 (10)	19:39	18:46	6	08:11 (9)	16:59	16:37
6	05:39		06:07	06:29 (10)	06:40	07:12	08:00 (9)	06:49	07:25
	20:51	30	20:26	06:59 (10)	19:37	18:44	16	08:16 (9)	16:58	16:37
7	05:40		06:08	06:30 (10)	06:41	07:13	07:57 (9)	06:50	07:26
	20:50	30	20:25	07:00 (10)	19:35	18:42	20	08:17 (9)	16:57	16:37
8	05:40		06:09	06:31 (10)	06:42	07:14	07:57 (9)	06:52	07:27
	20:50	28	20:24	06:59 (10)	19:34	18:41	22	08:19 (9)	16:56	16:37
9	05:41		06:10	06:32 (10)	06:43	07:15	07:54 (9)	06:53	07:27
	20:50	26	20:22	06:58 (10)	19:32	18:39	26	08:20 (9)	16:54	16:37
10	05:42		06:11	06:33 (10)	06:44	07:17	07:53 (9)	06:54	07:28
	20:49	26	20:21	06:59 (10)	19:30	18:37	28	08:21 (9)	16:53	16:37
11	05:42		06:12	06:34 (10)	06:45	07:18	07:52 (9)	06:55	07:29
	20:49	24	20:20	06:58 (10)	19:28	18:36	30	08:22 (9)	16:52	16:37
12	05:43		06:13	06:35 (10)	06:46	07:19	07:51 (9)	06:57	07:30
	20:48	22	20:18	06:57 (10)	19:27	18:34	30	08:21 (9)	16:51	16:37
13	05:44		06:14	06:36 (10)	06:47	07:20	07:51 (9)	06:58	07:31
	20:48	20	20:17	06:56 (10)	19:25	18:32	32	08:23 (9)	16:50	16:37
14	05:45		06:15	06:37 (10)	06:48	07:21	07:50 (9)	06:59	07:32
	20:47	18	20:15	06:55 (10)	19:23	18:31	32	08:22 (9)	16:49	16:37
15	05:45		06:16	06:38 (10)	06:49	07:22	07:49 (9)	07:00	07:32
	20:47	16	20:14	06:54 (10)	19:21	18:29	34	08:23 (9)	16:48	16:38
16	05:46		06:17	06:39 (10)	06:50	07:23	07:50 (9)	07:02	07:33
	20:46	14	20:13	06:53 (10)	19:19	18:28	32	08:22 (9)	16:47	16:38
17	05:47		06:18	06:40 (10)	06:51	07:25	07:49 (9)	07:03	07:34
	20:46	10	20:11	06:50 (10)	19:18	18:26	32	08:21 (9)	16:47	16:38
18	05:48		06:19	06:41 (10)	06:52	07:26	07:51 (9)	07:04	07:35
	20:45	6	20:10	06:47 (10)	19:16	18:24	30	08:21 (9)	16:46	16:38
19	05:49	06:42 (10)	06:20		06:53	07:27	07:50 (9)	07:05	07:35
	20:44	4	06:46 (10)	20:08		19:14	18:23	30	08:20 (9)	16:45	16:39
20	05:50	06:37 (10)	06:21		06:54	07:28	07:51 (9)	07:07	07:36
	20:43	10	06:47 (10)	20:07		19:12	18:21	28	08:19 (9)	16:44	16:39
21	05:51	06:36 (10)	06:22		06:56	07:29	07:50 (9)	07:08	07:36
	20:43	14	06:50 (10)	20:05		19:11	18:20	28	08:18 (9)	16:43	16:40
22	05:52	06:34 (10)	06:24		06:57	07:31	07:52 (9)	07:09	07:37
	20:42	16	06:50 (10)	20:04		19:09	18:18	26	08:18 (9)	16:43	16:40
23	05:52	06:33 (10)	06:25		06:58	07:32	07:53 (9)	07:10	07:37
	20:41	20	06:53 (10)	20:02		19:07	18:17	24	08:17 (9)	16:42	16:41
24	05:53	06:32 (10)	06:26		06:59	07:33	07:54 (9)	07:11	07:38
	20:40	22	06:54 (10)	20:00		19:05	18:15	20	08:14 (9)	16:42	16:41
25	05:54	06:31 (10)	06:27		07:00	06:34	06:58 (9)	07:13	07:38
	20:39	24	06:55 (10)	19:57		19:03	17:14	14	07:12 (9)	16:41	16:42
26	05:55	06:30 (10)	06:28		07:01	06:35	07:01 (9)	07:14	07:39
	20:38	26	06:56 (10)	19:56		19:02	17:12	8	07:09 (9)	16:40	16:42
27	05:56	06:29 (10)	06:29		07:02	06:37	07:15	07:39
	20:37	28	06:57 (10)	19:54		19:00	17:11	16:40	16:43
28	05:57	06:28 (10)	06:30		07:03	06:38	07:16	07:39
	20:36	28	06:56 (10)	19:52		18:58	17:09	16:39	16:44
29	05:58	06:29 (10)	06:31		07:04	06:39	07:17	07:39
	20:35	28	06:57 (10)	19:51		18:56	17:08	16:39	16:45
30	05:59	06:28 (10)	06:32		07:05	06:40	07:18	07:40
	20:34	30	06:58 (10)	19:49		18:55	17:07	16:39	16:45
31	06:00	06:27 (10)	06:33			06:42		07:40
	20:33	32	06:59 (10)	19:47			17:05		16:46
Potential sun hours	-280		-145		375	343		294	283
Total, worst case		282		432			548		
Sun reduction		0.65		0.55			0.45		
Oper. time red.		0.86		0.86			0.86		
Wind dir. red.		0.59		0.59			0.61		
Total reduction		0.33		0.28			0.24		
Total, real		94		122			130		

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	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, Mid / Northeast part
20 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
1000 meter max shadow distance applied along with default 3° inclination
Sunshine probabilities applied (pdf plots)
Directional run-hours applied from tab file (tower 1)
.

Licensed user:
Wind Engineers, Inc.
7660 Whitegate Avenue
US-RIVERSIDE, CA 92506

Calculated:
03/01/06 21:02/2.4.0.67

SHADOW - Calendar

Calculation: Mid / Northeast part **Shadow receptor:** 712 - 712

Assumptions for shadow calculations

Maximum distance for influence	1,000 m
Minimum sun height over horizon for influence	3 °
Day step for calculation	1 days
Time step for calculation	2 minutes

Sun shine probabilities (part of time from sun rise to sun set with sun shine)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.35	0.45	0.45	0.55	0.55	0.55	0.65	0.55	0.55	0.45	0.35	0.30

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
475	585	238	199	220	474	1,184	813	840	1,246	803	479	7,555

	January	February	March		April		May	June	July	August		September		October	November	December
1	07:40	07:25	06:47		05:54		06:17 (9)	06:06	05:36	05:36	06:01		06:34	07:09 (9)	07:06	06:43	07:19
	16:47	17:23	17:59		18:35	30	06:47 (9)	20:08	20:40	20:52	20:32		19:46	36	07:45 (9)	18:53	17:04	16:38
2	07:40	07:24	06:45		05:52		06:15 (9)	06:05	05:35	05:37	06:02		06:35	07:08 (9)	07:08	06:44	07:21
	16:48	17:24	18:00		18:36	32	06:47 (9)	20:09	20:40	20:51	20:31		19:44	38	07:46 (9)	18:51	17:03	16:38
3	07:40	07:23	06:44		05:50		06:14 (9)	06:03	05:35	05:37	06:03		06:36		07:07 (9)	07:09	06:45	07:22
	16:49	17:26	18:01		18:38	34	06:48 (9)	20:10	20:41	20:51	20:30		19:42	38	07:45 (9)	18:49	17:02	16:38
4	07:40	07:22	06:42		05:49		06:14 (9)	06:02	05:34	05:38	06:04		06:37		07:08 (9)	07:10	06:47	07:23
	16:50	17:27	18:03		18:39	34	06:48 (9)	20:12	20:42	20:51	20:29		19:40	38	07:46 (9)	18:48	17:00	16:37
5	07:40	07:21	06:40		06:47		07:12 (9)	06:01	05:34	05:38	06:06		06:39		07:07 (9)	07:11	06:48	07:24
	16:51	17:28	18:04		19:40	36	07:48 (9)	20:13	20:43	20:51	20:27		19:39	38	07:45 (9)	18:46	16:59	16:37
6	07:40	07:19	06:39		06:45		07:13 (9)	05:59	05:34	05:39	06:07		06:40		07:08 (9)	07:12	06:49	07:25
	16:52	17:30	18:05		19:41	36	07:49 (9)	20:14	20:43	20:51	20:26		19:37	36	07:44 (9)	18:44	16:58	16:37
7	07:40	07:18	06:37		06:44		07:11 (9)	05:58	05:33	05:40	06:08		06:41		07:07 (9)	07:13	06:50	07:26
	16:53	17:31	18:06		19:42	38	07:49 (9)	20:15	20:44	20:50	20:25		19:35	36	07:43 (9)	18:42	16:57	16:37
8	07:40	07:17	06:35		06:42		07:11 (9)	05:57	05:33	05:40	06:09		06:42		07:08 (9)	07:14	06:52	07:27
	16:54	17:32	18:08		19:43	38	07:49 (9)	20:16	20:45	20:50	20:24		19:34	34	07:42 (9)	18:41	16:56	16:37
9	07:40	07:16	06:34		06:40		07:10 (9)	05:56	05:33	05:41	06:10		06:43		07:07 (9)	07:15	06:53	07:27
	16:55	17:34	18:09		19:44	38	07:48 (9)	20:17	20:45	20:50	20:22		19:32	34	07:41 (9)	18:39	16:54	16:37
10	07:39	07:15	06:32		06:38		07:10 (9)	05:55	05:33	05:42	06:11		06:44		07:08 (9)	07:17	06:54	07:28
	16:56	17:35	18:10		19:46	38	07:48 (9)	20:18	20:46	20:49	20:21		19:30	32	07:40 (9)	18:37	16:53	16:37
11	07:39	07:13	06:30		06:37		07:10 (9)	05:53	05:32	05:42	06:12		06:45		07:09 (9)	07:18	06:55	07:29
	16:57	17:36	18:11		19:47	36	07:46 (9)	20:19	20:47	20:49	20:20		19:28	30	07:39 (9)	18:36	16:52	16:37
12	07:39	07:12	06:29		06:35		07:11 (9)	05:52	05:32	05:43	06:13		06:46		07:11 (9)	07:19	06:57	07:30
	16:58	17:37	18:12		19:48	36	07:47 (9)	20:20	20:47	20:48	20:18		19:27	28	07:39 (9)	18:34	16:51	16:37
13	07:38	07:11	06:27		06:34		07:11 (9)	05:51	05:32	05:44	06:14		06:47		07:12 (9)	07:20	06:58	07:31
	16:59	17:39	18:13		19:49	34	07:45 (9)	20:21	20:48	20:48	20:17		19:25	24	07:36 (9)	18:32	16:50	16:37
14	07:38	07:09	06:25		06:32		07:11 (9)	05:50	05:32	05:45	06:15		06:48		07:13 (9)	07:21	06:59	07:32
	17:00	17:40	18:15		19:50	32	07:43 (9)	20:23	20:48	20:47	20:15		19:23	22	07:35 (9)	18:31	16:49	16:37
15	07:38	07:08	06:23		06:30		07:12 (9)	05:49	05:32	05:45	06:16		06:49		07:16 (9)	07:22	07:00	07:32
	17:02	17:41	18:16		19:51	32	07:44 (9)	20:24	20:49	20:47	20:14		19:21	16	07:32 (9)	18:29	16:48	16:38
16	07:37	07:07	06:22		06:29		07:12 (9)	05:48	05:32	05:46	06:17		06:50		07:19 (9)	07:23	07:02	07:33
	17:03	17:43	18:17		19:52	30	07:42 (9)	20:25	20:49	20:46	20:13		19:19	8	07:27 (9)	18:28	16:47	16:38
17	07:37	07:05	06:20		06:27		07:13 (9)	05:47	05:32	05:47	06:18		06:51			07:25	07:03	07:34
	17:04	17:44	18:18		19:53	28	07:41 (9)	20:26	20:49	20:46	20:11		19:18			18:26	16:47	16:38
18	07:36	07:04	06:18		06:25		07:15 (9)	05:46	05:32	05:48	06:19		06:52			07:26	07:04	07:34
	17:05	17:45	18:19		19:55	24	07:39 (9)	20:27	20:50	20:45	20:10		19:16			18:24	16:46	16:38
19	07:36	07:02	06:17		06:24		07:15 (9)	05:45	05:32	05:49	06:20		06:53			07:27	07:05	07:35
	17:06	17:46	18:20		19:56	20	07:35 (9)	20:28	20:50	20:44	20:08		19:14			18:23	16:45	16:39
20	07:35	07:01	06:15		06:22		07:18 (9)	05:44	05:32	05:50	06:21		06:54			07:28	07:07	07:36
	17:08	17:48	18:22		19:57	16	07:34 (9)	20:29	20:50	20:43	20:07		19:12			18:21	16:44	16:39
21	07:34	06:59	06:13		06:21		07:22 (9)	05:43	05:33	05:51	06:22		06:56			07:29	07:08	07:36
	17:09	17:49	18:23		19:58	6	07:28 (9)	20:30	20:51	20:43	20:05		19:11			18:20	16:44	16:40
22	07:34	06:58	06:11		06:19			05:42	05:33	05:52	06:24	07:27 (9)	06:57			07:31	07:09	07:37
	17:10	17:50	18:24		19:59			20:31	20:51	20:42	20:04	8 07:35 (9)	19:09			18:18	16:43	16:40
23	07:33	06:56	06:10		06:18			05:42	05:33	05:52	06:25	07:22 (9)	06:58			07:32	07:10	07:37
	17:11	17:52	18:25		20:00			20:32	20:51	20:41	20:02	16 07:38 (9)	19:07			18:17	16:42	16:41
24	07:32	06:55	06:08		06:16			05:41	05:33	05:53	06:26	07:19 (9)	06:59			07:33	07:11	07:38
	17:13	17:53	18:26		20:00			20:33	20:51	20:40	20:00	20 07:39 (9)	19:05			18:15	16:42	16:41
25	07:31	06:53	06:06		06:15			05:40	05:34	05:54	06:27	07:18 (9)	07:00			06:34	07:13	07:38
	17:14	17:54	18:27		20:01			20:34	20:52	20:39	19:57	24 07:42 (9)	19:03			17:14	16:41	16:42
26	07:31	06:52	06:04		06:13			05:39	05:34	05:55	06:28	07:15 (9)	07:01			06:35	07:14	07:39
	17:15	17:55	18:29		20:03			20:34	20:52	20:38	19:56	28 07:43 (9)	19:02			17:12	16:40	16:42
27	07:30	06:50	06:03		06:32 (9)		06:12	05:39	05:34	05:56	06:29	07:14 (9)	07:02			06:37	07:15	07:39
	17:16	17:57	18:30	4	06:36 (9)		20:04	20:35	20:52	20:37	19:54	30 07:44 (9)	19:00			17:11	16:40	16:43
28	07:29	06:49	06:01		06:26 (9)		06:10	05:38	05:35	05:57	06:30	07:13 (9)	07:03			06:38	07:16	07:39
	17:18	17:58	18:31	14	06:40 (9)		20:05	20:36	20:52	20:36	19:52	32 07:45 (9)	18:58			17:09	16:39	16:44
29	07:28		05:59		06:22 (9)		06:09	05:37	05:35	05:58	06:31	07:12 (9)	07:04			06:39	07:17	07:39
	17:19		18:32	20	06:42 (9)		20:06	20:37	20:52	20:35	19:51	32 07:44 (9)	18:56			17:08	16:39	16:45
30	07:27		05:57		06:21 (9)		06:07	05:37	05:36	05:59	06:32	07:11 (9)	07:05			06:40	07:18	07:40
	17:20		18:33	24	06:45 (9)		20:07	20:38	20:52	20:34	19:49	34 07:45 (9)	18:55			17:07	16:39	16:45
31	07:26		05:56		06:19 (9)			05:36		06:00	06:33	07:10 (9)				06:42		07:40
	17:22		18:34	28	06:47 (9)			20:39		20:33	19:47	36 07:46 (9)				17:05		16:46
Potential sun hours	293	295	370				209	-292	-263	-280	-145		375			343	294	283
Total, worst case				90			648					260		488				
Sun reduction				0.45			0.55					0.55		0.55				
Oper. time red.				0.86			0.86					0.86		0.86				
Wind dir. red.				0.61			0.61					0.61		0.61				
Total reduction				0.24			0.29					0.29		0.29				
Total, real				21			188					75		141				

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	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, Mid / Northeast part
20 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
1000 meter max shadow distance applied along with default 3° inclination
Sunshine probabilities applied (pdf plots)
Directional run-hours applied from tab file (tower 1)
.

Licensed user:
Wind Engineers, Inc.
7660 Whitegate Avenue
US-RIVERSIDE, CA 92506

Calculated:
03/01/06 21:02/2.4.0.67

SHADOW - Calendar

Calculation: Mid / Northeast part **Shadow receptor:** 713 - 713

Assumptions for shadow calculations

Maximum distance for influence	1,000 m
Minimum sun height over horizon for influence	3 °
Day step for calculation	1 days
Time step for calculation	2 minutes

Sun shine probabilities (part of time from sun rise to sun set with sun shine)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.35	0.45	0.45	0.55	0.55	0.55	0.65	0.55	0.55	0.45	0.35	0.30

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
475	585	238	199	220	474	1,184	813	840	1,246	803	479	7,555

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:40	07:25	06:47	05:54	06:06	05:36	05:36	06:01	06:34	07:06	06:43	07:19
	16:47	17:23	17:59	18:35	20:08	20:40	20:52	20:32	19:46 34	07:39 (9) 18:53	17:04	16:38
2	07:40	07:24	06:45	05:52	06:19 (9) 06:05	05:35	05:37	06:02	06:35	07:04 (9) 07:08	06:44	07:21
	16:48	17:24	18:00	18:36 14	06:33 (9) 20:09	20:40	20:51	20:31	19:44 34	07:38 (9) 18:51	17:03	16:38
3	07:40	07:23	06:44	05:50	06:16 (9) 06:03	05:35	05:37	06:03	06:36	07:05 (9) 07:09	06:45	07:22
	16:49	17:26	18:01	18:38 20	06:36 (9) 20:10	20:41	20:51	20:30	19:42 32	07:37 (9) 18:49	17:02	16:38
4	07:40	07:22	06:42	05:49	06:14 (9) 06:02	05:34	05:38	06:04	06:37	07:06 (9) 07:10	06:47	07:23
	16:50	17:27	18:03	18:39 24	06:38 (9) 20:12	20:42	20:51	20:29	19:40 30	07:36 (9) 18:48	17:00	16:37
5	07:40	07:21	06:40	06:47	07:12 (9) 06:01	05:34	05:38	06:06	06:39	07:05 (9) 07:11	06:48	07:24
	16:51	17:28	18:04	19:40 26	07:38 (9) 20:13	20:43	20:51	20:27	19:39 30	07:35 (9) 18:46	16:59	16:37
6	07:40	07:19	06:39	06:45	07:11 (9) 05:59	05:34	05:39	06:07	06:40	07:06 (9) 07:12	06:49	07:25
	16:52	17:30	18:05	19:41 28	07:39 (9) 20:14	20:43	20:51	20:26	19:37 28	07:34 (9) 18:44	16:58	16:37
7	07:40	07:18	06:37	06:44	07:09 (9) 05:58	05:33	05:40	06:08	06:41	07:07 (9) 07:13	06:50	07:26
	16:53	17:31	18:06	19:42 30	07:39 (9) 20:15	20:44	20:50	20:25	19:35 26	07:33 (9) 18:42	16:57	16:37
8	07:40	07:17	06:35	06:42	07:09 (9) 05:57	05:33	05:40	06:09	06:42	07:08 (9) 07:14	06:52	07:27
	16:54	17:32	18:08	19:43 30	07:39 (9) 20:16	20:45	20:50	20:24	19:34 24	07:32 (9) 18:41	16:56	16:37
9	07:40	07:16	06:34	06:40	07:08 (9) 05:56	05:33	05:41	06:10	06:43	07:09 (9) 07:15	06:53	07:27
	16:55	17:34	18:09	19:44 32	07:40 (9) 20:17	20:45	20:50	20:22	19:32 20	07:29 (9) 18:39	16:54	16:37
10	07:39	07:15	06:32	06:39	07:06 (9) 05:55	05:33	05:42	06:11	06:44	07:12 (9) 07:17	06:54	07:28
	16:56	17:35	18:10	19:46 34	07:40 (9) 20:18	20:46	20:49	20:21	19:30 14	07:26 (9) 18:37	16:53	16:37
11	07:39	07:13	06:30	06:37	07:06 (9) 05:53	05:32	05:42	06:12	06:45	07:17 (9) 07:18	06:55	07:29
	16:57	17:36	18:11	19:47 34	07:40 (9) 20:19	20:47	20:49	20:20	19:28 4	07:21 (9) 18:36	16:52	16:37
12	07:39	07:12	06:29	06:35	07:07 (9) 05:52	05:32	05:43	06:13	06:46	07:19	06:57	07:30
	16:58	17:37	18:12	19:48 34	07:41 (9) 20:20	20:47	20:48	20:18	19:27	18:34	16:51	16:37
13	07:39	07:11	06:27	06:34	07:05 (9) 05:51	05:32	05:44	06:14	06:47	07:20	06:58	07:31
	16:59	17:39	18:13	19:49 34	07:39 (9) 20:21	20:48	20:48	20:17	19:25	18:32	16:50	16:37
14	07:38	07:09	06:25	06:32	07:05 (9) 05:50	05:32	05:45	06:15	06:48	07:21	06:59	07:32
	17:00	17:40	18:15	19:50 34	07:39 (9) 20:23	20:48	20:47	20:15	19:23	18:31	16:49	16:37
15	07:38	07:08	06:23	06:30	07:06 (9) 05:49	05:32	05:45	06:16	06:49	07:22	07:00	07:32
	17:02	17:41	18:16	19:51 34	07:40 (9) 20:24	20:49	20:47	20:14	19:21	18:29	16:48	16:38
16	07:37	07:07	06:22	06:29	07:06 (9) 05:48	05:32	05:46	06:17	06:50	07:23	07:02	07:33
	17:03	17:43	18:17	19:52 32	07:38 (9) 20:25	20:49	20:46	20:13	19:19	18:28	16:47	16:38
17	07:37	07:05	06:20	06:27	07:05 (9) 05:47	05:32	05:47	06:18	06:51	07:25	07:03	07:34
	17:04	17:44	18:18	19:54 32	07:37 (9) 20:26	20:49	20:46	20:11	19:18	18:26	16:47	16:38
18	07:36	07:04	06:18	06:25	07:05 (9) 05:46	05:32	05:48	06:19	06:52	07:26	07:04	07:34
	17:05	17:45	18:19	19:55 32	07:37 (9) 20:27	20:50	20:45	20:10	19:16	18:24	16:46	16:38
19	07:36	07:02	06:17	06:24	07:07 (9) 05:45	05:32	05:49	06:20 07:20 (9)	06:53	07:27	07:05	07:35
	17:06	17:46	18:20	19:56 28	07:35 (9) 20:28	20:50	20:44	20:08 12	07:32 (9) 19:14	18:23	16:45	16:39
20	07:35	07:01	06:15	06:22	07:08 (9) 05:44	05:32	05:50	06:21 07:17 (9)	06:54	07:28	07:07	07:36
	17:08	17:48	18:22	19:57 26	07:34 (9) 20:29	20:50	20:43	20:07 18	07:35 (9) 19:12	18:21	16:44	16:39
21	07:34	06:59	06:13	06:21	07:08 (9) 05:43	05:33	05:51	06:22 07:14 (9)	06:56	07:29	07:08	07:36
	17:09	17:49	18:23	19:58 24	07:32 (9) 20:30	20:51	20:43	20:05 22	07:36 (9) 19:11	18:20	16:44	16:40
22	07:34	06:58	06:11	06:19	07:09 (9) 05:42	05:33	05:52	06:24 07:13 (9)	06:57	07:31	07:09	07:37
	17:10	17:50	18:24	19:59 22	07:31 (9) 20:31	20:51	20:42	20:04 24	07:37 (9) 19:09	18:18	16:43	16:40
23	07:33	06:56	06:10	06:18	07:11 (9) 05:42	05:33	05:53	06:25 07:10 (9)	06:58	07:32	07:10	07:37
	17:11	17:52	18:25	20:00 16	07:27 (9) 20:32	20:51	20:41	20:02 28	07:38 (9) 19:07	18:17	16:42	16:41
24	07:32	06:55	06:08	06:16	07:14 (9) 05:41	05:33	05:53	06:26 07:09 (9)	06:59	07:33	07:11	07:38
	17:13	17:53	18:26	20:00 12	07:26 (9) 20:33	20:51	20:40	20:00 30	07:39 (9) 19:05	18:15	16:42	16:41
25	07:31	06:53	06:06	06:15	05:40	05:34	05:54	06:27 07:08 (9)	07:00	06:34	07:13	07:38
	17:14	17:54	18:27	20:01	20:34	20:52	20:39	19:57 32	07:40 (9) 19:03	17:14	16:41	16:42
26	07:31	06:52	06:04	06:13	05:39	05:34	05:55	06:28 07:07 (9)	07:01	06:35	07:14	07:39
	17:15	17:55	18:29	20:03	20:34	20:52	20:38	19:56 32	07:39 (9) 19:02	17:12	16:40	16:42
27	07:30	06:50	06:03	06:12	05:39	05:34	05:56	06:29 07:06 (9)	07:02	06:37	07:15	07:39
	17:16	17:57	18:30	20:04	20:35	20:52	20:37	19:54 34	07:40 (9) 19:00	17:11	16:40	16:43
28	07:29	06:49	06:01	06:10	05:38	05:35	05:57	06:30 07:07 (9)	07:03	06:38	07:16	07:39
	17:18	17:58	18:31	20:05	20:36	20:52	20:36	19:52 32	07:39 (9) 18:58	17:10	16:39	16:44
29	07:28		05:59	06:09	05:37	05:35	05:58	06:31 07:06 (9)	07:04	06:39	07:17	07:39
	17:19		18:32	20:06	20:37	20:52	20:35	19:51 34	07:40 (9) 18:56	17:08	16:39	16:45
30	07:27		05:57	06:07	05:37	05:36	05:59	06:32 07:05 (9)	07:05	06:40	07:18	07:40
	17:20		18:33	20:07	20:38	20:52	20:34	19:49 34	07:39 (9) 18:55	17:07	16:39	16:45
31	07:26		05:56		05:36		06:00	06:33 07:06 (9)		06:42		07:40
	17:22		18:34		20:39		20:33	19:47 34	07:40 (9)	17:05		16:46
Potential sun hours	293	295	370	209	-292	-263	-280	-145	375	343	294	283
Total, worst case				632				366	276			
Sun reduction				0.55				0.55	0.55			
Oper. time red.				0.86				0.86	0.86			
Wind dir. red.				0.61				0.61	0.61			
Total reduction				0.29				0.29	0.29			
Total, real				183				106	80			

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	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, Mid / Northeast part
20 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
1000 meter max shadow distance applied along with default 3° inclination
Sunshine probabilities applied (pdf plots)
Directional run-hours applied from tab file (tower 1)
.

Licensed user:
Wind Engineers, Inc.
7660 Whitegate Avenue
US-RIVERSIDE, CA 92506

Calculated:
03/01/06 21:02/2.4.0.67

SHADOW - Calendar

Calculation: Mid / Northeast part **Shadow receptor:** 714 - 714

Assumptions for shadow calculations

Maximum distance for influence	1,000	m
Minimum sun height over horizon for influence	3	°
Day step for calculation	1	days
Time step for calculation	2	minutes

Sun shine probabilities (part of time from sun rise to sun set with sun shine)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.35	0.45	0.45	0.55	0.55	0.55	0.65	0.55	0.55	0.45	0.35	0.30

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
475	585	238	199	220	474	1,184	813	840	1,246	803	479	7,555

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:40	07:25	06:47	05:54	06:06	05:36	06:08 (9)	05:36	06:13 (9)	06:01	06:32 (9)	06:34	07:06	06:43	07:19
	16:47	17:23	17:59	18:35	20:08	20:40 40	06:48 (9)	20:52 42	06:55 (9)	20:32 10	06:42 (9)	19:46	18:53	17:04	16:38
2	07:40	07:24	06:45	05:52	06:05	05:35	06:07 (9)	05:37	06:14 (9)	06:02		06:35	07:08	06:44	07:21
	16:48	17:24	18:00	18:36	20:09	20:40 42	06:49 (9)	20:51 42	06:56 (9)	20:31		19:44	18:51	17:03	16:38
3	07:40	07:23	06:44	05:50	06:03	05:35	06:07 (9)	05:37	06:14 (9)	06:03		06:36	07:09	06:45	07:22
	16:49	17:26	18:01	18:38	20:10	20:41 42	06:49 (9)	20:51 40	06:54 (9)	20:30		19:42	18:49	17:02	16:38
4	07:40	07:22	06:42	05:49	06:02	05:34	06:07 (9)	05:38	06:13 (9)	06:04		06:37	07:10	06:47	07:23
	16:50	17:27	18:03	18:39	20:12	20:42 42	06:49 (9)	20:51 42	06:55 (9)	20:29		19:40	18:48	17:00	16:37
5	07:40	07:21	06:40	06:47	06:01	05:34	06:08 (9)	05:38	06:13 (9)	06:06		06:39	07:11	06:48	07:24
	16:51	17:28	18:04	19:40	20:13	20:43 40	06:48 (9)	20:51 42	06:55 (9)	20:27		19:39	18:46	16:59	16:37
6	07:40	07:19	06:39	06:45	05:59	05:34	06:08 (9)	05:39	06:14 (9)	06:07		06:40	07:12	06:49	07:25
	16:52	17:30	18:05	19:41	20:14	20:43 42	06:50 (9)	20:51 42	06:56 (9)	20:26		19:37	18:44	16:58	16:37
7	07:40	07:18	06:37	06:44	05:58	05:33	06:08 (9)	05:40	06:15 (9)	06:08		06:41	07:13	06:50	07:26
	16:53	17:31	18:06	19:42	20:15	20:44 42	06:50 (9)	20:50 42	06:57 (9)	20:25		19:35	18:42	16:57	16:37
8	07:40	07:17	06:35	06:42	05:57	05:33	06:08 (9)	05:40	06:15 (9)	06:09		06:42	07:14	06:52	07:27
	16:54	17:32	18:08	19:43	20:16	20:45 42	06:50 (9)	20:50 40	06:55 (9)	20:24		19:34	18:41	16:56	16:37
9	07:40	07:16	06:34	06:40	05:56	05:33	06:09 (9)	05:41	06:14 (9)	06:10		06:43	07:15	06:53	07:27
	16:55	17:34	18:09	19:44	20:17	20:45 40	06:49 (9)	20:50 42	06:56 (9)	20:22		19:32	18:39	16:54	16:37
10	07:39	07:15	06:32	06:38	05:55	05:33	06:09 (9)	05:42	06:15 (9)	06:11		06:44	07:17	06:54	07:28
	16:56	17:35	18:10	19:46	20:18	20:46 40	06:49 (9)	20:49 42	06:57 (9)	20:21		19:30	18:37	16:53	16:37
11	07:39	07:13	06:30	06:37	05:53	05:32	06:09 (9)	05:42	06:15 (9)	06:12		06:45	07:18	06:55	07:29
	16:57	17:36	18:11	19:47	20:19	20:47 42	06:51 (9)	20:49 40	06:55 (9)	20:20		19:28	18:36	16:52	16:37
12	07:39	07:12	06:29	06:35	05:52	06:21 (9)	05:32	06:09 (9)	05:43	06:16 (9)	06:13		06:46	07:19	06:57	07:30
	16:58	17:37	18:12	19:48	20:20 12	06:33 (9)	20:47 42	06:51 (9)	20:48 40	06:56 (9)	20:18		19:27	18:34	16:51	16:37
13	07:38	07:11	06:27	06:34	05:51	06:18 (9)	05:32	06:09 (9)	05:44	06:15 (9)	06:14		06:47	07:20	06:58	07:31
	16:59	17:39	18:13	19:49	20:21 18	06:36 (9)	20:48 42	06:51 (9)	20:48 42	06:57 (9)	20:17		19:25	18:32	16:50	16:37
14	07:38	07:09	06:25	06:32	05:50	06:17 (9)	05:32	06:09 (9)	05:45	06:16 (9)	06:15		06:48	07:21	06:59	07:32
	17:00	17:40	18:15	19:50	20:22 20	06:37 (9)	20:48 42	06:51 (9)	20:47 40	06:56 (9)	20:15		19:23	18:31	16:49	16:37
15	07:38	07:08	06:23	06:30	05:49	06:14 (9)	05:32	06:09 (9)	05:45	06:17 (9)	06:16		06:49	07:22	07:00	07:32
	17:02	17:41	18:16	19:51	20:24 26	06:40 (9)	20:49 42	06:51 (9)	20:47 40	06:57 (9)	20:14		19:21	18:29	16:48	16:38
16	07:37	07:07	06:22	06:29	05:48	06:13 (9)	05:32	06:11 (9)	05:46	06:17 (9)	06:17		06:50	07:23	07:02	07:33
	17:03	17:43	18:17	19:52	20:25 28	06:41 (9)	20:49 40	06:51 (9)	20:46 40	06:57 (9)	20:13		19:19	18:28	16:47	16:38
17	07:37	07:05	06:20	06:27	05:47	06:12 (9)	05:32	06:11 (9)	05:47	06:16 (9)	06:18		06:51	07:25	07:03	07:34
	17:04	17:44	18:18	19:53	20:26 30	06:42 (9)	20:49 40	06:51 (9)	20:46 40	06:56 (9)	20:11		19:18	18:26	16:47	16:38
18	07:36	07:04	06:18	06:25	05:46	06:11 (9)	05:32	06:11 (9)	05:48	06:17 (9)	06:19		06:52	07:26	07:04	07:34
	17:05	17:45	18:19	19:55	20:27 32	06:43 (9)	20:50 40	06:51 (9)	20:45 40	06:57 (9)	20:10		19:16	18:24	16:46	16:38
19	07:36	07:02	06:17	06:24	05:45	06:10 (9)	05:32	06:11 (9)	05:49	06:18 (9)	06:20		06:53	07:27	07:05	07:35
	17:06	17:46	18:20	19:56	20:28 32	06:42 (9)	20:50 40	06:51 (9)	20:44 38	06:56 (9)	20:08		19:14	18:23	16:45	16:39
20	07:35	07:01	06:15	06:22	05:44	06:10 (9)	05:32	06:11 (9)	05:50	06:19 (9)	06:21		06:54	07:28	07:07	07:36
	17:08	17:48	18:22	19:57	20:29 34	06:44 (9)	20:50 40	06:51 (9)	20:43 38	06:57 (9)	20:07		19:12	18:21	16:44	16:39
21	07:34	06:59	06:13	06:21	05:43	06:09 (9)	05:33	06:12 (9)	05:51	06:20 (9)	06:22		06:56	07:29	07:08	07:36
	17:09	17:49	18:23	19:58	20:30 36	06:45 (9)	20:51 40	06:52 (9)	20:43 36	06:56 (9)	20:05		19:11	18:20	16:44	16:40
22	07:34	06:58	06:11	06:19	05:42	06:10 (9)	05:33	06:12 (9)	05:52	06:18 (9)	06:24		06:57	07:31	07:09	07:37
	17:10	17:50	18:24	19:59	20:31 36	06:46 (9)	20:51 40	06:52 (9)	20:42 36	06:54 (9)	20:04		19:09	18:18	16:43	16:40
23	07:33	06:56	06:10	06:18	05:42	06:09 (9)	05:33	06:12 (9)	05:53	06:19 (9)	06:25		06:58	07:32	07:10	07:37
	17:11	17:52	18:25	20:00	20:32 36	06:45 (9)	20:51 40	06:52 (9)	20:41 36	06:55 (9)	20:02		19:07	18:17	16:42	16:41
24	07:32	06:55	06:08	06:16	05:41	06:08 (9)	05:33	06:12 (9)	05:53	06:20 (9)	06:26		06:59	07:33	07:11	07:38
	17:13	17:53	18:26	20:00	20:33 38	06:46 (9)	20:51 40	06:52 (9)	20:40 34	06:54 (9)	20:00		19:05	18:15	16:42	16:41
25	07:31	06:53	06:06	06:15	05:40	06:08 (9)	05:34	06:13 (9)	05:54	06:21 (9)	06:27		07:00	06:34	07:13	07:38
	17:14	17:54	18:27	20:01	20:34 38	06:46 (9)	20:52 40	06:53 (9)	20:39 32	06:53 (9)	19:57		19:03	17:14	16:41	16:42
26	07:31	06:52	06:04	06:13	05:39	06:07 (9)	05:34	06:13 (9)	05:55	06:22 (9)	06:28		07:01	06:35	07:14	07:39
	17:15	17:55	18:28	20:03	20:34 40	06:47 (9)	20:52 40	06:53 (9)	20:38 30	06:52 (9)	19:56		19:02	17:12	16:40	16:42
27	07:30	06:50	06:03	06:12	05:39	06:09 (9)	05:34	06:12 (9)	05:56	06:23 (9)	06:29		07:02	06:37	07:15	07:39
	17:16	17:57	18:30	20:04	20:35 38	06:47 (9)	20:52 42	06:54 (9)	20:37 28	06:51 (9)	19:54		19:00	17:11	16:40	16:43
28	07:29	06:49	06:01	06:10	05:38	06:08 (9)	05:35	06:12 (9)	05:57	06:24 (9)	06:30		07:03	06:38	07:16	07:39
	17:18	17:58	18:31	20:05	20:36 40	06:48 (9)	20:52 42	06:54 (9)	20:36 26	06:50 (9)	19:52		18:58	17:09	16:39	16:44
29	07:28		05:59	06:09	05:37	06:07 (9)	05:35	06:12 (9)	05:58	06:25 (9)	06:31		07:04	06:39	07:17	07:39
	17:19		18:32	20:06	20:37 40	06:47 (9)	20:52 42	06:54 (9)	20:35 24	06:49 (9)	19:51		18:56	17:08	16:39	16:45
30	07:27		05:57	06:07	05:37	06:07 (9)	05:36	06:13 (9)	05:59	06:28 (9)	06:32		07:05	06:40	07:18	07:40
	17:20		18:33	20:07	20:38 42	06:49 (9)	20:52 42	06:55 (9)	20:34 20	06:48 (9)	19:49		18:55	17:07	16:39	16:45
31	07:26		05:56		05:36	06:08 (9)		06:00	06:29 (9)	06:33			06:42		07:40
	17:22		18:34		20:39 40	06:48 (9)		20:33 16	06:45 (9)	19:47			17:05		16:46
Potential sun hours	293	295	370	209	-292	-263		-280		-145		375	343	294	283
Total, worst case					656	1230		1132		10					
Sun reduction					0.55	0.55		0.65		0.55					
Oper. time red.					0.86	0.86		0.86		0.86					
Wind dir. red.					0.62	0.62		0.62		0.62					
Total reduction					0.29	0.29		0.34		0.29					
Total, real					191	359		390		3					

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	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, Mid / Northeast part
20 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
1000 meter max shadow distance applied along with default 3° inclination
Sunshine probabilities applied (pdf plots)
Directional run-hours applied from tab file (tower 1)
.

Printed/Page
03/05/06 23:23 / 30
Licensed user:
Wind Engineers, Inc.
7660 Whitegate Avenue
US-RIVERSIDE, CA 92506

Calculated:
03/01/06 21:02/2.4.0.67

SHADOW - Calendar

Calculation: Mid / Northeast part **Shadow receptor:** 715 - 715

Assumptions for shadow calculations

Maximum distance for influence	1,000	m
Minimum sun height over horizon for influence	3	°
Day step for calculation	1	days
Time step for calculation	2	minutes

Sun shine probabilities (part of time from sun rise to sun set with sun shine)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.35	0.45	0.45	0.55	0.55	0.55	0.65	0.55	0.55	0.45	0.35	0.30

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
475	585	238	199	220	474	1,184	813	840	1,246	803	479	7,555

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:40	07:25	06:47	05:54	06:06	05:36	06:12 (9)	05:36	06:17 (9)	06:01	06:34	07:06	06:43	07:19
	16:47	17:23	17:59	18:35	20:08	20:40 32	06:44 (9)	20:52 32	06:49 (9)	20:32	19:46	18:53	17:04	16:38
2	07:40	07:24	06:45	05:52	06:05	05:35	06:11 (9)	05:37	06:18 (9)	06:02	06:35	07:08	06:44	07:21
	16:48	17:24	18:00	18:36	20:09	20:40 32	06:43 (9)	20:51 32	06:50 (9)	20:31	19:44	18:51	17:03	16:38
3	07:40	07:23	06:44	05:50	06:03	05:35	06:11 (9)	05:37	06:18 (9)	06:03	06:36	07:09	06:45	07:22
	16:49	17:26	18:01	18:38	20:10	20:41 32	06:43 (9)	20:51 32	06:50 (9)	20:30	19:42	18:49	17:02	16:38
4	07:40	07:22	06:42	05:49	06:02	05:34	06:11 (9)	05:38	06:17 (9)	06:04	06:37	07:10	06:47	07:23
	16:50	17:27	18:03	18:39	20:12	20:42 34	06:45 (9)	20:51 34	06:51 (9)	20:29	19:40	18:48	17:00	16:37
5	07:40	07:21	06:40	06:47	06:01	05:34	06:12 (9)	05:38	06:17 (9)	06:06	06:39	07:11	06:48	07:24
	16:51	17:28	18:04	19:40	20:13	20:43 32	06:44 (9)	20:51 32	06:49 (9)	20:27	19:39	18:46	16:59	16:37
6	07:40	07:19	06:39	06:45	05:59	05:34	06:12 (9)	05:39	06:18 (9)	06:07	06:40	07:12	06:49	07:25
	16:52	17:30	18:05	19:41	20:14	20:43 32	06:44 (9)	20:51 32	06:50 (9)	20:26	19:37	18:44	16:58	16:37
7	07:40	07:18	06:37	06:44	05:58	05:33	06:12 (9)	05:40	06:19 (9)	06:08	06:41	07:13	06:50	07:26
	16:53	17:31	18:06	19:42	20:15	20:44 32	06:44 (9)	20:50 32	06:51 (9)	20:25	19:35	18:43	16:57	16:37
8	07:40	07:17	06:35	06:42	05:57	05:33	06:12 (9)	05:40	06:19 (9)	06:09	06:42	07:14	06:52	07:27
	16:54	17:32	18:08	19:43	20:16	20:45 34	06:46 (9)	20:50 32	06:51 (9)	20:24	19:34	18:41	16:56	16:37
9	07:40	07:16	06:34	06:40	05:56	05:33	06:13 (9)	05:41	06:18 (9)	06:10	06:43	07:15	06:53	07:27
	16:55	17:34	18:09	19:44	20:17	20:45 32	06:45 (9)	20:50 32	06:50 (9)	20:22	19:32	18:39	16:54	16:37
10	07:39	07:15	06:32	06:39	05:55	05:33	06:13 (9)	05:42	06:19 (9)	06:11	06:44	07:17	06:54	07:28
	16:56	17:35	18:10	19:46	20:18	20:46 32	06:45 (9)	20:49 32	06:51 (9)	20:21	19:30	18:37	16:53	16:37
11	07:39	07:13	06:30	06:37	05:53	05:32	06:13 (9)	05:42	06:19 (9)	06:12	06:45	07:18	06:55	07:29
	16:57	17:36	18:11	19:47	20:19	20:47 32	06:45 (9)	20:49 32	06:51 (9)	20:20	19:28	18:36	16:52	16:37
12	07:39	07:12	06:29	06:35	05:52	05:32	06:13 (9)	05:43	06:20 (9)	06:13	06:46	07:19	06:57	07:30
	16:58	17:37	18:12	19:48	20:20	20:47 32	06:45 (9)	20:48 32	06:52 (9)	20:18	19:27	18:34	16:51	16:37
13	07:38	07:11	06:27	06:34	05:51	05:32	06:13 (9)	05:44	06:19 (9)	06:14	06:47	07:20	06:58	07:31
	16:59	17:39	18:13	19:49	20:21	20:48 32	06:45 (9)	20:48 32	06:51 (9)	20:17	19:25	18:32	16:50	16:37
14	07:38	07:09	06:25	06:32	05:50	05:32	06:13 (9)	05:45	06:20 (9)	06:15	06:48	07:21	06:59	07:32
	17:00	17:40	18:15	19:50	20:23	20:48 32	06:45 (9)	20:47 32	06:52 (9)	20:15	19:23	18:31	16:49	16:37
15	07:38	07:08	06:23	06:30	05:49	06:24 (9) 05:32	06:13 (9)	05:45	06:21 (9)	06:16	06:49	07:22	07:00	07:32
	17:02	17:41	18:16	19:51	20:24 6	06:30 (9) 20:49 32	06:45 (9)	20:47 30	06:51 (9)	20:14	19:21	18:29	16:48	16:38
16	07:37	07:07	06:22	06:29	05:48	06:19 (9) 05:32	06:15 (9)	05:46	06:21 (9)	06:17	06:50	07:23	07:02	07:33
	17:03	17:43	18:17	19:52	20:25 14	06:33 (9) 20:49 30	06:45 (9)	20:46 30	06:51 (9)	20:13	19:19	18:28	16:48	16:38
17	07:37	07:05	06:20	06:27	05:47	06:18 (9) 05:32	06:15 (9)	05:47	06:20 (9)	06:18	06:51	07:25	07:03	07:34
	17:04	17:44	18:18	19:54	20:26 16	06:34 (9) 20:49 30	06:45 (9)	20:46 30	06:50 (9)	20:11	19:18	18:26	16:47	16:38
18	07:36	07:04	06:18	06:25	05:46	06:17 (9) 05:32	06:15 (9)	05:48	06:21 (9)	06:19	06:52	07:26	07:04	07:34
	17:05	17:45	18:19	19:55	20:27 18	06:35 (9) 20:50 32	06:47 (9)	20:45 30	06:51 (9)	20:10	19:16	18:24	16:46	16:38
19	07:36	07:02	06:17	06:24	05:45	06:16 (9) 05:32	06:15 (9)	05:49	06:22 (9)	06:20	06:53	07:27	07:05	07:35
	17:06	17:46	18:20	19:56	20:28 20	06:36 (9) 20:50 32	06:47 (9)	20:44 28	06:50 (9)	20:08	19:14	18:23	16:45	16:39
20	07:35	07:01	06:15	06:22	05:44	06:16 (9) 05:32	06:16 (9)	05:50	06:23 (9)	06:21	06:54	07:28	07:07	07:36
	17:08	17:48	18:22	19:57	20:29 22	06:38 (9) 20:50 32	06:48 (9)	20:43 28	06:51 (9)	20:07	19:12	18:21	16:44	16:39
21	07:34	06:59	06:13	06:21	05:43	06:15 (9) 05:33	06:16 (9)	05:51	06:24 (9)	06:23	06:56	07:29	07:08	07:36
	17:09	17:49	18:23	19:58	20:30 24	06:39 (9) 20:51 32	06:48 (9)	20:43 26	06:50 (9)	20:05	19:11	18:20	16:44	16:40
22	07:34	06:58	06:11	06:19	05:42	06:14 (9) 05:33	06:16 (9)	05:52	06:24 (9)	06:24	06:57	07:31	07:09	07:37
	17:10	17:50	18:24	19:59	20:31 26	06:40 (9) 20:51 32	06:48 (9)	20:42 24	06:48 (9)	20:04	19:09	18:18	16:43	16:40
23	07:33	06:56	06:10	06:18	05:42	06:13 (9) 05:33	06:16 (9)	05:53	06:25 (9)	06:25	06:58	07:32	07:10	07:37
	17:11	17:52	18:25	20:00	20:32 26	06:39 (9) 20:51 32	06:48 (9)	20:41 24	06:49 (9)	20:02	19:07	18:17	16:42	16:41
24	07:32	06:55	06:08	06:16	05:41	06:13 (9) 05:33	06:16 (9)	05:53	06:26 (9)	06:26	06:59	07:33	07:11	07:38
	17:13	17:53	18:26	20:00	20:33 28	06:41 (9) 20:51 32	06:48 (9)	20:40 22	06:48 (9)	20:00	19:05	18:15	16:42	16:41
25	07:31	06:53	06:06	06:15	05:40	06:12 (9) 05:34	06:17 (9)	05:54	06:27 (9)	06:27	07:00	06:34	07:13	07:38
	17:14	17:54	18:27	20:01	20:34 30	06:42 (9) 20:52 32	06:49 (9)	20:39 20	06:47 (9)	19:57	19:03	17:14	16:41	16:42
26	07:31	06:52	06:04	06:13	05:39	06:11 (9) 05:34	06:17 (9)	05:55	06:28 (9)	06:28	07:01	06:35	07:14	07:39
	17:15	17:55	18:29	20:03	20:34 30	06:41 (9) 20:52 30	06:47 (9)	20:38 18	06:46 (9)	19:56	19:02	17:12	16:40	16:42
27	07:30	06:50	06:03	06:12	05:39	06:11 (9) 05:34	06:16 (9)	05:56	06:29 (9)	06:29	07:02	06:37	07:15	07:39
	17:16	17:57	18:30	20:04	20:35 32	06:43 (9) 20:52 32	06:48 (9)	20:37 16	06:45 (9)	19:54	19:00	17:11	16:40	16:43
28	07:29	06:49	06:01	06:10	05:38	06:12 (9) 05:35	06:16 (9)	05:57	06:32 (9)	06:30	07:03	06:38	07:16	07:39
	17:18	17:58	18:31	20:05	20:36 30	06:42 (9) 20:52 32	06:48 (9)	20:36 10	06:42 (9)	19:52	18:58	17:10	16:39	16:44
29	07:28		05:59	06:09	05:37	06:11 (9) 05:35	06:16 (9)	05:58		06:31	07:04	06:39	07:17	07:39
	17:19		18:32	20:06	20:37 32	06:43 (9) 20:52 32	06:48 (9)	20:35		19:51	18:56	17:08	16:39	16:45
30	07:27		05:57	06:07	05:37	06:11 (9) 05:36	06:17 (9)	05:59		06:32	07:05	06:40	07:18	07:40
	17:20		18:33	20:07	20:38 32	06:43 (9) 20:52 32	06:49 (9)	20:34		19:49	18:55	17:07	16:39	16:45
31	07:26		05:56		05:36	06:10 (9)		06:00		06:33		06:42		07:40
	17:22		18:34		20:39 32	06:42 (9)		20:33		19:47		17:05		16:46
Potential sun hours	293	295	370	209	-292	-263		-280		-145	375	343	294	283
Total, worst case					418	958		786						
Sun reduction					0.55	0.55		0.65						
Oper. time red.					0.86	0.86		0.86						
Wind dir. red.					0.61	0.61		0.61						
Total reduction					0.29	0.29		0.34						
Total, real					122	279		271						

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	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, Mid / Northeast part
20 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
1000 meter max shadow distance applied along with default 3° inclination
Sunshine probabilities applied (pdf plots)
Directional run-hours applied from tab file (tower 1)
.

Printed/Page
03/05/06 23:23 / 31
Licensed user:
Wind Engineers, Inc.
7660 Whitegate Avenue
US-RIVERSIDE, CA 92506

Calculated:
03/01/06 21:02/2.4.0.67

SHADOW - Calendar

Calculation: Mid / Northeast part **Shadow receptor:** 716 - 716

Assumptions for shadow calculations

Maximum distance for influence	1,000	m
Minimum sun height over horizon for influence	3	°
Day step for calculation	1	days
Time step for calculation	2	minutes

Sun shine probabilities (part of time from sun rise to sun set with sun shine)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.35	0.45	0.45	0.55	0.55	0.55	0.65	0.55	0.55	0.45	0.35	0.30

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
475	585	238	199	220	474	1,184	813	840	1,246	803	479	7,555

	January		February	March	April		May		June	July		August		September	October	November	December	
1	07:40	09:01 (8)	07:25	06:47	05:54		06:06	06:38 (9)	05:36	05:36		06:01	06:42 (9)	06:34	07:06	06:43	07:19	
	16:47	10 09:11 (8)	17:23	17:59	18:35		20:08	14 06:52 (9)	20:40	20:52		20:32	26 07:08 (9)	19:46	18:53	17:04	16:38	
2	07:40	09:03 (8)	07:24	06:45	05:52		06:05	06:37 (9)	05:35	05:37		06:02	06:41 (9)	06:35	07:08	06:44	07:21	
	16:48	8 09:11 (8)	17:24	18:00	18:36		20:09	18 06:55 (9)	20:40	20:51		20:31	28 07:09 (9)	19:44	18:51	17:03	16:38	
3	07:40		07:23	06:44	05:50		06:03	06:36 (9)	05:35	05:37		06:03	06:42 (9)	06:36	07:09	06:45	07:22	
	16:49		17:26	18:01	18:38		20:10	20 06:56 (9)	20:41	20:51		20:30	26 07:08 (9)	19:42	18:49	17:02	16:38	
4	07:40		07:22	06:42	05:49		06:02	06:34 (9)	05:34	05:38		06:04	06:41 (9)	06:37	07:10	06:47	07:23	
	16:50		17:27	18:03	18:39		20:12	22 06:56 (9)	20:42	20:51		20:29	26 07:07 (9)	19:40	18:48	17:00	16:37	
5	07:40		07:21	06:40	06:47		06:01	06:33 (9)	05:34	05:38		06:06	06:42 (9)	06:39	07:11	06:48	07:24	
	16:51		17:28	18:04	19:40		20:13	24 06:57 (9)	20:43	20:51		20:27	26 07:08 (9)	19:39	18:46	16:59	16:37	
6	07:40		07:19	06:39	06:45		05:59	06:32 (9)	05:34	05:39		06:07	06:41 (9)	06:40	07:12	06:49	07:25	
	16:52		17:30	18:05	19:41		20:14	26 06:58 (9)	20:43	20:51		20:26	26 07:07 (9)	19:37	18:44	16:58	16:37	
7	07:40		07:18	06:37	06:44		05:58	06:31 (9)	05:33	05:40		06:08	06:42 (9)	06:41	07:13	06:50	07:26	
	16:53		17:31	18:06	19:42		20:15	26 06:57 (9)	20:44	20:50		20:25	24 07:06 (9)	19:35	18:43	16:57	16:37	
8	07:40		07:17	06:35	06:42		05:57	06:31 (9)	05:33	05:40		06:09	06:43 (9)	06:42	07:14	06:52	07:27	
	16:54		17:32	18:08	19:43		20:16	26 06:57 (9)	20:45	20:50		20:24	24 07:07 (9)	19:34	18:41	16:56	16:37	
9	07:40		07:16	06:34	06:40		05:56	06:30 (9)	05:33	05:41		06:10	06:44 (9)	06:43	07:15	06:53	07:27	
	16:55		17:34	18:09	19:44		20:17	28 06:58 (9)	20:45	20:50		20:22	22 07:06 (9)	19:32	18:39	16:54	16:37	
10	07:39		07:15	06:32	06:39		05:55	06:31 (9)	05:33	05:42		06:11	06:45 (9)	06:44	07:17	06:54	07:28	08:53 (8)
	16:56		17:35	18:10	19:46		20:18	26 06:57 (9)	20:46	20:49		20:21	20 07:05 (9)	19:30	18:37	16:53	16:37	8 09:01 (8)
11	07:39		07:13	06:30	06:37		05:53	06:30 (9)	05:32	05:42		06:12	06:46 (9)	06:45	07:18	06:55	07:29	08:52 (8)
	16:57		17:36	18:11	19:47		20:19	28 06:58 (9)	20:47	20:49		20:20	16 07:02 (9)	19:28	18:36	16:52	16:37	10 09:02 (8)
12	07:39		07:12	06:29	06:35		05:52	06:31 (9)	05:32	05:43		06:13	06:47 (9)	06:46	07:19	06:57	07:30	08:52 (8)
	16:58		17:37	18:12	19:48		20:20	26 06:57 (9)	20:47	20:48		20:18	14 07:01 (9)	19:27	18:34	16:51	16:37	10 09:02 (8)
13	07:39		07:11	06:27	06:34		05:51	06:30 (9)	05:32	05:44		06:14	06:50 (9)	06:47	07:20	06:58	07:31	08:51 (8)
	16:59		17:39	18:13	19:49		20:21	28 06:58 (9)	20:48	20:48		20:17	8 06:58 (9)	19:25	18:32	16:50	16:37	12 09:03 (8)
14	07:38		07:09	06:25	06:32		05:50	06:31 (9)	05:32	05:45		06:15		06:48	07:21	06:59	07:32	08:52 (8)
	17:00		17:40	18:15	19:50		20:23	26 06:57 (9)	20:48	20:47		20:15		19:23	18:31	16:49	16:37	14 09:06 (8)
15	07:38		07:08	06:23	06:30		05:49	06:32 (9)	05:32	05:45		06:16		06:49	07:22	07:00	07:32	08:51 (8)
	17:02		17:41	18:16	19:51		20:24	24 06:56 (9)	20:49	20:47		20:14		19:21	18:29	16:48	16:38	16 09:07 (8)
16	07:37		07:07	06:22	06:29		05:48	06:31 (9)	05:32	05:46		06:17		06:50	07:23	07:02	07:33	08:51 (8)
	17:03		17:43	18:17	19:52		20:25	26 06:57 (9)	20:49	20:46		20:13		19:19	18:28	16:48	16:38	16 09:07 (8)
17	07:37		07:05	06:20	06:27		05:47	06:32 (9)	05:32	05:47		06:18		06:51	07:25	07:03	07:34	08:52 (8)
	17:04		17:44	18:18	19:54		20:26	24 06:56 (9)	20:49	20:46		20:11		19:18	18:26	16:47	16:38	16 09:08 (8)
18	07:36		07:04	06:18	06:25		05:46	06:33 (9)	05:32	05:48		06:19		06:52	07:26	07:04	07:34	08:51 (8)
	17:05		17:45	18:19	19:55		20:27	22 06:55 (9)	20:50	20:45		20:10		19:16	18:24	16:46	16:38	18 09:09 (8)
19	07:36		07:02	06:17	06:24		05:45	06:34 (9)	05:32	05:49	06:52 (9)	06:20		06:53	07:27	07:05	07:35	08:51 (8)
	17:06		17:47	18:20	19:56		20:28	20 06:54 (9)	20:50	20:44	4 06:56 (9)	20:08		19:14	18:23	16:45	16:39	18 09:09 (8)
20	07:35		07:01	06:15	06:22		05:44	06:34 (9)	05:32	05:50	06:49 (9)	06:21		06:54	07:28	07:07	07:36	08:52 (8)
	17:08		17:48	18:22	19:57		20:29	20 06:54 (9)	20:50	20:43	10 06:59 (9)	20:07		19:12	18:21	16:44	16:39	18 09:10 (8)
21	07:34		06:59	06:13	06:21		05:43	06:35 (9)	05:33	05:51	06:48 (9)	06:23		06:56	07:29	07:08	07:36	08:52 (8)
	17:09		17:49	18:23	19:58		20:30	18 06:53 (9)	20:51	20:43	14 07:02 (9)	20:05		19:11	18:20	16:44	16:40	18 09:10 (8)
22	07:34		06:58	06:11	06:19		05:42	06:36 (9)	05:33	05:52	06:46 (9)	06:24		06:57	07:31	07:09	07:37	08:53 (8)
	17:10		17:50	18:24	19:59		20:31	16 06:52 (9)	20:51	20:42	16 07:02 (9)	20:04		19:09	18:18	16:43	16:40	18 09:11 (8)
23	07:33		06:56	06:10	06:18		05:42	06:37 (9)	05:33	05:53	06:45 (9)	06:25		06:58	07:32	07:10	07:37	08:53 (8)
	17:11		17:52	18:25	20:00		20:32	12 06:49 (9)	20:51	20:41	18 07:03 (9)	20:02		19:07	18:17	16:42	16:41	18 09:11 (8)
24	07:32		06:55	06:08	06:16		05:41	06:41 (9)	05:33	05:53	06:44 (9)	06:26		06:59	07:33	07:11	07:38	08:54 (8)
	17:13		17:53	18:26	20:00		20:33	8 06:49 (9)	20:51	20:40	20 07:04 (9)	20:00		19:05	18:15	16:42	16:41	18 09:12 (8)
25	07:31		06:53	06:06	06:15		05:40		05:34	05:54	06:43 (9)	06:27		07:00	06:34	07:13	07:38	08:54 (8)
	17:14		17:54	18:27	20:01		20:34		20:52	20:39	22 07:05 (9)	19:57		19:03	17:14	16:41	16:42	18 09:12 (8)
26	07:31		06:52	06:04	06:13		05:39		05:34	05:55	06:44 (9)	06:28		07:01	06:35	07:14	07:39	08:56 (8)
	17:15		17:55	18:29	20:03		20:34		20:52	20:38	22 07:06 (9)	19:56		19:02	17:12	16:40	16:42	16 09:12 (8)
27	07:30		06:50	06:03	06:12		05:39		05:34	05:56	06:43 (9)	06:29		07:02	06:37	07:15	07:39	08:57 (8)
	17:16		17:57	18:30	20:04		20:35		20:52	20:37	24 07:07 (9)	19:54		19:00	17:11	16:40	16:43	16 09:13 (8)
28	07:29		06:49	06:01	06:10		05:38		05:35	05:57	06:42 (9)	06:30		07:03	06:38	07:16	07:39	08:57 (8)
	17:18		17:58	18:31	20:05		20:36		20:52	20:36	24 07:06 (9)	19:52		18:58	17:10	16:39	16:44	16 09:13 (8)
29	07:28			05:59	06:09		05:37		05:35	05:58	06:41 (9)	06:31		07:04	06:39	07:17	07:39	08:57 (8)
	17:19			18:32	20:06		20:37		20:52	20:35	26 07:07 (9)	19:51		18:56	17:08	16:39	16:45	16 09:13 (8)
30	07:27			05:57	06:07	06:39 (9)	05:37		05:36	05:59	06:42 (9)	06:32		07:05	06:40	07:18	07:40	08:59 (8)
	17:20			18:33	20:07	12 06:51 (9)	20:38		20:52	20:34	26 07:08 (9)	19:49		18:55	17:07	16:39	16:45	14 09:13 (8)
31	07:26			05:56			05:36			06:00	06:41 (9)	06:33			06:42		07:40	08:59 (8)
	17:22			18:34			20:39			20:33	26 07:07 (9)	19:47			17:05		16:46	12 09:11 (8)
Potential sun hours	293		295	370	209		-292		-263	-280		-145		375	343	294	283	
Total, worst case		18				12		528			252		286					336
Sun reduction		0.35				0.55		0.55			0.65		0.55					0.30
Oper. time red.		0.86				0.86		0.86			0.86		0.86					0.86
Wind dir. red.		0.64				0.59		0.59			0.59		0.59					0.64
Total reduction		0.19				0.28		0.28			0.33		0.28					0.17
Total, real		3				3		148			84		80					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	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, Mid / Northeast part
20 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
1000 meter max shadow distance applied along with default 3° inclination
Sunshine probabilities applied (pdf plots)
Directional run-hours applied from tab file (tower 1)
.

Printed/Page
03/05/06 23:23 / 32
Licensed user:
Wind Engineers, Inc.
7660 Whitegate Avenue
US-RIVERSIDE, CA 92506

Calculated:
03/01/06 21:02/2.4.0.67

SHADOW - Calendar

Calculation: Mid / Northeast part **Shadow receptor:** 717 - 717

Assumptions for shadow calculations

Maximum distance for influence	1,000	m
Minimum sun height over horizon for influence	3	°
Day step for calculation	1	days
Time step for calculation	2	minutes

Sun shine probabilities (part of time from sun rise to sun set with sun shine)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.35	0.45	0.45	0.55	0.55	0.55	0.65	0.55	0.55	0.45	0.35	0.30

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
475	585	238	199	220	474	1,184	813	840	1,246	803	479	7,555

	January		February		March	April	May		June		July		August	September	October	November		December	
1	07:40	08:27 (8)	07:25	08:32 (8)	06:47	05:54	06:06		05:36	06:18 (9)	05:36	06:27 (9)	06:01	06:34	07:06	06:43		07:19	08:08 (8)
	16:47 10	08:37 (8)	17:23 20	08:52 (8)	17:59	18:35	20:08		20:40 22	06:40 (9)	20:52 16	06:43 (9)	20:32	19:46	18:53	17:04		16:38 24	08:32 (8)
2	07:40	08:27 (8)	07:24	08:33 (8)	06:45	05:52	06:05		05:35	06:18 (9)	05:37	06:26 (9)	06:02	06:35	07:08	06:44		07:21	08:07 (8)
	16:48 12	08:39 (8)	17:24 18	08:51 (8)	18:00	18:36	20:09		20:40 22	06:40 (9)	20:51 18	06:44 (9)	20:31	19:44	18:51	17:03		16:38 24	08:31 (8)
3	07:40	08:27 (8)	07:23	08:36 (8)	06:44	05:50	06:03		05:35	06:19 (9)	05:37	06:26 (9)	06:03	06:36	07:09	06:45		07:22	08:08 (8)
	16:49 12	08:39 (8)	17:26 14	08:50 (8)	18:01	18:38	20:10		20:41 22	06:41 (9)	20:51 18	06:44 (9)	20:30	19:42	18:49	17:02		16:38 22	08:30 (8)
4	07:40	08:27 (8)	07:22	08:41 (8)	06:42	05:49	06:02		05:34	06:19 (9)	05:38	06:27 (9)	06:04	06:37	07:10	06:47		07:23	08:09 (8)
	16:50 14	08:41 (8)	17:27 4	08:45 (8)	18:03	18:39	20:12		20:42 22	06:41 (9)	20:51 18	06:45 (9)	20:29	19:41	18:48	17:00		16:37 22	08:31 (8)
5	07:40	08:25 (8)	07:21		06:40	06:47	06:01		05:34	06:18 (9)	05:38	06:26 (9)	06:06	06:39	07:11	06:48		07:24	08:10 (8)
	16:51 18	08:43 (8)	17:28		18:04	19:40	20:13		20:43 22	06:40 (9)	20:51 20	06:46 (9)	20:27	19:39	18:46	16:59		16:37 20	08:30 (8)
6	07:40	08:25 (8)	07:19		06:39	06:45	05:59		05:34	06:20 (9)	05:39	06:26 (9)	06:07	06:40	07:12	06:49		07:25	08:11 (8)
	16:52 18	08:43 (8)	17:30		18:05	19:41	20:14		20:43 20	06:40 (9)	20:51 20	06:46 (9)	20:26	19:37	18:44	16:58		16:37 18	08:29 (8)
7	07:40	08:25 (8)	07:18		06:37	06:44	05:58		05:33	06:20 (9)	05:40	06:27 (9)	06:08	06:41	07:13	06:50	08:09 (8)	07:26	08:12 (8)
	16:53 20	08:45 (8)	17:31		18:06	19:42	20:15		20:44 20	06:40 (9)	20:50 20	06:47 (9)	20:25	19:35	18:43	16:57 6	08:15 (8)	16:37 18	08:30 (8)
8	07:40	08:25 (8)	07:17		06:35	06:42	05:57		05:33	06:22 (9)	05:40	06:25 (9)	06:09	06:42	07:14	06:52	08:06 (8)	07:27	08:15 (8)
	16:54 22	08:47 (8)	17:32		18:08	19:43	20:16		20:45 18	06:40 (9)	20:50 22	06:47 (9)	20:24	19:34	18:41	16:56 14	08:20 (8)	16:37 14	08:29 (8)
9	07:40	08:24 (8)	07:16		06:34	06:40	05:56		05:33	06:21 (9)	05:41	06:26 (9)	06:10	06:43	07:15	06:53	08:04 (8)	07:27	08:16 (8)
	16:55 22	08:46 (8)	17:34		18:09	19:44	20:17		20:45 18	06:39 (9)	20:50 22	06:48 (9)	20:22	19:32	18:39	16:54 18	08:22 (8)	16:37 12	08:28 (8)
10	07:39	08:24 (8)	07:15		06:32	06:39	05:55		05:33	06:21 (9)	05:42	06:25 (9)	06:11	06:44	07:17	06:54	08:03 (8)	07:28	08:17 (8)
	16:56 24	08:48 (8)	17:35		18:10	19:46	20:18		20:46 18	06:39 (9)	20:49 22	06:47 (9)	20:21	19:30	18:37	16:53 20	08:23 (8)	16:37 12	08:29 (8)
11	07:39	08:26 (8)	07:13		06:30	06:37	05:53		05:32	06:23 (9)	05:42	06:25 (9)	06:12	06:45	07:18	06:55	08:02 (8)	07:29	08:18 (8)
	16:57 24	08:50 (8)	17:36		18:11	19:47	20:19		20:47 16	06:39 (9)	20:49 22	06:47 (9)	20:20	19:28	18:36	16:52 22	08:24 (8)	16:37 10	08:28 (8)
12	07:39	08:25 (8)	07:12		06:29	06:35	05:52		05:32	06:23 (9)	05:43	06:26 (9)	06:13	06:46	07:19	06:57	08:02 (8)	07:30	08:18 (8)
	16:58 24	08:49 (8)	17:37		18:12	19:48	20:20		20:47 16	06:39 (9)	20:48 22	06:48 (9)	20:18	19:27	18:34	16:51 24	08:26 (8)	16:37 8	08:26 (8)
13	07:39	08:25 (8)	07:11		06:27	06:34	05:51	06:24 (9)	05:32	06:23 (9)	05:44	06:25 (9)	06:14	06:47	07:20	06:58	08:01 (8)	07:31	08:21 (8)
	16:59 26	08:51 (8)	17:39		18:13	19:49	20:21 8	06:32 (9)	20:48 16	06:39 (9)	20:48 24	06:49 (9)	20:17	19:25	18:32	16:50 26	08:27 (8)	16:37 4	08:25 (8)
14	07:38	08:24 (8)	07:09		06:25	06:32	05:50	06:23 (9)	05:32	06:23 (9)	05:45	06:26 (9)	06:15	06:48	07:21	06:59	08:00 (8)	07:32	
	17:00 26	08:50 (8)	17:40		18:15	19:50	20:23 10	06:33 (9)	20:48 16	06:39 (9)	20:47 24	06:50 (9)	20:15	19:23	18:31	16:49 28	08:28 (8)	16:37	
15	07:38	08:24 (8)	07:08		06:23	06:30	05:49	06:20 (9)	05:32	06:25 (9)	05:45	06:27 (9)	06:16	06:49	07:22	07:00	08:00 (8)	07:32	
	17:02 28	08:52 (8)	17:41		18:16	19:51	20:24 16	06:36 (9)	20:49 14	06:39 (9)	20:47 22	06:49 (9)	20:14	19:21	18:29	16:48 28	08:28 (8)	16:38	
16	07:37	08:25 (8)	07:07		06:22	06:29	05:48	06:19 (9)	05:32	06:25 (9)	05:46	06:25 (9)	06:17	06:50	07:23	07:02	07:59 (8)	07:33	
	17:03 28	08:53 (8)	17:43		18:17	19:52	20:25 18	06:37 (9)	20:49 14	06:39 (9)	20:46 24	06:49 (9)	20:13	19:19	18:28	16:48 30	08:29 (8)	16:38	
17	07:37	08:25 (8)	07:05		06:20	06:27	05:47	06:18 (9)	05:32	06:25 (9)	05:47	06:26 (9)	06:18	06:51	07:25	07:03	08:00 (8)	07:34	
	17:04 28	08:53 (8)	17:44		18:18	19:54	20:26 20	06:38 (9)	20:49 14	06:39 (9)	20:46 24	06:50 (9)	20:11	19:18	18:26	16:47 28	08:28 (8)	16:38	
18	07:36	08:24 (8)	07:04		06:18	06:25	05:46	06:17 (9)	05:32	06:25 (9)	05:48	06:25 (9)	06:19	06:52	07:26	07:04	08:00 (8)	07:34	
	17:05 30	08:54 (8)	17:45		18:19	19:55	20:27 20	06:37 (9)	20:50 14	06:39 (9)	20:45 24	06:49 (9)	20:10	19:16	18:24	16:46 30	08:30 (8)	16:38	
19	07:36	08:25 (8)	07:02		06:17	06:24	05:45	06:16 (9)	05:32	06:25 (9)	05:49	06:26 (9)	06:20	06:53	07:27	07:05	08:01 (8)	07:35	
	17:06 28	08:53 (8)	17:47		18:20	19:56	20:28 22	06:38 (9)	20:50 14	06:39 (9)	20:44 24	06:50 (9)	20:08	19:14	18:23	16:45 28	08:29 (8)	16:39	
20	07:35	08:25 (8)	07:01		06:15	06:22	05:44	06:18 (9)	05:32	06:26 (9)	05:50	06:27 (9)	06:21	06:54	07:28	07:07	08:00 (8)	07:36	
	17:08 30	08:55 (8)	17:48		18:22	19:57	20:29 22	06:40 (9)	20:50 14	06:40 (9)	20:43 24	06:51 (9)	20:07	19:12	18:21	16:44 30	08:30 (8)	16:39	
21	07:34	08:24 (8)	06:59		06:13	06:21	05:43	06:17 (9)	05:33	06:26 (9)	05:51	06:26 (9)	06:23	06:56	07:29	07:08	08:00 (8)	07:36	
	17:09 30	08:54 (8)	17:49		18:23	19:58	20:30 22	06:39 (9)	20:51 14	06:40 (9)	20:43 24	06:50 (9)	20:05	19:11	18:20	16:44 30	08:30 (8)	16:40	
22	07:34	08:25 (8)	06:58		06:11	06:19	05:42	06:16 (9)	05:33	06:26 (9)	05:52	06:26 (9)	06:24	06:57	07:31	07:09	08:01 (8)	07:37	
	17:10 30	08:55 (8)	17:50		18:24	19:59	20:31 24	06:40 (9)	20:51 14	06:40 (9)	20:42 24	06:50 (9)	20:04	19:09	18:18	16:43 30	08:31 (8)	16:40	
23	07:33	08:26 (8)	06:56		06:10	06:18	05:42	06:17 (9)	05:33	06:26 (9)	05:53	06:27 (9)	06:25	06:58	07:32	07:10	08:02 (8)	07:37	
	17:11 28	08:54 (8)	17:52		18:25	20:00	20:32 22	06:39 (9)	20:51 14	06:40 (9)	20:41 22	06:49 (9)	20:02	19:07	18:17	16:42 28	08:30 (8)	16:41	
24	07:32	08:26 (8)	06:55		06:08	06:16	05:41	06:17 (9)	05:33	06:26 (9)	05:53	06:28 (9)	06:26	06:59	07:33	07:11	08:01 (8)	07:38	
	17:13 30	08:56 (8)	17:53		18:26	20:00	20:33 24	06:41 (9)	20:51 14	06:40 (9)	20:40 20	06:48 (9)	20:00	19:05	18:15	16:42 30	08:31 (8)	16:41	
25	07:31	08:27 (8)	06:53		06:06	06:15	05:40	06:16 (9)	05:34	06:27 (9)	05:54	06:27 (9)	06:27	07:00	06:34	07:13	08:03 (8)	07:38	
	17:14 28	08:55 (8)	17:54		18:27	20:01	20:34 24	06:40 (9)	20:52 14	06:41 (9)	20:39 22	06:49 (9)	19:57	19:03	17:14	16:41 28	08:31 (8)	16:42	
26	07:31	08:26 (8)	06:52		06:04	06:13	05:39	06:17 (9)	05:34	06:27 (9)	05:55	06:28 (9)	06:28	07:01	06:35	07:14	08:04 (8)	07:39	
	17:15 30	08:56 (8)	17:55		18:29	20:03	20:34 24	06:41 (9)	20:52 14	06:41 (9)	20:38 20	06:48 (9)	19:56	19:02	17:12	16:40 28	08:32 (8)	16:42	
27	07:30	08:27 (8)	06:50		06:03	06:12	05:39	06:17 (9)	05:34	06:28 (9)	05:56	06:29 (9)	06:29	07:02	06:37	07:15	08:03 (8)	07:39	
	17:16 28	08:55 (8)	17:57		18:30	20:04	20:35 24	06:41 (9)	20:52 14	06:42 (9)	20:37 18	06:47 (9)	19:54	19:00	17:11	16:40 28	08:31 (8)	16:43	
28	07:29	08:28 (8)	06:49		06:01	06:10	05:38	06:16 (9)	05:35	06:26 (9)	05:57	06:30 (9)	06:30	07:03	06:38	07:16	08:04 (8)	07:39	
	17:18 28	08:56 (8)	17:58		18:31	20:05	20:36 24	06:40 (9)	20:52 16	06:42 (9)	20:36 16	06:46 (9)	19:52	18:58	17:10	16:39 26	08:30 (8)	16:44	
29	07:28	08:29 (8)			05:59	06:09	05:37	06:17 (9)	05:35	06:26 (9)	05:58	06:31 (9)	06:31	07:04	06:39	07:17	08:05 (8)	07:39	
	17:19 26	08:55 (8)			18:32	20:06	20:37 24	06:41 (9)	20:52 16	06:42 (9)	20:35 14	06:45 (9)	19:51	18:56	17:08	16:39 26	08:31 (8)	16:45	
30	07:27	08:30 (8)			05:57	06:07	05:37	06:17 (9)	05:36	06:27 (9)	05:59	06:34 (9)	06:32	07:05	06:40	07:18	08:07 (8)	07:40	08:29 (8)
	17:20 24	08:54 (8)			18:33	20:07	20:38 24	06:41 (9)	20:52 16	06:43 (9)	20:34 10	06:44 (9)	19:49	18:55	17:07	16:39 24	08:31 (8)	16:45 4	08:33 (8)
31	07:26	08:31 (8)			05:56		05:36	06:18 (9)			06:00	06:37 (9)	06:33		06:42			07:40	08:29 (8)
	17:22 22	08:53 (8)			18:34		20:39 22	06:40 (9)			20:33 4	06:41 (9)	19:47		17:05			16:46 6	08:35 (8)
Potential sun hours	293		295		370	209	-292		-263		-280		-145	375	343	294		283	
Total, worst case	748		56				394		498		624					610		218	
Sun reduction	0.35		0.45				0.55		0.55		0.65					0.35		0.30	
Oper. time red.	0.86		0.86				0.86		0.86		0.86					0.86		0.86	
Wind dir. red.	0.63		0.63				0.61		0.61		0.61					0.63		0.63	
Total reduction	0.19		0.24				0.29		0.29		0.34					0.19		0.16	
Total, real	142		14				114		145		214					116		36	

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	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, Mid / Northeast part
20 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
1000 meter max shadow distance applied along with default 3° inclination
Sunshine probabilities applied (pdf plots)
Directional run-hours applied from tab file (tower 1)
.

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03/05/06 23:23 / 33
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7660 Whitegate Avenue
US-RIVERSIDE, CA 92506

Calculated:
03/01/06 21:02/2.4.0.67

SHADOW - Calendar

Calculation: Mid / Northeast part **Shadow receptor:** 718 - 718

Assumptions for shadow calculations

Maximum distance for influence	1,000 m
Minimum sun height over horizon for influence	3 °
Day step for calculation	1 days
Time step for calculation	2 minutes

Sun shine probabilities (part of time from sun rise to sun set with sun shine)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.35	0.45	0.45	0.55	0.55	0.55	0.65	0.55	0.55	0.45	0.35	0.30

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
475	585	238	199	220	474	1,184	813	840	1,246	803	479	7,555

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:40	07:25	06:47	05:54	06:06	05:36	05:36	06:01	06:34	07:06	06:43	07:19
	16:47	17:23	17:59	18:35	20:08	20:40	20:52	20:32	19:46	18:53	17:04 26	07:51 (8) 16:38
2	07:40	07:24	08:03 (8)	06:45	05:52	06:05	05:35	05:37	06:02	06:35	07:08	06:44	07:26 (8)	07:21
	16:48	17:24 10	08:13 (8)	18:00	18:36	20:09	20:40	20:51	20:31	19:44	18:51	17:03 24	07:50 (8)	16:38
3	07:40	07:23	08:02 (8)	06:44	05:50	06:03	05:35	05:37	06:03	06:36	07:09	06:45	07:25 (8)	07:22
	16:49	17:26 14	08:16 (8)	18:01	18:38	20:10	20:41	20:51	20:30	19:42	18:49	17:02 24	07:49 (8)	16:38
4	07:40	07:22	08:01 (8)	06:42	05:49	06:02	05:34	05:38	06:04	06:37	07:10	06:47	07:27 (8)	07:23
	16:50	17:27 16	08:17 (8)	18:03	18:39	20:12	20:42	20:51	20:29	19:41	18:48	17:00 22	07:49 (8)	16:37
5	07:40	07:21	07:59 (8)	06:40	06:47	06:01	05:34	05:38	06:06	06:39	07:11	06:48	07:28 (8)	07:24
	16:51	17:28 18	08:17 (8)	18:04	19:40	20:13	20:43	20:51	20:27	19:39	18:46	16:59 20	07:48 (8)	16:37
6	07:40	07:19	07:58 (8)	06:39	06:45	05:59	05:34	05:39	06:07	06:40	07:12	06:49	07:30 (8)	07:25
	16:52	17:30 22	08:20 (8)	18:05	19:41	20:14	20:43	20:51	20:26	19:37	18:44	16:58 18	07:48 (8)	16:37
7	07:40	07:18	07:57 (8)	06:37	06:44	05:58	05:33	05:40	06:08	06:41	07:13	06:50	07:31 (8)	07:26
	16:53	17:31 24	08:21 (8)	18:06	19:42	20:15	20:44	20:50	20:25	19:35	18:43	16:57 16	07:47 (8)	16:37
8	07:40	07:17	07:56 (8)	06:35	06:42	05:57	05:33	05:40	06:09	06:42	07:14	06:52	07:32 (8)	07:27
	16:54	17:32 26	08:22 (8)	18:08	19:43	20:16	20:45	20:50	20:24	19:34	18:41	16:56 12	07:44 (8)	16:37
9	07:40	07:16	07:56 (8)	06:34	06:40	05:56	05:33	05:41	06:10	06:43	07:15	06:53	07:34 (8)	07:27
	16:55	17:34 24	08:20 (8)	18:09	19:44	20:17	20:45	20:50	20:22	19:32	18:39	16:54 8	07:42 (8)	16:37
10	07:39	07:15	07:55 (8)	06:32	06:39	05:55	05:33	05:42	06:11	06:44	07:17	06:54		07:28
	16:56	17:35 26	08:21 (8)	18:10	19:46	20:18	20:46	20:49	20:21	19:30	18:37	16:53		16:37
11	07:39	07:13	07:56 (8)	06:30	06:37	05:53	05:32	05:42	06:12	06:45	07:18	06:55		07:29
	16:57	17:36 26	08:22 (8)	18:11	19:47	20:19	20:47	20:49	20:20	19:28	18:36	16:52		16:37
12	07:39	07:12	07:54 (8)	06:29	06:35	05:52	05:32	05:43	06:13	06:46	07:19	06:57		07:30
	16:58	17:37 28	08:22 (8)	18:12	19:48	20:20	20:47	20:48	20:18	19:27	18:34	16:51		16:37
13	07:39	07:11	07:55 (8)	06:27	06:34	05:51	05:32	05:44	06:14	06:47	07:20	06:58		07:31
	16:59	17:39 26	08:21 (8)	18:13	19:49	20:21	20:48	20:48	20:17	19:25	18:32	16:50		16:37
14	07:38	07:09	07:56 (8)	06:25	06:32	05:50	05:32	05:45	06:15	06:48	07:21	06:59		07:32
	17:00	17:40 26	08:22 (8)	18:15	19:50	20:23	20:48	20:47	20:15	19:23	18:31	16:49		16:37
15	07:38	07:08	07:56 (8)	06:23	06:30	05:49	05:32	05:45	06:16	06:49	07:22	07:00		07:32
	17:02	17:41 24	08:20 (8)	18:16	19:51	20:24	20:49	20:47	20:14	19:21	18:29	16:48		16:38
16	07:37	07:07	07:57 (8)	06:22	06:29	05:48	05:32	05:46	06:17	06:50	07:23	07:02		07:33
	17:03	17:43 24	08:21 (8)	18:17	19:52	20:25	20:49	20:46	20:13	19:19	18:28	16:48		16:38
17	07:37	07:05	07:57 (8)	06:20	06:27	05:47	05:32	05:47	06:18	06:51	07:25	07:03		07:34
	17:04	17:44 22	08:19 (8)	18:18	19:54	20:26	20:49	20:46	20:11	19:18	18:26	16:47		16:38
18	07:36	07:04	07:58 (8)	06:18	06:25	05:46	05:32	05:48	06:19	06:52	07:26	07:04		07:34
	17:05	17:45 20	08:18 (8)	18:19	19:55	20:27	20:50	20:45	20:10	19:16	18:24	16:46		16:38
19	07:36	07:02	08:00 (8)	06:17	06:24	05:45	05:32	05:49	06:20	06:53	07:27	07:05		07:35
	17:06	17:47 16	08:16 (8)	18:20	19:56	20:28	20:50	20:44	20:08	19:14	18:23	16:45		16:39
20	07:35	07:01	08:03 (8)	06:15	06:22	05:44	05:32	05:50	06:21	06:54	07:28	07:07		07:36
	17:08	17:48 10	08:13 (8)	18:22	19:57	20:29	20:50	20:43	20:07	19:12	18:21	16:44		16:39
21	07:34	06:59	06:13	06:21	05:43	05:33	05:51	06:23	06:56	07:29	08:36 (8)	07:08		07:36
	17:09	17:49	18:23	19:58	20:30	20:51	20:43	20:05	19:11	18:20 4	08:40 (8)	16:44		16:40
22	07:34	06:58	06:11	06:19	05:42	05:33	05:52	06:24	06:57	07:31	08:32 (8)	07:09		07:37
	17:10	17:50	18:24	19:59	20:31	20:51	20:42	20:04	19:09	18:18 14	08:46 (8)	16:43		16:40
23	07:33	06:56	06:10	06:18	05:42	05:33	05:53	06:25	06:58	07:32	08:29 (8)	07:10		07:37
	17:11	17:52	18:25	20:00	20:32	20:51	20:41	20:02	19:07	18:17 18	08:47 (8)	16:42		16:41
24	07:32	06:55	06:08	06:16	05:41	05:33	05:53	06:26	06:59	07:33	08:28 (8)	07:11		07:38
	17:13	17:53	18:26	20:00	20:33	20:51	20:40	20:00	19:05	18:15 20	08:48 (8)	16:42		16:41
25	07:31	06:53	06:06	06:15	05:40	05:34	05:54	06:27	07:00	06:34	07:28 (8)	07:13		07:38
	17:14	17:54	18:27	20:01	20:34	20:52	20:39	19:57	19:03	17:14 22	07:50 (8)	16:41		16:42
26	07:31	06:52	06:04	06:13	05:39	05:34	05:55	06:28	07:01	06:35	07:27 (8)	07:14		07:39
	17:15	17:55	18:29	20:03	20:34	20:52	20:38	19:56	19:02	17:12 24	07:51 (8)	16:40		16:42
27	07:30	06:50	06:03	06:12	05:39	05:34	05:56	06:29	07:02	06:37	07:26 (8)	07:15		07:39
	17:17	17:57	18:30	20:04	20:35	20:52	20:37	19:54	19:00	17:11 24	07:50 (8)	16:40		16:43
28	07:29	06:49	06:01	06:10	05:38	05:35	05:57	06:30	07:03	06:38	07:25 (8)	07:16		07:39
	17:18	17:58	18:31	20:05	20:36	20:52	20:36	19:52	18:58	17:10 26	07:51 (8)	16:39		16:44
29	07:28		05:59	06:09	05:37	05:35	05:58	06:31	07:04	06:39	07:25 (8)	07:17		07:39
	17:19		18:32	20:06	20:37	20:52	20:35	19:51	18:56	17:08 26	07:51 (8)	16:39		16:45
30	07:27		05:57	06:07	05:37	05:36	05:59	06:32	07:05	06:40	07:24 (8)	07:18		07:40
	17:20		18:33	20:07	20:38	20:52	20:34	19:49	18:55	17:07 28	07:52 (8)	16:39		16:45
31	07:26		05:56		05:36		06:00	06:33		06:42	07:25 (8)			07:40
	17:22		18:34		20:39		20:33	19:47		17:05 26	07:51 (8)			16:46
Potential sun hours	293	295	370	209	-292	-263	-280	-145	375	343	294	283
Total, worst case		402								232	170	
Sun reduction		0.45								0.45	0.35	
Oper. time red.		0.86								0.86	0.86	
Wind dir. red.		0.63								0.63	0.63	
Total reduction		0.24								0.24	0.19	
Total, real		98								57	32	

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	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, Mid / Northeast part
20 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
1000 meter max shadow distance applied along with default 3° inclination
Sunshine probabilities applied (pdf plots)
Directional run-hours applied from tab file (tower 1)
.

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03/05/06 23:23 / 34
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7660 Whitegate Avenue
US-RIVERSIDE, CA 92506

Calculated:
03/01/06 21:02/2.4.0.67

SHADOW - Calendar

Calculation: Mid / Northeast part **Shadow receptor:** 725 - 725

Assumptions for shadow calculations

Maximum distance for influence	1,000 m
Minimum sun height over horizon for influence	3 °
Day step for calculation	1 days
Time step for calculation	2 minutes

Sun shine probabilities (part of time from sun rise to sun set with sun shine)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.35	0.45	0.45	0.55	0.55	0.55	0.65	0.55	0.55	0.45	0.35	0.30

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
475	585	238	199	220	474	1,184	813	840	1,246	803	479	7,555

	January			February	March	April	May	June	July	August	September	October	November	December		
1	07:40		09:03 (7)	07:25	06:47	05:54	06:06	05:36	05:36	06:01	06:34	07:06	06:43	07:20		08:58 (7)
	16:47	20	09:23 (7)	17:23	17:59	18:35	20:08	20:40	20:52	20:32	19:46	18:53	17:04	16:38	4	09:02 (7)
2	07:40		09:03 (7)	07:24	06:45	05:52	06:05	05:35	05:37	06:02	06:35	07:08	06:44	07:21		08:55 (7)
	16:48	20	09:23 (7)	17:24	18:00	18:37	20:09	20:41	20:52	20:31	19:44	18:51	17:03	16:38	10	09:05 (7)
3	07:40		09:05 (7)	07:23	06:44	05:50	06:03	05:35	05:37	06:03	06:36	07:09	06:45	07:22		08:54 (7)
	16:49	18	09:23 (7)	17:26	18:02	18:38	20:10	20:41	20:51	20:30	19:42	18:49	17:02	16:38	12	09:06 (7)
4	07:40		09:05 (7)	07:22	06:42	05:49	06:02	05:34	05:38	06:05	06:37	07:10	06:47	07:23		08:53 (7)
	16:50	18	09:23 (7)	17:27	18:03	18:39	20:12	20:42	20:51	20:29	19:41	18:48	17:00	16:37	14	09:07 (7)
5	07:40		09:07 (7)	07:21	06:40	06:47	06:01	05:34	05:38	06:06	06:39	07:11	06:48	07:24		08:54 (7)
	16:51	16	09:23 (7)	17:28	18:04	19:40	20:13	20:43	20:51	20:27	19:39	18:46	16:59	16:37	14	09:08 (7)
6	07:40		09:07 (7)	07:20	06:39	06:45	05:59	05:34	05:39	06:07	06:40	07:12	06:49	07:25		08:53 (7)
	16:52	16	09:23 (7)	17:30	18:05	19:41	20:14	20:43	20:51	20:26	19:37	18:44	16:58	16:37	16	09:09 (7)
7	07:40		09:09 (7)	07:18	06:37	06:44	05:58	05:33	05:40	06:08	06:41	07:13	06:50	07:26		08:54 (7)
	16:53	14	09:23 (7)	17:31	18:06	19:42	20:15	20:44	20:50	20:25	19:35	18:43	16:57	16:37	16	09:10 (7)
8	07:40		09:09 (7)	07:17	06:35	06:42	05:57	05:33	05:40	06:09	06:42	07:14	06:52	07:27		08:53 (7)
	16:54	14	09:23 (7)	17:32	18:08	19:43	20:16	20:45	20:50	20:24	19:34	18:41	16:56	16:37	18	09:11 (7)
9	07:40		09:10 (7)	07:16	06:34	06:40	05:56	05:33	05:41	06:10	06:43	07:15	06:53	07:28		08:54 (7)
	16:55	12	09:22 (7)	17:34	18:09	19:44	20:17	20:45	20:50	20:22	19:32	18:39	16:55	16:37	18	09:12 (7)
10	07:39		09:12 (7)	07:15	06:32	06:39	05:55	05:33	05:42	06:11	06:44	07:17	06:54	07:28		08:53 (7)
	16:56	10	09:22 (7)	17:35	18:10	19:46	20:18	20:46	20:49	20:21	19:30	18:37	16:53	16:37	20	09:13 (7)
11	07:39		09:16 (7)	07:13	06:30	06:37	05:53	05:32	05:42	06:12	06:45	07:18	06:56	07:29		08:54 (7)
	16:57	4	09:20 (7)	17:36	18:11	19:47	20:19	20:47	20:49	20:20	19:28	18:36	16:52	16:37	20	09:14 (7)
12	07:39			07:12	06:29	06:35	05:52	05:32	05:43	06:13	06:46	07:19	06:57	07:30		08:55 (7)
	16:58			17:38	18:12	19:48	20:20	20:47	20:48	20:18	19:27	18:34	16:51	16:37	20	09:15 (7)
13	07:39			07:11	06:27	06:34	05:51	05:32	05:44	06:14	06:47	07:20	06:58	07:31		08:53 (7)
	16:59			17:39	18:14	19:49	20:21	20:48	20:48	20:17	19:25	18:32	16:50	16:37	22	09:15 (7)
14	07:38			07:09	06:25	06:32	05:50	05:32	05:45	06:15	06:48	07:21	06:59	07:32		08:54 (7)
	17:00			17:40	18:15	19:50	20:23	20:48	20:47	20:16	19:23	18:31	16:49	16:37	22	09:16 (7)
15	07:38			07:08	06:24	06:30	05:49	05:32	05:45	06:16	06:49	07:22	07:01	07:32		08:55 (7)
	17:02			17:41	18:16	19:51	20:24	20:49	20:47	20:14	19:21	18:29	16:48	16:38	22	09:17 (7)
16	07:37			07:07	06:22	06:29	05:48	05:32	05:46	06:17	06:50	07:24	07:02	07:33		08:56 (7)
	17:03			17:43	18:17	19:52	20:25	20:49	20:46	20:13	19:19	18:28	16:48	16:38	20	09:16 (7)
17	07:37			07:05	06:20	06:27	05:47	05:32	05:47	06:18	06:51	07:25	07:03	07:34		08:56 (7)
	17:04			17:44	18:18	19:54	20:26	20:50	20:46	20:11	19:18	18:26	16:47	16:38	20	09:16 (7)
18	07:36			07:04	06:18	06:25	05:46	05:32	05:48	06:19	06:52	07:26	07:04	07:35		08:57 (7)
	17:05			17:45	18:19	19:55	20:27	20:50	20:45	20:10	19:16	18:24	16:46	16:38	20	09:17 (7)
19	07:36			07:02	06:17	06:24	05:45	05:32	05:49	06:20	06:53	07:27	07:05	07:35		08:55 (7)
	17:06			17:47	18:21	19:56	20:28	20:50	20:44	20:08	19:14	18:23	16:45	16:39	22	09:17 (7)
20	07:35			07:01	06:15	06:22	05:44	05:32	05:50	06:21	06:55	07:28	07:07	07:36		08:56 (7)
	17:08			17:48	18:22	19:57	20:29	20:51	20:43	20:07	19:12	18:21	16:44	16:39	22	09:18 (7)
21	07:34			06:59	06:13	06:21	05:43	05:33	05:51	06:23	06:56	07:29	07:08	07:36		08:56 (7)
	17:09			17:49	18:23	19:58	20:30	20:51	20:43	20:05	19:11	18:20	16:44	16:40	22	09:18 (7)
22	07:34			06:58	06:11	06:19	05:42	05:33	05:52	06:24	06:57	07:31	07:09	07:37		08:57 (7)
	17:10			17:50	18:24	19:59	20:31	20:51	20:42	20:04	19:09	18:18	16:43	16:40	22	09:19 (7)
23	07:33			06:56	06:10	06:18	05:42	05:33	05:53	06:25	06:58	07:32	07:10	07:37		08:57 (7)
	17:11			17:52	18:25	20:00	20:32	20:51	20:41	20:02	19:07	18:17	16:42	16:41	22	09:19 (7)
24	07:32			06:55	06:08	06:16	05:41	05:33	05:53	06:26	06:59	07:33	07:12	07:38		08:58 (7)
	17:13			17:53	18:26	20:00	20:33	20:51	20:40	20:00	19:05	18:15	16:42	16:41	22	09:20 (7)
25	07:31			06:53	06:06	06:15	05:40	05:34	05:54	06:27	07:00	06:34	07:13	07:38		09:00 (7)
	17:14			17:54	18:27	20:01	20:34	20:52	20:39	19:57	19:03	17:14	16:41	16:42	20	09:20 (7)
26	07:31			06:52	06:04	06:13	05:39	05:34	05:55	06:28	07:01	06:36	07:14	07:39		09:00 (7)
	17:15			17:55	18:29	20:03	20:35	20:52	20:38	19:56	19:02	17:12	16:40	16:43	20	09:20 (7)
27	07:30			06:50	06:03	06:12	05:39	05:34	05:56	06:29	07:02	06:37	07:15	07:39		09:01 (7)
	17:17			17:57	18:30	20:04	20:35	20:52	20:37	19:54	19:00	17:11	16:40	16:43	20	09:21 (7)
28	07:29			06:49	06:01	06:10	05:38	05:35	05:57	06:30	07:03	06:38	07:16	07:39		09:01 (7)
	17:18			17:58	18:31	20:05	20:36	20:52	20:36	19:52	18:58	17:10	16:39	16:44	20	09:21 (7)
29	07:28				05:59	06:09	05:37	05:35	05:58	06:31	07:04	06:39	07:17	07:39		09:01 (7)
	17:19				18:32	20:06	20:37	20:52	20:35	19:51	18:56	17:08	16:39	16:45	22	09:23 (7)
30	07:27				05:57	06:07	05:37	05:36	05:59	06:32	07:05	06:40	07:18	07:40		09:01 (7)
	17:20				18:33	20:07	20:38	20:52	20:34	19:49	18:55	17:07	16:39	16:45	22	09:23 (7)
31	07:26				05:56		05:36		06:00	06:33		06:42		07:40		09:03 (7)
	17:22				18:34		20:39		20:33	19:47		17:05		16:46	20	09:23 (7)
Potential sun hours	293			295	370	209	-292	-263	-280	-145	375	343	294	283		
Total, worst case		162													584	
Sun reduction		0.35													0.30	
Oper. time red.		0.86													0.86	
Wind dir. red.		0.64													0.64	
Total reduction		0.19													0.16	
Total, real		31													96	

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	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, Mid / Northeast part
20 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
1000 meter max shadow distance applied along with default 3° inclination
Sunshine probabilities applied (pdf plots)
Directional run-hours applied from tab file (tower 1)
.

Licensed user:
Wind Engineers, Inc.
7660 Whitegate Avenue
US-RIVERSIDE, CA 92506

Calculated:
03/01/06 21:02/2.4.0.67

SHADOW - Calendar

Calculation: Mid / Northeast part **Shadow receptor:** 726 - 726

Assumptions for shadow calculations

Maximum distance for influence	1,000 m
Minimum sun height over horizon for influence	3 °
Day step for calculation	1 days
Time step for calculation	2 minutes

Sun shine probabilities (part of time from sun rise to sun set with sun shine)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.35	0.45	0.45	0.55	0.55	0.55	0.65	0.55	0.55	0.45	0.35	0.30

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
475	585	238	199	220	474	1,184	813	840	1,246	803	479	7,555

	January		February		March	April	May	June	July	August	September	October	November		December
1	07:40		07:25	08:42 (7)	06:47	05:54	06:06	05:36	05:36	06:01	06:34	07:06	06:43		07:20
	16:47		17:23	16 08:58 (7)	17:59	18:35	20:08	20:40	20:52	20:32	19:46	18:53	17:04		16:38
2	07:40		07:24	08:43 (7)	06:45	05:52	06:05	05:35	05:37	06:02	06:35	07:08	06:44		07:21
	16:48		17:24	14 08:57 (7)	18:00	18:37	20:09	20:41	20:52	20:31	19:44	18:51	17:03		16:38
3	07:40		07:23	08:46 (7)	06:44	05:50	06:03	05:35	05:37	06:03	06:36	07:09	06:45		07:22
	16:49		17:26	8 08:54 (7)	18:02	18:38	20:10	20:41	20:51	20:30	19:42	18:49	17:02		16:38
4	07:40		07:22		06:42	05:49	06:02	05:34	05:38	06:05	06:38	07:10	06:47		07:23
	16:50		17:27		18:03	18:39	20:12	20:42	20:51	20:29	19:41	18:48	17:00		16:37
5	07:40		07:21		06:40	06:47	06:01	05:34	05:38	06:06	06:39	07:11	06:48		07:24
	16:51		17:28		18:04	19:40	20:13	20:43	20:51	20:27	19:39	18:46	16:59		16:37
6	07:40		07:20		06:39	06:45	05:59	05:34	05:39	06:07	06:40	07:12	06:49		07:25
	16:52		17:30		18:05	19:41	20:14	20:43	20:51	20:26	19:37	18:44	16:58		16:37
7	07:40		07:18		06:37	06:44	05:58	05:33	05:40	06:08	06:41	07:13	06:50		07:26
	16:53		17:31		18:06	19:42	20:15	20:44	20:50	20:25	19:35	18:43	16:57		16:37
8	07:40		07:17		06:35	06:42	05:57	05:33	05:40	06:09	06:42	07:14	06:52		08:16 (7) 07:27
	16:54		17:32		18:08	19:43	20:16	20:45	20:50	20:24	19:34	18:41	16:56	10	08:26 (7) 16:37
9	07:40		07:16		06:34	06:40	05:56	05:33	05:41	06:10	06:43	07:15	06:53		08:14 (7) 07:28
	16:55		17:34		18:09	19:44	20:17	20:45	20:50	20:22	19:32	18:39	16:55	14	08:28 (7) 16:37
10	07:39		07:15		06:32	06:39	05:55	05:33	05:42	06:11	06:44	07:17	06:54		08:13 (7) 07:28
	16:56		17:35		18:10	19:46	20:18	20:46	20:49	20:21	19:30	18:37	16:53	16	08:29 (7) 16:37
11	07:39		07:13		06:30	06:37	05:53	05:32	05:42	06:12	06:45	07:18	06:56		08:12 (7) 07:29
	16:57		17:36		18:11	19:47	20:19	20:47	20:49	20:20	19:28	18:36	16:52	18	08:30 (7) 16:37
12	07:39		07:12		06:29	06:35	05:52	05:32	05:43	06:13	06:46	07:19	06:57		08:12 (7) 07:30
	16:58		17:38		18:12	19:48	20:20	20:47	20:48	20:18	19:27	18:34	16:51	20	08:32 (7) 16:37
13	07:39	08:43 (7)	07:11		06:27	06:34	05:51	05:32	05:44	06:14	06:47	07:20	06:58		08:11 (7) 07:31
	16:59	6 08:49 (7)	17:39		18:14	19:49	20:21	20:48	20:48	20:17	19:25	18:33	16:50	20	08:31 (7) 16:37
14	07:38	08:40 (7)	07:09		06:25	06:32	05:50	05:32	05:45	06:15	06:48	07:21	06:59		08:10 (7) 07:32
	17:00	10 08:50 (7)	17:40		18:15	19:50	20:23	20:48	20:47	20:16	19:23	18:31	16:49	22	08:32 (7) 16:37
15	07:38	08:40 (7)	07:08		06:24	06:30	05:49	05:32	05:46	06:16	06:49	07:22	07:01		08:12 (7) 07:32
	17:02	12 08:52 (7)	17:41		18:16	19:51	20:24	20:49	20:47	20:14	19:21	18:29	16:48	22	08:34 (7) 16:38
16	07:37	08:39 (7)	07:07		06:22	06:29	05:48	05:32	05:46	06:17	06:50	07:24	07:02		08:11 (7) 07:33
	17:03	14 08:53 (7)	17:43		18:17	19:52	20:25	20:49	20:46	20:13	19:19	18:28	16:48	22	08:33 (7) 16:38
17	07:37	08:39 (7)	07:05		06:20	06:27	05:47	05:32	05:47	06:18	06:51	07:25	07:03		08:10 (7) 07:34
	17:04	16 08:55 (7)	17:44		18:18	19:54	20:26	20:50	20:46	20:11	19:18	18:26	16:47	24	08:34 (7) 16:38
18	07:36	08:38 (7)	07:04		06:18	06:25	05:46	05:32	05:48	06:19	06:52	07:26	07:04		08:12 (7) 07:35
	17:05	18 08:56 (7)	17:45		18:19	19:55	20:27	20:50	20:45	20:10	19:16	18:24	16:46	22	08:34 (7) 16:38
19	07:36	08:37 (7)	07:02		06:17	06:24	05:45	05:32	05:49	06:20	06:53	07:27	07:05		08:11 (7) 07:35
	17:06	20 08:57 (7)	17:47		18:21	19:56	20:28	20:50	20:44	20:08	19:14	18:23	16:45	24	08:35 (7) 16:39
20	07:35	08:37 (7)	07:01		06:15	06:22	05:44	05:32	05:50	06:21	06:55	07:28	07:07		08:12 (7) 07:36
	17:08	22 08:59 (7)	17:48		18:22	19:57	20:29	20:51	20:43	20:07	19:12	18:21	16:44	22	08:34 (7) 16:39
21	07:34	08:38 (7)	06:59		06:13	06:21	05:43	05:33	05:51	06:23	06:56	07:29	07:08		08:14 (7) 07:36
	17:09	20 08:58 (7)	17:49		18:23	19:58	20:30	20:51	20:43	20:05	19:11	18:20	16:44	20	08:34 (7) 16:40
22	07:34	08:37 (7)	06:58		06:11	06:19	05:42	05:33	05:52	06:24	06:57	07:31	07:09		08:13 (7) 07:37
	17:10	22 08:59 (7)	17:50		18:24	19:59	20:31	20:51	20:42	20:04	19:09	18:18	16:43	22	08:35 (7) 16:40
23	07:33	08:36 (7)	06:56		06:10	06:18	05:42	05:33	05:53	06:25	06:58	07:32	07:10		08:14 (7) 07:37
	17:11	24 09:00 (7)	17:52		18:25	20:00	20:32	20:51	20:41	20:02	19:07	18:17	16:42	20	08:34 (7) 16:41
24	07:32	08:38 (7)	06:55		06:08	06:16	05:41	05:33	05:54	06:26	06:59	07:33	07:12		08:15 (7) 07:38
	17:13	22 09:00 (7)	17:53		18:26	20:00	20:33	20:51	20:40	20:00	19:05	18:15	16:42	18	08:33 (7) 16:41
25	07:31	08:37 (7)	06:53		06:06	06:15	05:40	05:34	05:54	06:27	07:00	06:34	07:13		08:17 (7) 07:38
	17:14	24 09:01 (7)	17:54		18:27	20:01	20:34	20:52	20:39	19:57	19:03	17:14	16:41	16	08:33 (7) 16:42
26	07:31	08:38 (7)	06:52		06:04	06:13	05:39	05:34	05:55	06:28	07:01	06:36	07:14		08:18 (7) 07:39
	17:15	22 09:00 (7)	17:55		18:29	20:03	20:35	20:52	20:38	19:56	19:02	17:12	16:40	14	08:32 (7) 16:43
27	07:30	08:39 (7)	06:50		06:03	06:12	05:39	05:34	05:56	06:29	07:02	06:37	07:15		08:19 (7) 07:39
	17:17	22 09:01 (7)	17:57		18:30	20:04	20:35	20:52	20:37	19:54	19:00	17:11	16:40	12	08:31 (7) 16:43
28	07:29	08:38 (7)	06:49		06:01	06:10	05:38	05:35	05:57	06:30	07:03	06:38	07:16		08:20 (7) 07:39
	17:18	22 09:00 (7)	17:58		18:31	20:05	20:36	20:52	20:36	19:52	18:58	17:10	16:39	10	08:30 (7) 16:44
29	07:28	08:39 (7)			05:59	06:09	05:37	05:35	05:58	06:31	07:04	06:39	07:17		08:23 (7) 07:39
	17:19	22 09:01 (7)			18:32	20:06	20:37	20:52	20:35	19:51	18:56	17:08	16:39	6	08:29 (7) 16:45
30	07:27	08:40 (7)			05:57	06:07	05:37	05:36	05:59	06:32	07:05	06:40	07:18		07:40
	17:20	20 09:00 (7)			18:33	20:07	20:38	20:52	20:34	19:49	18:55	17:07	16:39		16:45
31	07:26	08:41 (7)			05:56		05:36		06:00	06:33		06:42			07:40
	17:22	18 08:59 (7)			18:34		20:39		20:33	19:47		17:05			16:46
Potential sun hours	293		295		370	209	-292	-263	-280	-145	375	343	294		283
Total, worst case		356		38										394	
Sun reduction		0.35		0.45										0.35	
Oper. time red.		0.86		0.86										0.86	
Wind dir. red.		0.63		0.63										0.63	
Total reduction		0.19		0.24										0.19	
Total, real		67		9										75	

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	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, Mid / Northeast part
20 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
1000 meter max shadow distance applied along with default 3° inclination
Sunshine probabilities applied (pdf plots)
Directional run-hours applied from tab file (tower 1)
.

Licensed user:
Wind Engineers, Inc.
7660 Whitegate Avenue
US-RIVERSIDE, CA 92506

Calculated:
03/01/06 21:02/2.4.0.67

SHADOW - Calendar

Calculation: Mid / Northeast part **Shadow receptor:** 727 - 727

Assumptions for shadow calculations

Maximum distance for influence	1,000 m
Minimum sun height over horizon for influence	3 °
Day step for calculation	1 days
Time step for calculation	2 minutes

Sun shine probabilities (part of time from sun rise to sun set with sun shine)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.35	0.45	0.45	0.55	0.55	0.55	0.65	0.55	0.55	0.45	0.35	0.30

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
475	585	238	199	220	474	1,184	813	840	1,246	803	479	7,555

	January		February		March	April	May	June	July	August	September	October		November		December
1	07:40		07:25	08:24 (7)	06:47	05:54	06:06	05:36	05:36	06:01	06:34	07:06		06:43	07:51 (7)	07:20
	16:47		17:23 16	08:40 (7)	17:59	18:35	20:08	20:40	20:52	20:32	19:46	18:53		17:04 20	08:11 (7)	16:38
2	07:40		07:24	08:23 (7)	06:45	05:52	06:05	05:35	05:37	06:02	06:35	07:08		06:44	07:50 (7)	07:21
	16:48		17:24 18	08:41 (7)	18:00	18:37	20:09	20:41	20:52	20:31	19:44	18:51		17:03 22	08:12 (7)	16:38
3	07:40		07:23	08:22 (7)	06:44	05:50	06:03	05:35	05:37	06:03	06:36	07:09		06:45	07:52 (7)	07:22
	16:49		17:26 20	08:42 (7)	18:02	18:38	20:11	20:41	20:51	20:30	19:42	18:49		17:02 20	08:12 (7)	16:38
4	07:40		07:22	08:21 (7)	06:42	05:49	06:02	05:34	05:38	06:05	06:38	07:10		06:47	07:51 (7)	07:23
	16:50		17:27 22	08:43 (7)	18:03	18:39	20:12	20:42	20:51	20:29	19:41	18:48		17:00 22	08:13 (7)	16:38
5	07:40		07:21	08:21 (7)	06:40	06:47	06:01	05:34	05:38	06:06	06:39	07:11		06:48	07:50 (7)	07:24
	16:51		17:28 20	08:41 (7)	18:04	19:40	20:13	20:43	20:51	20:27	19:39	18:46		16:59 22	08:12 (7)	16:37
6	07:40		07:20	08:20 (7)	06:39	06:45	05:59	05:34	05:39	06:07	06:40	07:12		06:49	07:52 (7)	07:25
	16:52		17:30 22	08:42 (7)	18:05	19:41	20:14	20:43	20:51	20:26	19:37	18:44		16:58 20	08:12 (7)	16:37
7	07:40		07:18	08:21 (7)	06:37	06:44	05:58	05:33	05:40	06:08	06:41	07:13		06:50	07:51 (7)	07:26
	16:53		17:31 22	08:43 (7)	18:06	19:42	20:15	20:44	20:50	20:25	19:35	18:43		16:57 20	08:11 (7)	16:37
8	07:40		07:17	08:22 (7)	06:35	06:42	05:57	05:33	05:40	06:09	06:42	07:14		06:52	07:52 (7)	07:27
	16:54		17:32 20	08:42 (7)	18:08	19:43	20:16	20:45	20:50	20:24	19:34	18:41		16:56 20	08:12 (7)	16:37
9	07:40		07:16	08:22 (7)	06:34	06:40	05:56	05:33	05:41	06:10	06:43	07:15		06:53	07:54 (7)	07:28
	16:55		17:34 20	08:42 (7)	18:09	19:44	20:17	20:45	20:50	20:22	19:32	18:39		16:55 18	08:12 (7)	16:37
10	07:39		07:15	08:23 (7)	06:32	06:39	05:55	05:33	05:42	06:11	06:44	07:17		06:54	07:55 (7)	07:28
	16:56		17:35 18	08:41 (7)	18:10	19:46	20:18	20:46	20:49	20:21	19:30	18:37		16:53 16	08:11 (7)	16:37
11	07:39		07:13	08:24 (7)	06:30	06:37	05:53	05:32	05:42	06:12	06:45	07:18		06:56	07:56 (7)	07:29
	16:57		17:36 16	08:40 (7)	18:11	19:47	20:19	20:47	20:49	20:20	19:28	18:36		16:52 12	08:08 (7)	16:37
12	07:39		07:12	08:24 (7)	06:29	06:35	05:52	05:32	05:43	06:13	06:46	07:19		06:57	07:58 (7)	07:30
	16:58		17:38 14	08:38 (7)	18:12	19:48	20:20	20:47	20:48	20:18	19:27	18:34		16:51 10	08:08 (7)	16:37
13	07:39		07:11	08:25 (7)	06:27	06:34	05:51	05:32	05:44	06:14	06:47	07:20		06:58	08:01 (7)	07:31
	16:59		17:39 12	08:37 (7)	18:14	19:49	20:21	20:48	20:48	20:17	19:25	18:33		16:50 4	08:05 (7)	16:37
14	07:38		07:09	08:28 (7)	06:25	06:32	05:50	05:32	05:45	06:15	06:48	07:21		06:59		07:32
	17:00		17:40 6	08:34 (7)	18:15	19:50	20:23	20:48	20:47	20:16	19:23	18:31		16:49		16:37
15	07:38		07:08		06:24	06:30	05:49	05:32	05:46	06:16	06:49	07:22		07:01		07:32
	17:02		17:41		18:16	19:51	20:24	20:49	20:47	20:14	19:21	18:29		16:48		16:38
16	07:37		07:07		06:22	06:29	05:48	05:32	05:46	06:17	06:50	07:24		07:02		07:33
	17:03		17:43		18:17	19:52	20:25	20:49	20:46	20:13	19:19	18:28		16:48		16:38
17	07:37		07:05		06:20	06:27	05:47	05:32	05:47	06:18	06:51	07:25		07:03		07:34
	17:04		17:44		18:18	19:54	20:26	20:50	20:46	20:11	19:18	18:26		16:47		16:38
18	07:36		07:04		06:18	06:25	05:46	05:32	05:48	06:19	06:52	07:26		07:04		07:35
	17:05		17:45		18:19	19:55	20:27	20:50	20:45	20:10	19:16	18:24		16:46		16:38
19	07:36		07:02		06:17	06:24	05:45	05:32	05:49	06:20	06:53	07:27		07:05		07:35
	17:06		17:47		18:21	19:56	20:28	20:50	20:44	20:08	19:14	18:23		16:45		16:39
20	07:35		07:01		06:15	06:22	05:44	05:32	05:50	06:21	06:55	07:28		07:07		07:36
	17:08		17:48		18:22	19:57	20:29	20:51	20:43	20:07	19:12	18:21		16:44		16:39
21	07:34		06:59		06:13	06:21	05:43	05:33	05:51	06:23	06:56	07:29		07:08		07:36
	17:09		17:49		18:23	19:58	20:30	20:51	20:43	20:05	19:11	18:20		16:44		16:40
22	07:34		06:58		06:11	06:19	05:42	05:33	05:52	06:24	06:57	07:31		07:09		07:37
	17:10		17:50		18:24	19:59	20:31	20:51	20:42	20:04	19:09	18:18		16:43		16:40
23	07:33		06:56		06:10	06:18	05:42	05:33	05:53	06:25	06:58	07:32		07:10		07:37
	17:11		17:52		18:25	20:00	20:32	20:51	20:41	20:02	19:07	18:17		16:42		16:41
24	07:32		06:55		06:08	06:16	05:41	05:33	05:54	06:26	06:59	07:33		07:12		07:38
	17:13		17:53		18:26	20:00	20:33	20:51	20:40	20:00	19:05	18:15		16:42		16:41
25	07:31		06:53		06:06	06:15	05:40	05:34	05:54	06:27	07:00	06:34		07:13		07:38
	17:14		17:54		18:27	20:01	20:34	20:52	20:39	19:57	19:03	17:14		16:41		16:42
26	07:31		06:52		06:04	06:13	05:39	05:34	05:55	06:28	07:01	06:36		07:14		07:39
	17:15		17:55		18:29	20:03	20:35	20:52	20:38	19:56	19:02	17:12		16:40		16:43
27	07:30		06:50		06:03	06:12	05:39	05:34	05:56	06:29	07:02	06:37		07:15		07:39
	17:17		17:57		18:30	20:04	20:35	20:52	20:37	19:54	19:00	17:11		16:40		16:43
28	07:29		06:49		06:01	06:10	05:38	05:35	05:57	06:30	07:03	06:38	07:58 (7)	07:16		07:39
	17:18		17:58		18:31	20:05	20:36	20:52	20:36	19:52	18:58	17:10 8	08:06 (7)	16:39		16:44
29	07:28	08:29 (7)			05:59	06:09	05:37	05:35	05:58	06:31	07:04	06:39	07:55 (7)	07:17		07:39
	17:19 4	08:33 (7)			18:32	20:06	20:37	20:52	20:35	19:51	18:56	17:08 12	08:07 (7)	16:39		16:45
30	07:27	08:26 (7)			05:57	06:07	05:37	05:36	05:59	06:32	07:05	06:40	07:54 (7)	07:18		07:40
	17:20 10	08:36 (7)			18:33	20:07	20:38	20:52	20:34	19:49	18:55	17:07 14	08:08 (7)	16:39		16:45
31	07:26	08:25 (7)			05:56		05:36		06:00	06:33		06:42	07:51 (7)			07:40
	17:22 12	08:37 (7)			18:34		20:39		20:33	19:47		17:05 18	08:09 (7)			16:46
Potential sun hours	293		295		370	209	-292	-263	-280	-145	375	343		294		283
Total, worst case	26		246									52		226		
Sun reduction	0.35		0.45									0.45		0.35		
Oper. time red.	0.86		0.86									0.86		0.86		
Wind dir. red.	0.63		0.63									0.63		0.63		
Total reduction	0.19		0.24									0.24		0.19		
Total, real	5		60									13		43		

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	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, Mid / Northeast part
20 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
1000 meter max shadow distance applied along with default 3° inclination
Sunshine probabilities applied (pdf plots)
Directional run-hours applied from tab file (tower 1)
.

Printed/Page
03/05/06 23:23 / 37
Licensed user:
Wind Engineers, Inc.
7660 Whitegate Avenue
US-RIVERSIDE, CA 92506

Calculated:
03/01/06 21:02/2.4.0.67

SHADOW - Calendar

Calculation: Mid / Northeast part **Shadow receptor:** 729 - 729

Assumptions for shadow calculations

Maximum distance for influence	1,000	m
Minimum sun height over horizon for influence	3	°
Day step for calculation	1	days
Time step for calculation	2	minutes

Sun shine probabilities (part of time from sun rise to sun set with sun shine)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.35	0.45	0.45	0.55	0.55	0.55	0.65	0.55	0.55	0.45	0.35	0.30

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
475	585	238	199	220	474	1,184	813	840	1,246	803	479	7,555

	January			February	March	April	May	June	July	August	September	October	November	December		
1	07:40		08:55 (1)	07:25	06:47	05:54	06:06	05:36	05:36	06:01	06:34	07:06	06:43	07:20		08:48 (1)
	16:47	20	09:15 (1)	17:23	17:59	18:35	20:08	20:40	20:52	20:32	19:46	18:53	17:04	16:38	6	08:54 (1)
2	07:40		08:55 (1)	07:24	06:45	05:52	06:05	05:35	05:37	06:02	06:35	07:08	06:44	07:21		08:47 (1)
	16:48	20	09:15 (1)	17:24	18:00	18:37	20:09	20:41	20:52	20:31	19:44	18:51	17:03	16:38	10	08:57 (1)
3	07:40		08:57 (1)	07:23	06:44	05:50	06:03	05:35	05:37	06:04	06:36	07:09	06:45	07:22		08:46 (1)
	16:49	18	09:15 (1)	17:26	18:02	18:38	20:11	20:41	20:51	20:30	19:42	18:49	17:02	16:38	12	08:58 (1)
4	07:40		08:57 (1)	07:22	06:42	05:49	06:02	05:34	05:38	06:05	06:38	07:10	06:47	07:23		08:45 (1)
	16:50	18	09:15 (1)	17:27	18:03	18:39	20:12	20:42	20:51	20:29	19:41	18:48	17:00	16:38	14	08:59 (1)
5	07:40		08:57 (1)	07:21	06:40	06:47	06:01	05:34	05:38	06:06	06:39	07:11	06:48	07:24		08:44 (1)
	16:51	18	09:15 (1)	17:28	18:04	19:40	20:13	20:43	20:51	20:27	19:39	18:46	16:59	16:37	16	09:00 (1)
6	07:40		08:59 (1)	07:20	06:39	06:45	05:59	05:34	05:39	06:07	06:40	07:12	06:49	07:25		08:45 (1)
	16:52	16	09:15 (1)	17:30	18:05	19:41	20:14	20:44	20:51	20:26	19:37	18:44	16:58	16:37	16	09:01 (1)
7	07:40		08:59 (1)	07:18	06:37	06:44	05:58	05:33	05:40	06:08	06:41	07:13	06:51	07:26		08:44 (1)
	16:53	16	09:15 (1)	17:31	18:06	19:42	20:15	20:44	20:50	20:25	19:35	18:43	16:57	16:37	18	09:02 (1)
8	07:40		09:01 (1)	07:17	06:35	06:42	05:57	05:33	05:40	06:09	06:42	07:14	06:52	07:27		08:45 (1)
	16:54	14	09:15 (1)	17:32	18:08	19:43	20:16	20:45	20:50	20:24	19:34	18:41	16:56	16:37	18	09:03 (1)
9	07:40		09:02 (1)	07:16	06:34	06:40	05:56	05:33	05:41	06:10	06:43	07:15	06:53	07:28		08:46 (1)
	16:55	12	09:14 (1)	17:34	18:09	19:45	20:17	20:45	20:50	20:22	19:32	18:39	16:55	16:37	18	09:04 (1)
10	07:39		09:04 (1)	07:15	06:32	06:39	05:55	05:33	05:42	06:11	06:44	07:17	06:54	07:28		08:45 (1)
	16:56	10	09:14 (1)	17:35	18:10	19:46	20:18	20:46	20:49	20:21	19:30	18:38	16:53	16:37	20	09:05 (1)
11	07:39		09:06 (1)	07:13	06:30	06:37	05:53	05:32	05:42	06:12	06:45	07:18	06:56	07:29		08:46 (1)
	16:57	8	09:14 (1)	17:36	18:11	19:47	20:19	20:47	20:49	20:20	19:28	18:36	16:52	16:37	20	09:06 (1)
12	07:39		09:07 (1)	07:12	06:29	06:35	05:52	05:32	05:43	06:13	06:46	07:19	06:57	07:30		08:47 (1)
	16:58	4	09:11 (1)	17:38	18:12	19:48	20:20	20:47	20:48	20:18	19:27	18:34	16:51	16:37	18	09:05 (1)
13	07:39			07:11	06:27	06:34	05:51	05:32	05:44	06:14	06:47	07:20	06:58	07:31		08:45 (1)
	16:59			17:39	18:14	19:49	20:22	20:48	20:48	20:17	19:25	18:33	16:50	16:37	20	09:05 (1)
14	07:38			07:09	06:25	06:32	05:50	05:32	05:45	06:15	06:48	07:21	06:59	07:32		08:46 (1)
	17:01			17:40	18:15	19:50	20:23	20:48	20:47	20:16	19:23	18:31	16:49	16:37	20	09:06 (1)
15	07:38			07:08	06:24	06:30	05:49	05:32	05:46	06:16	06:49	07:22	07:01	07:32		08:47 (1)
	17:02			17:41	18:16	19:51	20:24	20:49	20:47	20:14	19:21	18:29	16:48	16:38	20	09:07 (1)
16	07:37			07:07	06:22	06:29	05:48	05:32	05:46	06:17	06:50	07:24	07:02	07:33		08:48 (1)
	17:03			17:43	18:17	19:52	20:25	20:49	20:46	20:13	19:20	18:28	16:48	16:38	20	09:08 (1)
17	07:37			07:05	06:20	06:27	05:47	05:32	05:47	06:18	06:51	07:25	07:03	07:34		08:48 (1)
	17:04			17:44	18:18	19:54	20:26	20:50	20:46	20:11	19:18	18:26	16:47	16:38	20	09:08 (1)
18	07:36			07:04	06:18	06:25	05:46	05:32	05:48	06:19	06:52	07:26	07:04	07:35		08:49 (1)
	17:05			17:45	18:19	19:55	20:27	20:50	20:45	20:10	19:16	18:24	16:46	16:39	20	09:09 (1)
19	07:36			07:02	06:17	06:24	05:45	05:32	05:49	06:20	06:53	07:27	07:06	07:35		08:49 (1)
	17:06			17:47	18:21	19:56	20:28	20:50	20:44	20:08	19:14	18:23	16:45	16:39	20	09:09 (1)
20	07:35			07:01	06:15	06:22	05:44	05:32	05:50	06:22	06:55	07:28	07:07	07:36		08:48 (1)
	17:08			17:48	18:22	19:57	20:29	20:51	20:43	20:07	19:12	18:21	16:44	16:39	22	09:10 (1)
21	07:34			06:59	06:13	06:21	05:43	05:33	05:51	06:23	06:56	07:29	07:08	07:36		08:48 (1)
	17:09			17:49	18:23	19:58	20:30	20:51	20:43	20:05	19:11	18:20	16:44	16:40	22	09:10 (1)
22	07:34			06:58	06:11	06:19	05:42	05:33	05:52	06:24	06:57	07:31	07:09	07:37		08:49 (1)
	17:10			17:50	18:24	19:59	20:31	20:51	20:42	20:04	19:09	18:18	16:43	16:40	22	09:11 (1)
23	07:33			06:56	06:10	06:18	05:42	05:33	05:53	06:25	06:58	07:32	07:10	07:37		08:49 (1)
	17:11			17:52	18:25	20:00	20:32	20:51	20:41	20:02	19:07	18:17	16:42	16:41	22	09:11 (1)
24	07:32			06:55	06:08	06:16	05:41	05:33	05:54	06:26	06:59	07:33	07:12	07:38		08:50 (1)
	17:13			17:53	18:26	20:00	20:33	20:51	20:40	20:00	19:05	18:15	16:42	16:41	22	09:12 (1)
25	07:31			06:53	06:06	06:15	05:40	05:34	05:54	06:27	07:00	06:34	07:13	07:38		08:52 (1)
	17:14			17:54	18:27	20:02	20:34	20:52	20:39	19:57	19:04	17:14	16:41	16:42	20	09:12 (1)
26	07:31			06:52	06:04	06:13	05:39	05:34	05:55	06:28	07:01	06:36	07:14	07:39		08:52 (1)
	17:15			17:55	18:29	20:03	20:35	20:52	20:38	19:56	19:02	17:12	16:40	16:43	20	09:12 (1)
27	07:30			06:50	06:03	06:12	05:39	05:34	05:56	06:29	07:02	06:37	07:15	07:39		08:53 (1)
	17:17			17:57	18:30	20:04	20:35	20:52	20:37	19:54	19:00	17:11	16:40	16:43	20	09:13 (1)
28	07:29			06:49	06:01	06:10	05:38	05:35	05:57	06:30	07:03	06:38	07:16	07:39		08:53 (1)
	17:18			17:58	18:31	20:05	20:36	20:52	20:36	19:52	18:58	17:10	16:40	16:44	20	09:13 (1)
29	07:28				05:59	06:09	05:37	05:35	05:58	06:31	07:04	06:39	07:17	07:39		08:53 (1)
	17:19				18:32	20:06	20:37	20:52	20:35	19:51	18:56	17:08	16:39	16:45	20	09:13 (1)
30	07:27				05:57	06:07	05:37	05:36	05:59	06:32	07:05	06:40	07:18	07:40		08:53 (1)
	17:20				18:33	20:07	20:38	20:52	20:34	19:49	18:55	17:07	16:39	16:45	20	09:13 (1)
31	07:26				05:56		05:36		06:00	06:33		06:42		07:40		08:55 (1)
	17:22				18:34		20:39		20:33	19:47		17:05		16:46	18	09:13 (1)
Potential sun hours	293			295	370	209	-292	-263	-280	-145	375	343	294	283		
Total, worst case		174													574	
Sun reduction		0.35													0.30	
Oper. time red.		0.86													0.86	
Wind dir. red.		0.63													0.63	
Total reduction		0.19													0.16	
Total, real		33													94	

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	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, Mid / Northeast part
20 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
1000 meter max shadow distance applied along with default 3° inclination
Sunshine probabilities applied (pdf plots)
Directional run-hours applied from tab file (tower 1)
.

Licensed user:
Wind Engineers, Inc.
7660 Whitegate Avenue
US-RIVERSIDE, CA 92506

Calculated:
03/01/06 21:02/2.4.0.67

SHADOW - Calendar

Calculation: Mid / Northeast part **Shadow receptor:** 730 - 730

Assumptions for shadow calculations

Maximum distance for influence	1,000 m
Minimum sun height over horizon for influence	3 °
Day step for calculation	1 days
Time step for calculation	2 minutes

Sun shine probabilities (part of time from sun rise to sun set with sun shine)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.35	0.45	0.45	0.55	0.55	0.55	0.65	0.55	0.55	0.45	0.35	0.30

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
475	585	238	199	220	474	1,184	813	840	1,246	803	479	7,555

	January		February	March	April	May	June	July	August	September	October	November		December	
1	07:40	15:07 (20)	07:25	06:47	05:54	06:06	05:36	05:36	06:01	06:34	07:06	06:43		07:20	08:32 (1)
	16:47 22	15:29 (20)	17:23	17:59	18:35	20:08	20:40	20:52	20:32	19:46	18:53	17:04		16:38 34	15:12 (20)
2	07:40	08:53 (1)	07:24	06:45	05:52	06:05	05:35	05:37	06:02	06:35	07:08	06:44		07:21	08:33 (1)
	16:48 28	15:29 (20)	17:24	18:00	18:37	20:09	20:41	20:52	20:31	19:44	18:51	17:03		16:38 34	15:13 (20)
3	07:40	08:53 (1)	07:23	06:44	05:50	06:03	05:35	05:37	06:04	06:36	07:09	06:45		07:22	08:34 (1)
	16:49 28	15:29 (20)	17:26	18:02	18:38	20:11	20:41	20:51	20:30	19:42	18:49	17:02		16:38 36	15:14 (20)
4	07:40	08:51 (1)	07:22	06:42	05:49	06:02	05:34	05:38	06:05	06:38	07:10	06:47		07:23	08:35 (1)
	16:50 30	15:29 (20)	17:27	18:03	18:39	20:12	20:42	20:51	20:29	19:41	18:48	17:00		16:38 34	15:15 (20)
5	07:40	08:51 (1)	07:21	06:40	06:47	06:01	05:34	05:38	06:06	06:39	07:11	06:48		07:24	08:36 (1)
	16:51 32	15:29 (20)	17:28	18:04	19:40	20:13	20:43	20:51	20:27	19:39	18:46	16:59		16:37 34	15:16 (20)
6	07:40	08:51 (1)	07:20	06:39	06:45	05:59	05:34	05:39	06:07	06:40	07:12	06:49		07:25	08:37 (1)
	16:52 34	15:31 (20)	17:30	18:05	19:41	20:14	20:44	20:51	20:26	19:37	18:44	16:58		16:37 34	15:17 (20)
7	07:40	08:51 (1)	07:18	06:37	06:44	05:58	05:33	05:40	06:08	06:41	07:13	06:51		07:26	08:38 (1)
	16:53 34	15:31 (20)	17:31	18:06	19:42	20:15	20:44	20:50	20:25	19:35	18:43	16:57		16:37 32	15:16 (20)
8	07:40	08:51 (1)	07:17	06:35	06:42	05:57	05:33	05:40	06:09	06:42	07:14	06:52		07:27	08:39 (1)
	16:54 34	15:31 (20)	17:32	18:08	19:43	20:16	20:45	20:50	20:24	19:34	18:41	16:56		16:37 30	15:17 (20)
9	07:40	08:50 (1)	07:16	06:34	06:40	05:56	05:33	05:41	06:10	06:43	07:15	06:53		07:28	08:42 (1)
	16:55 34	15:30 (20)	17:34	18:09	19:45	20:17	20:45	20:50	20:22	19:32	18:39	16:55		16:37 30	15:18 (20)
10	07:39	08:50 (1)	07:15	06:32	06:39	05:55	05:33	05:42	06:11	06:44	07:17	06:54		07:28	08:43 (1)
	16:56 34	15:30 (20)	17:35	18:10	19:46	20:18	20:46	20:49	20:21	19:30	18:38	16:53		16:37 28	15:19 (20)
11	07:39	08:50 (1)	07:13	06:30	06:37	05:53	05:32	05:42	06:12	06:45	07:18	06:56		07:29	14:58 (20)
	16:57 34	15:30 (20)	17:36	18:11	19:47	20:19	20:47	20:49	20:20	19:28	18:36	16:52		16:37 22	15:20 (20)
12	07:39	08:49 (1)	07:12	06:29	06:35	05:52	05:32	05:43	06:13	06:46	07:19	06:57		07:30	14:59 (20)
	16:58 32	15:29 (20)	17:38	18:12	19:48	20:20	20:47	20:48	20:18	19:27	18:34	16:51		16:37 22	15:21 (20)
13	07:39	08:51 (1)	07:11	06:27	06:34	05:51	05:32	05:44	06:14	06:47	07:20	06:58	08:31 (1)	07:31	14:57 (20)
	16:59 28	15:27 (20)	17:39	18:14	19:49	20:22	20:48	20:48	20:17	19:25	18:33	16:50 10	08:41 (1)	16:37 24	15:21 (20)
14	07:38	08:50 (1)	07:09	06:25	06:32	05:50	05:32	05:45	06:15	06:48	07:21	06:59	08:30 (1)	07:32	14:58 (20)
	17:01 24	15:26 (20)	17:40	18:15	19:50	20:23	20:48	20:47	20:16	19:23	18:31	16:49 12	08:42 (1)	16:37 22	15:20 (20)
15	07:38	08:50 (1)	07:08	06:24	06:30	05:49	05:32	05:46	06:16	06:49	07:22	07:01	08:30 (1)	07:32	14:59 (20)
	17:02 22	09:12 (1)	17:41	18:16	19:51	20:24	20:49	20:47	20:14	19:21	18:29	16:48 14	08:44 (1)	16:38 22	15:21 (20)
16	07:37	08:49 (1)	07:07	06:22	06:29	05:48	05:32	05:46	06:17	06:50	07:24	07:02	08:29 (1)	07:33	15:00 (20)
	17:03 24	09:13 (1)	17:43	18:17	19:52	20:25	20:49	20:46	20:13	19:20	18:28	16:48 16	08:45 (1)	16:38 22	15:22 (20)
17	07:37	08:51 (1)	07:05	06:20	06:27	05:47	05:32	05:47	06:18	06:51	07:25	07:03	08:28 (1)	07:34	15:00 (20)
	17:04 22	09:13 (1)	17:44	18:18	19:54	20:26	20:50	20:46	20:11	19:18	18:26	16:47 18	08:46 (1)	16:38 22	15:22 (20)
18	07:36	08:50 (1)	07:04	06:18	06:25	05:46	05:32	05:48	06:19	06:52	07:26	07:04	08:28 (1)	07:35	15:01 (20)
	17:05 24	09:14 (1)	17:45	18:19	19:55	20:27	20:50	20:45	20:10	19:16	18:24	16:46 20	08:48 (1)	16:39 22	15:23 (20)
19	07:36	08:51 (1)	07:02	06:17	06:24	05:45	05:32	05:49	06:20	06:53	07:27	07:06	08:27 (1)	07:35	14:59 (20)
	17:06 22	09:13 (1)	17:47	18:21	19:56	20:28	20:50	20:44	20:08	19:14	18:23	16:45 22	08:49 (1)	16:39 24	15:23 (20)
20	07:35	08:51 (1)	07:01	06:15	06:22	05:44	05:32	05:50	06:22	06:55	07:28	07:07	08:26 (1)	07:36	15:00 (20)
	17:08 24	09:15 (1)	17:48	18:22	19:57	20:29	20:51	20:43	20:07	19:12	18:21	16:44 22	08:48 (1)	16:39 24	15:24 (20)
21	07:34	08:52 (1)	06:59	06:13	06:21	05:43	05:33	05:51	06:23	06:56	07:29	07:08	08:28 (1)	07:36	15:00 (20)
	17:09 22	09:14 (1)	17:49	18:23	19:58	20:30	20:51	20:43	20:05	19:11	18:20	16:44 22	08:50 (1)	16:40 24	15:24 (20)
22	07:34	08:51 (1)	06:58	06:11	06:19	05:42	05:33	05:52	06:24	06:57	07:31	07:09	08:27 (1)	07:37	15:01 (20)
	17:10 22	09:13 (1)	17:50	18:24	19:59	20:31	20:51	20:42	20:04	19:09	18:18	16:43 24	08:51 (1)	16:40 24	15:25 (20)
23	07:33	08:52 (1)	06:56	06:10	06:18	05:42	05:33	05:53	06:25	06:58	07:32	07:10	08:28 (1)	07:37	15:01 (20)
	17:11 22	09:14 (1)	17:52	18:25	20:00	20:32	20:51	20:41	20:02	19:07	18:17	16:42 22	08:50 (1)	16:41 24	15:25 (20)
24	07:32	08:54 (1)	06:55	06:08	06:16	05:41	05:33	05:54	06:26	06:59	07:33	07:12	08:27 (1)	07:38	15:02 (20)
	17:13 20	09:14 (1)	17:53	18:26	20:00	20:33	20:51	20:40	20:00	19:05	18:15	16:42 24	08:51 (1)	16:41 24	15:26 (20)
25	07:31	08:55 (1)	06:53	06:06	06:15	05:40	05:34	05:54	06:27	07:00	06:34	07:13	08:29 (1)	07:38	15:02 (20)
	17:14 18	09:13 (1)	17:54	18:27	20:02	20:34	20:52	20:39	19:57	19:04	17:14	16:41 22	08:51 (1)	16:42 24	15:26 (20)
26	07:31	08:56 (1)	06:52	06:04	06:13	05:39	05:34	05:55	06:28	07:01	06:36	07:14	08:30 (1)	07:39	15:04 (20)
	17:15 16	09:12 (1)	17:55	18:29	20:03	20:35	20:52	20:38	19:56	19:02	17:12	16:40 22	08:52 (1)	16:43 22	15:26 (20)
27	07:30	08:57 (1)	06:50	06:03	06:12	05:39	05:34	05:56	06:29	07:02	06:37	07:15	08:29 (1)	07:39	15:05 (20)
	17:17 14	09:11 (1)	17:57	18:30	20:04	20:35	20:52	20:37	19:54	19:00	17:11	16:40 22	08:51 (1)	16:43 22	15:27 (20)
28	07:29	08:58 (1)	06:49	06:01	06:10	05:38	05:35	05:57	06:30	07:03	06:38	07:16	08:30 (1)	07:39	15:05 (20)
	17:18 12	09:10 (1)	17:58	18:31	20:05	20:36	20:52	20:36	19:52	18:58	17:10	16:40 24	15:06 (20)	16:44 22	15:27 (20)
29	07:28	09:01 (1)		05:59	06:09	05:37	05:35	05:58	06:31	07:04	06:39	07:17	08:31 (1)	07:39	15:05 (20)
	17:19 8	09:09 (1)		18:32	20:06	20:37	20:52	20:35	19:51	18:56	17:08	16:39 28	15:07 (20)	16:45 22	15:27 (20)
30	07:27			05:57	06:07	05:37	05:36	05:59	06:32	07:05	06:40	07:18	08:31 (1)	07:40	15:05 (20)
	17:20			18:33	20:07	20:38	20:52	20:34	19:49	18:55	17:07	16:39 32	15:11 (20)	16:45 24	15:29 (20)
31	07:26			05:56		05:36		06:00	06:33		06:42			07:40	15:05 (20)
	17:22			18:34		20:39		20:33	19:47		17:05			16:46 24	15:29 (20)
Potential sun hours	293		295	370	209	-292	-263	-280	-145	375	343	294		283	
Total, worst case		720											376		808
Sun reduction		0.35											0.35		0.30
Oper. time red.		0.86											0.86		0.86
Wind dir. red.		0.63											0.62		0.64
Total reduction		0.19											0.19		0.17
Total, real		137											71		135

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	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, Mid / Northeast part
20 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
1000 meter max shadow distance applied along with default 3° inclination
Sunshine probabilities applied (pdf plots)
Directional run-hours applied from tab file (tower 1)
.

Printed/Page
03/05/06 23:23 / 39
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Wind Engineers, Inc.
7660 Whitegate Avenue
US-RIVERSIDE, CA 92506

Calculated:
03/01/06 21:02/2.4.0.67

SHADOW - Calendar

Calculation: Mid / Northeast part **Shadow receptor:** 733 - 733

Assumptions for shadow calculations

Maximum distance for influence	1,000 m
Minimum sun height over horizon for influence	3 °
Day step for calculation	1 days
Time step for calculation	2 minutes

Sun shine probabilities (part of time from sun rise to sun set with sun shine)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.35	0.45	0.45	0.55	0.55	0.55	0.65	0.55	0.55	0.45	0.35	0.30

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
475	585	238	199	220	474	1,184	813	840	1,246	803	479	7,555

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:40	07:25	06:47	05:54	06:06	05:36	05:36	06:01	06:34	07:07	17:33 (2)	06:43	07:20
	16:47	17:23	17:59	18:35	20:08	20:40	20:52	20:32	19:46	18:53 18	17:51 (2)	17:04	16:38
2	07:40	07:24	06:45 16:59 (2)	05:52	06:05	05:35	05:37	06:03	06:35	07:08	17:32 (2)	06:44	07:21
	16:48	17:24	18:00 10 17:09 (2)	18:37	20:09	20:41	20:52	20:31	19:44	18:51 18	17:50 (2)	17:03	16:38
3	07:40	07:23	06:44 16:58 (2)	05:51	06:03	05:35	05:37	06:04	06:36	07:09	17:31 (2)	06:46	07:22
	16:49	17:26	18:02 14 17:12 (2)	18:38	20:11	20:41	20:51	20:30	19:42	18:49 20	17:51 (2)	17:02	16:38
4	07:40	07:22	06:42 16:56 (2)	05:49	06:02	05:34	05:38	06:05	06:38	07:10	17:30 (2)	06:47	07:23
	16:50	17:27	18:03 16 17:12 (2)	18:39	20:12	20:42	20:51	20:29	19:41	18:48 20	17:50 (2)	17:00	16:38
5	07:40	07:21	06:41 16:54 (2)	06:47	06:01	05:34	05:38	06:06	06:39	07:11	17:29 (2)	06:48	07:24
	16:51	17:28	18:04 18 17:12 (2)	19:40	20:13	20:43	20:51	20:27	19:39	18:46 22	17:51 (2)	16:59	16:37
6	07:40	07:20	06:39 16:55 (2)	06:45	06:00	05:34	05:39	06:07	06:40	07:12	17:28 (2)	06:49	07:25
	16:52	17:30	18:05 20 17:15 (2)	19:41	20:14	20:44	20:51	20:26	19:37	18:44 22	17:50 (2)	16:58	16:37
7	07:40	07:18	06:37 16:53 (2)	06:44	05:58	05:33	05:40	06:08	06:41	07:13	17:30 (2)	06:51	07:26
	16:53	17:31	18:06 22 17:15 (2)	19:42	20:15	20:44	20:50	20:25	19:35	18:43 20	17:50 (2)	16:57	16:37
8	07:40	07:17	06:36 16:53 (2)	06:42	05:57	05:33	05:40	06:09	06:42	07:14	17:29 (2)	06:52	07:27
	16:54	17:32	18:08 20 17:13 (2)	19:43	20:16	20:45	20:50	20:24	19:34	18:41 20	17:49 (2)	16:56	16:37
9	07:40	07:16	06:34 16:53 (2)	06:40	05:56	05:33	05:41	06:10	06:43	07:15	17:30 (2)	06:53	07:28
	16:55	17:34	18:09 20 17:13 (2)	19:45	20:17	20:46	20:50	20:22	19:32	18:39 18	17:48 (2)	16:55	16:37
10	07:40	07:15	06:32 16:52 (2)	06:39	05:55	05:33	05:42	06:11	06:44	07:17	17:31 (2)	06:54	07:28
	16:56	17:35	18:10 22 17:14 (2)	19:46	20:18	20:46	20:49	20:21	19:30	18:38 14	17:45 (2)	16:53	16:37
11	07:39	07:13	06:30 16:54 (2)	06:37	05:53	05:32	05:42	06:12	06:45	07:18	17:32 (2)	06:56	07:29
	16:57	17:36	18:11 18 17:12 (2)	19:47	20:19	20:47	20:49	20:20	19:28	18:36 12	17:44 (2)	16:52	16:37
12	07:39	07:12	06:29 16:54 (2)	06:35	05:52	05:32	05:43	06:13	06:46	07:19	17:35 (2)	06:57	07:30
	16:58	17:38	18:12 16 17:10 (2)	19:48	20:20	20:47	20:48	20:18	19:27	18:34 4	17:39 (2)	16:51	16:37
13	07:39	07:11	06:27 16:55 (2)	06:34	05:51	05:32	05:44	06:14	06:47	07:20		06:58	07:31
	16:59	17:39	18:14 16 17:11 (2)	19:49	20:22	20:48	20:48	20:17	19:25	18:33		16:50	16:37
14	07:38	07:09	06:25 16:57 (2)	06:32	05:50	05:32	05:45	06:15	06:48	07:21		06:59	07:32
	17:01	17:40	18:15 10 17:07 (2)	19:50	20:23	20:48	20:47	20:16	19:23	18:31		16:49	16:37
15	07:38	07:08	06:24	06:30	05:49	05:32	05:46	06:16	06:49	07:22		07:01	07:33
	17:02	17:41	18:16	19:51	20:24	20:49	20:47	20:14	19:21	18:29		16:49	16:38
16	07:37	07:07	06:22	06:29	05:48	05:32	05:46	06:17	06:50	07:24		07:02	07:33
	17:03	17:43	18:17	19:52	20:25	20:49	20:46	20:13	19:20	18:28		16:48	16:38
17	07:37	07:05	06:20	06:27	05:47	05:32	05:47	06:18	06:51	07:25		07:03	07:34
	17:04	17:44	18:18	19:54	20:26	20:50	20:46	20:11	19:18	18:26		16:47	16:38
18	07:36	07:04	06:18	06:26	05:46	05:32	05:48	06:19	06:52	07:26		07:04	07:35
	17:05	17:45	18:19	19:55	20:27	20:50	20:45	20:10	19:16	18:25		16:46	16:39
19	07:36	07:02	06:17	06:24	05:45	05:32	05:49	06:20	06:54	07:27		07:06	07:35
	17:06	17:47	18:21	19:56	20:28	20:50	20:44	20:08	19:14	18:23		16:45	16:39
20	07:35	07:01	06:15	06:22	05:44	05:32	05:50	06:22	06:55	07:28		07:07	07:36
	17:08	17:48	18:22	19:57	20:29	20:51	20:43	20:07	19:12	18:21		16:44	16:39
21	07:34	06:59	06:13	06:21	05:43	05:33	05:51	06:23	06:56	07:29		07:08	07:36
	17:09	17:49	18:23	19:58	20:30	20:51	20:43	20:05	19:11	18:20		16:44	16:40
22	07:34	06:58	06:11	06:19	05:43	05:33	05:52	06:24	06:57	07:31		07:09	07:37
	17:10	17:50	18:24	19:59	20:31	20:51	20:42	20:04	19:09	18:18		16:43	16:40
23	07:33	06:56	06:10	06:18	05:42	05:33	05:53	06:25	06:58	07:32		07:10	07:37
	17:11	17:52	18:25	20:00	20:32	20:51	20:41	20:02	19:07	18:17		16:42	16:41
24	07:32	06:55	06:08	06:16	05:41	05:33	05:54	06:26	06:59	07:33		07:12	07:38
	17:13	17:53	18:26	20:00	20:33	20:51	20:40	20:00	19:05	18:15		16:42	16:41
25	07:31	06:53	06:06	06:15	05:40	05:34	05:55	06:27	07:00	06:34		07:13	07:38
	17:14	17:54	18:27	20:02	20:34	20:52	20:39	19:57	19:04	17:14		16:41	16:42
26	07:31	06:52	06:04	06:13	05:39	05:34	05:55	06:28	07:01	06:36		07:14	07:39
	17:15	17:55	18:29	20:03	20:35	20:52	20:38	19:56	19:02	17:12		16:41	16:43
27	07:30	06:50	06:03	06:12	05:39	05:34	05:56	06:29	07:02	06:37		07:15	07:39
	17:17	17:57	18:30	20:04	20:35	20:52	20:37	19:54	19:00	17:11		16:40	16:43
28	07:29	06:49	06:01	06:10	05:38	05:35	05:57	06:30	07:03	06:38		07:16	07:39
	17:18	17:58	18:31	20:05	20:36	20:52	20:36	19:52	18:58	17:10		16:40	16:44
29	07:28		05:59	06:09	05:37	05:35	05:58	06:31	07:04 17:39 (2)	06:39		07:17	07:40
	17:19		18:32	20:06	20:37	20:52	20:35	19:51	18:56 8 17:47 (2)	17:08		16:39	16:45
30	07:27		05:57	06:08	05:37	05:36	05:59	06:32	07:05 17:36 (2)	06:41		07:18	07:40
	17:20		18:33	20:07	20:38	20:52	20:34	19:49	18:55 14 17:50 (2)	17:07		16:39	16:45
31	07:26		05:56		05:36		06:00	06:33		06:42			07:40
	17:22		18:34		20:39		20:33	19:47		17:06			16:46
Potential sun hours	293	295	370	209	-292	-263	-280	-145	375	343	294		283
Total, worst case			222						22	208			
Sun reduction			0.45						0.55	0.45			
Oper. time red.			0.86						0.86	0.86			
Wind dir. red.			0.59						0.59	0.59			
Total reduction			0.23						0.28	0.23			
Total, real			51						6	48			

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	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, Mid / Northeast part
20 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
1000 meter max shadow distance applied along with default 3° inclination
Sunshine probabilities applied (pdf plots)
Directional run-hours applied from tab file (tower 1)
.

Printed/Page
03/05/06 23:23 / 40
Licensed user:
Wind Engineers, Inc.
7660 Whitegate Avenue
US-RIVERSIDE, CA 92506

Calculated:
03/01/06 21:02/2.4.0.67

SHADOW - Calendar

Calculation: Mid / Northeast part **Shadow receptor:** 734 - 734

Assumptions for shadow calculations

Maximum distance for influence	1,000	m
Minimum sun height over horizon for influence	3	°
Day step for calculation	1	days
Time step for calculation	2	minutes

Sun shine probabilities (part of time from sun rise to sun set with sun shine)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.35	0.45	0.45	0.55	0.55	0.55	0.65	0.55	0.55	0.45	0.35	0.30

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
475	585	238	199	220	474	1,184	813	840	1,246	803	479	7,555

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:40	07:25	06:47	05:54	06:06	05:36	05:36	06:01	06:34	07:07	06:43	07:20
	16:47	17:23	17:59 26	16:27 (2) 18:35	20:08	20:40	20:52	20:32	19:46	18:53	17:04	16:38
2	07:40	07:24	06:45	16:27 (2) 05:52	06:05	05:35	05:37	06:03	06:35	07:08	06:44	07:21
	16:48	17:24	18:00 26	16:53 (2) 18:37	20:09	20:41	20:52	20:31	19:44	18:51	17:03	16:38
3	07:40	07:23	06:44	16:28 (2) 05:51	06:03	05:35	05:37	06:04	06:37	07:09	06:46	07:22
	16:49	17:26	18:02 24	16:52 (2) 18:38	20:11	20:41	20:51	20:30	19:42	18:49	17:02	16:38
4	07:40	07:22	06:42	16:28 (2) 05:49	06:02	05:34	05:38	06:05	06:38	07:10	06:47	07:23
	16:50	17:27	18:03 22	16:50 (2) 18:39	20:12	20:42	20:51	20:29	19:41	18:48	17:00	16:38
5	07:40	07:21	06:41	16:30 (2) 06:47	06:01	05:34	05:38	06:06	06:39	07:11	06:48	07:24
	16:51	17:28	18:04 20	16:50 (2) 19:40	20:13	20:43	20:51	20:28	19:39	18:46	16:59	16:37
6	07:40	07:20	06:39	16:31 (2) 06:45	06:00	05:34	05:39	06:07	06:40	07:12	17:10 (2) 06:49	07:25
	16:52	17:30	18:05 18	16:49 (2) 19:41	20:14	20:44	20:51	20:26	19:37	18:44 10	17:20 (2) 16:58	16:37
7	07:40	07:18	06:37	16:33 (2) 06:44	05:58	05:33	05:40	06:08	06:41	07:13	17:08 (2) 06:51	07:26
	16:53	17:31	18:06 12	16:45 (2) 19:42	20:15	20:44	20:51	20:25	19:35	18:43 16	17:24 (2) 16:57	16:37
8	07:40	07:17	06:36	16:37 (2) 06:42	05:57	05:33	05:40	06:09	06:42	07:14	17:05 (2) 06:52	07:27
	16:54	17:32	18:08 4	16:41 (2) 19:43	20:16	20:45	20:50	20:24	19:34	18:41 20	17:25 (2) 16:56	16:37
9	07:40	07:16	06:34	06:40	05:56	05:33	05:41	06:10	06:43	07:15	17:04 (2) 06:53	07:28
	16:55	17:34	18:09	19:45	20:17	20:46	20:50	20:22	19:32	18:39 22	17:26 (2) 16:55	16:37
10	07:40	07:15	06:32	06:39	05:55	05:33	05:42	06:11	06:44	07:17	17:03 (2) 06:54	07:28
	16:56	17:35	18:10	19:46	20:18	20:46	20:49	20:21	19:30	18:38 22	17:25 (2) 16:53	16:37
11	07:39	07:13	06:30	06:37	05:53	05:32	05:42	06:12	06:45	07:18	17:02 (2) 06:56	07:29
	16:57	17:36	18:11	19:47	20:19	20:47	20:49	20:20	19:28	18:36 24	17:26 (2) 16:52	16:37
12	07:39	07:12	06:29	06:35	05:52	05:32	05:43	06:13	06:46	07:19	17:01 (2) 06:57	07:30
	16:58	17:38	18:12	19:48	20:20	20:47	20:49	20:18	19:27	18:34 24	17:25 (2) 16:51	16:37
13	07:39	07:11	06:27	06:34	05:51	05:32	05:44	06:14	06:47	07:20	17:01 (2) 06:58	07:31
	16:59	17:39	18:14	19:49	20:22	20:48	20:48	20:17	19:25	18:33 26	17:27 (2) 16:50	16:37
14	07:38	07:09	06:25	06:32	05:50	05:32	05:45	06:15	06:48	07:21	17:00 (2) 06:59	07:32
	17:01	17:40	18:15	19:50	20:23	20:48	20:47	20:16	19:23	18:31 26	17:26 (2) 16:49	16:37
15	07:38	07:08	06:24	06:30	05:49	05:32	05:46	06:16	06:49	07:22	16:59 (2) 07:01	07:33
	17:02	17:41	18:16	19:51	20:24	20:49	20:47	20:14	19:21	18:29 26	17:25 (2) 16:49	16:38
16	07:37	07:07	06:22	06:29	05:48	05:32	05:46	06:17	06:50	07:24	17:00 (2) 07:02	07:33
	17:03	17:43	18:17	19:52	20:25	20:49	20:46	20:13	19:20	18:28 24	17:24 (2) 16:48	16:38
17	07:37	07:05	06:20	06:27	05:47	05:32	05:47	06:18	06:51	07:25	17:00 (2) 07:03	07:34
	17:04	17:44	18:18	19:54	20:26	20:50	20:46	20:11	19:18	18:26 24	17:24 (2) 16:47	16:38
18	07:36	07:04	06:18	06:26	05:46	05:32	05:48	06:19	06:52	07:26	17:01 (2) 07:04	07:35
	17:05	17:45	18:19	19:55	20:27	20:50	20:45	20:10	19:16	18:25 22	17:23 (2) 16:46	16:39
19	07:36	07:02	06:17	06:24	05:45	05:32	05:49	06:20	06:54	07:27	17:02 (2) 07:06	07:35
	17:06	17:47	18:21	19:56	20:28	20:50	20:44	20:08	19:14	18:23 20	17:22 (2) 16:45	16:39
20	07:35	07:01 16:35 (2)	06:15	06:22	05:44	05:32	05:50	06:22	06:55	07:28	17:03 (2) 07:07	07:36
	17:08	17:48 10 16:45 (2)	18:22	19:57	20:29	20:51	20:43	20:07	19:12	18:21 18	17:21 (2) 16:44	16:39
21	07:34	06:59 16:34 (2)	06:13	06:21	05:43	05:33	05:51	06:23	06:56	07:30	17:05 (2) 07:08	07:36
	17:09	17:49 14 16:48 (2)	18:23	19:58	20:30	20:51	20:43	20:05	19:11	18:20 14	17:19 (2) 16:44	16:40
22	07:34	06:58 16:32 (2)	06:11	06:19	05:43	05:33	05:52	06:24	06:57	07:31	17:08 (2) 07:09	07:37
	17:10	17:50 18 16:50 (2)	18:24	19:59	20:31	20:51	20:42	20:04	19:09	18:18 8	17:16 (2) 16:43	16:40
23	07:33	06:56 16:30 (2)	06:10	06:18	05:42	05:33	05:53	06:25	06:58	07:32	07:10	07:37
	17:11	17:52 20 16:50 (2)	18:25	20:00	20:32	20:51	20:41	20:02	19:07	18:17	16:42	16:41
24	07:32	06:55 16:29 (2)	06:08	06:16	05:41	05:33	05:54	06:26	06:59	07:33	07:12	07:38
	17:13	17:53 24 16:53 (2)	18:26	20:00	20:33	20:51	20:40	20:01	19:05	18:15	16:42	16:41
25	07:31	06:53 16:29 (2)	06:06	06:15	05:40	05:34	05:55	06:27	07:00	06:34	07:13	07:38
	17:14	17:54 24 16:53 (2)	18:27	20:02	20:34	20:52	20:39	19:57	19:04	17:14	16:41	16:42
26	07:31	06:52 16:28 (2)	06:04	06:13	05:39	05:34	05:55	06:28	07:01	06:36	07:14	07:39
	17:15	17:55 26 16:54 (2)	18:29	20:03	20:35	20:52	20:38	19:56	19:02	17:12	16:41	16:43
27	07:30	06:50 16:28 (2)	06:03	06:12	05:39	05:34	05:56	06:29	07:02	06:37	07:15	07:39
	17:17	17:57 24 16:52 (2)	18:30	20:04	20:35	20:52	20:37	19:54	19:00	17:11	16:40	16:43
28	07:29	06:49 16:27 (2)	06:01	06:10	05:38	05:35	05:57	06:30	07:03	06:38	07:16	07:39
	17:18	17:58 26 16:53 (2)	18:31	20:05	20:36	20:52	20:36	19:52	18:58	17:10	16:40	16:44
29	07:28		05:59	06:09	05:37	05:35	05:58	06:31	07:04	06:39	07:17	07:40
	17:19		18:32	20:06	20:37	20:52	20:35	19:51	18:56	17:08	16:39	16:45
30	07:27		05:57	06:08	05:37	05:36	05:59	06:32	07:05	06:41	07:18	07:40
	17:20		18:33	20:07	20:38	20:52	20:34	19:49	18:55	17:07	16:39	16:45
31	07:26		05:56		05:36		06:00	06:33		06:42		07:40
	17:22		18:34		20:39		20:33	19:47		17:06		16:46
Potential sun hours	293	295	370	209	-292	-263	-280	-145	375	343	294	283
Total, worst case		186	152							346		
Sun reduction		0.45	0.45							0.45		
Oper. time red.		0.86	0.86							0.86		
Wind dir. red.		0.62	0.62							0.62		
Total reduction		0.24	0.24							0.24		
Total, real		45	36							83		

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	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, Mid / Northeast part
20 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
1000 meter max shadow distance applied along with default 3° inclination
Sunshine probabilities applied (pdf plots)
Directional run-hours applied from tab file (tower 1)
.

Printed/Page
03/05/06 23:23 / 41
Licensed user:
Wind Engineers, Inc.
7660 Whitegate Avenue
US-RIVERSIDE, CA 92506

Calculated:
03/01/06 21:02/2.4.0.67

SHADOW - Calendar

Calculation: Mid / Northeast part **Shadow receptor:** 735 - 735

Assumptions for shadow calculations

Maximum distance for influence	1,000 m
Minimum sun height over horizon for influence	3 °
Day step for calculation	1 days
Time step for calculation	2 minutes

Sun shine probabilities (part of time from sun rise to sun set with sun shine)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.35	0.45	0.45	0.55	0.55	0.55	0.65	0.55	0.55	0.45	0.35	0.30

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
475	585	238	199	220	474	1,184	813	840	1,246	803	479	7,555

	January	February	March		April	May	June	July	August	September		October	November	December
1	07:40	07:25	06:47		05:54	06:06	05:36	05:36	06:01	06:34		07:07	06:43	07:20
	16:47	17:23	17:59		18:35	20:08	20:40	20:52	20:32	19:46		18:53	17:04	16:38
2	07:40	07:24	06:45		05:52	06:05	05:35	05:37	06:03	06:35		07:08	06:44	07:21
	16:48	17:24	18:00		18:37	20:09	20:41	20:52	20:31	19:44		18:51	17:03	16:38
3	07:40	07:23	06:44		05:51	06:03	05:35	05:37	06:04	06:36		07:09	06:45	07:22
	16:49	17:26	18:02		18:38	20:11	20:41	20:51	20:30	19:42		18:49	17:02	16:38
4	07:40	07:22	06:42		05:49	06:02	05:34	05:38	06:05	06:38		07:10	06:47	07:23
	16:50	17:27	18:03		18:39	20:12	20:42	20:51	20:29	19:41		18:48	17:00	16:38
5	07:40	07:21	06:41		06:47	06:01	05:34	05:38	06:06	06:39		07:11	06:48	07:24
	16:51	17:28	18:04		19:40	20:13	20:43	20:51	20:27	19:39		18:46	16:59	16:37
6	07:40	07:20	06:39		06:45	06:00	05:34	05:39	06:07	06:40		07:12	06:49	07:25
	16:52	17:30	18:05		19:41	20:14	20:44	20:51	20:26	19:37		18:44	16:58	16:37
7	07:40	07:18	06:37		06:44	05:58	05:33	05:40	06:08	06:41		07:13	06:51	07:26
	16:53	17:31	18:06		19:42	20:15	20:44	20:50	20:25	19:35		18:43	16:57	16:37
8	07:40	07:17	06:36		06:42	05:57	05:33	05:40	06:09	06:42		07:14	06:52	07:27
	16:54	17:32	18:08		19:43	20:16	20:45	20:50	20:24	19:34		18:41	16:56	16:37
9	07:40	07:16	06:34		06:40	05:56	05:33	05:41	06:10	06:43		07:15	06:53	07:28
	16:55	17:34	18:09		19:45	20:17	20:46	20:50	20:22	19:32		18:39	16:55	16:37
10	07:40	07:15	06:32		06:39	05:55	05:33	05:42	06:11	06:44		07:17	06:54	07:28
	16:56	17:35	18:10		19:46	20:18	20:46	20:49	20:21	19:30		18:38	16:53	16:37
11	07:39	07:13	06:30		06:37	05:53	05:32	05:42	06:12	06:45		07:18	06:56	07:29
	16:57	17:36	18:11		19:47	20:19	20:47	20:49	20:20	19:28		18:36	16:52	16:37
12	07:39	07:12	06:29		06:35	05:52	05:32	05:43	06:13	06:46		18:31 (2)	07:19	06:57	07:30
	16:58	17:38	18:12		19:48	20:20	20:47	20:48	20:18	19:27	10	18:41 (2)	18:34	16:51	16:37
13	07:39	07:11	06:27		06:34	05:51	05:32	05:44	06:14	06:47		18:28 (2)	07:20	06:58	07:31
	16:59	17:39	18:14		19:49	20:22	20:48	20:48	20:17	19:25	14	18:42 (2)	18:33	16:50	16:37
14	07:38	07:09	06:25		06:32	05:50	05:32	05:45	06:15	06:48		18:27 (2)	07:21	06:59	07:32
	17:01	17:40	18:15		19:50	20:23	20:48	20:47	20:16	19:23	16	18:43 (2)	18:31	16:49	16:37
15	07:38	07:08	06:24		06:30	05:49	05:32	05:46	06:16	06:49		18:24 (2)	07:22	07:01	07:33
	17:02	17:41	18:16		19:51	20:24	20:49	20:47	20:14	19:21	20	18:44 (2)	18:29	16:49	16:38
16	07:37	07:07	06:22		06:29	05:48	05:32	05:46	06:17	06:50		18:23 (2)	07:24	07:02	07:33
	17:03	17:43	18:17		19:52	20:25	20:49	20:46	20:13	19:20	20	18:43 (2)	18:28	16:48	16:38
17	07:37	07:05	06:20		06:27	05:47	05:32	05:47	06:18	06:51		18:24 (2)	07:25	07:03	07:34
	17:04	17:44	18:18		19:54	20:26	20:50	20:46	20:11	19:18	20	18:44 (2)	18:26	16:47	16:38
18	07:36	07:04	06:18		06:26	05:46	05:32	05:48	06:19	06:52		18:23 (2)	07:26	07:04	07:35
	17:05	17:45	18:19		19:55	20:27	20:50	20:45	20:10	19:16	20	18:43 (2)	18:25	16:46	16:39
19	07:36	07:02	06:17		17:44 (2)	06:24	05:45	05:32	05:49	06:20	06:53		18:22 (2)	07:27	07:06	07:35
	17:06	17:47	18:21	4	17:48 (2)	19:56	20:28	20:50	20:44	20:08	19:14	20	18:42 (2)	18:23	16:45	16:39
20	07:35	07:01	06:15		17:40 (2)	06:22	05:44	05:32	05:50	06:22	06:55		18:23 (2)	07:28	07:07	07:36
	17:08	17:48	18:22	12	17:52 (2)	19:57	20:29	20:51	20:43	20:07	19:12	18	18:41 (2)	18:21	16:44	16:39
21	07:34	06:59	06:13		17:39 (2)	06:21	05:43	05:33	05:51	06:23	06:56		18:22 (2)	07:29	07:08	07:36
	17:09	17:49	18:23	16	17:55 (2)	19:58	20:30	20:51	20:43	20:05	19:11	18	18:40 (2)	18:20	16:44	16:40
22	07:34	06:58	06:11		17:37 (2)	06:19	05:43	05:33	05:52	06:24	06:57		18:23 (2)	07:31	07:09	07:37
	17:10	17:50	18:24	18	17:55 (2)	19:59	20:31	20:51	20:42	20:04	19:09	16	18:39 (2)	18:18	16:43	16:40
23	07:33	06:56	06:10		17:37 (2)	06:18	05:42	05:33	05:53	06:25	06:58		18:24 (2)	07:32	07:10	07:37
	17:11	17:52	18:25	18	17:55 (2)	20:00	20:32	20:51	20:41	20:02	19:07	12	18:36 (2)	18:17	16:42	16:41
24	07:32	06:55	06:08		17:35 (2)	06:16	05:41	05:33	05:54	06:26	06:59		18:27 (2)	07:33	07:12	07:38
	17:13	17:53	18:26	20	17:55 (2)	20:00	20:33	20:51	20:40	20:00	19:05	6	18:33 (2)	18:15	16:42	16:41
25	07:31	06:53	06:06		17:36 (2)	06:15	05:40	05:34	05:55	06:27	07:00			06:34	07:13	07:38
	17:14	17:54	18:27	20	17:56 (2)	20:02	20:34	20:52	20:39	19:57	19:04			17:14	16:41	16:42
26	07:31	06:52	06:04		17:34 (2)	06:13	05:39	05:34	05:55	06:28	07:01			06:36	07:14	07:39
	17:15	17:55	18:29	22	17:56 (2)	20:03	20:35	20:52	20:38	19:56	19:02			17:12	16:41	16:43
27	07:30	06:50	06:03		17:34 (2)	06:12	05:39	05:34	05:56	06:29	07:02			06:37	07:15	07:39
	17:17	17:57	18:30	20	17:54 (2)	20:04	20:35	20:52	20:37	19:54	19:00			17:11	16:40	16:43
28	07:29	06:49	06:01		17:34 (2)	06:10	05:38	05:35	05:57	06:30	07:03			06:38	07:16	07:39
	17:18	17:58	18:31	20	17:54 (2)	20:05	20:36	20:52	20:36	19:52	18:58			17:10	16:40	16:44
29	07:28		05:59		17:34 (2)	06:09	05:37	05:35	05:58	06:31	07:04			06:39	07:17	07:39
	17:19		18:32	18	17:52 (2)	20:06	20:37	20:52	20:35	19:51	18:56			17:08	16:39	16:45
30	07:27		05:57		17:37 (2)	06:08	05:37	05:36	05:59	06:32	07:05			06:40	07:18	07:40
	17:20		18:33	14	17:51 (2)	20:07	20:38	20:52	20:34	19:49	18:55			17:07	16:39	16:45
31	07:26		05:56		17:39 (2)		05:36		06:00	06:33				06:42		07:40
	17:22		18:34	10	17:49 (2)		20:39		20:33	19:47				17:06		16:46
Potential sun hours	293	295	370			209	-292	-263	-280	-145	375			343	294	283
Total, worst case				212								210				
Sun reduction				0.45								0.55				
Oper. time red.				0.86								0.86				
Wind dir. red.				0.61								0.61				
Total reduction				0.24								0.29				
Total, real				50								61				

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	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, Mid / Northeast part
20 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
1000 meter max shadow distance applied along with default 3° inclination
Sunshine probabilities applied (pdf plots)
Directional run-hours applied from tab file (tower 1)
.

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Wind Engineers, Inc.
7660 Whitegate Avenue
US-RIVERSIDE, CA 92506

Calculated:
03/01/06 21:02/2.4.0.67

SHADOW - Calendar

Calculation: Mid / Northeast part **Shadow receptor:** 736 - 736

Assumptions for shadow calculations

Maximum distance for influence	1,000 m
Minimum sun height over horizon for influence	3 °
Day step for calculation	1 days
Time step for calculation	2 minutes

Sun shine probabilities (part of time from sun rise to sun set with sun shine)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.35	0.45	0.45	0.55	0.55	0.55	0.65	0.55	0.55	0.45	0.35	0.30

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
475	585	238	199	220	474	1,184	813	840	1,246	803	479	7,555

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:40	07:25	06:47	05:54	17:41 (2)	06:06	05:36	05:36	06:01	06:34	18:39 (2)	07:07	06:43	07:20
	16:47	17:23	17:59	18:35 26	18:07 (2)	20:08	20:40	20:52	20:32	19:46 20	18:59 (2)	18:53	17:04	16:38
2	07:40	07:24	06:45	05:52	17:40 (2)	06:05	05:35	05:37	06:03	06:35	18:38 (2)	07:08	06:44	07:21
	16:48	17:24	18:00	18:37 28	18:08 (2)	20:09	20:41	20:52	20:31	19:44 22	19:00 (2)	18:51	17:03	16:38
3	07:40	07:23	06:44	05:51	17:40 (2)	06:03	05:35	05:37	06:04	06:37	18:37 (2)	07:09	06:46	07:22
	16:49	17:26	18:02	18:38 28	18:08 (2)	20:11	20:41	20:51	20:30	19:42 24	19:01 (2)	18:49	17:02	16:38
4	07:40	07:22	06:42	05:49	17:38 (2)	06:02	05:34	05:38	06:05	06:38	18:36 (2)	07:10	06:47	07:23
	16:50	17:27	18:03	18:39 30	18:08 (2)	20:12	20:42	20:51	20:29	19:41 26	19:02 (2)	18:48	17:00	16:38
5	07:40	07:21	06:41	06:47	18:38 (2)	06:01	05:34	05:38	06:06	06:39	18:35 (2)	07:11	06:48	07:24
	16:51	17:28	18:04	19:40 28	19:06 (2)	20:13	20:43	20:51	20:27	19:39 26	19:01 (2)	18:46	16:59	16:37
6	07:40	07:20	06:39	06:45	18:39 (2)	06:00	05:34	05:39	06:07	06:40	18:34 (2)	07:12	06:49	07:25
	16:52	17:30	18:05	19:41 28	19:07 (2)	20:14	20:44	20:51	20:26	19:37 28	19:02 (2)	18:44	16:58	16:37
7	07:40	07:18	06:37	06:44	18:39 (2)	05:58	05:33	05:40	06:08	06:41	18:34 (2)	07:13	06:51	07:26
	16:53	17:31	18:06	19:42 26	19:05 (2)	20:15	20:44	20:50	20:25	19:35 28	19:02 (2)	18:43	16:57	16:37
8	07:40	07:17	06:36	06:42	18:39 (2)	05:57	05:33	05:40	06:09	06:42	18:33 (2)	07:14	06:52	07:27
	16:54	17:32	18:08	19:43 26	19:05 (2)	20:16	20:45	20:50	20:24	19:34 30	19:03 (2)	18:41	16:56	16:37
9	07:40	07:16	06:34	06:40	18:40 (2)	05:56	05:33	05:41	06:10	06:43	18:34 (2)	07:15	06:53	07:28
	16:55	17:34	18:09	19:45 24	19:04 (2)	20:17	20:46	20:50	20:22	19:32 28	19:02 (2)	18:39	16:55	16:37
10	07:40	07:15	06:32	06:39	18:40 (2)	05:55	05:33	05:42	06:11	06:44	18:33 (2)	07:17	06:54	07:28
	16:56	17:35	18:10	19:46 22	19:02 (2)	20:18	20:46	20:49	20:21	19:30 28	19:01 (2)	18:38	16:53	16:37
11	07:39	07:13	06:30	06:37	18:40 (2)	05:53	05:32	05:42	06:12	06:45	18:34 (2)	07:18	06:56	07:29
	16:57	17:36	18:11	19:47 20	19:00 (2)	20:19	20:47	20:49	20:20	19:28 26	19:00 (2)	18:36	16:52	16:37
12	07:39	07:12	06:29	06:35	18:43 (2)	05:52	05:32	05:43	06:13	06:46	18:33 (2)	07:19	06:57	07:30
	16:58	17:38	18:12	19:48 16	18:59 (2)	20:20	20:47	20:49	20:18	19:27 26	18:59 (2)	18:34	16:51	16:37
13	07:39	07:11	06:27	06:34	18:45 (2)	05:51	05:32	05:44	06:14	06:47	18:34 (2)	07:20	06:58	07:31
	16:59	17:39	18:14	19:49 12	18:57 (2)	20:22	20:48	20:48	20:17	19:25 24	18:58 (2)	18:33	16:50	16:37
14	07:38	07:09	06:25	06:32	05:50	05:32	05:45	06:15	06:48	18:35 (2)	07:21	06:59	07:32
	17:01	17:40	18:15	19:50	20:23	20:48	20:47	20:16	19:23 20	18:55 (2)	18:31	16:49	16:37
15	07:38	07:08	06:24	06:30	05:49	05:32	05:46	06:16	06:49	18:36 (2)	07:22	07:01	07:33
	17:02	17:41	18:16	19:51	20:24	20:49	20:47	20:14	19:21 18	18:54 (2)	18:29	16:49	16:38
16	07:37	07:07	06:22	06:29	05:48	05:32	05:46	06:17	06:50	18:39 (2)	07:24	07:02	07:33
	17:03	17:43	18:17	19:52	20:25	20:49	20:46	20:13	19:20 12	18:51 (2)	18:28	16:48	16:38
17	07:37	07:05	06:20	06:27	05:47	05:32	05:47	06:18	06:51	07:25	07:03	07:34
	17:04	17:44	18:18	19:54	20:26	20:50	20:46	20:11	19:18	18:26	16:47	16:38
18	07:36	07:04	06:18	06:26	05:46	05:32	05:48	06:19	06:52	07:26	07:04	07:35
	17:05	17:45	18:19	19:55	20:27	20:50	20:45	20:10	19:16	18:25	16:46	16:39
19	07:36	07:02	06:17	06:24	05:45	05:32	05:49	06:20	06:54	07:27	07:06	07:35
	17:07	17:47	18:21	19:56	20:28	20:50	20:44	20:08	19:14	18:23	16:45	16:39
20	07:35	07:01	06:15	06:22	05:44	05:32	05:50	06:22	06:55	07:28	07:07	07:36
	17:08	17:48	18:22	19:57	20:29	20:51	20:43	20:07	19:12	18:21	16:44	16:39
21	07:34	06:59	06:13	06:21	05:43	05:33	05:51	06:23	06:56	07:29	07:08	07:36
	17:09	17:49	18:23	19:58	20:30	20:51	20:43	20:05	19:11	18:20	16:44	16:40
22	07:34	06:58	06:11	06:19	05:43	05:33	05:52	06:24	06:57	07:31	07:09	07:37
	17:10	17:50	18:24	19:59	20:31	20:51	20:42	20:04	19:09	18:18	16:43	16:40
23	07:33	06:56	06:10	06:18	05:42	05:33	05:53	06:25	06:58	07:32	07:10	07:37
	17:11	17:52	18:25	20:00	20:32	20:51	20:41	20:02	19:07	18:17	16:42	16:41
24	07:32	06:55	06:08	06:16	05:41	05:33	05:54	06:26	06:59	07:33	07:12	07:38
	17:13	17:53	18:26	20:00	20:33	20:51	20:40	20:01	19:05	18:15	16:42	16:41
25	07:31	06:53	06:06	06:15	05:40	05:34	05:55	06:27	07:00	06:34	07:13	07:38
	17:14	17:54	18:27	20:02	20:34	20:52	20:39	19:57	19:04	17:14	16:41	16:42
26	07:31	06:52	06:04	06:13	05:39	05:34	05:55	06:28	07:01	06:36	07:14	07:39
	17:15	17:55	18:29	20:03	20:35	20:52	20:38	19:56	19:02	17:12	16:41	16:43
27	07:30	06:50	06:03	17:50 (2) 06:12	05:39	05:34	05:56	06:29	07:02	06:37	07:15	07:39
	17:17	17:57	18:30 12	18:02 (2) 20:04	20:35	20:52	20:37	19:54	19:00	17:11	16:40	16:43
28	07:29	06:49	06:01	17:46 (2) 06:10	05:38	05:35	05:57	06:30	07:03	06:38	07:16	07:39
	17:18	17:58	18:31 18	18:04 (2) 20:05	20:36	20:52	20:36	19:52	18:58	17:10	16:40	16:44
29	07:28		05:59	17:45 (2) 06:09	05:37	05:35	05:58	06:31	18:50 (2) 07:04	06:39	07:17	07:40
	17:19		18:32 20	18:05 (2) 20:06	20:37	20:52	20:35	19:51 4	18:54 (2) 18:56	17:08	16:39	16:45
30	07:27		05:57	17:43 (2) 06:08	05:37	05:36	05:59	06:32	18:45 (2) 07:05	06:41	07:18	07:40
	17:21		18:33 24	18:07 (2) 20:07	20:38	20:52	20:34	19:49 12	18:57 (2) 18:55	17:07	16:39	16:45
31	07:26		05:56	17:41 (2)	05:36		06:00	06:33	18:42 (2)	06:42		07:40
	17:22		18:34 26	18:07 (2)	20:39		20:33	19:47 16	18:58 (2)	17:06		16:46
Potential sun hours	293	295	370	209	-292	-263	-280	-145	375	343	294	283
Total, worst case			100	314				32	386			
Sun reduction			0.45	0.55				0.55	0.55			
Oper. time red.			0.86	0.86				0.86	0.86			
Wind dir. red.			0.61	0.61				0.61	0.61			
Total reduction			0.24	0.29				0.29	0.29			
Total, real			24	91				9	112			

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	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, Mid / Northeast part
20 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
1000 meter max shadow distance applied along with default 3° inclination
Sunshine probabilities applied (pdf plots)
Directional run-hours applied from tab file (tower 1)
.

Printed/Page
03/05/06 23:23 / 43
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Wind Engineers, Inc.
7660 Whitegate Avenue
US-RIVERSIDE, CA 92506

Calculated:
03/01/06 21:02/2.4.0.67

SHADOW - Calendar

Calculation: Mid / Northeast part **Shadow receptor:** 740 - 740

Assumptions for shadow calculations

Maximum distance for influence	1,000	m
Minimum sun height over horizon for influence	3	°
Day step for calculation	1	days
Time step for calculation	2	minutes

Sun shine probabilities (part of time from sun rise to sun set with sun shine)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.35	0.45	0.45	0.55	0.55	0.55	0.65	0.55	0.55	0.45	0.35	0.30

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
475	585	238	199	220	474	1,184	813	840	1,246	803	479	7,555

	January			February	March	April	May	June	July	August	September	October	November	December	
1	07:40		09:47 (2)	07:25	06:47	05:54	06:06	05:36	05:36	06:02	06:34	07:07	06:43	07:20	09:42 (2)
	16:47	24	10:11 (2)	17:23	17:59	18:36	20:08	20:40	20:52	20:32	19:46	18:53	17:04	16:38 8	09:50 (2)
2	07:40		09:49 (2)	07:24	06:45	05:52	06:05	05:35	05:37	06:03	06:35	07:08	06:44	07:21	09:41 (2)
	16:48	22	10:11 (2)	17:24	18:00	18:37	20:09	20:41	20:52	20:31	19:44	18:51	17:03	16:38 10	09:51 (2)
3	07:40		09:49 (2)	07:23	06:44	05:51	06:03	05:35	05:37	06:04	06:37	07:09	06:46	07:22	09:40 (2)
	16:49	22	10:11 (2)	17:26	18:02	18:38	20:11	20:41	20:52	20:30	19:42	18:50	17:02	16:38 14	09:54 (2)
4	07:40		09:49 (2)	07:22	06:42	05:49	06:02	05:34	05:38	06:05	06:38	07:10	06:47	07:23	09:39 (2)
	16:50	22	10:11 (2)	17:27	18:03	18:39	20:12	20:42	20:51	20:29	19:41	18:48	17:00	16:38 16	09:55 (2)
5	07:40		09:51 (2)	07:21	06:41	06:47	06:01	05:34	05:38	06:06	06:39	07:11	06:48	07:24	09:38 (2)
	16:51	20	10:11 (2)	17:28	18:04	19:40	20:13	20:43	20:51	20:28	19:39	18:46	16:59	16:37 18	09:56 (2)
6	07:40		09:51 (2)	07:20	06:39	06:45	06:00	05:34	05:39	06:07	06:40	07:12	06:49	07:25	09:39 (2)
	16:52	20	10:11 (2)	17:30	18:05	19:41	20:14	20:44	20:51	20:26	19:37	18:44	16:58	16:37 18	09:57 (2)
7	07:40		09:53 (2)	07:18	06:37	06:44	05:58	05:33	05:40	06:08	06:41	07:13	06:51	07:26	09:38 (2)
	16:53	18	10:11 (2)	17:31	18:06	19:42	20:15	20:44	20:51	20:25	19:35	18:43	16:57	16:37 20	09:58 (2)
8	07:40		09:55 (2)	07:17	06:36	06:42	05:57	05:33	05:40	06:09	06:42	07:14	06:52	07:27	09:37 (2)
	16:54	16	10:11 (2)	17:32	18:08	19:43	20:16	20:45	20:50	20:24	19:34	18:41	16:56	16:37 22	09:59 (2)
9	07:40		09:56 (2)	07:16	06:34	06:40	05:56	05:33	05:41	06:10	06:43	07:16	06:53	07:28	09:38 (2)
	16:55	14	10:10 (2)	17:34	18:09	19:45	20:17	20:46	20:50	20:22	19:32	18:39	16:55	16:37 22	10:00 (2)
10	07:40		09:58 (2)	07:15	06:32	06:39	05:55	05:33	05:42	06:11	06:44	07:17	06:54	07:29	09:39 (2)
	16:56	10	10:08 (2)	17:35	18:10	19:46	20:18	20:46	20:49	20:21	19:30	18:38	16:54	16:37 22	10:01 (2)
11	07:39		10:00 (2)	07:13	06:31	06:37	05:54	05:33	05:42	06:12	06:45	07:18	06:56	07:29	09:38 (2)
	16:57	8	10:08 (2)	17:36	18:11	19:47	20:19	20:47	20:49	20:20	19:28	18:36	16:52	16:37 24	10:02 (2)
12	07:39			07:12	06:29	06:35	05:52	05:32	05:43	06:13	06:46	07:19	06:57	07:30	09:39 (2)
	16:58			17:38	18:12	19:48	20:21	20:47	20:49	20:18	19:27	18:34	16:51	16:37 24	10:03 (2)
13	07:39			07:11	06:27	06:34	05:51	05:32	05:44	06:14	06:47	07:20	06:58	07:31	09:39 (2)
	16:59			17:39	18:14	19:49	20:22	20:48	20:48	20:17	19:25	18:33	16:50	16:37 24	10:03 (2)
14	07:38			07:10	06:25	06:32	05:50	05:32	05:45	06:15	06:48	07:21	06:59	07:32	09:38 (2)
	17:01			17:40	18:15	19:50	20:23	20:48	20:48	20:16	19:23	18:31	16:49	16:37 26	10:04 (2)
15	07:38			07:08	06:24	06:30	05:49	05:32	05:46	06:16	06:49	07:22	07:01	07:33	09:39 (2)
	17:02			17:42	18:16	19:51	20:24	20:49	20:47	20:14	19:21	18:29	16:49	16:38 26	10:05 (2)
16	07:37			07:07	06:22	06:29	05:48	05:32	05:46	06:17	06:50	07:24	07:02	07:33	09:40 (2)
	17:03			17:43	18:17	19:53	20:25	20:49	20:46	20:13	19:20	18:28	16:48	16:38 26	10:06 (2)
17	07:37			07:05	06:20	06:27	05:47	05:32	05:47	06:18	06:51	07:25	07:03	07:34	09:40 (2)
	17:04			17:44	18:18	19:54	20:26	20:50	20:46	20:11	19:18	18:26	16:47	16:38 26	10:06 (2)
18	07:36			07:04	06:18	06:26	05:46	05:32	05:48	06:19	06:52	07:26	07:04	07:35	09:41 (2)
	17:05			17:45	18:19	19:55	20:27	20:50	20:45	20:10	19:16	18:25	16:46	16:39 24	10:05 (2)
19	07:36			07:02	06:17	06:24	05:45	05:32	05:49	06:21	06:54	07:27	07:06	07:35	09:42 (2)
	17:07			17:47	18:21	19:56	20:28	20:50	20:44	20:08	19:14	18:23	16:45	16:39 24	10:06 (2)
20	07:35			07:01	06:15	06:22	05:44	05:33	05:50	06:22	06:55	07:28	07:07	07:36	09:42 (2)
	17:08			17:48	18:22	19:57	20:29	20:51	20:44	20:07	19:12	18:21	16:44	16:39 24	10:06 (2)
21	07:35			07:00	06:13	06:21	05:43	05:33	05:51	06:23	06:56	07:30	07:08	07:36	09:43 (2)
	17:09			17:49	18:23	19:58	20:30	20:51	20:43	20:05	19:11	18:20	16:44	16:40 24	10:07 (2)
22	07:34			06:58	06:11	06:19	05:43	05:33	05:52	06:24	06:57	07:31	07:09	07:37	09:43 (2)
	17:10			17:50	18:24	19:59	20:31	20:51	20:42	20:04	19:09	18:18	16:43	16:40 24	10:07 (2)
23	07:33			06:57	06:10	06:18	05:42	05:33	05:53	06:25	06:58	07:32	07:10	07:37	09:44 (2)
	17:12			17:52	18:25	20:00	20:32	20:51	20:41	20:02	19:07	18:17	16:42	16:41 24	10:08 (2)
24	07:32			06:55	06:08	06:16	05:41	05:33	05:54	06:26	06:59	07:33	07:12	07:38	09:44 (2)
	17:13			17:53	18:26	20:00	20:33	20:52	20:40	20:01	19:05	18:15	16:42	16:41 24	10:08 (2)
25	07:32			06:53	06:06	06:15	05:40	05:34	05:55	06:27	07:00	06:34	07:13	07:38	09:44 (2)
	17:14			17:54	18:28	20:02	20:34	20:52	20:39	19:57	19:04	17:14	16:41	16:42 24	10:08 (2)
26	07:31			06:52	06:04	06:13	05:39	05:34	05:56	06:28	07:01	06:36	07:14	07:39	09:45 (2)
	17:15			17:55	18:29	20:03	20:35	20:52	20:38	19:56	19:02	17:12	16:41	16:43 26	10:11 (2)
27	07:30			06:50	06:03	06:12	05:39	05:34	05:57	06:29	07:02	06:37	07:15	07:39	09:45 (2)
	17:17			17:57	18:30	20:04	20:36	20:52	20:37	19:54	19:00	17:11	16:40	16:43 26	10:11 (2)
28	07:29			06:49	06:01	06:10	05:38	05:35	05:58	06:30	07:03	06:38	07:16	07:39	09:45 (2)
	17:18			17:58	18:31	20:05	20:36	20:52	20:36	19:52	18:58	17:10	16:40	16:44 26	10:11 (2)
29	07:28				05:59	06:09	05:37	05:35	05:58	06:31	07:04	06:39	07:17	07:40	09:45 (2)
	17:19				18:32	20:06	20:37	20:52	20:35	19:51	18:57	17:08	16:39	16:45 26	10:11 (2)
30	07:27				05:57	06:08	05:37	05:36	06:00	06:32	07:05	06:41	07:19	07:40	09:47 (2)
	17:21				18:33	20:07	20:38	20:52	20:34	19:49	18:55	17:07	16:39	16:45 24	10:11 (2)
31	07:26				05:56		05:36		06:01	06:33		06:42		07:40	09:48 (2)
	17:22				18:34		20:39		20:33	19:47		17:06		16:46 24	10:12 (2)
Potential sun hours	293			295	370	209	-292	-263	-280	-145	375	343	294	283	
Total, worst case		196													690
Sun reduction		0.35													0.30
Oper. time red.		0.86													0.86
Wind dir. red.		0.65													0.65
Total reduction		0.20													0.17
Total, real		38													116

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	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, Mid / Northeast part
20 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
1000 meter max shadow distance applied along with default 3° inclination
Sunshine probabilities applied (pdf plots)
Directional run-hours applied from tab file (tower 1)
.

Printed/Page
03/05/06 23:23 / 44
Licensed user:
Wind Engineers, Inc.
7660 Whitegate Avenue
US-RIVERSIDE, CA 92506

Calculated:
03/01/06 21:02/2.4.0.67

SHADOW - Calendar

Calculation: Mid / Northeast part **Shadow receptor:** 741 - 741

Assumptions for shadow calculations

Maximum distance for influence	1,000	m
Minimum sun height over horizon for influence	3	°
Day step for calculation	1	days
Time step for calculation	2	minutes

Sun shine probabilities (part of time from sun rise to sun set with sun shine)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.35	0.45	0.45	0.55	0.55	0.55	0.65	0.55	0.55	0.45	0.35	0.30

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
475	585	238	199	220	474	1,184	813	840	1,246	803	479	7,555

	January		February	March	April	May	June	July	August	September	October	November	December		
1	07:40		09:47 (2)	07:25	06:47	05:54	06:06	05:36	05:36	06:02	06:34	07:07	06:43	07:20		
	16:47	8	09:55 (2)	17:23	17:59	18:36	20:08	20:40	20:52	20:32	19:46	18:53	17:04	16:38		
2	07:40		09:49 (2)	07:24	06:45	05:52	06:05	05:35	05:37	06:03	06:35	07:08	06:44	07:21		
	16:48	4	09:53 (2)	17:24	18:00	18:37	20:09	20:41	20:52	20:31	19:44	18:51	17:03	16:38		
3	07:40			07:23	06:44	05:51	06:03	05:35	05:37	06:04	06:37	07:09	06:46	07:22		
	16:49			17:26	18:02	18:38	20:11	20:41	20:52	20:30	19:42	18:50	17:02	16:38		
4	07:40			07:22	06:42	05:49	06:02	05:34	05:38	06:05	06:38	07:10	06:47	07:23		
	16:50			17:27	18:03	18:39	20:12	20:42	20:51	20:29	19:41	18:48	17:00	16:38		
5	07:40			07:21	06:41	06:47	06:01	05:34	05:38	06:06	06:39	07:11	06:48	07:24		
	16:51			17:28	18:04	19:40	20:13	20:43	20:51	20:28	19:39	18:46	16:59	16:37		
6	07:40			07:20	06:39	06:45	06:00	05:34	05:39	06:07	06:40	07:12	06:49	07:25		
	16:52			17:30	18:05	19:41	20:14	20:44	20:51	20:26	19:37	18:44	16:58	16:37		
7	07:40			07:18	06:37	06:44	05:58	05:33	05:40	06:08	06:41	07:13	06:51	07:26		
	16:53			17:31	18:06	19:42	20:15	20:44	20:51	20:25	19:35	18:43	16:57	16:37		
8	07:40			07:17	06:36	06:42	05:57	05:33	05:40	06:09	06:42	07:14	06:52	07:27		
	16:54			17:32	18:08	19:43	20:16	20:45	20:50	20:24	19:34	18:41	16:56	16:37		
9	07:40			07:16	06:34	06:40	05:56	05:33	05:41	06:10	06:43	07:16	06:53	07:28		
	16:55			17:34	18:09	19:45	20:17	20:46	20:50	20:22	19:32	18:39	16:55	16:37		
10	07:40			07:15	06:32	06:39	05:55	05:33	05:42	06:11	06:44	07:17	06:54	07:29		09:39 (2)
	16:56			17:35	18:10	19:46	20:18	20:46	20:49	20:21	19:30	18:38	16:54	16:37	4	09:43 (2)
11	07:39			07:14	06:31	06:37	05:54	05:33	05:42	06:12	06:45	07:18	06:56	07:29		09:38 (2)
	16:57			17:36	18:11	19:47	20:19	20:47	20:49	20:20	19:28	18:36	16:52	16:37	8	09:46 (2)
12	07:39			07:12	06:29	06:35	05:52	05:32	05:43	06:13	06:46	07:19	06:57	07:30		09:37 (2)
	16:58			17:38	18:12	19:48	20:21	20:47	20:49	20:18	19:27	18:34	16:51	16:37	10	09:47 (2)
13	07:39			07:11	06:27	06:34	05:51	05:32	05:44	06:14	06:47	07:20	06:58	07:31		09:37 (2)
	16:59			17:39	18:14	19:49	20:22	20:48	20:48	20:17	19:25	18:33	16:50	16:37	10	09:47 (2)
14	07:38			07:10	06:25	06:32	05:50	05:32	05:45	06:15	06:48	07:21	06:59	07:32		09:36 (2)
	17:01			17:40	18:15	19:50	20:23	20:48	20:48	20:16	19:23	18:31	16:49	16:37	14	09:50 (2)
15	07:38			07:08	06:24	06:30	05:49	05:32	05:46	06:16	06:49	07:22	07:01	07:33		09:37 (2)
	17:02			17:42	18:16	19:51	20:24	20:49	20:47	20:14	19:21	18:29	16:49	16:38	14	09:51 (2)
16	07:37			07:07	06:22	06:29	05:48	05:32	05:46	06:17	06:50	07:24	07:02	07:33		09:36 (2)
	17:03			17:43	18:17	19:53	20:25	20:49	20:46	20:13	19:20	18:28	16:48	16:38	16	09:52 (2)
17	07:37			07:05	06:20	06:27	05:47	05:32	05:47	06:18	06:51	07:25	07:03	07:34		09:36 (2)
	17:04			17:44	18:18	19:54	20:26	20:50	20:46	20:11	19:18	18:26	16:47	16:38	16	09:52 (2)
18	07:36			07:04	06:18	06:26	05:46	05:32	05:48	06:19	06:52	07:26	07:04	07:35		09:37 (2)
	17:05			17:45	18:19	19:55	20:27	20:50	20:45	20:10	19:16	18:25	16:46	16:39	16	09:53 (2)
19	07:36			07:02	06:17	06:24	05:45	05:32	05:49	06:21	06:54	07:27	07:06	07:35		09:38 (2)
	17:07			17:47	18:21	19:56	20:28	20:50	20:44	20:08	19:14	18:23	16:45	16:39	16	09:54 (2)
20	07:35			07:01	06:15	06:22	05:44	05:33	05:50	06:22	06:55	07:28	07:07	07:36		09:38 (2)
	17:08			17:48	18:22	19:57	20:29	20:51	20:44	20:07	19:12	18:21	16:44	16:39	16	09:54 (2)
21	07:35			07:00	06:13	06:21	05:43	05:33	05:51	06:23	06:56	07:30	07:08	07:36		09:39 (2)
	17:09			17:49	18:23	19:58	20:30	20:51	20:43	20:05	19:11	18:20	16:44	16:40	16	09:55 (2)
22	07:34			06:58	06:11	06:19	05:43	05:33	05:52	06:24	06:57	07:31	07:09	07:37		09:39 (2)
	17:10			17:50	18:24	19:59	20:31	20:51	20:42	20:04	19:09	18:18	16:43	16:40	16	09:55 (2)
23	07:33			06:57	06:10	06:18	05:42	05:33	05:53	06:25	06:58	07:32	07:10	07:37		09:40 (2)
	17:12			17:52	18:25	20:00	20:32	20:51	20:41	20:02	19:07	18:17	16:42	16:41	16	09:56 (2)
24	07:32			06:55	06:08	06:16	05:41	05:33	05:54	06:26	06:59	07:33	07:12	07:38		09:40 (2)
	17:13			17:53	18:26	20:00	20:33	20:52	20:40	20:01	19:05	18:15	16:42	16:41	16	09:56 (2)
25	07:32			06:53	06:06	06:15	05:40	05:34	05:55	06:27	07:00	06:34	07:13	07:38		09:40 (2)
	17:14			17:54	18:28	20:02	20:34	20:52	20:39	19:57	19:04	17:14	16:41	16:42	16	09:56 (2)
26	07:31			06:52	06:04	06:13	05:39	05:34	05:56	06:28	07:01	06:36	07:14	07:39		09:41 (2)
	17:15			17:55	18:29	20:03	20:35	20:52	20:38	19:56	19:02	17:12	16:41	16:43	16	09:57 (2)
27	07:30			06:50	06:03	06:12	05:39	05:34	05:57	06:29	07:02	06:37	07:15	07:39		09:41 (2)
	17:17			17:57	18:30	20:04	20:36	20:52	20:37	19:54	19:00	17:11	16:40	16:43	16	09:57 (2)
28	07:29			06:49	06:01	06:10	05:38	05:35	05:58	06:30	07:03	06:38	07:16	07:39		09:43 (2)
	17:18			17:58	18:31	20:05	20:36	20:52	20:36	19:52	18:58	17:10	16:40	16:44	14	09:57 (2)
29	07:28				05:59	06:09	05:37	05:35	05:58	06:31	07:04	06:39	07:17	07:40		09:43 (2)
	17:19				18:32	20:06	20:37	20:52	20:35	19:51	18:57	17:08	16:39	16:45	14	09:57 (2)
30	07:27				05:58	06:08	05:37	05:36	06:00	06:32	07:05	06:41	07:19	07:40		09:43 (2)
	17:21				18:33	20:07	20:38	20:52	20:34	19:49	18:55	17:07	16:39	16:45	12	09:55 (2)
31	07:26				05:56		05:36		06:01	06:33		06:42		07:40		09:46 (2)
	17:22				18:34		20:39		20:33	19:47		17:06		16:46	10	09:56 (2)
Potential sun hours	293			295	370	209	-292	-263	-280	-145	375	343	294	283		
Total, worst case		12													302	
Sun reduction		0.35													0.30	
Oper. time red.		0.86													0.86	
Wind dir. red.		0.65													0.65	
Total reduction		0.20													0.17	
Total, real		2													51	

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	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, Mid / Northeast part
20 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
1000 meter max shadow distance applied along with default 3° inclination
Sunshine probabilities applied (pdf plots)
Directional run-hours applied from tab file (tower 1)
.

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03/05/06 23:23 / 45
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7660 Whitegate Avenue
US-RIVERSIDE, CA 92506

Calculated:
03/01/06 21:02/2.4.0.67

SHADOW - Calendar

Calculation: Mid / Northeast part **Shadow receptor:** 742 - 742

Assumptions for shadow calculations

Maximum distance for influence	1,000 m
Minimum sun height over horizon for influence	3 °
Day step for calculation	1 days
Time step for calculation	2 minutes

Sun shine probabilities (part of time from sun rise to sun set with sun shine)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.35	0.45	0.45	0.55	0.55	0.55	0.65	0.55	0.55	0.45	0.35	0.30

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
475	585	238	199	220	474	1,184	813	840	1,246	803	479	7,555

	January		February		March	April	May	June	July	August	September	October	November		December	
1	07:40	09:15 (2)	07:25	09:28 (2)	06:47	05:54	06:06	05:36	05:36	06:02	06:34	07:07	06:43		07:20	08:56 (2)
	16:47 10	09:25 (2)	17:23 4	09:32 (2)	17:59	18:36	20:08	20:40	20:52	20:32	19:46	18:53	17:04		16:38 22	09:18 (2)
2	07:40	09:15 (2)	07:24		06:46	05:52	06:05	05:35	05:37	06:03	06:35	07:08	06:44		07:21	08:57 (2)
	16:48 12	09:27 (2)	17:24		18:00	18:37	20:10	20:41	20:52	20:31	19:44	18:51	17:03		16:38 22	09:19 (2)
3	07:40	09:15 (2)	07:23		06:44	05:51	06:03	05:35	05:37	06:04	06:37	07:09	06:46		07:22	08:58 (2)
	16:49 14	09:29 (2)	17:26		18:02	18:38	20:11	20:41	20:52	20:30	19:42	18:50	17:02		16:38 20	09:18 (2)
4	07:40	09:15 (2)	07:22		06:42	05:49	06:02	05:34	05:38	06:05	06:38	07:10	06:47		07:23	08:59 (2)
	16:50 14	09:29 (2)	17:27		18:03	18:39	20:12	20:42	20:51	20:29	19:41	18:48	17:00		16:38 20	09:19 (2)
5	07:40	09:15 (2)	07:21		06:41	06:47	06:01	05:34	05:38	06:06	06:39	07:11	06:48		07:24	09:00 (2)
	16:51 16	09:31 (2)	17:28		18:04	19:40	20:13	20:43	20:51	20:28	19:39	18:46	16:59		16:37 18	09:18 (2)
6	07:40	09:13 (2)	07:20		06:39	06:45	06:00	05:34	05:39	06:07	06:40	07:12	06:49		07:25	08:59 (2)
	16:52 18	09:31 (2)	17:30		18:05	19:41	20:14	20:44	20:51	20:26	19:37	18:44	16:58		16:37 18	09:17 (2)
7	07:40	09:13 (2)	07:18		06:37	06:44	05:58	05:33	05:40	06:08	06:41	07:13	06:51		07:26	09:02 (2)
	16:53 20	09:33 (2)	17:31		18:06	19:42	20:15	20:44	20:51	20:25	19:35	18:43	16:57		16:37 16	09:18 (2)
8	07:40	09:15 (2)	07:17		06:36	06:42	05:57	05:33	05:40	06:09	06:42	07:14	06:52		07:27	09:03 (2)
	16:54 20	09:35 (2)	17:32		18:08	19:43	20:16	20:45	20:50	20:24	19:34	18:41	16:56		16:37 14	09:17 (2)
9	07:40	09:14 (2)	07:16		06:34	06:40	05:56	05:33	05:41	06:10	06:43	07:16	06:53		07:28	09:04 (2)
	16:55 20	09:34 (2)	17:34		18:09	19:45	20:17	20:46	20:50	20:22	19:32	18:39	16:55		16:37 14	09:18 (2)
10	07:40	09:14 (2)	07:15		06:32	06:39	05:55	05:33	05:42	06:11	06:44	07:17	06:54	08:59 (2)	07:29	09:05 (2)
	16:56 22	09:36 (2)	17:35		18:10	19:46	20:18	20:46	20:49	20:21	19:30	18:38	16:54 4	09:03 (2)	16:37 12	09:17 (2)
11	07:39	09:14 (2)	07:14		06:31	06:37	05:54	05:33	05:42	06:12	06:45	07:18	06:56	08:54 (2)	07:29	09:06 (2)
	16:57 22	09:36 (2)	17:36		18:11	19:47	20:19	20:47	20:49	20:20	19:28	18:36	16:52 12	09:06 (2)	16:37 10	09:16 (2)
12	07:39	09:13 (2)	07:12		06:29	06:35	05:52	05:32	05:43	06:13	06:46	07:19	06:57	08:54 (2)	07:30	09:07 (2)
	16:58 24	09:37 (2)	17:38		18:12	19:48	20:21	20:47	20:49	20:18	19:27	18:34	16:51 16	09:10 (2)	16:37 10	09:17 (2)
13	07:39	09:13 (2)	07:11		06:27	06:34	05:51	05:32	05:44	06:14	06:47	07:20	06:58	08:53 (2)	07:31	09:09 (2)
	16:59 24	09:37 (2)	17:39		18:14	19:49	20:22	20:48	20:48	20:17	19:25	18:33	16:50 18	09:11 (2)	16:37 6	09:15 (2)
14	07:38	09:12 (2)	07:10		06:25	06:32	05:50	05:32	05:45	06:15	06:48	07:21	06:59	08:50 (2)	07:32	09:10 (2)
	17:01 26	09:38 (2)	17:40		18:15	19:50	20:23	20:48	20:48	20:16	19:23	18:31	16:50 22	09:12 (2)	16:38 4	09:14 (2)
15	07:38	09:14 (2)	07:08		06:24	06:30	05:49	05:32	05:46	06:16	06:49	07:22	07:01	08:50 (2)	07:33	
	17:02 26	09:40 (2)	17:42		18:16	19:51	20:24	20:49	20:47	20:14	19:21	18:29	16:49 24	09:14 (2)	16:38	
16	07:37	09:13 (2)	07:07		06:22	06:29	05:48	05:32	05:46	06:17	06:50	07:24	07:02	08:51 (2)	07:33	
	17:03 26	09:39 (2)	17:43		18:17	19:53	20:25	20:49	20:46	20:13	19:20	18:28	16:48 22	09:13 (2)	16:38	
17	07:37	09:13 (2)	07:05		06:20	06:27	05:47	05:32	05:47	06:18	06:51	07:25	07:03	08:50 (2)	07:34	
	17:04 28	09:41 (2)	17:44		18:18	19:54	20:26	20:50	20:46	20:11	19:18	18:26	16:47 24	09:14 (2)	16:38	
18	07:36	09:14 (2)	07:04		06:18	06:26	05:46	05:32	05:48	06:19	06:53	07:26	07:04	08:50 (2)	07:35	
	17:05 26	09:40 (2)	17:45		18:19	19:55	20:27	20:50	20:45	20:10	19:16	18:25	16:46 26	09:16 (2)	16:39	
19	07:36	09:14 (2)	07:02		06:17	06:24	05:45	05:32	05:49	06:21	06:54	07:27	07:06	08:49 (2)	07:35	
	17:07 28	09:42 (2)	17:47		18:21	19:56	20:28	20:50	20:44	20:08	19:14	18:23	16:45 26	09:15 (2)	16:39	
20	07:35	09:15 (2)	07:01		06:15	06:22	05:44	05:33	05:50	06:22	06:55	07:28	07:07	08:50 (2)	07:36	
	17:08 26	09:41 (2)	17:48		18:22	19:57	20:29	20:51	20:44	20:07	19:12	18:21	16:44 26	09:16 (2)	16:39	
21	07:35	09:14 (2)	07:00		06:13	06:21	05:43	05:33	05:51	06:23	06:56	07:30	07:08	08:50 (2)	07:36	
	17:09 28	09:42 (2)	17:49		18:23	19:58	20:30	20:51	20:43	20:05	19:11	18:20	16:44 28	09:18 (2)	16:40	
22	07:34	09:15 (2)	06:58		06:11	06:19	05:43	05:33	05:52	06:24	06:57	07:31	07:09	08:51 (2)	07:37	
	17:10 26	09:41 (2)	17:50		18:24	19:59	20:31	20:51	20:42	20:04	19:09	18:18	16:43 26	09:17 (2)	16:40	
23	07:33	09:15 (2)	06:57		06:10	06:18	05:42	05:33	05:53	06:25	06:58	07:32	07:10	08:50 (2)	07:37	
	17:12 26	09:41 (2)	17:52		18:25	20:00	20:32	20:51	20:41	20:02	19:07	18:17	16:42 28	09:18 (2)	16:41	
24	07:32	09:16 (2)	06:55		06:08	06:16	05:41	05:33	05:54	06:26	06:59	07:33	07:12	08:52 (2)	07:38	
	17:13 26	09:42 (2)	17:53		18:26	20:00	20:33	20:52	20:40	20:01	19:05	18:15	16:42 26	09:18 (2)	16:41	
25	07:32	09:17 (2)	06:53		06:06	06:15	05:40	05:34	05:55	06:27	07:00	06:34	07:13	08:51 (2)	07:38	
	17:14 24	09:41 (2)	17:54		18:28	20:02	20:34	20:52	20:39	19:57	19:04	17:14	16:41 28	09:19 (2)	16:42	
26	07:31	09:18 (2)	06:52		06:04	06:13	05:39	05:34	05:56	06:28	07:01	06:36	07:14	08:52 (2)	07:39	
	17:15 22	09:40 (2)	17:55		18:29	20:03	20:35	20:52	20:38	19:56	19:02	17:13	16:41 26	09:18 (2)	16:43	
27	07:30	09:19 (2)	06:50		06:03	06:12	05:39	05:34	05:57	06:29	07:02	06:37	07:15	08:53 (2)	07:39	
	17:17 22	09:41 (2)	17:57		18:30	20:04	20:36	20:52	20:37	19:54	19:00	17:11	16:40 26	09:19 (2)	16:43	
28	07:29	09:18 (2)	06:49		06:01	06:10	05:38	05:35	05:58	06:30	07:03	06:38	07:16	08:52 (2)	07:39	
	17:18 22	09:40 (2)	17:58		18:31	20:05	20:36	20:52	20:36	19:52	18:58	17:10	16:40 26	09:18 (2)	16:44	
29	07:28	09:21 (2)			05:59	06:09	05:38	05:35	05:59	06:31	07:04	06:39	07:17	08:54 (2)	07:40	09:17 (2)
	17:19 18	09:39 (2)			18:32	20:06	20:37	20:52	20:35	19:51	18:57	17:08	16:39 24	09:18 (2)	16:45 4	09:21 (2)
30	07:27	09:22 (2)			05:58	06:08	05:37	05:36	06:00	06:32	07:05	06:41	07:19	08:55 (2)	07:40	09:17 (2)
	17:21 16	09:38 (2)			18:33	20:07	20:38	20:52	20:34	19:49	18:55	17:07	16:39 24	09:19 (2)	16:46 6	09:23 (2)
31	07:26	09:23 (2)			05:56		05:36		06:01	06:33		06:42			07:40	09:16 (2)
	17:22 12	09:35 (2)			18:34		20:39		20:33	19:47		17:06			16:46 8	09:24 (2)
Potential sun hours	293		295		370	209	-292	-263	-280	-145	375	343	294		283	
Total, worst case	664		4										482		224	
Sun reduction	0.35		0.45										0.35		0.30	
Oper. time red.	0.86		0.86										0.86		0.86	
Wind dir. red.	0.63		0.63										0.63		0.63	
Total reduction	0.19		0.25										0.19		0.16	
Total, real	127		1										92		37	

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	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, Mid / Northeast part
20 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
1000 meter max shadow distance applied along with default 3° inclination
Sunshine probabilities applied (pdf plots)
Directional run-hours applied from tab file (tower 1)
.

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03/05/06 23:23 / 46
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US-RIVERSIDE, CA 92506

Calculated:
03/01/06 21:02/2.4.0.67

SHADOW - Calendar

Calculation: Mid / Northeast part **Shadow receptor:** 743 - 743

Assumptions for shadow calculations

Maximum distance for influence	1,000	m
Minimum sun height over horizon for influence	3	°
Day step for calculation	1	days
Time step for calculation	2	minutes

Sun shine probabilities (part of time from sun rise to sun set with sun shine)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.35	0.45	0.45	0.55	0.55	0.55	0.65	0.55	0.55	0.45	0.35	0.30

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
475	585	238	199	220	474	1,184	813	840	1,246	803	479	7,555

	January		February		March	April	May	June	July	August	September	October	November		December	
1	07:40		10:35 (3)	07:25	09:00 (2)	06:47	05:54	06:06	05:36	05:36	06:02	06:34	07:07	06:43		07:20
	16:47	16	10:51 (3)	17:23	26 09:26 (2)	17:59	18:36	20:08	20:40	20:52	20:32	19:46	18:53	17:04		16:38
2	07:40		10:35 (3)	07:24	09:01 (2)	06:46	05:52	06:05	05:35	05:37	06:03	06:35	07:08	06:44		07:21
	16:48	16	10:51 (3)	17:24	26 09:27 (2)	18:00	18:37	20:10	20:41	20:52	20:31	19:44	18:51	17:03		16:38
3	07:40		10:37 (3)	07:23	09:02 (2)	06:44	05:51	06:03	05:35	05:37	06:04	06:37	07:09	06:46	08:38 (2)	07:22
	16:49	14	10:51 (3)	17:26	24 09:26 (2)	18:02	18:38	20:11	20:41	20:52	20:30	19:42	18:50	17:02	12 08:50 (2)	16:38
4	07:40		10:39 (3)	07:22	09:03 (2)	06:42	05:49	06:02	05:34	05:38	06:05	06:38	07:10	06:47	08:37 (2)	07:23
	16:50	12	10:51 (3)	17:27	22 09:25 (2)	18:03	18:39	20:12	20:42	20:51	20:29	19:41	18:48	17:00	14 08:51 (2)	16:38
5	07:40		10:41 (3)	07:21	09:04 (2)	06:41	06:47	06:01	05:34	05:38	06:06	06:39	07:11	06:48	08:34 (2)	07:24
	16:51	8	10:49 (3)	17:28	20 09:24 (2)	18:04	19:40	20:13	20:43	20:51	20:28	19:39	18:46	16:59	18 08:52 (2)	16:37
6	07:40		10:43 (3)	07:20	09:04 (2)	06:39	06:45	06:00	05:34	05:39	06:07	06:40	07:12	06:49	08:34 (2)	07:25
	16:52	4	10:47 (3)	17:30	18 09:22 (2)	18:05	19:41	20:14	20:44	20:51	20:26	19:37	18:44	16:58	20 08:54 (2)	16:37
7	07:40			07:18	09:07 (2)	06:37	06:44	05:58	05:33	05:40	06:08	06:41	07:13	06:51	08:33 (2)	07:26 10:28 (3)
	16:53			17:31	14 09:21 (2)	18:07	19:42	20:15	20:44	20:51	20:25	19:35	18:43	16:57	22 08:55 (2)	16:37 8 10:36 (3)
8	07:40			07:17	09:10 (2)	06:36	06:42	05:57	05:33	05:40	06:09	06:42	07:14	06:52	08:32 (2)	07:27 10:27 (3)
	16:54			17:32	8 09:18 (2)	18:08	19:43	20:16	20:45	20:50	20:24	19:34	18:41	16:56	24 08:56 (2)	16:37 10 10:37 (3)
9	07:40			07:16		06:34	06:40	05:56	05:33	05:41	06:10	06:43	07:16	06:53	08:32 (2)	07:28 10:26 (3)
	16:55			17:34		18:09	19:45	20:17	20:46	20:50	20:22	19:32	18:39	16:55	26 08:58 (2)	16:37 14 10:40 (3)
10	07:40			07:15		06:32	06:39	05:55	05:33	05:42	06:11	06:44	07:17	06:54	08:31 (2)	07:29 10:25 (3)
	16:56			17:35		18:10	19:46	20:18	20:46	20:49	20:21	19:30	18:38	16:54	26 08:57 (2)	16:37 16 10:41 (3)
11	07:39			07:14		06:31	06:37	05:54	05:33	05:42	06:12	06:45	07:18	06:56	08:32 (2)	07:29 10:26 (3)
	16:57			17:36		18:11	19:47	20:19	20:47	20:49	20:20	19:28	18:36	16:52	26 08:58 (2)	16:37 16 10:42 (3)
12	07:39			07:12		06:29	06:35	05:52	05:32	05:43	06:13	06:46	07:19	06:57	08:32 (2)	07:30 10:25 (3)
	16:58			17:38		18:12	19:48	20:21	20:47	20:49	20:18	19:27	18:34	16:51	26 08:58 (2)	16:37 18 10:43 (3)
13	07:39			07:11		06:27	06:34	05:51	05:32	05:44	06:14	06:47	07:20	06:58	08:31 (2)	07:31 10:25 (3)
	16:59			17:39		18:14	19:49	20:22	20:48	20:48	20:17	19:25	18:33	16:50	28 08:59 (2)	16:37 18 10:43 (3)
14	07:38			07:10		06:25	06:32	05:50	05:32	05:45	06:15	06:48	07:21	06:59	08:32 (2)	07:32 10:24 (3)
	17:01			17:40		18:15	19:50	20:23	20:48	20:48	20:16	19:23	18:31	16:50	26 08:58 (2)	16:38 20 10:44 (3)
15	07:38			07:08		06:24	06:30	05:49	05:32	05:46	06:16	06:49	07:22	07:01	08:34 (2)	07:33 10:25 (3)
	17:02			17:42		18:16	19:51	20:24	20:49	20:47	20:14	19:21	18:29	16:49	24 08:58 (2)	16:38 20 10:45 (3)
16	07:37			07:07		06:22	06:29	05:48	05:32	05:46	06:17	06:50	07:24	07:02	08:33 (2)	07:33 10:26 (3)
	17:03			17:43		18:17	19:53	20:25	20:49	20:46	20:13	19:20	18:28	16:48	26 08:59 (2)	16:38 20 10:46 (3)
17	07:37		09:07 (2)	07:05		06:20	06:27	05:47	05:32	05:47	06:18	06:51	07:25	07:03	08:34 (2)	07:34 10:26 (3)
	17:04	8	09:15 (2)	17:44		18:18	19:54	20:26	20:50	20:46	20:11	19:18	18:26	16:47	24 08:58 (2)	16:38 20 10:46 (3)
18	07:36		09:04 (2)	07:04		06:18	06:26	05:46	05:32	05:48	06:19	06:53	07:26	07:04	08:34 (2)	07:35 10:25 (3)
	17:05	12	09:16 (2)	17:45		18:19	19:55	20:27	20:50	20:45	20:10	19:16	18:25	16:46	24 08:58 (2)	16:39 24 10:49 (3)
19	07:36		09:04 (2)	07:02		06:17	06:24	05:45	05:32	05:49	06:21	06:54	07:27	07:06	08:35 (2)	07:35 10:26 (3)
	17:07	14	09:18 (2)	17:47		18:21	19:56	20:28	20:50	20:44	20:08	19:14	18:23	16:45	22 08:57 (2)	16:39 24 10:50 (3)
20	07:35		09:03 (2)	07:01		06:15	06:22	05:44	05:33	05:50	06:22	06:55	07:28	07:07	08:36 (2)	07:36 10:26 (3)
	17:08	18	09:21 (2)	17:48		18:22	19:57	20:29	20:51	20:44	20:07	19:12	18:21	16:44	20 08:56 (2)	16:39 24 10:50 (3)
21	07:35		09:02 (2)	07:00		06:13	06:21	05:43	05:33	05:51	06:23	06:56	07:30	07:08	08:38 (2)	07:36 10:27 (3)
	17:09	20	09:22 (2)	17:49		18:23	19:58	20:30	20:51	20:43	20:05	19:11	18:20	16:44	20 08:58 (2)	16:40 24 10:51 (3)
22	07:34		09:01 (2)	06:58		06:11	06:19	05:43	05:33	05:52	06:24	06:57	07:31	07:09	08:39 (2)	07:37 10:27 (3)
	17:10	20	09:21 (2)	17:50		18:24	19:59	20:31	20:51	20:42	20:04	19:09	18:18	16:43	18 08:57 (2)	16:40 24 10:51 (3)
23	07:33		09:01 (2)	06:57		06:10	06:18	05:42	05:33	05:53	06:25	06:58	07:32	07:10	08:40 (2)	07:37 10:28 (3)
	17:12	22	09:23 (2)	17:52		18:25	20:00	20:32	20:51	20:41	20:02	19:07	18:17	16:42	16 08:56 (2)	16:41 24 10:52 (3)
24	07:32		09:00 (2)	06:55		06:08	06:16	05:41	05:33	05:54	06:26	06:59	07:33	07:12	08:42 (2)	07:38 10:28 (3)
	17:13	24	09:24 (2)	17:53		18:26	20:00	20:33	20:52	20:40	20:01	19:05	18:15	16:42	12 08:54 (2)	16:41 24 10:52 (3)
25	07:32		09:01 (2)	06:53		06:06	06:15	05:40	05:34	05:55	06:27	07:00	06:34	07:13	08:45 (2)	07:38 10:28 (3)
	17:14	24	09:25 (2)	17:54		18:28	20:02	20:34	20:52	20:39	19:57	19:04	17:14	16:41	8 08:53 (2)	16:42 24 10:52 (3)
26	07:31		09:00 (2)	06:52		06:04	06:13	05:39	05:34	05:56	06:28	07:01	06:36	07:14		07:39 10:31 (3)
	17:15	26	09:26 (2)	17:55		18:29	20:03	20:35	20:52	20:38	19:56	19:02	17:13	16:41		16:43 20 10:51 (3)
27	07:30		09:01 (2)	06:50		06:03	06:12	05:39	05:34	05:57	06:29	07:02	06:37	07:15		07:39 10:31 (3)
	17:17	24	09:25 (2)	17:57		18:30	20:04	20:36	20:52	20:37	19:54	19:00	17:11	16:40		16:43 20 10:51 (3)
28	07:29		09:00 (2)	06:49		06:01	06:10	05:38	05:35	05:58	06:30	07:03	06:38	07:16		07:39 10:31 (3)
	17:18	26	09:26 (2)	17:58		18:31	20:05	20:36	20:52	20:36	19:52	18:58	17:10	16:40		16:44 20 10:51 (3)
29	07:28		09:01 (2)			05:59	06:09	05:38	05:35	05:59	06:31	07:04	06:39	07:17		07:40 10:31 (3)
	17:19	26	09:27 (2)			18:32	20:06	20:37	20:52	20:35	19:51	18:57	17:08	16:39		16:45 20 10:51 (3)
30	07:27		09:00 (2)			05:58	06:08	05:37	05:36	06:00	06:32	07:05	06:41	07:19		07:40 10:33 (3)
	17:21	26	09:26 (2)			18:33	20:07	20:38	20:52	20:34	19:49	18:55	17:07	16:39		16:46 18 10:51 (3)
31	07:26		09:01 (2)			05:56		05:36		06:01	06:33		06:42			07:40 10:34 (3)
	17:22	26	09:27 (2)			18:34		20:39		20:33	19:47		17:06			16:46 18 10:52 (3)
Potential sun hours	293		295			370	209	-292	-263	-280	-145	375	343	294		283
Total, worst case	386		158											482		488
Sun reduction	0.35		0.45											0.35		0.30
Oper. time red.	0.86		0.86											0.86		0.86
Wind dir. red.	0.62		0.62											0.62		0.64
Total reduction	0.19		0.24											0.19		0.17
Total, real	73		38											91		81

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	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, Mid / Northeast part
20 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
1000 meter max shadow distance applied along with default 3° inclination
Sunshine probabilities applied (pdf plots)
Directional run-hours applied from tab file (tower 1)
.

Printed/Page
03/05/06 23:23 / 47
Licensed user:
Wind Engineers, Inc.
7660 Whitegate Avenue
US-RIVERSIDE, CA 92506

Calculated:
03/01/06 21:02/2.4.0.67

SHADOW - Calendar

Calculation: Mid / Northeast part **Shadow receptor:** 744 - 744

Assumptions for shadow calculations

Maximum distance for influence	1,000 m
Minimum sun height over horizon for influence	3 °
Day step for calculation	1 days
Time step for calculation	2 minutes

Sun shine probabilities (part of time from sun rise to sun set with sun shine)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.35	0.45	0.45	0.55	0.55	0.55	0.65	0.55	0.55	0.45	0.35	0.30

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
475	585	238	199	220	474	1,184	813	840	1,246	803	479	7,555

	January		February		March	April	May	June	July	August	September	October		November		December	
1	07:40	10:09 (3)	07:25	08:48 (2)	06:47	05:54	06:06	05:36	05:36	06:02	06:34	07:07		06:43	08:19 (2)	07:20	10:00 (3)
	16:47 30	10:39 (3)	17:23 24	09:12 (2)	17:59	18:36	20:08	20:40	20:52	20:32	19:46	18:53		17:04 22	08:41 (2)	16:38 22	10:22 (3)
2	07:40	10:09 (3)	07:24	08:49 (2)	06:46	05:52	06:05	05:35	05:37	06:03	06:35	07:08		06:44	08:18 (2)	07:21	09:59 (3)
	16:48 30	10:39 (3)	17:24 24	09:13 (2)	18:00	18:37	20:10	20:41	20:52	20:31	19:44	18:51		17:03 24	08:42 (2)	16:38 24	10:23 (3)
3	07:40	10:11 (3)	07:23	08:48 (2)	06:44	05:51	06:03	05:35	05:37	06:04	06:37	07:09		06:46	08:18 (2)	07:22	09:58 (3)
	16:49 28	10:39 (3)	17:26 26	09:14 (2)	18:02	18:38	20:11	20:41	20:52	20:30	19:42	18:50		17:02 26	08:44 (2)	16:38 26	10:24 (3)
4	07:40	10:11 (3)	07:22	08:49 (2)	06:42	05:49	06:02	05:34	05:38	06:05	06:38	07:10		06:47	08:19 (2)	07:23	09:59 (3)
	16:50 30	10:41 (3)	17:27 24	09:13 (2)	18:03	18:39	20:12	20:42	20:51	20:29	19:41	18:48		17:00 24	08:43 (2)	16:38 26	10:25 (3)
5	07:40	10:11 (3)	07:21	08:48 (2)	06:41	06:47	06:01	05:34	05:38	06:06	06:39	07:11		06:48	08:18 (2)	07:24	09:58 (3)
	16:51 30	10:41 (3)	17:28 26	09:14 (2)	18:04	19:40	20:13	20:43	20:51	20:28	19:39	18:46		16:59 26	08:44 (2)	16:37 28	10:26 (3)
6	07:40	10:13 (3)	07:20	08:48 (2)	06:39	06:45	06:00	05:34	05:39	06:07	06:40	07:12		06:49	08:18 (2)	07:25	09:59 (3)
	16:52 28	10:41 (3)	17:30 26	09:14 (2)	18:05	19:41	20:14	20:44	20:51	20:26	19:37	18:44		16:58 26	08:44 (2)	16:37 28	10:27 (3)
7	07:40	10:13 (3)	07:18	08:49 (2)	06:37	06:44	05:58	05:33	05:40	06:08	06:41	07:13		06:51	08:19 (2)	07:26	09:58 (3)
	16:53 28	10:41 (3)	17:31 24	09:13 (2)	18:07	19:42	20:15	20:44	20:51	20:25	19:35	18:43		16:57 24	08:43 (2)	16:37 30	10:28 (3)
8	07:40	10:15 (3)	07:17	08:50 (2)	06:36	06:42	05:57	05:33	05:40	06:09	06:42	07:14		06:52	08:18 (2)	07:27	09:59 (3)
	16:54 26	10:41 (3)	17:32 24	09:14 (2)	18:08	19:43	20:16	20:45	20:50	20:24	19:34	18:41		16:56 26	08:44 (2)	16:37 30	10:29 (3)
9	07:40	10:14 (3)	07:16	08:51 (2)	06:34	06:40	05:56	05:33	05:41	06:10	06:43	07:16		06:53	08:20 (2)	07:28	10:00 (3)
	16:55 26	10:40 (3)	17:34 22	09:13 (2)	18:09	19:45	20:17	20:46	20:50	20:22	19:32	18:39		16:55 24	08:44 (2)	16:37 28	10:28 (3)
10	07:40	10:16 (3)	07:15	08:51 (2)	06:32	06:39	05:55	05:33	05:42	06:11	06:44	07:17		06:54	08:19 (2)	07:29	09:59 (3)
	16:56 24	10:40 (3)	17:35 20	09:11 (2)	18:10	19:46	20:18	20:46	20:49	20:21	19:30	18:38		16:54 24	08:43 (2)	16:37 30	10:29 (3)
11	07:39	10:18 (3)	07:14	08:52 (2)	06:31	06:37	05:54	05:33	05:42	06:12	06:45	07:18		06:56	08:20 (2)	07:29	10:00 (3)
	16:57 22	10:40 (3)	17:36 18	09:10 (2)	18:11	19:47	20:19	20:47	20:49	20:20	19:28	18:36		16:52 22	08:42 (2)	16:37 30	10:30 (3)
12	07:39	10:17 (3)	07:12	08:53 (2)	06:29	06:35	05:52	05:32	05:43	06:13	06:46	07:19		06:57	08:22 (2)	07:30	10:01 (3)
	16:58 22	10:39 (3)	17:38 16	09:09 (2)	18:12	19:48	20:21	20:47	20:49	20:18	19:27	18:34		16:51 20	08:42 (2)	16:37 30	10:31 (3)
13	07:39	10:19 (3)	07:11	08:55 (2)	06:27	06:34	05:51	05:32	05:44	06:14	06:47	07:20		06:58	08:23 (2)	07:31	10:01 (3)
	16:59 20	10:39 (3)	17:39 12	09:07 (2)	18:14	19:49	20:22	20:48	20:48	20:17	19:25	18:33		16:50 18	08:41 (2)	16:37 30	10:31 (3)
14	07:38	10:20 (3)	07:10	08:58 (2)	06:25	06:32	05:50	05:32	05:45	06:15	06:48	07:21		06:59	08:24 (2)	07:32	10:00 (3)
	17:01 18	10:38 (3)	17:40 6	09:04 (2)	18:15	19:50	20:23	20:48	20:48	20:16	19:23	18:31		16:50 16	08:40 (2)	16:38 32	10:32 (3)
15	07:38	10:22 (3)	07:08		06:24	06:30	05:49	05:32	05:46	06:16	06:49	07:22		07:01	08:26 (2)	07:33	10:01 (3)
	17:02 14	10:36 (3)	17:42		18:16	19:51	20:24	20:49	20:47	20:14	19:21	18:29		16:49 14	08:40 (2)	16:38 32	10:33 (3)
16	07:37	10:25 (3)	07:07		06:22	06:29	05:48	05:32	05:46	06:17	06:50	07:24		07:02	08:27 (2)	07:33	10:02 (3)
	17:03 10	10:35 (3)	17:43		18:17	19:53	20:25	20:49	20:46	20:13	19:20	18:28		16:48 10	08:37 (2)	16:38 32	10:34 (3)
17	07:37		07:05		06:20	06:27	05:47	05:32	05:47	06:18	06:51	07:25		07:03		07:34	10:02 (3)
	17:04		17:44		18:18	19:54	20:26	20:50	20:46	20:11	19:18	18:26		16:47		16:38 32	10:34 (3)
18	07:36		07:04		06:18	06:26	05:46	05:32	05:48	06:19	06:53	07:26		07:04		07:35	10:03 (3)
	17:05		17:45		18:19	19:55	20:27	20:50	20:45	20:10	19:16	18:25		16:46		16:39 32	10:35 (3)
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	17:12		17:52		18:25	20:00	20:32	20:51	20:41	20:02	19:07	18:17		16:42		16:41 30	10:36 (3)
24	07:32		06:55		06:08	06:16	05:41	05:33	05:54	06:26	06:59	07:33		07:12		07:38	10:06 (3)
	17:13		17:53		18:26	20:00	20:33	20:52	20:40	20:01	19:05	18:15		16:42		16:41 32	10:38 (3)
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26	07:31	08:54 (2)	06:52		06:04	06:13	05:39	05:34	05:56	06:28	07:01	06:36		07:14	10:04 (3)	07:39	10:07 (3)
	17:15 10	09:04 (2)	17:55		18:29	20:03	20:35	20:52	20:38	19:56	19:02	17:13		16:41 10	10:14 (3)	16:43 32	10:39 (3)
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	17:17 14	09:07 (2)	17:57		18:30	20:04	20:36	20:52	20:37	19:54	19:00	17:11		16:40 14	10:15 (3)	16:43 32	10:39 (3)
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	17:18 16	09:08 (2)	17:58		18:31	20:05	20:36	20:52	20:36	19:52	18:58	17:10 8	08:34 (2)	16:40 18	10:18 (3)	16:44 32	10:39 (3)
29	07:28	08:51 (2)			05:59	06:09	05:38	05:35	05:59	06:31	07:04	06:39	08:23 (2)	07:17	10:00 (3)	07:40	10:07 (3)
	17:19 18	09:09 (2)			18:32	20:06	20:37	20:52	20:35	19:51	18:57	17:08 14	08:37 (2)	16:39 20	10:20 (3)	16:45 32	10:39 (3)
30	07:27	08:50 (2)			05:58	06:08	05:37	05:36	06:00	06:32	07:05	06:41	08:22 (2)	07:19	09:59 (3)	07:40	10:07 (3)
	17:21 20	09:10 (2)			18:33	20:07	20:38	20:52	20:34	19:49	18:55	17:07 16	08:38 (2)	16:39 22	10:21 (3)	16:46 32	10:39 (3)
31	07:26	08:49 (2)			05:56		05:36		06:01	06:33		06:42	08:20 (2)			07:40	10:10 (3)
	17:22 22	09:11 (2)			18:34		20:39		20:33	19:47		17:06 20	08:40 (2)			16:46 30	10:40 (3)
Potential sun hours	293		295		370	209	-292	-263	-280	-145	375	343		294		283	
Total, worst case	486		292									58		430		928	
Sun reduction	0.35		0.45									0.45		0.35		0.30	
Oper. time red.	0.86		0.86									0.86		0.86		0.86	
Wind dir. red.	0.64		0.63									0.63		0.63		0.64	
Total reduction	0.19		0.24									0.24		0.19		0.17	
Total, real	94		71									14		82		155	

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	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, Mid / Northeast part
20 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
1000 meter max shadow distance applied along with default 3° inclination
Sunshine probabilities applied (pdf plots)
Directional run-hours applied from tab file (tower 1)
.

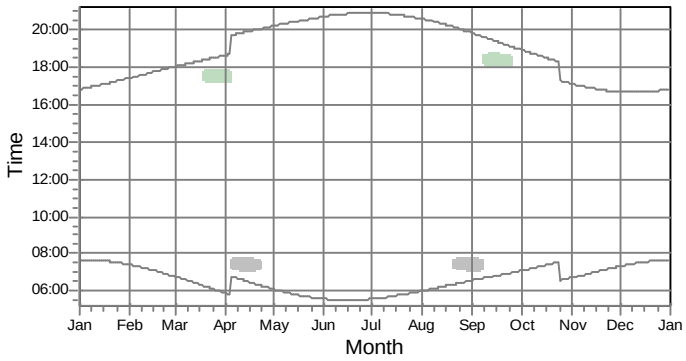
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Wind Engineers, Inc.
7660 Whitegate Avenue
US-RIVERSIDE, CA 92506

Calculated:
03/01/06 21:02/2.4.0.67

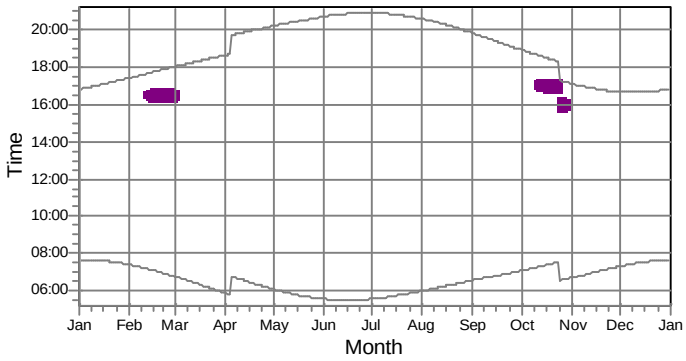
SHADOW - Calendar, graphical

Calculation: Mid / Northeast part

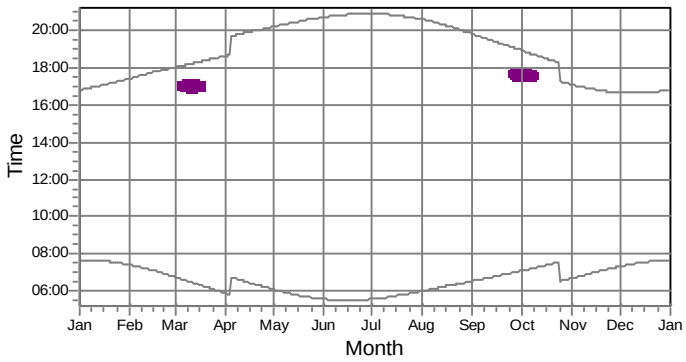
686: 686



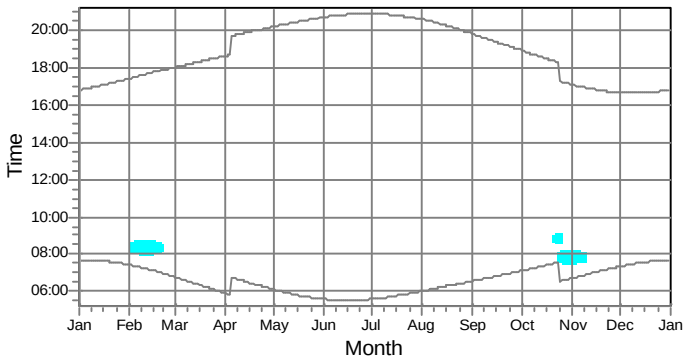
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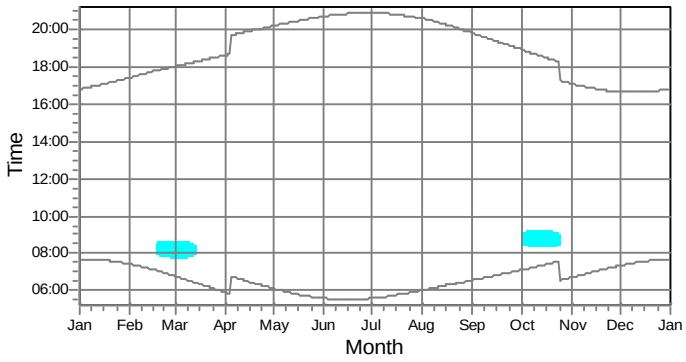
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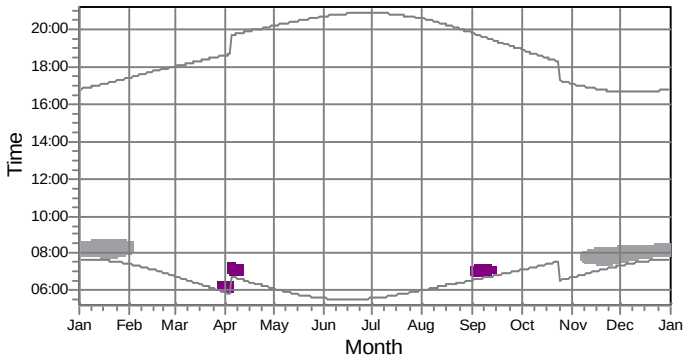
689: 689



690: 690



691: 691



WTGs

15 12 13 11 16

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, Mid / Northeast part
20 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
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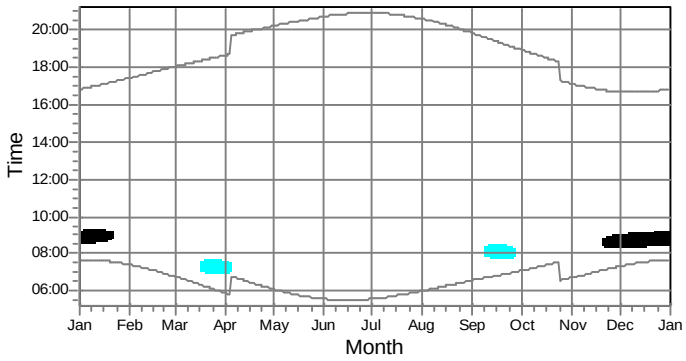
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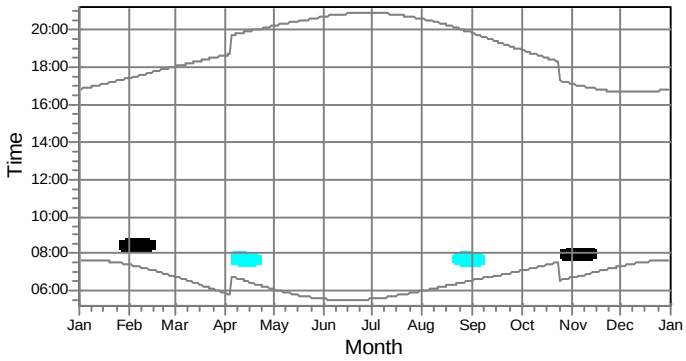
SHADOW - Calendar, graphical

Calculation: Mid / Northeast part

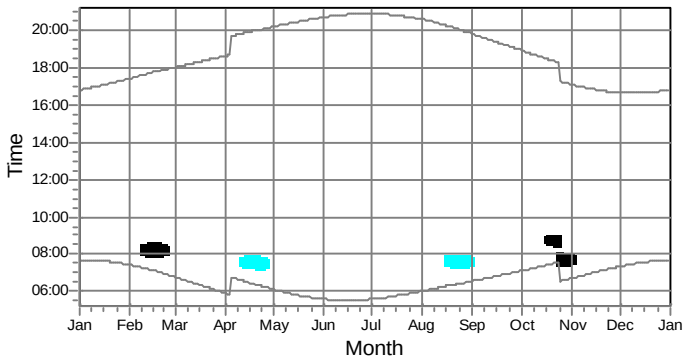
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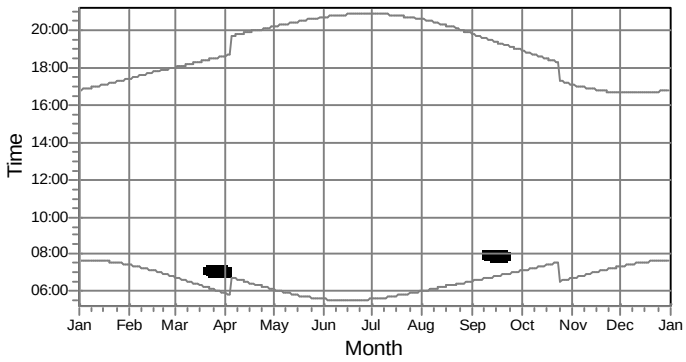
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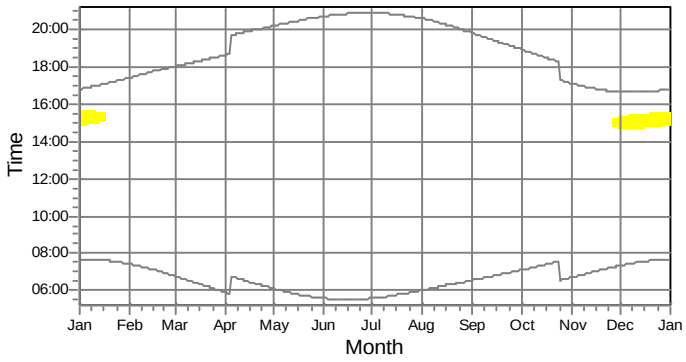
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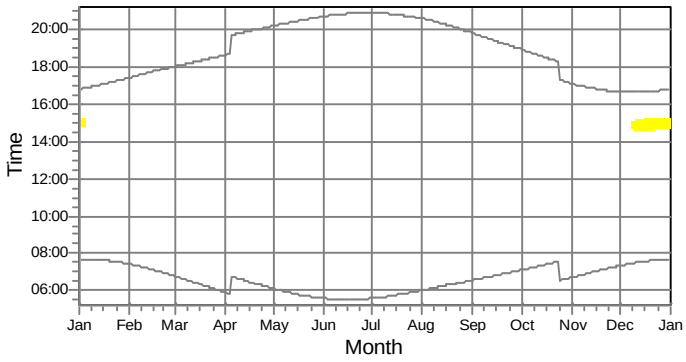
695: 695



698: 698



699: 699



WTGs

25 13 14

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, Mid / Northeast part
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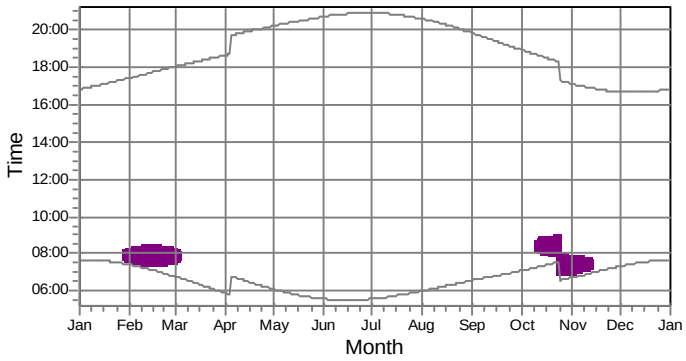
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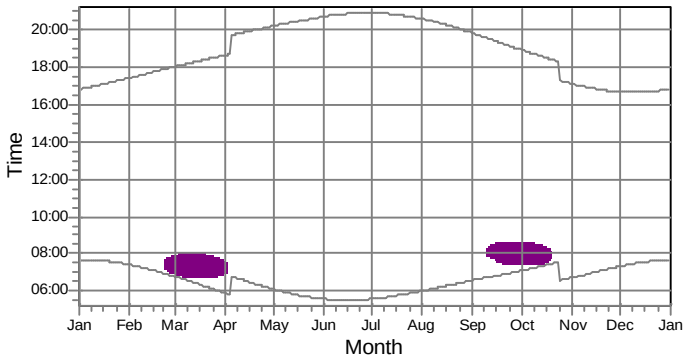
SHADOW - Calendar, graphical

Calculation: Mid / Northeast part

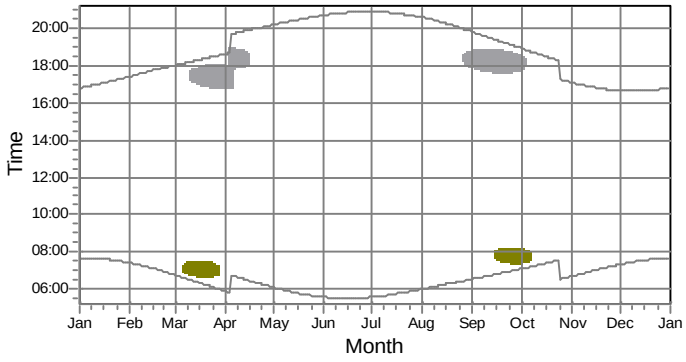
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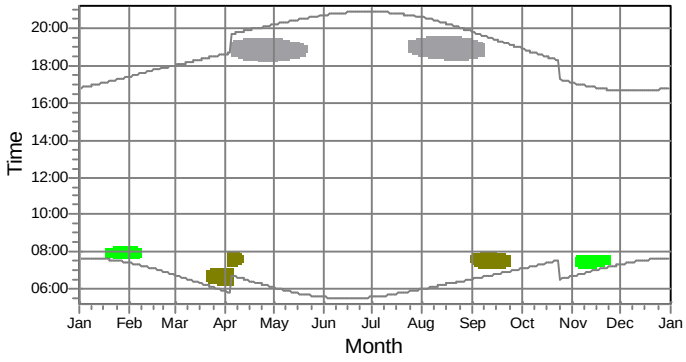
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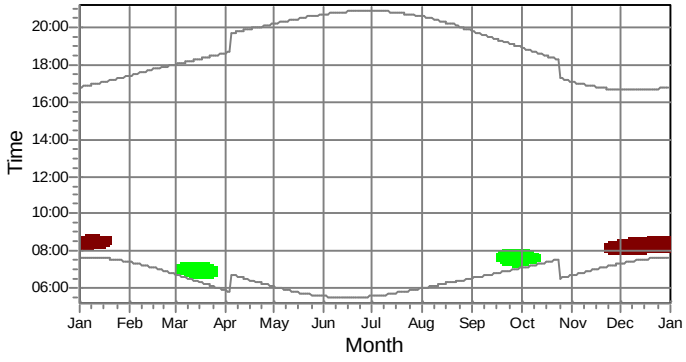
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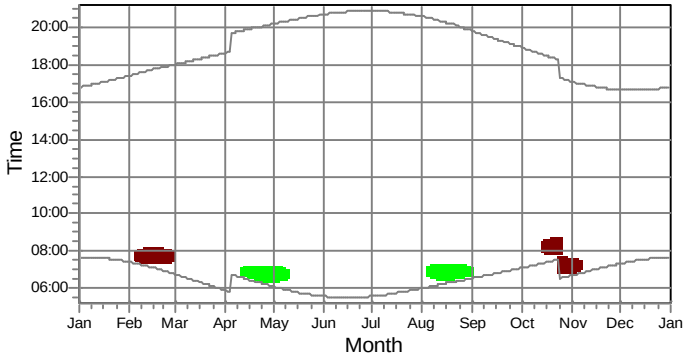
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709: 709



710: 710



WTGs

19 18 17 15 16

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, Mid / Northeast part
20 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
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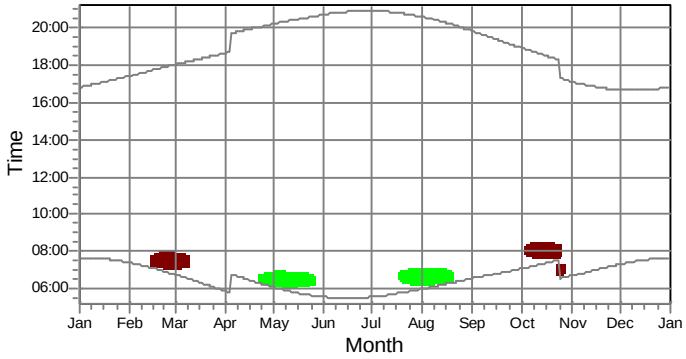
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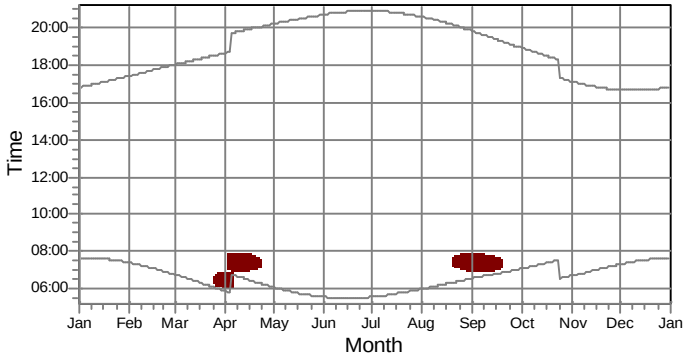
SHADOW - Calendar, graphical

Calculation: Mid / Northeast part

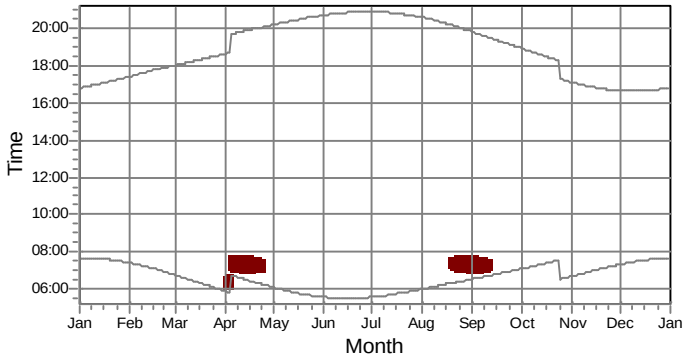
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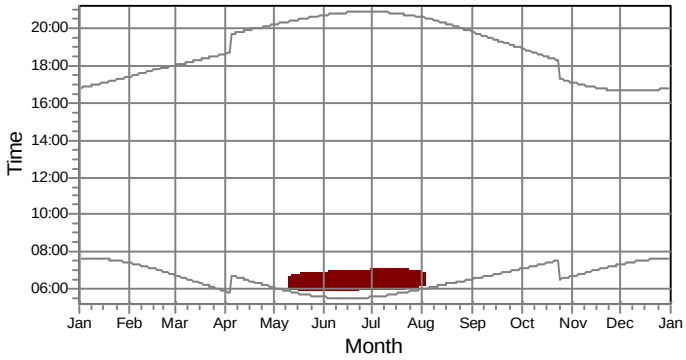
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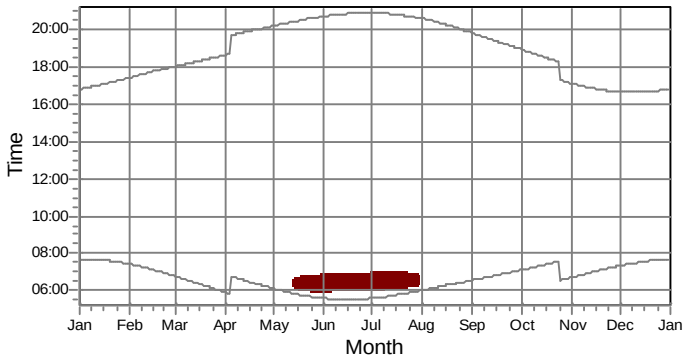
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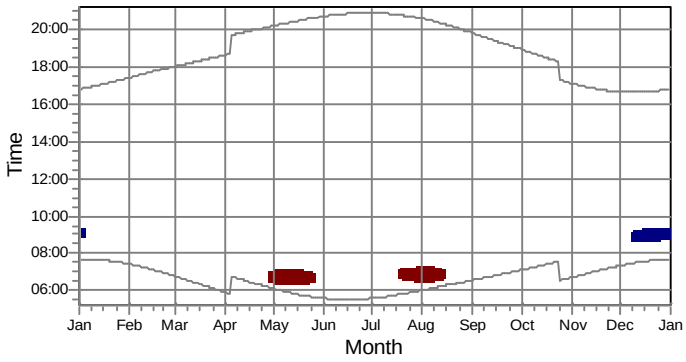
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715: 715



716: 716



WTGs

20 19 18

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, Mid / Northeast part
20 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
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.

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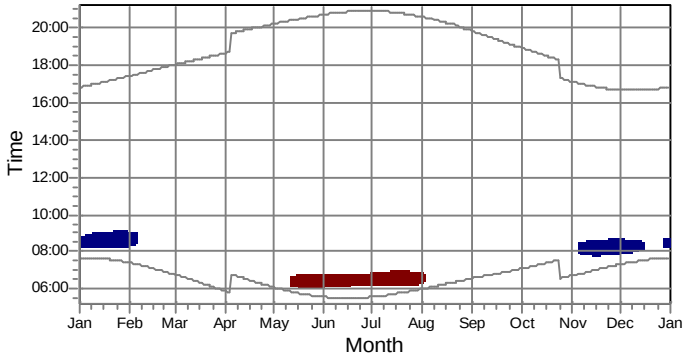
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US-RIVERSIDE, CA 92506

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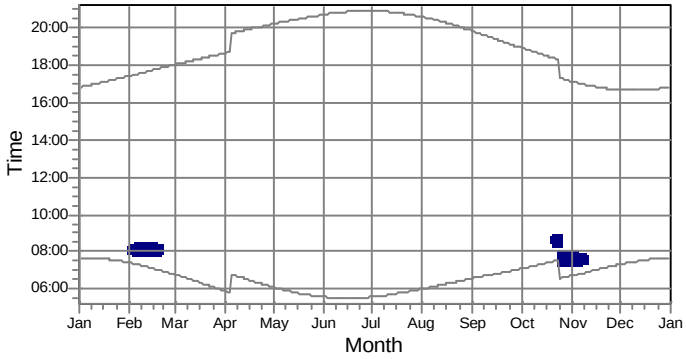
SHADOW - Calendar, graphical

Calculation: Mid / Northeast part

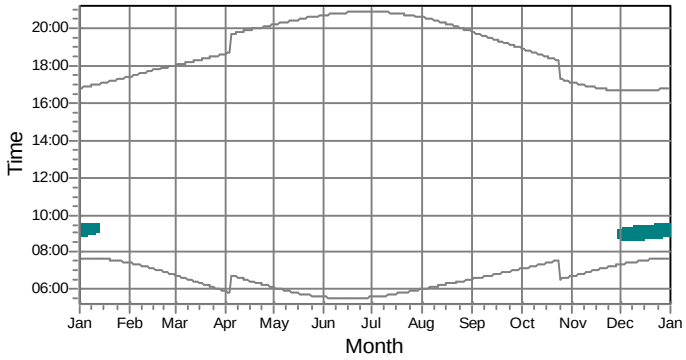
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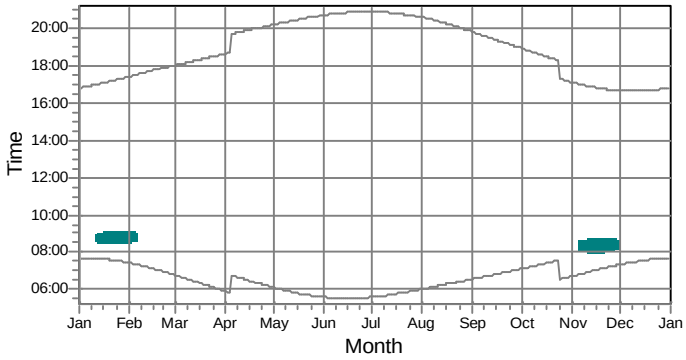
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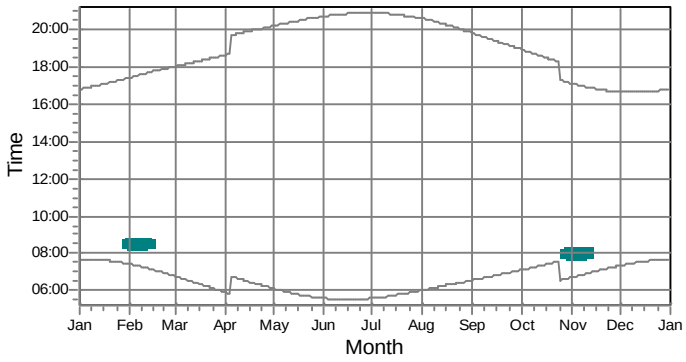
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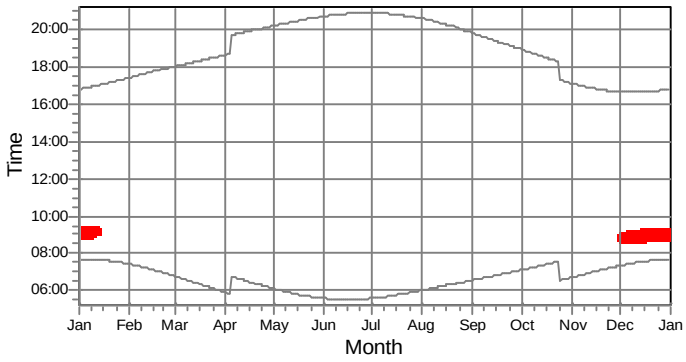
726: 726



727: 727



729: 729



WTGs

22 21 20 19

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, Mid / Northeast part
20 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
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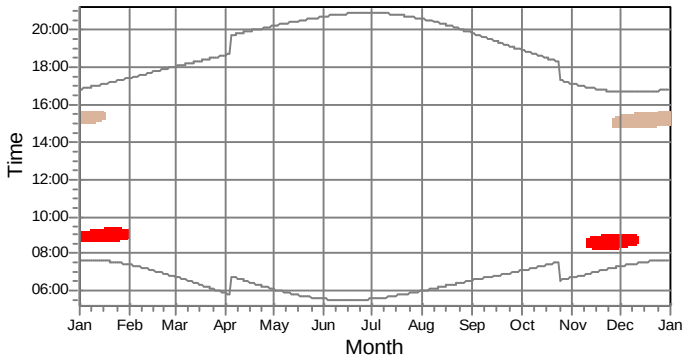
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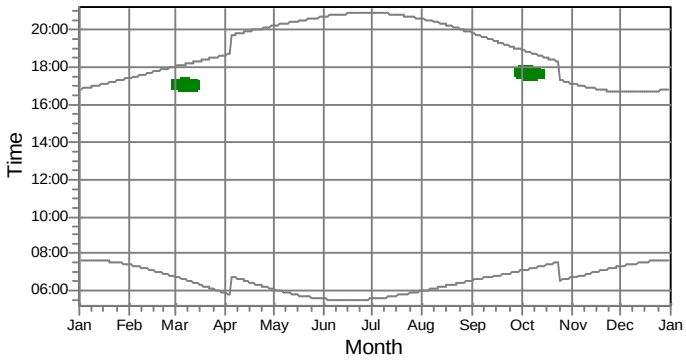
SHADOW - Calendar, graphical

Calculation: Mid / Northeast part

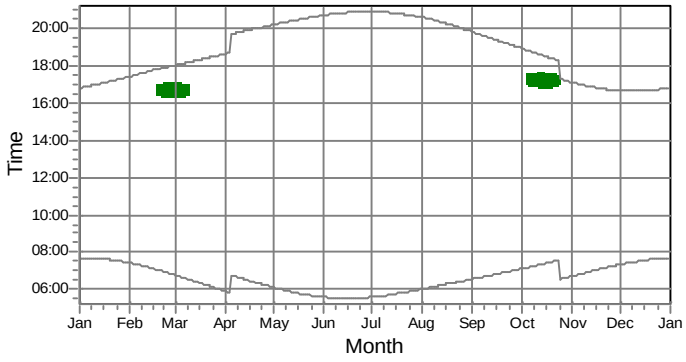
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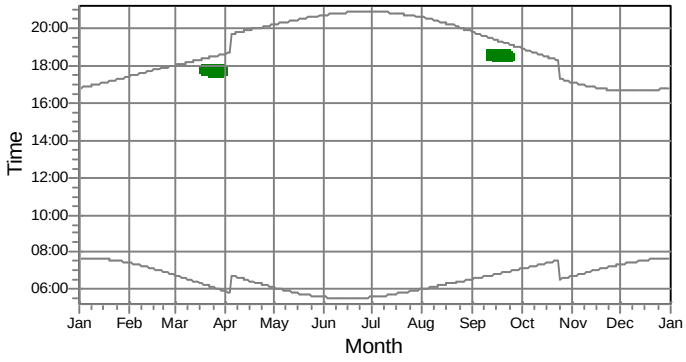
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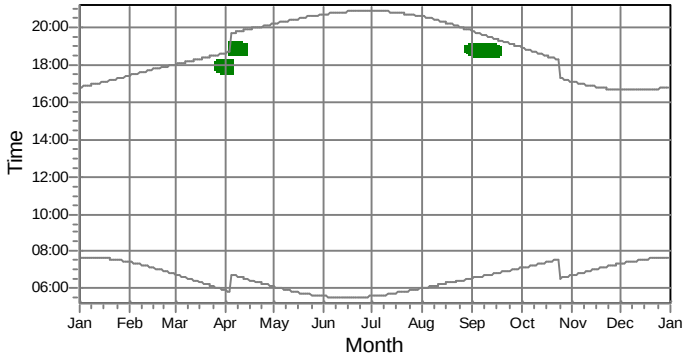
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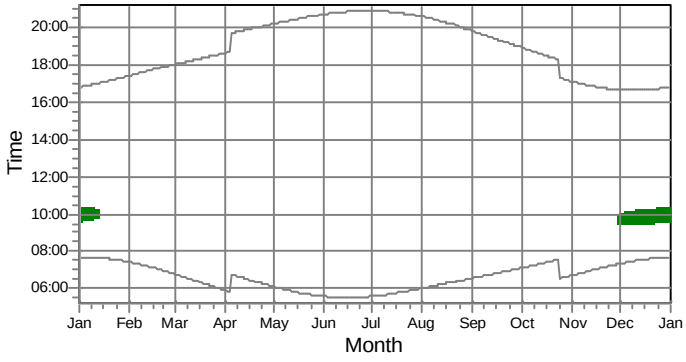
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736: 736



740: 740



WTGs

22 24 23

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, Mid / Northeast part
20 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
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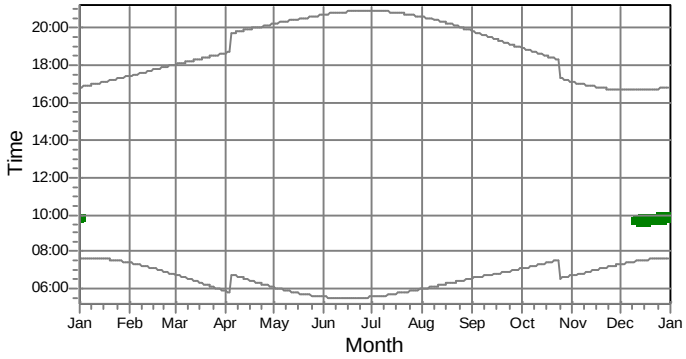
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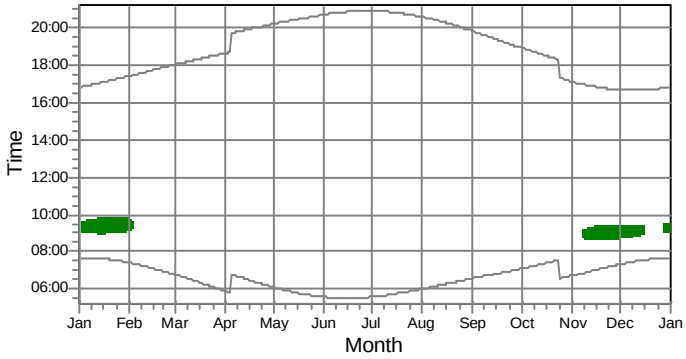
SHADOW - Calendar, graphical

Calculation: Mid / Northeast part

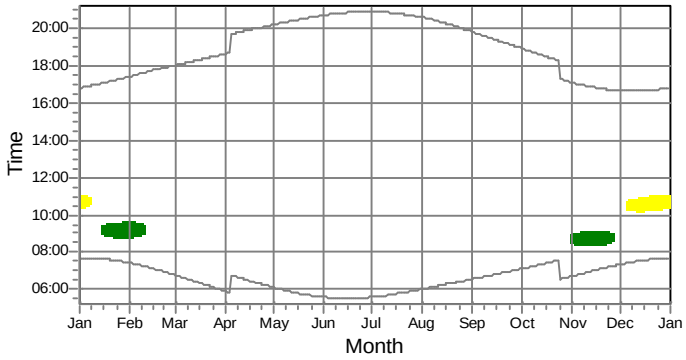
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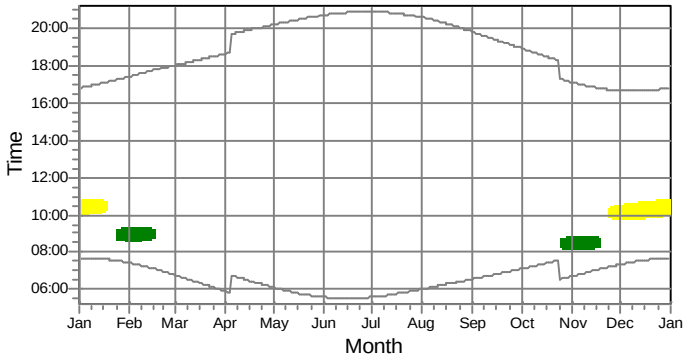
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743: 743



744: 744



WTGs

24

25

Project:
060226 Cohocton

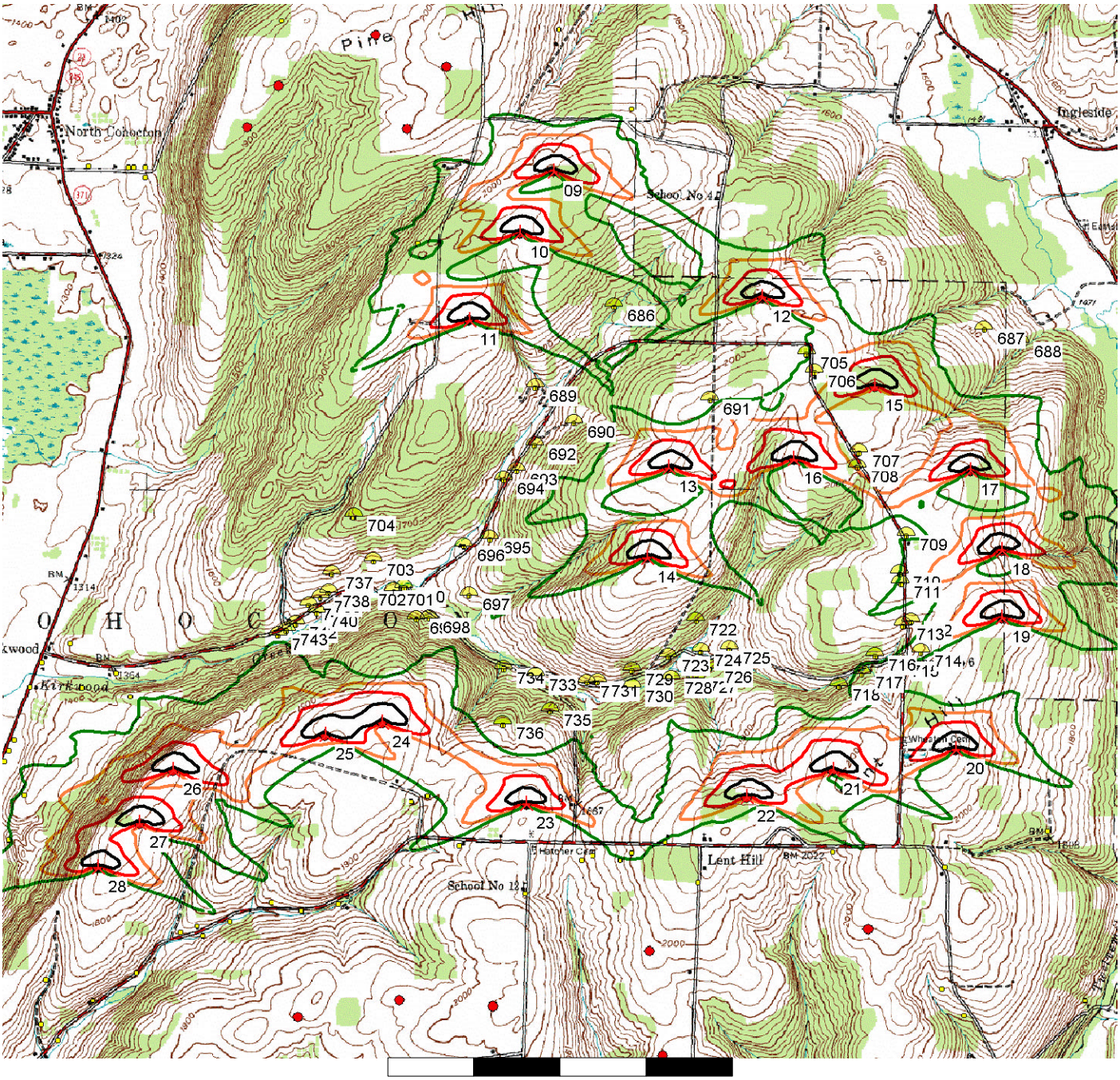
Description:
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20 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
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Directional run-hours applied from tab file (tower 1)
.

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SHADOW - 060226 Cohocton USGS z13 w, 50k, 30x30

Calculation: Mid / Northeast part **File:** 060226 Cohocton USGS z13 w, 50k, 30x30.bmi



0 500 1000 1500 2000 m

Map: 060226 Cohocton USGS z13 w, 50k, 30x30 , Print scale 1:35,000, Map center UTM NAD27 Zone: 18 East: 300,617 North: 4,712,404

New WTG Shadow receptor

Isolines showing shadow in Shadow hours|per year. Real value calculation.

10 25 50 100

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, Mid Western part
9 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
1000 meter max shadow distance applied along with default 3° inclination
Sunshine probabilities applied (pdf plots)
Directional run-hours applied from tab file (tower 1)
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SHADOW - Main Result

Calculation: Mid Western part

Assumptions for shadow calculations

Maximum distance for influence	1,000	m
Minimum sun height over horizon for influence	3	°
Day step for calculation	1	days
Time step for calculation	2	minutes

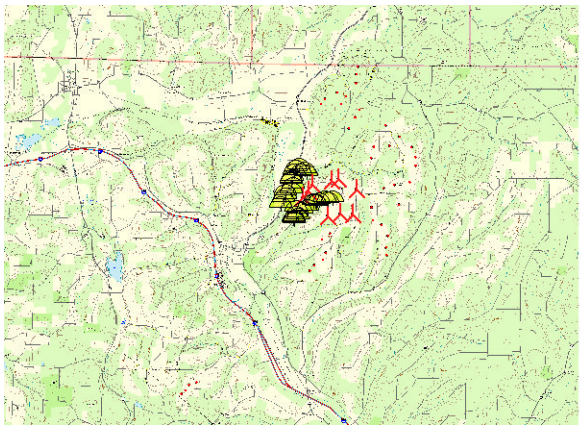
Sun shine probabilities (part of time from sun rise to sun set with sun shine)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.35	0.45	0.45	0.55	0.55	0.55	0.65	0.55	0.55	0.45	0.35	0.30

Operational hours are calculated from WTGs in calculation and wind distribution:
'Cohocton-1 80m LT projection'

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
475	585	238	199	220	474	1,184	813	840	1,246	803	479	7,555



Scale 1:350,000

New WTG Shadow receptor

WTGs

	UTM NAD27 Zone: 18					WTG type						
	East	North	Z [m]	Row data/Description	Valid	Manufact.	Type	Power [kW]	Diam. [m]	Height [m]	RPM [RPM]
23	300,296	4,710,749	599	23	Yes	GAMESA	G87/2000	2,000	87.0	78.0	16.7
24	299,474	4,711,242	580	24	Yes	GAMESA	G87/2000	2,000	87.0	78.0	16.7
25	299,142	4,711,180	580	25	Yes	GAMESA	G87/2000	2,000	87.0	78.0	16.7
26	298,246	4,711,001	560	26	Yes	GAMESA	G87/2000	2,000	87.0	78.0	16.7
27	298,043	4,710,702	560	27	Yes	GAMESA	G87/2000	2,000	87.0	78.0	16.7
28	297,794	4,710,451	560	28	Yes	GAMESA	G87/2000	2,000	87.0	78.0	16.7
29	298,935	4,709,555	580	29	Yes	GAMESA	G87/2000	2,000	87.0	78.0	16.7
30	299,525	4,709,635	599	30	Yes	GAMESA	G87/2000	2,000	87.0	78.0	16.7
31	300,072	4,709,586	600	31	Yes	GAMESA	G87/2000	2,000	87.0	78.0	16.7

Shadow receptor-Input

		UTM NAD27 Zone: 18							
No.	Name	East	North	Z [m]	Width [m]	Height [m]	Height a.g.l. [m]	Degrees from south cw [°]	Slope of window [°]
745	745	297,932	4,711,576	420	1.0	1.0	1.0	0.0	0.0
746	746	298,010	4,711,435	440	1.0	1.0	1.0	0.0	0.0
747	747	297,734	4,711,495	420	1.0	1.0	1.0	0.0	0.0
748	748	297,670	4,711,755	420	1.0	1.0	1.0	0.0	0.0
749	749	297,504	4,711,650	415	1.0	1.0	1.0	0.0	0.0
750	750	297,428	4,711,509	414	1.0	1.0	1.0	0.0	0.0
751	751	297,328	4,711,207	414	1.0	1.0	1.0	0.0	0.0
752	752	297,293	4,711,146	413	1.0	1.0	1.0	0.0	0.0
753	753	297,267	4,711,084	411	1.0	1.0	1.0	0.0	0.0
754	754	297,376	4,710,886	421	1.0	1.0	1.0	0.0	0.0
755	755	297,278	4,710,631	419	1.0	1.0	1.0	0.0	0.0
756	756	296,999	4,710,587	400	1.0	1.0	1.0	0.0	0.0
757	757	296,998	4,710,386	403	1.0	1.0	1.0	0.0	0.0
758	758	296,880	4,710,280	400	1.0	1.0	1.0	0.0	0.0
759	759	296,743	4,709,998	400	1.0	1.0	1.0	0.0	0.0
765	765	297,348	4,709,251	471	1.0	1.0	1.0	0.0	0.0
766	766	297,316	4,709,304	479	1.0	1.0	1.0	0.0	0.0
767	767	297,380	4,709,350	480	1.0	1.0	1.0	0.0	0.0
825	825	299,186	4,710,204	540	1.0	1.0	1.0	0.0	0.0
826	826	298,965	4,710,172	534	1.0	1.0	1.0	0.0	0.0
827	827	298,794	4,710,225	526	1.0	1.0	1.0	0.0	0.0

Continued on next page...

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, Mid Western part
9 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
1000 meter max shadow distance applied along with default 3° inclination
Sunshine probabilities applied (pdf plots)
Directional run-hours applied from tab file (tower 1)
.

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7660 Whitegate Avenue
US-RIVERSIDE, CA 92506

Calculated:
03/01/06 23:22/2.4.0.67

SHADOW - Main Result

Calculation: Mid Western part

...continued from previous page

UTM NAD27 Zone: 18

No.	Name	East	North	Z	Width	Height	Height a.g.l.	Degrees from south cw	Slope of window
				[m]	[m]	[m]	[m]	[°]	[°]
828	828	298,552	4,710,122	520	1.0	1.0	1.0	0.0	0.0
829	829	298,392	4,710,045	505	1.0	1.0	1.0	0.0	0.0
830	830	298,360	4,710,104	507	1.0	1.0	1.0	0.0	0.0
831	831	298,258	4,710,068	500	1.0	1.0	1.0	0.0	0.0
832	832	297,998	4,709,837	500	1.0	1.0	1.0	0.0	0.0
833	833	297,740	4,709,688	485	1.0	1.0	1.0	0.0	0.0
834	834	297,471	4,709,819	500	1.0	1.0	1.0	0.0	0.0
835	835	297,435	4,709,558	480	1.0	1.0	1.0	0.0	0.0
836	836	297,532	4,709,465	480	1.0	1.0	1.0	0.0	0.0

Calculation Results

		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]
745	745	29:36	64	0:32	5:19
746	746	50:54	94	0:40	9:37
747	747	16:16	44	0:28	3:25
748	748	13:36	44	0:22	2:20
749	749	10:22	38	0:22	2:02
750	750	7:52	29	0:22	1:54
751	751	20:40	80	0:24	4:47
752	752	36:06	112	0:26	7:40
753	753	38:44	134	0:26	8:20
754	754	44:18	124	0:34	11:02
755	755	32:32	85	0:34	9:00
756	756	9:26	30	0:24	2:37
757	757	12:56	40	0:26	3:44
758	758	12:26	44	0:22	3:44
759	759	0:00	0	0:00	0:00
765	765	0:00	0	0:00	0:00
766	766	0:00	0	0:00	0:00
767	767	0:00	0	0:00	0:00
825	825	0:00	0	0:00	0:00
826	826	29:10	74	0:28	5:09
827	827	13:58	48	0:22	2:38
828	828	28:14	78	0:26	8:51
829	829	22:26	61	0:30	4:15
830	830	27:54	76	0:28	4:58
831	831	13:34	42	0:26	2:44
832	832	6:56	26	0:20	1:37
833	833	0:00	0	0:00	0:00
834	834	0:00	0	0:00	0:00
835	835	0:00	0	0:00	0:00
836	836	0:00	0	0:00	0:00

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, Mid Western part
9 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
1000 meter max shadow distance applied along with default 3° inclination
Sunshine probabilities applied (pdf plots)
Directional run-hours applied from tab file (tower 1)
.

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03/01/06 23:22/2.4.0.67

SHADOW - Calendar

Calculation: Mid Western part **Shadow receptor:** 745 - 745

Assumptions for shadow calculations

Maximum distance for influence	1,000 m
Minimum sun height over horizon for influence	3 °
Day step for calculation	1 days
Time step for calculation	2 minutes

Sun shine probabilities (part of time from sun rise to sun set with sun shine)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.35	0.45	0.45	0.55	0.55	0.55	0.65	0.55	0.55	0.45	0.35	0.30

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
475	585	238	199	220	474	1,184	813	840	1,246	803	479	7,555

	January			February	March	April	May	June	July	August	September	October	November			December		
1	07:40		09:52 (3)	07:25	06:47	05:54	06:06	05:36	05:36	06:02	06:34	07:07	06:43			07:20		09:38 (3)
	16:47	32	10:24 (3)	17:23	17:59	18:36	20:08	20:40	20:52	20:32	19:46	18:53	17:04			16:38	30	10:08 (3)
2	07:40		09:52 (3)	07:24	06:46	05:52	06:05	05:35	05:37	06:03	06:36	07:08	06:44			07:21		09:39 (3)
	16:48	32	10:24 (3)	17:25	18:00	18:37	20:10	20:41	20:52	20:31	19:44	18:51	17:03			16:38	30	10:09 (3)
3	07:40		09:52 (3)	07:23	06:44	05:51	06:04	05:35	05:37	06:04	06:37	07:09	06:46			07:22		09:38 (3)
	16:49	32	10:24 (3)	17:26	18:02	18:38	20:11	20:41	20:52	20:30	19:42	18:50	17:02			16:38	30	10:08 (3)
4	07:40		09:51 (3)	07:22	06:42	05:49	06:02	05:35	05:38	06:05	06:38	07:10	06:47			07:23		09:39 (3)
	16:50	32	10:23 (3)	17:27	18:03	18:39	20:12	20:42	20:51	20:29	19:41	18:48	17:01			16:38	30	10:09 (3)
5	07:40		09:53 (3)	07:21	06:41	06:47	06:01	05:34	05:38	06:06	06:39	07:11	06:48			07:24		09:38 (3)
	16:51	30	10:23 (3)	17:28	18:04	19:40	20:13	20:43	20:51	20:28	19:39	18:46	16:59			16:37	32	10:10 (3)
6	07:40		09:53 (3)	07:20	06:39	06:45	06:00	05:34	05:39	06:07	06:40	07:12	06:49			07:25		09:39 (3)
	16:52	32	10:25 (3)	17:30	18:05	19:41	20:14	20:44	20:51	20:26	19:37	18:44	16:58			16:37	32	10:11 (3)
7	07:40		09:53 (3)	07:19	06:37	06:44	05:58	05:33	05:40	06:08	06:41	07:13	06:51			07:26		09:40 (3)
	16:53	32	10:25 (3)	17:31	18:07	19:42	20:15	20:44	20:51	20:25	19:36	18:43	16:57			16:37	30	10:10 (3)
8	07:40		09:55 (3)	07:17	06:36	06:42	05:57	05:33	05:40	06:09	06:42	07:14	06:52			07:27		09:41 (3)
	16:54	30	10:25 (3)	17:32	18:08	19:44	20:16	20:45	20:50	20:24	19:34	18:41	16:56			16:37	30	10:11 (3)
9	07:40		09:54 (3)	07:16	06:34	06:40	05:56	05:33	05:41	06:10	06:43	07:16	06:53			07:28		09:40 (3)
	16:55	30	10:24 (3)	17:34	18:09	19:45	20:17	20:46	20:50	20:23	19:32	18:39	16:55			16:37	32	10:12 (3)
10	07:40		09:56 (3)	07:15	06:32	06:39	05:55	05:33	05:42	06:11	06:44	07:17	06:54			07:29		09:41 (3)
	16:56	30	10:26 (3)	17:35	18:10	19:46	20:18	20:46	20:50	20:21	19:30	18:38	16:54			16:37	32	10:13 (3)
11	07:39		09:56 (3)	07:14	06:31	06:37	05:54	05:33	05:43	06:12	06:45	07:18	06:56			07:29		09:42 (3)
	16:57	30	10:26 (3)	17:36	18:11	19:47	20:20	20:47	20:49	20:20	19:29	18:36	16:53			16:37	32	10:14 (3)
12	07:39		09:57 (3)	07:12	06:29	06:35	05:52	05:32	05:43	06:13	06:46	07:19	06:57			07:30		09:43 (3)
	16:58	28	10:25 (3)	17:38	18:13	19:48	20:21	20:47	20:49	20:18	19:27	18:34	16:52			16:37	30	10:13 (3)
13	07:39		09:57 (3)	07:11	06:27	06:34	05:51	05:32	05:44	06:14	06:47	07:20	06:58			07:31		09:41 (3)
	17:00	28	10:25 (3)	17:39	18:14	19:49	20:22	20:48	20:48	20:17	19:25	18:33	16:51			16:37	32	10:13 (3)
14	07:38		09:59 (3)	07:10	06:25	06:32	05:50	05:32	05:45	06:15	06:48	07:21	06:59			07:32		09:42 (3)
	17:01	26	10:25 (3)	17:40	18:15	19:50	20:23	20:48	20:48	20:16	19:23	18:31	16:50			16:38	32	10:14 (3)
15	07:38		10:00 (3)	07:08	06:24	06:30	05:49	05:32	05:46	06:16	06:49	07:23	07:01			07:33		09:43 (3)
	17:02	24	10:24 (3)	17:42	18:16	19:51	20:24	20:49	20:47	20:14	19:21	18:29	16:49			16:38	32	10:15 (3)
16	07:37		09:59 (3)	07:07	06:22	06:29	05:48	05:32	05:46	06:17	06:50	07:24	07:02			07:33		09:44 (3)
	17:03	26	10:25 (3)	17:43	18:17	19:53	20:25	20:49	20:46	20:13	19:20	18:28	16:48			16:38	32	10:16 (3)
17	07:37		10:01 (3)	07:05	06:20	06:27	05:47	05:32	05:47	06:18	06:51	07:25	07:03			07:34		09:44 (3)
	17:04	24	10:25 (3)	17:44	18:18	19:54	20:26	20:50	20:46	20:11	19:18	18:26	16:47			16:38	32	10:16 (3)
18	07:36		10:02 (3)	07:04	06:19	06:26	05:46	05:32	05:48	06:20	06:53	07:26	07:04			07:35		09:45 (3)
	17:05	22	10:24 (3)	17:45	18:20	19:55	20:27	20:50	20:45	20:10	19:16	18:25	16:46			16:39	32	10:17 (3)
19	07:36		10:04 (3)	07:03	06:17	06:24	05:45	05:32	05:49	06:21	06:54	07:27	07:06			07:35		09:46 (3)
	17:07	20	10:24 (3)	17:47	18:21	19:56	20:28	20:50	20:44	20:08	19:14	18:23	16:45			16:39	32	10:18 (3)
20	07:35		10:05 (3)	07:01	06:15	06:22	05:44	05:33	05:50	06:22	06:55	07:28	07:07		09:46 (3)	07:36		09:46 (3)
	17:08	16	10:21 (3)	17:48	18:22	19:57	20:29	20:51	20:44	20:07	19:13	18:22	16:44	6	09:52 (3)	16:39	30	10:16 (3)
21	07:35		10:06 (3)	07:00	06:13	06:21	05:43	05:33	05:51	06:23	06:56	07:30	07:08		09:44 (3)	07:36		09:47 (3)
	17:09	14	10:20 (3)	17:49	18:23	19:58	20:30	20:51	20:43	20:05	19:11	18:20	16:44	12	09:56 (3)	16:40	30	10:17 (3)
22	07:34		10:11 (3)	06:58	06:12	06:19	05:43	05:33	05:52	06:24	06:57	07:31	07:09		09:41 (3)	07:37		09:47 (3)
	17:10	6	10:17 (3)	17:51	18:24	19:59	20:31	20:51	20:42	20:04	19:09	18:18	16:43	16	09:57 (3)	16:40	30	10:17 (3)
23	07:33			06:57	06:10	06:18	05:42	05:33	05:53	06:25	06:58	07:32	07:11		09:40 (3)	07:37		09:48 (3)
	17:12			17:52	18:25	20:01	20:32	20:51	20:41	20:02	19:07	18:17	16:42	20	10:00 (3)	16:41	30	10:18 (3)
24	07:32			06:55	06:08	06:16	05:41	05:33	05:54	06:26	06:59	07:33	07:12		09:40 (3)	07:38		09:48 (3)
	17:13			17:53	18:26	20:01	20:33	20:52	20:40	20:01	19:05	18:15	16:42	22	10:02 (3)	16:41	30	10:18 (3)
25	07:32			06:53	06:06	06:15	05:40	05:34	05:55	06:27	07:00	06:34	07:13		09:39 (3)	07:38		09:48 (3)
	17:14			17:54	18:28	20:02	20:34	20:52	20:39	19:57	19:04	17:14	16:41	24	10:03 (3)	16:42	32	10:20 (3)
26	07:31			06:52	06:05	06:13	05:40	05:34	05:56	06:28	07:01	06:36	07:14		09:38 (3)	07:39		09:49 (3)
	17:15			17:56	18:29	20:03	20:35	20:52	20:38	19:56	19:02	17:13	16:41	26	10:04 (3)	16:43	32	10:21 (3)
27	07:30			06:50	06:03	06:12	05:39	05:34	05:57	06:29	07:02	06:37	07:15		09:39 (3)	07:39		09:49 (3)
	17:17			17:57	18:30	20:04	20:36	20:52	20:38	19:54	19:00	17:11	16:40	26	10:05 (3)	16:43	32	10:21 (3)
28	07:29			06:49	06:01	06:10	05:38	05:35	05:58	06:30	07:03	06:38	07:16		09:38 (3)	07:39		09:49 (3)
	17:18			17:58	18:31	20:05	20:36	20:52	20:37	19:53	18:58	17:10	16:40	26	10:04 (3)	16:44	32	10:21 (3)
29	07:28				05:59	06:09	05:38	05:35	05:59	06:31	07:04	06:39	07:17		09:38 (3)	07:40		09:49 (3)
	17:19				18:32	20:06	20:37	20:52	20:36	19:51	18:57	17:08	16:39	28	10:06 (3)	16:45	32	10:21 (3)
30	07:27				05:58	06:08	05:37	05:36	06:00	06:32	07:06	06:41	07:19		09:39 (3)	07:40		09:49 (3)
	17:21				18:33	20:07	20:38	20:52	20:34	19:49	18:55	17:07	16:39	28	10:07 (3)	16:46	32	10:21 (3)
31	07:26				05:56		05:36		06:01	06:33		06:42				07:40		09:52 (3)
	17:22				18:34		20:39		20:33	19:48		17:06				16:46	30	10:22 (3)
Potential sun hours	293			295	370	209	-292	-263	-280	-145	375	343	294			283		
Total, worst case		576												234			966	
Sun reduction		0.35												0.35			0.30	
Oper. time red.		0.86												0.86			0.86	
Wind dir. red.		0.65												0.65			0.65	
Total reduction		0.20												0.20			0.17	
Total, real		112												46			162	

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	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, Mid Western part
9 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
1000 meter max shadow distance applied along with default 3° inclination
Sunshine probabilities applied (pdf plots)
Directional run-hours applied from tab file (tower 1)
.

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US-RIVERSIDE, CA 92506

Calculated:
03/01/06 23:22/2.4.0.67

SHADOW - Calendar

Calculation: Mid Western part **Shadow receptor:** 746 - 746

Assumptions for shadow calculations

Maximum distance for influence	1,000	m
Minimum sun height over horizon for influence	3	°
Day step for calculation	1	days
Time step for calculation	2	minutes

Sun shine probabilities (part of time from sun rise to sun set with sun shine)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.35	0.45	0.45	0.55	0.55	0.55	0.65	0.55	0.55	0.45	0.35	0.30

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
475	585	238	199	220	474	1,184	813	840	1,246	803	479	7,555

	January		February		March	April	May	June	July	August	September	October	November		December	
1	07:40	10:00 (3)	07:25	10:08 (3)	06:47	05:54	06:06	05:36	05:36	06:02	06:34	07:07	06:43		07:20	09:42 (3)
	16:47 30	10:30 (3)	17:23 30	10:38 (3)	17:59	18:36	20:08	20:40	20:52	20:32	19:46	18:53	17:04		16:38 36	10:18 (3)
2	07:40	10:00 (3)	07:24	10:09 (3)	06:46	05:52	06:05	05:35	05:37	06:03	06:36	07:08	06:44		07:21	09:43 (3)
	16:48 30	10:30 (3)	17:25 26	10:35 (3)	18:00	18:37	20:10	20:41	20:52	20:31	19:44	18:51	17:03		16:38 36	10:19 (3)
3	07:40	09:59 (3)	07:23	10:10 (3)	06:44	05:51	06:04	05:35	05:37	06:04	06:37	07:09	06:46		07:22	09:42 (3)
	16:49 30	10:29 (3)	17:26 24	10:34 (3)	18:02	18:38	20:11	20:41	20:52	20:30	19:42	18:50	17:02		16:38 36	10:18 (3)
4	07:40	09:59 (3)	07:22	10:13 (3)	06:42	05:49	06:02	05:35	05:38	06:05	06:38	07:10	06:47		07:23	09:43 (3)
	16:50 32	10:31 (3)	17:27 20	10:33 (3)	18:03	18:39	20:12	20:42	20:51	20:29	19:41	18:48	17:01		16:38 36	10:19 (3)
5	07:40	09:59 (3)	07:21	10:16 (3)	06:41	06:47	06:01	05:34	05:38	06:06	06:39	07:11	06:48	09:48 (3)	07:24	09:44 (3)
	16:51 32	10:31 (3)	17:28 14	10:30 (3)	18:04	19:40	20:13	20:43	20:51	20:28	19:39	18:46	16:59 6	09:54 (3)	16:37 34	10:18 (3)
6	07:40	09:59 (3)	07:20	10:20 (3)	06:39	06:45	06:00	05:34	05:39	06:07	06:40	07:12	06:49	09:44 (3)	07:25	09:45 (3)
	16:52 34	10:33 (3)	17:30 4	10:24 (3)	18:05	19:41	20:14	20:44	20:51	20:26	19:37	18:44	16:58 16	10:00 (3)	16:37 34	10:19 (3)
7	07:40	09:59 (3)	07:19		06:37	06:44	05:58	05:33	05:40	06:08	06:41	07:13	06:51	09:41 (3)	07:26	09:46 (3)
	16:53 34	10:33 (3)	17:31		18:07	19:42	20:15	20:44	20:51	20:25	19:36	18:43	16:57 22	10:03 (3)	16:37 32	10:18 (3)
8	07:40	09:59 (3)	07:17		06:36	06:42	05:57	05:33	05:40	06:09	06:42	07:14	06:52	09:40 (3)	07:27	09:47 (3)
	16:54 36	10:35 (3)	17:32		18:08	19:44	20:16	20:45	20:50	20:24	19:34	18:41	16:56 24	10:04 (3)	16:37 32	10:19 (3)
9	07:40	09:58 (3)	07:16		06:34	06:40	05:56	05:33	05:41	06:10	06:43	07:16	06:53	09:40 (3)	07:28	09:48 (3)
	16:55 36	10:34 (3)	17:34		18:09	19:45	20:17	20:46	20:50	20:23	19:32	18:39	16:55 28	10:08 (3)	16:37 30	10:18 (3)
10	07:40	10:00 (3)	07:15		06:32	06:39	05:55	05:33	05:42	06:11	06:44	07:17	06:54	09:39 (3)	07:29	09:49 (3)
	16:56 36	10:36 (3)	17:35		18:10	19:46	20:18	20:46	20:50	20:21	19:30	18:38	16:54 30	10:09 (3)	16:37 30	10:19 (3)
11	07:39	10:00 (3)	07:14		06:31	06:37	05:54	05:33	05:43	06:12	06:45	07:18	06:56	09:36 (3)	07:29	09:50 (3)
	16:57 36	10:36 (3)	17:36		18:11	19:47	20:19	20:47	20:49	20:20	19:29	18:36	16:53 34	10:10 (3)	16:37 30	10:20 (3)
12	07:39	09:59 (3)	07:12		06:29	06:35	05:52	05:32	05:43	06:13	06:46	07:19	06:57	09:36 (3)	07:30	09:51 (3)
	16:58 38	10:37 (3)	17:38		18:13	19:48	20:21	20:47	20:49	20:18	19:27	18:34	16:52 34	10:10 (3)	16:37 28	10:19 (3)
13	07:39	09:59 (3)	07:11		06:27	06:34	05:51	05:32	05:44	06:14	06:47	07:20	06:58	09:37 (3)	07:31	09:51 (3)
	17:00 38	10:37 (3)	17:39		18:14	19:49	20:22	20:48	20:48	20:17	19:25	18:33	16:51 34	10:11 (3)	16:37 28	10:19 (3)
14	07:38	10:01 (3)	07:10		06:25	06:32	05:50	05:32	05:45	06:15	06:48	07:21	06:59	09:37 (3)	07:32	09:50 (3)
	17:01 38	10:39 (3)	17:40		18:15	19:50	20:23	20:48	20:48	20:16	19:23	18:31	16:50 36	10:13 (3)	16:38 30	10:20 (3)
15	07:38	10:00 (3)	07:08		06:24	06:30	05:49	05:32	05:46	06:16	06:49	07:23	07:01	09:36 (3)	07:33	09:51 (3)
	17:02 38	10:38 (3)	17:42		18:16	19:51	20:24	20:49	20:47	20:14	19:21	18:29	16:49 38	10:14 (3)	16:38 28	10:19 (3)
16	07:37	09:59 (3)	07:07		06:22	06:29	05:48	05:32	05:46	06:17	06:50	07:24	07:02	09:35 (3)	07:33	09:52 (3)
	17:03 40	10:39 (3)	17:43		18:17	19:53	20:25	20:49	20:46	20:13	19:20	18:28	16:48 38	10:13 (3)	16:38 28	10:20 (3)
17	07:37	10:01 (3)	07:05		06:20	06:27	05:47	05:32	05:47	06:18	06:51	07:25	07:03	09:37 (3)	07:34	09:52 (3)
	17:04 38	10:39 (3)	17:44		18:18	19:54	20:26	20:50	20:46	20:11	19:18	18:26	16:47 38	10:15 (3)	16:38 28	10:20 (3)
18	07:36	10:00 (3)	07:04		06:18	06:26	05:46	05:32	05:48	06:20	06:53	07:26	07:04	09:36 (3)	07:35	09:53 (3)
	17:05 40	10:40 (3)	17:45		18:20	19:55	20:27	20:50	20:45	20:10	19:16	18:25	16:46 40	10:16 (3)	16:39 28	10:21 (3)
19	07:36	10:00 (3)	07:03		06:17	06:24	05:45	05:32	05:49	06:21	06:54	07:27	07:06	09:35 (3)	07:35	09:54 (3)
	17:07 40	10:40 (3)	17:47		18:21	19:56	20:28	20:50	20:44	20:08	19:14	18:23	16:45 40	10:15 (3)	16:39 28	10:22 (3)
20	07:35	10:01 (3)	07:01		06:15	06:22	05:44	05:33	05:50	06:22	06:55	07:28	07:07	09:36 (3)	07:36	09:54 (3)
	17:08 40	10:41 (3)	17:48		18:22	19:57	20:29	20:51	20:44	20:07	19:13	18:22	16:44 40	10:16 (3)	16:39 28	10:22 (3)
21	07:35	10:00 (3)	07:00		06:13	06:21	05:43	05:33	05:51	06:23	06:56	07:30	07:08	09:36 (3)	07:36	09:55 (3)
	17:09 40	10:40 (3)	17:49		18:23	19:58	20:30	20:51	20:43	20:05	19:11	18:20	16:44 40	10:16 (3)	16:40 26	10:21 (3)
22	07:34	10:01 (3)	06:58		06:12	06:19	05:43	05:33	05:52	06:24	06:57	07:31	07:09	09:37 (3)	07:37	09:55 (3)
	17:10 40	10:41 (3)	17:51		18:24	19:59	20:31	20:51	20:42	20:04	19:09	18:18	16:43 40	10:17 (3)	16:40 26	10:21 (3)
23	07:33	10:01 (3)	06:57		06:10	06:18	05:42	05:33	05:53	06:25	06:58	07:32	07:11	09:36 (3)	07:37	09:56 (3)
	17:12 40	10:41 (3)	17:52		18:25	20:01	20:32	20:51	20:41	20:02	19:07	18:17	16:42 40	10:16 (3)	16:41 26	10:22 (3)
24	07:32	10:02 (3)	06:55		06:08	06:16	05:41	05:33	05:54	06:26	06:59	07:33	07:12	09:38 (3)	07:38	09:56 (3)
	17:13 40	10:42 (3)	17:53		18:26	20:01	20:33	20:52	20:40	20:01	19:05	18:15	16:42 40	10:18 (3)	16:41 28	10:24 (3)
25	07:32	10:03 (3)	06:53		06:06	06:15	05:40	05:34	05:55	06:27	07:00	06:34	07:13	09:39 (3)	07:38	09:56 (3)
	17:14 38	10:41 (3)	17:54		18:28	20:02	20:34	20:52	20:39	19:57	19:04	17:14	16:41 38	10:17 (3)	16:42 28	10:24 (3)
26	07:31	10:02 (3)	06:52		06:05	06:13	05:40	05:34	05:56	06:28	07:01	06:36	07:14	09:38 (3)	07:39	09:57 (3)
	17:15 38	10:40 (3)	17:56		18:29	20:03	20:35	20:52	20:38	19:56	19:02	17:13	16:41 40	10:18 (3)	16:43 28	10:25 (3)
27	07:30	10:03 (3)	06:50		06:03	06:12	05:39	05:34	05:57	06:29	07:02	06:37	07:15	09:39 (3)	07:39	09:57 (3)
	17:17 38	10:41 (3)	17:57		18:30	20:04	20:36	20:52	20:38	19:54	19:00	17:11	16:40 38	10:17 (3)	16:43 28	10:25 (3)
28	07:29	10:04 (3)	06:49		06:01	06:10	05:38	05:35	05:58	06:30	07:03	06:38	07:16	09:40 (3)	07:39	09:57 (3)
	17:18 36	10:40 (3)	17:58		18:31	20:05	20:36	20:52	20:37	19:53	18:58	17:10	16:40 38	10:18 (3)	16:44 28	10:25 (3)
29	07:28	10:05 (3)			05:59	06:09	05:38	05:35	05:59	06:31	07:04	06:39	07:17	09:40 (3)	07:40	09:57 (3)
	17:19 34	10:39 (3)			18:32	20:06	20:37	20:52	20:35	19:51	18:57	17:08	16:39 38	10:18 (3)	16:45 28	10:25 (3)
30	07:27	10:06 (3)			05:58	06:08	05:37	05:36	06:00	06:32	07:06	06:41	07:19	09:41 (3)	07:40	09:57 (3)
	17:21 32	10:38 (3)			18:33	20:07	20:38	20:52	20:34	19:49	18:55	17:07	16:39 38	10:19 (3)	16:46 30	10:27 (3)
31	07:26	10:07 (3)			05:56		05:36		06:01	06:33		06:42			07:40	10:00 (3)
	17:22 32	10:39 (3)			18:34		20:39		20:33	19:48		17:06			16:46 28	10:28 (3)
Potential sun hours	293		295		370	209	-292	-263	-280	-145	375	343	294		283	
Total, worst case		1124		118										888		924
Sun reduction		0.35		0.45										0.35		0.30
Oper. time red.		0.86		0.86										0.86		0.86
Wind dir. red.		0.65		0.65										0.65		0.65
Total reduction		0.20		0.25										0.20		0.17
Total, real		220		30										173		155

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	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, Mid Western part
9 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
1000 meter max shadow distance applied along with default 3° inclination
Sunshine probabilities applied (pdf plots)
Directional run-hours applied from tab file (tower 1)
.

Printed/Page
03/05/06 23:05 / 5

Licensed user:
Wind Engineers, Inc.
7660 Whitegate Avenue
US-RIVERSIDE, CA 92506

Calculated:
03/01/06 23:22/2.4.0.67

SHADOW - Calendar

Calculation: Mid Western part **Shadow receptor:** 747 - 747

Assumptions for shadow calculations

Maximum distance for influence	1,000 m
Minimum sun height over horizon for influence	3 °
Day step for calculation	1 days
Time step for calculation	2 minutes

Sun shine probabilities (part of time from sun rise to sun set with sun shine)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.35	0.45	0.45	0.55	0.55	0.55	0.65	0.55	0.55	0.45	0.35	0.30

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
475	585	238	199	220	474	1,184	813	840	1,246	803	479	7,555

	January		February		March	April	May	June	July	August	September	October		November		December
1	07:40		07:25		09:00 (3)	06:47	05:54	06:06	05:36	05:36	06:02	06:34	07:07	06:43		08:31 (3)	07:20
	16:47		17:23	26	09:26 (3)	17:59	18:36	20:08	20:40	20:52	20:32	19:46	18:53	17:04	24	08:55 (3)	16:38
2	07:40		07:24		08:59 (3)	06:46	05:52	06:05	05:35	05:37	06:03	06:36	07:08	06:44		08:30 (3)	07:21
	16:48		17:25	28	09:27 (3)	18:00	18:37	20:10	20:41	20:52	20:31	19:44	18:51	17:03	26	08:56 (3)	16:38
3	07:40		07:23		09:00 (3)	06:44	05:51	06:04	05:35	05:37	06:04	06:37	07:09	06:46		08:30 (3)	07:22
	16:49		17:26	28	09:28 (3)	18:02	18:38	20:11	20:41	20:52	20:30	19:42	18:50	17:02	26	08:56 (3)	16:38
4	07:40		07:22		08:59 (3)	06:42	05:49	06:02	05:35	05:38	06:05	06:38	07:10	06:47		08:29 (3)	07:23
	16:50		17:27	28	09:27 (3)	18:03	18:39	20:12	20:42	20:51	20:29	19:41	18:48	17:01	28	08:57 (3)	16:38
5	07:40		07:21		09:00 (3)	06:41	06:47	06:01	05:34	05:38	06:06	06:39	07:11	06:48		08:30 (3)	07:24
	16:51		17:29	28	09:28 (3)	18:04	19:40	20:13	20:43	20:51	20:28	19:39	18:46	16:59	26	08:56 (3)	16:37
6	07:40		07:20		09:00 (3)	06:39	06:46	06:00	05:34	05:39	06:07	06:40	07:12	06:49		08:30 (3)	07:25
	16:52		17:30	26	09:26 (3)	18:05	19:41	20:14	20:44	20:51	20:26	19:37	18:44	16:58	28	08:58 (3)	16:37
7	07:40		07:19		08:59 (3)	06:37	06:44	05:58	05:34	05:40	06:08	06:41	07:13	06:51		08:29 (3)	07:26
	16:53		17:31	28	09:27 (3)	18:07	19:42	20:15	20:44	20:51	20:25	19:36	18:43	16:57	28	08:57 (3)	16:37
8	07:40		07:17		09:00 (3)	06:36	06:42	05:57	05:33	05:40	06:09	06:42	07:14	06:52		08:30 (3)	07:27
	16:54		17:32	26	09:26 (3)	18:08	19:44	20:16	20:45	20:50	20:24	19:34	18:41	16:56	28	08:58 (3)	16:37
9	07:40		07:16		09:01 (3)	06:34	06:40	05:56	05:33	05:41	06:10	06:43	07:16	06:53		08:30 (3)	07:28
	16:55		17:34	26	09:27 (3)	18:09	19:45	20:17	20:46	20:50	20:23	19:32	18:39	16:55	28	08:58 (3)	16:37
10	07:40		07:15		09:01 (3)	06:32	06:39	05:55	05:33	05:42	06:11	06:44	07:17	06:54		08:31 (3)	07:29
	16:56		17:35	24	09:25 (3)	18:10	19:46	20:18	20:46	20:50	20:21	19:30	18:38	16:54	26	08:57 (3)	16:37
11	07:39		07:14		09:02 (3)	06:31	06:37	05:54	05:33	05:43	06:12	06:45	07:18	06:56		08:30 (3)	07:29
	16:57		17:36	22	09:24 (3)	18:11	19:47	20:20	20:47	20:49	20:20	19:29	18:36	16:53	26	08:56 (3)	16:37
12	07:39		07:12		09:05 (3)	06:29	06:35	05:52	05:32	05:43	06:13	06:46	07:19	06:57		08:32 (3)	07:30
	16:58		17:38	18	09:23 (3)	18:13	19:48	20:21	20:47	20:49	20:19	19:27	18:34	16:52	24	08:56 (3)	16:37
13	07:39		07:11		09:05 (3)	06:27	06:34	05:51	05:32	05:44	06:14	06:47	07:20	06:58		08:33 (3)	07:31
	17:00		17:39	16	09:21 (3)	18:14	19:49	20:22	20:48	20:48	20:17	19:25	18:33	16:51	24	08:57 (3)	16:37
14	07:38		07:10		09:08 (3)	06:25	06:32	05:50	05:32	05:45	06:15	06:48	07:21	06:59		08:35 (3)	07:32
	17:01		17:40	10	09:18 (3)	18:15	19:50	20:23	20:48	20:48	20:16	19:23	18:31	16:50	22	08:57 (3)	16:38
15	07:38		07:08			06:24	06:30	05:49	05:32	05:46	06:16	06:49	07:23	07:01		08:36 (3)	07:33
	17:02		17:42			18:16	19:51	20:24	20:49	20:47	20:14	19:21	18:29	16:49	18	08:54 (3)	16:38
16	07:37		07:07			06:22	06:29	05:48	05:32	05:47	06:17	06:50	07:24	07:02		08:37 (3)	07:33
	17:03		17:43			18:17	19:53	20:25	20:49	20:46	20:13	19:20	18:28	16:48	16	08:53 (3)	16:38
17	07:37		07:05			06:20	06:27	05:47	05:32	05:47	06:18	06:51	07:25	07:03		08:39 (3)	07:34
	17:04		17:44			18:18	19:54	20:26	20:50	20:46	20:11	19:18	18:26	16:47	14	08:53 (3)	16:38
18	07:36		07:04			06:19	06:26	05:46	05:32	05:48	06:20	06:53	07:26	07:04		08:42 (3)	07:35
	17:05		17:45			18:20	19:55	20:27	20:50	20:45	20:10	19:16	18:25	16:46	8	08:50 (3)	16:39
19	07:36		07:03			06:17	06:24	05:45	05:32	05:49	06:21	06:54	07:27	07:06			07:35
	17:07		17:47			18:21	19:56	20:28	20:50	20:44	20:08	19:14	18:23	16:45			16:39
20	07:35		07:01			06:15	06:22	05:44	05:33	05:50	06:22	06:55	07:28	07:07			07:36
	17:08		17:48			18:22	19:57	20:29	20:51	20:44	20:07	19:13	18:22	16:44			16:39
21	07:35		07:00			06:13	06:21	05:43	05:33	05:51	06:23	06:56	07:30	07:08			07:36
	17:09		17:49			18:23	19:58	20:30	20:51	20:43	20:05	19:11	18:20	16:44			16:40
22	07:34		06:58			06:12	06:19	05:43	05:33	05:52	06:24	06:57	07:31	07:09			07:37
	17:10		17:51			18:24	19:59	20:31	20:51	20:42	20:04	19:09	18:18	16:43			16:40
23	07:33		06:57			06:10	06:18	05:42	05:33	05:53	06:25	06:58	07:32	07:11			07:37
	17:12		17:52			18:25	20:01	20:32	20:51	20:41	20:02	19:07	18:17	16:42			16:41
24	07:32		09:08 (3)	06:55		06:08	06:16	05:41	05:34	05:54	06:26	06:59	07:33	07:12			07:38
	17:13	8	09:16 (3)	17:53		18:26	20:01	20:33	20:52	20:40	20:01	19:05	18:15	16:42			16:41
25	07:32		09:05 (3)	06:53		06:06	06:15	05:40	05:34	05:55	06:27	07:00	06:34	07:13			07:38
	17:14	14	09:19 (3)	17:54		18:28	20:02	20:34	20:52	20:39	19:57	19:04	17:14	16:41			16:42
26	07:31		09:04 (3)	06:52		06:05	06:13	05:40	05:34	05:56	06:28	07:01	06:36	07:14			07:39
	17:15	16	09:20 (3)	17:56		18:29	20:03	20:35	20:52	20:38	19:56	19:02	17:13	16:41			16:43
27	07:30		09:03 (3)	06:50		06:03	06:12	05:39	05:35	05:57	06:29	07:02	06:37	07:15			07:39
	17:17	20	09:23 (3)	17:57		18:30	20:04	20:36	20:52	20:38	19:54	19:00	17:11	16:40			16:43
28	07:29		09:02 (3)	06:49		06:01	06:10	05:38	05:35	05:58	06:30	07:03	06:38	08:38 (3)	07:16		07:39
	17:18	22	09:24 (3)	17:58		18:31	20:05	20:36	20:52	20:37	19:53	18:58	17:10	10	08:48 (3)	16:40	16:44
29	07:28		09:01 (3)			05:59	06:09	05:38	05:35	05:59	06:31	07:04	06:39	08:35 (3)	07:17		07:40
	17:19	24	09:25 (3)			18:32	20:06	20:37	20:52	20:36	19:51	18:57	17:08	16	08:51 (3)	16:39	16:45
30	07:27		09:00 (3)			05:58	06:08	05:37	05:36	06:00	06:32	07:06	06:41	08:32 (3)	07:19		07:40
	17:21	24	09:24 (3)			18:33	20:07	20:38	20:52	20:34	19:49	18:55	17:07	20	08:52 (3)	16:39	16:46
31	07:26		08:59 (3)			05:56		05:36		06:01	06:33		06:42	08:32 (3)			07:40
	17:22	26	09:25 (3)			18:34		20:39		20:33	19:48		17:06	22	08:54 (3)		16:46
Potential sun hours	293		295		370	209	-292	-263	-280	-145	375	343		294			283
Total, worst case		154		334									68		420		
Sun reduction		0.35		0.45									0.45		0.35		
Oper. time red.		0.86		0.86									0.86		0.86		
Wind dir. red.		0.62		0.62									0.62		0.62		
Total reduction		0.19		0.24									0.24		0.19		
Total, real		29		81									16		79		

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	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, Mid Western part
9 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
1000 meter max shadow distance applied along with default 3° inclination
Sunshine probabilities applied (pdf plots)
Directional run-hours applied from tab file (tower 1)
.

Licensed user:
Wind Engineers, Inc.
7660 Whitegate Avenue
US-RIVERSIDE, CA 92506

Calculated:
03/01/06 23:22/2.4.0.67

SHADOW - Calendar

Calculation: Mid Western part **Shadow receptor:** 748 - 748

Assumptions for shadow calculations

Maximum distance for influence	1,000 m
Minimum sun height over horizon for influence	3 °
Day step for calculation	1 days
Time step for calculation	2 minutes

Sun shine probabilities (part of time from sun rise to sun set with sun shine)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.35	0.45	0.45	0.55	0.55	0.55	0.65	0.55	0.55	0.45	0.35	0.30

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
475	585	238	199	220	474	1,184	813	840	1,246	803	479	7,555

	January			February	March	April	May	June	July	August	September	October	November			December		
1	07:40		09:14 (3)	07:25	06:47	05:54	06:06	05:36	05:36	06:02	06:34	07:07	06:43			07:20		09:04 (3)
	16:47	20	09:34 (3)	17:23	17:59	18:36	20:08	20:40	20:52	20:32	19:46	18:53	17:04			16:38	10	09:14 (3)
2	07:40		09:14 (3)	07:24	06:46	05:52	06:05	05:35	05:37	06:03	06:36	07:08	06:44			07:21		09:03 (3)
	16:48	20	09:34 (3)	17:25	18:00	18:37	20:10	20:41	20:52	20:31	19:44	18:51	17:03			16:38	12	09:15 (3)
3	07:40		09:14 (3)	07:23	06:44	05:51	06:04	05:35	05:37	06:04	06:37	07:09	06:46			07:22		09:02 (3)
	16:49	20	09:34 (3)	17:26	18:02	18:38	20:11	20:41	20:52	20:30	19:42	18:50	17:02			16:38	16	09:18 (3)
4	07:40		09:15 (3)	07:22	06:42	05:49	06:02	05:35	05:38	06:05	06:38	07:10	06:47			07:23		09:03 (3)
	16:50	18	09:33 (3)	17:27	18:03	18:39	20:12	20:42	20:51	20:29	19:41	18:48	17:01			16:38	16	09:19 (3)
5	07:40		09:15 (3)	07:21	06:41	06:47	06:01	05:34	05:38	06:06	06:39	07:11	06:48			07:24		09:02 (3)
	16:51	18	09:33 (3)	17:29	18:04	19:40	20:13	20:43	20:51	20:28	19:39	18:46	16:59			16:37	18	09:20 (3)
6	07:40		09:17 (3)	07:20	06:39	06:46	06:00	05:34	05:39	06:07	06:40	07:12	06:49			07:25		09:03 (3)
	16:52	16	09:33 (3)	17:30	18:05	19:41	20:14	20:44	20:51	20:26	19:37	18:44	16:58			16:37	16	09:19 (3)
7	07:40		09:17 (3)	07:19	06:37	06:44	05:58	05:33	05:40	06:08	06:41	07:13	06:51			07:26		09:02 (3)
	16:53	18	09:35 (3)	17:31	18:07	19:42	20:15	20:44	20:51	20:25	19:36	18:43	16:57			16:37	18	09:20 (3)
8	07:40		09:19 (3)	07:17	06:36	06:42	05:57	05:33	05:40	06:09	06:42	07:14	06:52			07:27		09:03 (3)
	16:54	16	09:35 (3)	17:32	18:08	19:44	20:16	20:45	20:50	20:24	19:34	18:41	16:56			16:37	18	09:21 (3)
9	07:40		09:18 (3)	07:16	06:34	06:40	05:56	05:33	05:41	06:10	06:43	07:16	06:53			07:28		09:02 (3)
	16:55	16	09:34 (3)	17:34	18:09	19:45	20:17	20:46	20:50	20:23	19:32	18:39	16:55			16:37	20	09:22 (3)
10	07:40		09:20 (3)	07:15	06:32	06:39	05:55	05:33	05:42	06:11	06:44	07:17	06:54			07:29		09:03 (3)
	16:56	12	09:32 (3)	17:35	18:10	19:46	20:18	20:46	20:50	20:21	19:30	18:38	16:54			16:37	20	09:23 (3)
11	07:39		09:22 (3)	07:14	06:31	06:37	05:54	05:33	05:43	06:12	06:45	07:18	06:56			07:29		09:04 (3)
	16:57	10	09:32 (3)	17:36	18:11	19:47	20:20	20:47	20:49	20:20	19:29	18:36	16:53			16:37	20	09:24 (3)
12	07:39		09:23 (3)	07:12	06:29	06:35	05:52	05:32	05:43	06:13	06:46	07:19	06:57			07:30		09:03 (3)
	16:58	8	09:31 (3)	17:38	18:13	19:48	20:21	20:47	20:49	20:19	19:27	18:34	16:52			16:37	22	09:25 (3)
13	07:39			07:11	06:27	06:34	05:51	05:32	05:44	06:14	06:47	07:20	06:58			07:31		09:04 (3)
	17:00			17:39	18:14	19:49	20:22	20:48	20:48	20:17	19:25	18:33	16:51			16:37	22	09:26 (3)
14	07:38			07:10	06:25	06:32	05:50	05:32	05:45	06:15	06:48	07:21	06:59			07:32		09:04 (3)
	17:01			17:40	18:15	19:50	20:23	20:48	20:48	20:16	19:23	18:31	16:50			16:38	22	09:26 (3)
15	07:38			07:08	06:24	06:30	05:49	05:32	05:46	06:16	06:49	07:23	07:01			07:33		09:05 (3)
	17:02			17:42	18:16	19:51	20:24	20:49	20:47	20:14	19:21	18:29	16:49			16:38	22	09:27 (3)
16	07:37			07:07	06:22	06:29	05:48	05:32	05:47	06:17	06:50	07:24	07:02			07:33		09:06 (3)
	17:03			17:43	18:17	19:53	20:25	20:49	20:46	20:13	19:20	18:28	16:48			16:38	20	09:26 (3)
17	07:37			07:05	06:20	06:27	05:47	05:32	05:47	06:18	06:51	07:25	07:03			07:34		09:06 (3)
	17:04			17:44	18:18	19:54	20:26	20:50	20:46	20:11	19:18	18:26	16:47			16:38	20	09:26 (3)
18	07:36			07:04	06:19	06:26	05:46	05:32	05:48	06:20	06:53	07:26	07:04			07:35		09:05 (3)
	17:05			17:45	18:20	19:55	20:27	20:50	20:45	20:10	19:16	18:25	16:46			16:39	22	09:27 (3)
19	07:36			07:03	06:17	06:24	05:45	05:32	05:49	06:21	06:54	07:27	07:06			07:35		09:06 (3)
	17:07			17:47	18:21	19:56	20:28	20:50	20:44	20:08	19:14	18:23	16:45			16:39	22	09:28 (3)
20	07:35			07:01	06:15	06:22	05:44	05:33	05:50	06:22	06:55	07:28	07:07			07:36		09:06 (3)
	17:08			17:48	18:22	19:57	20:29	20:51	20:44	20:07	19:13	18:22	16:44			16:39	22	09:28 (3)
21	07:35			07:00	06:13	06:21	05:43	05:33	05:51	06:23	06:56	07:30	07:08			07:37		09:07 (3)
	17:09			17:49	18:23	19:58	20:30	20:51	20:43	20:05	19:11	18:20	16:44			16:40	22	09:29 (3)
22	07:34			06:58	06:12	06:19	05:43	05:33	05:52	06:24	06:57	07:31	07:09			07:37		09:07 (3)
	17:10			17:51	18:24	19:59	20:31	20:51	20:42	20:04	19:09	18:18	16:43			16:40	22	09:29 (3)
23	07:33			06:57	06:10	06:18	05:42	05:33	05:53	06:25	06:58	07:32	07:11			07:38		09:08 (3)
	17:12			17:52	18:25	20:01	20:32	20:51	20:41	20:02	19:07	18:17	16:42			16:41	22	09:30 (3)
24	07:32			06:55	06:08	06:16	05:41	05:33	05:54	06:26	06:59	07:33	07:12			07:38		09:08 (3)
	17:13			17:53	18:26	20:01	20:33	20:52	20:40	20:01	19:05	18:15	16:42			16:41	22	09:30 (3)
25	07:32			06:54	06:06	06:15	05:40	05:34	05:55	06:27	07:00	06:34	07:13			07:38		09:08 (3)
	17:14			17:54	18:28	20:02	20:34	20:52	20:39	19:57	19:04	17:14	16:41			16:42	22	09:30 (3)
26	07:31			06:52	06:05	06:13	05:40	05:34	05:56	06:28	07:01	06:36	07:14			07:39		09:09 (3)
	17:15			17:56	18:29	20:03	20:35	20:52	20:38	19:56	19:02	17:13	16:41			16:43	22	09:31 (3)
27	07:30			06:50	06:03	06:12	05:39	05:35	05:57	06:29	07:02	06:37	07:15			07:39		09:11 (3)
	17:17			17:57	18:30	20:04	20:36	20:52	20:38	19:54	19:00	17:11	16:40			16:43	20	09:31 (3)
28	07:29			06:49	06:01	06:10	05:38	05:35	05:58	06:30	07:03	06:38	07:16			07:39		09:11 (3)
	17:18			17:58	18:31	20:05	20:37	20:52	20:37	19:53	18:58	17:10	16:40			16:44	20	09:31 (3)
29	07:28				05:59	06:09	05:38	05:35	05:59	06:31	07:04	06:39	07:17			07:40		09:11 (3)
	17:19				18:32	20:06	20:37	20:52	20:36	19:51	18:57	17:08	16:39			16:45	22	09:33 (3)
30	07:27				05:58	06:08	05:37	05:36	06:00	06:32	07:06	06:41	07:19		09:05 (3)	07:40		09:11 (3)
	17:21				18:33	20:07	20:38	20:52	20:34	19:49	18:55	17:07	16:39	8	09:13 (3)	16:46	22	09:33 (3)
31	07:26				05:56		05:36		06:01	06:33		06:42				07:40		09:12 (3)
	17:22				18:34		20:39		20:33	19:48		17:06				16:46	22	09:34 (3)
Potential sun hours	293			295	370	209	-292	-263	-280	-145	375	343	294			283		
Total, worst case		192												8			616	
Sun reduction		0.35												0.35			0.30	
Oper. time red.		0.86												0.86			0.86	
Wind dir. red.		0.64												0.64			0.64	
Total reduction		0.19												0.19			0.17	
Total, real		37												2			102	

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	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, Mid Western part
9 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
1000 meter max shadow distance applied along with default 3° inclination
Sunshine probabilities applied (pdf plots)
Directional run-hours applied from tab file (tower 1)
.

Printed/Page
03/05/06 23:05 / 7
Licensed user:
Wind Engineers, Inc.
7660 Whitegate Avenue
US-RIVERSIDE, CA 92506

Calculated:
03/01/06 23:22/2.4.0.67

SHADOW - Calendar

Calculation: Mid Western part **Shadow receptor:** 749 - 749

Assumptions for shadow calculations

Maximum distance for influence	1,000	m
Minimum sun height over horizon for influence	3	°
Day step for calculation	1	days
Time step for calculation	2	minutes

Sun shine probabilities (part of time from sun rise to sun set with sun shine)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.35	0.45	0.45	0.55	0.55	0.55	0.65	0.55	0.55	0.45	0.35	0.30

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
475	585	238	199	220	474	1,184	813	840	1,246	803	479	7,555

	January		February		March	April	May	June	July	August	September	October	November		December
1	07:40		07:25	08:44 (3)	06:47	05:54	06:06	05:36	05:36	06:02	06:34	07:07	06:43		07:20
	16:47		17:23 18	09:02 (3)	17:59	18:36	20:08	20:40	20:52	20:32	19:46	18:53	17:04		16:39
2	07:40		07:24	08:45 (3)	06:46	05:52	06:05	05:35	05:37	06:03	06:36	07:08	06:44		07:21
	16:48		17:25 18	09:03 (3)	18:00	18:37	20:10	20:41	20:52	20:31	19:44	18:51	17:03		16:38
3	07:40		07:23	08:46 (3)	06:44	05:51	06:04	05:35	05:37	06:04	06:37	07:09	06:46		07:22
	16:49		17:26 16	09:02 (3)	18:02	18:38	20:11	20:41	20:52	20:30	19:42	18:50	17:02		16:38
4	07:40		07:22	08:47 (3)	06:42	05:49	06:02	05:35	05:38	06:05	06:38	07:10	06:47		07:23
	16:50		17:27 14	09:01 (3)	18:03	18:39	20:12	20:42	20:51	20:29	19:41	18:48	17:01		16:38
5	07:40		07:21	08:48 (3)	06:41	06:47	06:01	05:34	05:38	06:06	06:39	07:11	06:48	08:20 (3)	07:24
	16:51		17:29 12	09:00 (3)	18:04	19:40	20:13	20:43	20:51	20:28	19:39	18:46	16:59 6	08:26 (3)	16:37
6	07:40		07:20	08:50 (3)	06:39	06:46	06:00	05:34	05:39	06:07	06:40	07:12	06:49	08:18 (3)	07:25
	16:52		17:30 6	08:56 (3)	18:05	19:41	20:14	20:44	20:51	20:26	19:37	18:44	16:58 12	08:30 (3)	16:37
7	07:40		07:19		06:37	06:44	05:58	05:34	05:40	06:08	06:41	07:13	06:51	08:17 (3)	07:26
	16:53		17:31		18:07	19:42	20:15	20:44	20:51	20:25	19:36	18:43	16:57 14	08:31 (3)	16:37
8	07:40		07:17		06:36	06:42	05:57	05:33	05:40	06:09	06:42	07:14	06:52	08:14 (3)	07:27
	16:54		17:32		18:08	19:44	20:16	20:45	20:50	20:24	19:34	18:41	16:56 18	08:32 (3)	16:37
9	07:40		07:16		06:34	06:40	05:56	05:33	05:41	06:10	06:43	07:16	06:53	08:14 (3)	07:28
	16:55		17:34		18:09	19:45	20:17	20:46	20:50	20:23	19:32	18:39	16:55 20	08:34 (3)	16:37
10	07:40		07:15		06:32	06:39	05:55	05:33	05:42	06:11	06:44	07:17	06:54	08:15 (3)	07:29
	16:56		17:35		18:10	19:46	20:18	20:46	20:50	20:21	19:30	18:38	16:54 18	08:33 (3)	16:37
11	07:39		07:14		06:31	06:37	05:54	05:33	05:43	06:12	06:45	07:18	06:56	08:15 (3)	07:29
	16:57		17:36		18:11	19:47	20:20	20:47	20:49	20:20	19:29	18:36	16:53 20	08:35 (3)	16:37
12	07:39		07:12		06:29	06:35	05:52	05:32	05:43	06:13	06:46	07:19	06:57	08:14 (3)	07:30
	16:58		17:38		18:13	19:48	20:21	20:47	20:49	20:19	19:27	18:34	16:52 20	08:34 (3)	16:37
13	07:39		07:11		06:27	06:34	05:51	05:32	05:44	06:14	06:47	07:20	06:58	08:13 (3)	07:31
	17:00		17:39		18:14	19:49	20:22	20:48	20:48	20:17	19:25	18:33	16:51 22	08:35 (3)	16:37
14	07:38		07:10		06:25	06:32	05:50	05:32	05:45	06:15	06:48	07:21	06:59	08:15 (3)	07:32
	17:01		17:40		18:15	19:50	20:23	20:48	20:48	20:16	19:23	18:31	16:50 20	08:35 (3)	16:38
15	07:38		07:08		06:24	06:30	05:49	05:32	05:46	06:16	06:49	07:23	07:01	08:14 (3)	07:33
	17:02		17:42		18:16	19:51	20:24	20:49	20:47	20:14	19:21	18:29	16:49 22	08:36 (3)	16:38
16	07:37		07:07		06:22	06:29	05:48	05:32	05:47	06:17	06:50	07:24	07:02	08:15 (3)	07:33
	17:03		17:43		18:17	19:53	20:25	20:49	20:46	20:13	19:20	18:28	16:48 20	08:35 (3)	16:38
17	07:37		07:05		06:20	06:27	05:47	05:32	05:47	06:18	06:52	07:25	07:03	08:17 (3)	07:34
	17:04		17:44		18:18	19:54	20:26	20:50	20:46	20:11	19:18	18:26	16:47 18	08:35 (3)	16:38
18	07:36		07:04		06:19	06:26	05:46	05:32	05:48	06:20	06:53	07:26	07:04	08:16 (3)	07:35
	17:05		17:45		18:20	19:55	20:27	20:50	20:45	20:10	19:16	18:25	16:46 18	08:34 (3)	16:39
19	07:36	08:48 (3)	07:03		06:17	06:24	05:45	05:32	05:49	06:21	06:54	07:27	07:06	08:17 (3)	07:35
	17:07 6	08:54 (3)	17:47		18:21	19:56	20:28	20:50	20:44	20:08	19:14	18:23	16:45 18	08:35 (3)	16:39
20	07:35	08:45 (3)	07:01		06:15	06:23	05:44	05:33	05:50	06:22	06:55	07:28	07:07	08:18 (3)	07:36
	17:08 12	08:57 (3)	17:48		18:22	19:57	20:29	20:51	20:44	20:07	19:13	18:22	16:44 16	08:34 (3)	16:39
21	07:35	08:44 (3)	07:00		06:13	06:21	05:44	05:33	05:51	06:23	06:56	07:30	07:08	08:20 (3)	07:37
	17:09 14	08:58 (3)	17:49		18:23	19:58	20:30	20:51	20:43	20:05	19:11	18:20	16:44 14	08:34 (3)	16:40
22	07:34	08:43 (3)	06:58		06:12	06:19	05:43	05:33	05:52	06:24	06:57	07:31	07:09	08:21 (3)	07:37
	17:10 16	08:59 (3)	17:51		18:24	19:59	20:31	20:51	20:42	20:04	19:09	18:18	16:43 12	08:33 (3)	16:40
23	07:33	08:43 (3)	06:57		06:10	06:18	05:42	05:33	05:53	06:25	06:58	07:32	07:11	08:24 (3)	07:38
	17:12 18	09:01 (3)	17:52		18:25	20:01	20:32	20:51	20:41	20:02	19:07	18:17	16:42 6	08:30 (3)	16:41
24	07:32	08:42 (3)	06:55		06:08	06:16	05:41	05:34	05:54	06:26	06:59	07:33	07:12		07:38
	17:13 18	09:00 (3)	17:53		18:26	20:01	20:33	20:52	20:40	20:01	19:05	18:15	16:42		16:41
25	07:32	08:43 (3)	06:54		06:06	06:15	05:40	05:34	05:55	06:27	07:00	06:34	07:13		07:38
	17:14 18	09:01 (3)	17:54		18:28	20:02	20:34	20:52	20:39	19:57	19:04	17:14	16:41		16:42
26	07:31	08:42 (3)	06:52		06:05	06:13	05:40	05:34	05:56	06:28	07:01	06:36	07:14		07:39
	17:15 20	09:02 (3)	17:56		18:29	20:03	20:35	20:52	20:38	19:56	19:02	17:13	16:41		16:43
27	07:30	08:41 (3)	06:50		06:03	06:12	05:39	05:35	05:57	06:29	07:02	06:37	07:15		07:39
	17:17 22	09:03 (3)	17:57		18:30	20:04	20:36	20:52	20:38	19:54	19:00	17:11	16:40		16:43
28	07:29	08:42 (3)	06:49		06:01	06:10	05:38	05:35	05:58	06:30	07:03	06:38	07:16		07:39
	17:18 20	09:02 (3)	17:58		18:31	20:05	20:37	20:52	20:37	19:53	18:58	17:10	16:40		16:44
29	07:28	08:43 (3)			05:59	06:09	05:38	05:35	05:59	06:31	07:04	06:39	07:17		07:40
	17:19 20	09:03 (3)			18:32	20:06	20:37	20:52	20:36	19:51	18:57	17:08	16:39		16:45
30	07:27	08:42 (3)			05:58	06:08	05:37	05:36	06:00	06:32	07:06	06:41	07:19		07:40
	17:21 20	09:02 (3)			18:33	20:07	20:38	20:52	20:34	19:49	18:55	17:07	16:39		16:46
31	07:26	08:43 (3)			05:56		05:36		06:01	06:33		06:42			07:40
	17:22 20	09:03 (3)			18:34		20:39		20:33	19:48		17:06			16:46
Potential sun hours	293		295		370	209	-292	-263	-280	-145	375	343	294		283
Total, worst case	224		84										314		
Sun reduction	0.35		0.45										0.35		
Oper. time red.	0.86		0.86										0.86		
Wind dir. red.	0.63		0.63										0.63		
Total reduction	0.19		0.24										0.19		
Total, real	42		20										59		

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	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, Mid Western part
9 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
1000 meter max shadow distance applied along with default 3° inclination
Sunshine probabilities applied (pdf plots)
Directional run-hours applied from tab file (tower 1)
.

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Wind Engineers, Inc.
7660 Whitegate Avenue
US-RIVERSIDE, CA 92506

Calculated:
03/01/06 23:22/2.4.0.67

SHADOW - Calendar

Calculation: Mid Western part **Shadow receptor:** 750 - 750

Assumptions for shadow calculations

Maximum distance for influence	1,000 m
Minimum sun height over horizon for influence	3 °
Day step for calculation	1 days
Time step for calculation	2 minutes

Sun shine probabilities (part of time from sun rise to sun set with sun shine)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.35	0.45	0.45	0.55	0.55	0.55	0.65	0.55	0.55	0.45	0.35	0.30

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
475	585	238	199	220	474	1,184	813	840	1,246	803	479	7,555

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:40	07:25	06:47	05:54	06:06	05:36	05:36	06:02	06:35	07:07	06:43	07:20
	16:47	17:23	17:59	18:36	20:08	20:40	20:52	20:32	19:46	18:53	17:04 6 07:59 (3)	16:39
2	07:40	07:24	06:46	05:52	06:05	05:35	05:37	06:03	06:36	07:08	06:44	07:21
	16:48	17:25	18:01	18:37	20:10	20:41	20:52	20:31	19:44	18:51	17:03	16:38
3	07:40	07:23	06:44	05:51	06:04	05:35	05:37	06:04	06:37	07:09	06:46	07:22
	16:49	17:26	18:02	18:38	20:11	20:41	20:52	20:30	19:42	18:50	17:02	16:38
4	07:40	07:22	06:42	05:49	06:02	05:35	05:38	06:05	06:38	07:10	06:47	07:23
	16:50	17:27	18:03	18:39	20:12	20:42	20:51	20:29	19:41	18:48	17:01	16:38
5	07:40	07:21	06:41	06:47	06:01	05:34	05:39	06:06	06:39	07:11	06:48	07:24
	16:51	17:29	18:04	19:40	20:13	20:43	20:51	20:28	19:39	18:46	16:59	16:38
6	07:40	07:20	06:39	06:46	06:00	05:34	05:39	06:07	06:40	07:12	06:49	07:25
	16:52	17:30	18:05	19:41	20:14	20:44	20:51	20:26	19:37	18:44	16:58	16:37
7	07:40	07:19	06:37	06:44	05:58	05:34	05:40	06:08	06:41	07:13	06:51	07:26
	16:53	17:31	18:07	19:42	20:15	20:44	20:51	20:25	19:36	18:43	16:57	16:37
8	07:40	07:17	06:36	06:42	05:57	05:33	05:40	06:09	06:42	07:14	06:52	07:27
	16:54	17:32	18:08	19:44	20:16	20:45	20:50	20:24	19:34	18:41	16:56	16:37
9	07:40	07:16	06:34	06:40	05:56	05:33	05:41	06:10	06:43	07:16	06:53	07:28
	16:55	17:34	18:09	19:45	20:17	20:46	20:50	20:23	19:32	18:39	16:55	16:37
10	07:40	07:15 08:23 (3)	06:32	06:39	05:55	05:33	05:42	06:11	06:44	07:17	06:54	07:29
	16:56	17:35 6 08:29 (3)	18:10	19:46	20:18	20:46	20:50	20:21	19:30	18:38	16:54	16:37
11	07:39	07:14 08:20 (3)	06:31	06:37	05:54	05:33	05:43	06:12	06:45	07:18	06:56	07:29
	16:57	17:36 12 08:32 (3)	18:11	19:47	20:20	20:47	20:49	20:20	19:29	18:36	16:53	16:37
12	07:39	07:12 08:19 (3)	06:29	06:35	05:52	05:32	05:43	06:13	06:46	07:19	06:57	07:30
	16:58	17:38 16 08:35 (3)	18:13	19:48	20:21	20:47	20:49	20:19	19:27	18:34	16:52	16:37
13	07:39	07:11 08:17 (3)	06:27	06:34	05:51	05:32	05:44	06:14	06:47	07:20	06:58	07:31
	17:00	17:39 18 08:35 (3)	18:14	19:49	20:22	20:48	20:48	20:17	19:25	18:33	16:51	16:37
14	07:38	07:10 08:16 (3)	06:25	06:32	05:50	05:32	05:45	06:15	06:48	07:21	06:59	07:32
	17:01	17:40 20 08:36 (3)	18:15	19:50	20:23	20:48	20:48	20:16	19:23	18:31	16:50	16:38
15	07:38	07:08 08:16 (3)	06:24	06:30	05:49	05:32	05:46	06:16	06:49	07:23	07:01	07:33
	17:02	17:42 20 08:36 (3)	18:16	19:51	20:24	20:49	20:47	20:14	19:21	18:29	16:49	16:38
16	07:37	07:07 08:15 (3)	06:22	06:29	05:48	05:32	05:47	06:17	06:50	07:24	07:02	07:33
	17:03	17:43 22 08:37 (3)	18:17	19:53	20:25	20:49	20:46	20:13	19:20	18:28	16:48	16:38
17	07:37	07:05 08:16 (3)	06:20	06:27	05:47	05:32	05:47	06:18	06:52	07:25	07:03	07:34
	17:04	17:44 20 08:36 (3)	18:18	19:54	20:26	20:50	20:46	20:11	19:18	18:26	16:47	16:38
18	07:36	07:04 08:16 (3)	06:19	06:26	05:46	05:32	05:48	06:20	06:53	07:26 08:53 (3)	07:04	07:35
	17:05	17:45 20 08:36 (3)	18:20	19:55	20:27	20:50	20:45	20:10	19:16	18:25 6 08:59 (3)	16:46	16:39
19	07:36	07:03 08:17 (3)	06:17	06:24	05:45	05:32	05:49	06:21	06:54	07:27 08:50 (3)	07:06	07:35
	17:07	17:47 18 08:35 (3)	18:21	19:56	20:28	20:50	20:44	20:08	19:14	18:23 12 09:02 (3)	16:45	16:39
20	07:35	07:01 08:17 (3)	06:15	06:23	05:44	05:33	05:50	06:22	06:55	07:28 08:49 (3)	07:07	07:36
	17:08	17:48 18 08:35 (3)	18:22	19:57	20:29	20:51	20:44	20:07	19:13	18:22 14 09:03 (3)	16:44	16:39
21	07:35	07:00 08:18 (3)	06:13	06:21	05:44	05:33	05:51	06:23	06:56	07:30 08:47 (3)	07:08	07:37
	17:09	17:49 16 08:34 (3)	18:23	19:58	20:30	20:51	20:43	20:05	19:11	18:20 18 09:05 (3)	16:44	16:40
22	07:34	06:58 08:18 (3)	06:12	06:19	05:43	05:33	05:52	06:24	06:57	07:31 08:46 (3)	07:09	07:37
	17:10	17:51 14 08:32 (3)	18:24	19:59	20:31	20:51	20:42	20:04	19:09	18:18 20 09:06 (3)	16:43	16:40
23	07:33	06:57 08:21 (3)	06:10	06:18	05:42	05:33	05:53	06:25	06:58	07:32 08:45 (3)	07:11	07:38
	17:12	17:52 10 08:31 (3)	18:25	20:01	20:32	20:51	20:41	20:02	19:07	18:17 20 09:05 (3)	16:42	16:41
24	07:32	06:55 06:08	06:16	05:41	05:34	05:54	06:26	06:59	07:33	08:44 (3)	07:12	07:38
	17:13	17:53 18:26	20:01	20:33	20:52	20:40	20:01	19:05	18:15 22	09:06 (3)	16:42	16:41
25	07:32	06:54 06:06	06:15	05:40	05:34	05:55	06:27	07:00	06:34	07:46 (3)	07:13	07:38
	17:14	17:54 18:28	20:02	20:34	20:52	20:39	19:57	19:04	17:14 20	08:06 (3)	16:41	16:42
26	07:31	06:52 06:05	06:13	05:40	05:34	05:56	06:28	07:01	06:36	07:45 (3)	07:14	07:39
	17:15	17:56 18:29	20:03	20:35	20:52	20:38	19:56	19:02	17:13 20	08:05 (3)	16:41	16:43
27	07:30	06:50 06:03	06:12	05:39	05:35	05:57	06:29	07:02	06:37	07:46 (3)	07:15	07:39
	17:17	17:57 18:30	20:04	20:36	20:52	20:38	19:54	19:00	17:11 20	08:06 (3)	16:40	16:43
28	07:29	06:49 06:01	06:10	05:38	05:35	05:58	06:30	07:03	06:38	07:46 (3)	07:16	07:39
	17:18	17:58 18:31	20:05	20:37	20:52	20:37	19:53	18:58	17:10 20	08:06 (3)	16:40	16:44
29	07:28	05:59	06:09	05:38	05:35	05:59	06:31	07:04	06:39	07:47 (3)	07:17	07:40
	17:19	18:32	20:06	20:37	20:52	20:36	19:51	18:57	17:08 18	08:05 (3)	16:39	16:45
30	07:27	05:58	06:08	05:37	05:36	06:00	06:32	07:06	06:41	07:48 (3)	07:19	07:40
	17:21	18:33	20:07	20:38	20:52	20:34	19:49	18:55	17:07 14	08:02 (3)	16:39	16:46
31	07:26	05:56		05:36		06:01	06:33		06:42	07:50 (3)		07:40
	17:22	18:34		20:39		20:33	19:48		17:06 12	08:02 (3)		16:46
Potential sun hours	293	295	370	209	-292	-263	-280	-145	375	343	294	283
Total, worst case		230								236	6	
Sun reduction		0.45								0.45	0.35	
Oper. time red.		0.86								0.86	0.86	
Wind dir. red.		0.63								0.63	0.63	
Total reduction		0.24								0.24	0.19	
Total, real		56								58	1	

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	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, Mid Western part
9 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
1000 meter max shadow distance applied along with default 3° inclination
Sunshine probabilities applied (pdf plots)
Directional run-hours applied from tab file (tower 1)
.

Printed/Page
03/05/06 23:05 / 9
Licensed user:
Wind Engineers, Inc.
7660 Whitegate Avenue
US-RIVERSIDE, CA 92506

Calculated:
03/01/06 23:22/2.4.0.67

SHADOW - Calendar

Calculation: Mid Western part **Shadow receptor:** 751 - 751

Assumptions for shadow calculations

Maximum distance for influence	1,000 m
Minimum sun height over horizon for influence	3 °
Day step for calculation	1 days
Time step for calculation	2 minutes

Sun shine probabilities (part of time from sun rise to sun set with sun shine)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.35	0.45	0.45	0.55	0.55	0.55	0.65	0.55	0.55	0.45	0.35	0.30

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
475	585	238	199	220	474	1,184	813	840	1,246	803	479	7,555

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:40 09:44 (5)	07:25	06:47	05:54	06:06	05:36	05:36	06:02	06:35	07:07	06:43 07:59 (4)	07:20
	16:47 6 09:50 (5)	17:23	17:59	18:36	20:08	20:40	20:52	20:32	19:46	18:53	17:04 20 08:19 (4)	16:39
2	07:40	07:24	06:46	05:52	06:05	05:35	05:37	06:03	06:36	07:08	06:44 08:00 (4)	07:21
	16:48	17:25	18:01	18:37	20:10	20:41	20:52	20:31	19:44	18:51	17:03 18 08:18 (4)	16:38
3	07:40	07:23	06:44	05:51	06:04	05:35	05:37	06:04	06:37	07:09	06:46 08:02 (4)	07:22
	16:49	17:26	18:02	18:38	20:11	20:41	20:52	20:30	19:42	18:50	17:02 16 08:18 (4)	16:38
4	07:40	07:22	06:42	05:49	06:02	05:35	05:38	06:05	06:38	07:10	06:47 08:03 (4)	07:23
	16:50	17:27	18:03	18:39	20:12	20:42	20:51	20:29	19:41	18:48	17:01 14 08:17 (4)	16:38
5	07:40	07:21	06:41	06:47	06:01	05:34	05:39	06:06	06:39	07:11	06:48 08:04 (4)	07:24
	16:51	17:29	18:04	19:40	20:13	20:43	20:51	20:28	19:39	18:46	16:59 10 08:14 (4)	16:38
6	07:40	07:20 08:34 (4)	06:39	06:46	06:00	05:34	05:39	06:07	06:40	07:12	06:49	07:25
	16:52	17:30 10 08:44 (4)	18:05	19:41	20:14	20:44	20:51	20:26	19:37	18:44	16:58	16:37
7	07:40	07:19 08:33 (4)	06:37	06:44	05:58	05:34	05:40	06:08	06:41	07:13	06:51	07:26
	16:53	17:31 14 08:47 (4)	18:07	19:42	20:15	20:44	20:51	20:25	19:36	18:43	16:57	16:37
8	07:40	07:17 08:32 (4)	06:36	06:42	05:57	05:33	05:40	06:09	06:42	07:14	06:52	07:27
	16:54	17:32 16 08:48 (4)	18:08	19:44	20:16	20:45	20:50	20:24	19:34	18:41	16:56	16:37
9	07:40	07:16 08:31 (4)	06:34	06:40	05:56	05:33	05:41	06:10	06:43	07:16	06:53	07:28
	16:55	17:34 18 08:49 (4)	18:09	19:45	20:17	20:46	20:50	20:23	19:32	18:39	16:55	16:37
10	07:40	07:15 08:29 (4)	06:32	06:39	05:55	05:33	05:42	06:11	06:44	07:17	06:54	07:29
	16:56	17:35 20 08:49 (4)	18:10	19:46	20:18	20:46	20:50	20:21	19:30	18:38	16:54	16:37
11	07:39	07:14 08:28 (4)	06:31	06:37	05:54	05:33	05:43	06:12	06:45	07:18	06:56	07:29 09:36 (5)
	16:57	17:36 22 08:50 (4)	18:11	19:47	20:20	20:47	20:49	20:20	19:29	18:36	16:53	16:37 4 09:40 (5)
12	07:39	07:12 08:29 (4)	06:29	06:35	05:53	05:32	05:43	06:13	06:46	07:19	06:57	07:30 09:35 (5)
	16:58	17:38 22 08:51 (4)	18:13	19:48	20:21	20:47	20:49	20:19	19:27	18:34	16:52	16:37 6 09:41 (5)
13	07:39	07:11 08:27 (4)	06:27	06:34	05:51	05:32	05:44	06:14	06:47	07:20	06:58	07:31 09:34 (5)
	17:00	17:39 24 08:51 (4)	18:14	19:49	20:22	20:48	20:48	20:17	19:25	18:33	16:51	16:37 8 09:42 (5)
14	07:38	07:10 08:28 (4)	06:25	06:32	05:50	05:32	05:45	06:15	06:48 08:09 (3)	07:21	06:59	07:32 09:34 (5)
	17:01	17:40 22 08:50 (4)	18:15	19:50	20:23	20:48	20:48	20:16	19:23 8 08:17 (3)	18:31	16:50	16:38 10 09:44 (5)
15	07:38	07:08 08:28 (4)	06:24	06:30	05:49	05:32	05:46	06:16	06:49 08:06 (3)	07:23	07:01	07:33 09:33 (5)
	17:02	17:42 22 08:50 (4)	18:16	19:51	20:24	20:49	20:47	20:14	19:21 14 08:20 (3)	18:29	16:49	16:38 12 09:45 (5)
16	07:37	07:07 08:29 (4)	06:22	06:29	05:48	05:32	05:47	06:17	06:50 08:05 (3)	07:24	07:02	07:33 09:34 (5)
	17:03	17:43 22 08:51 (4)	18:17	19:53	20:25	20:49	20:46	20:13	19:20 16 08:21 (3)	18:28	16:48	16:38 12 09:46 (5)
17	07:37	07:05 08:30 (4)	06:20 07:24 (3)	06:27	05:47	05:32	05:47	06:18	06:52 08:04 (3)	07:25	07:03	07:34 09:34 (5)
	17:04	17:44 20 08:50 (4)	18:18 6 07:30 (3)	19:54	20:26	20:50	20:46	20:11	19:18 18 08:22 (3)	18:26	16:47	16:38 12 09:46 (5)
18	07:36	07:04 08:30 (4)	06:19 07:22 (3)	06:26	05:46	05:32	05:48	06:20	06:53 08:03 (3)	07:26	07:04	07:35 09:33 (5)
	17:05	17:45 18 08:48 (4)	18:20 12 07:34 (3)	19:55	20:27	20:50	20:45	20:10	19:16 18 08:21 (3)	18:25	16:46	16:39 14 09:47 (5)
19	07:36	07:03 08:31 (4)	06:17 07:18 (3)	06:24	05:45	05:33	05:49	06:21	06:54 08:02 (3)	07:27	07:06	07:35 09:34 (5)
	17:07	17:47 16 08:47 (4)	18:21 16 07:34 (3)	19:56	20:28	20:50	20:44	20:08	19:14 20 08:22 (3)	18:23	16:45	16:39 14 09:48 (5)
20	07:35	07:01 08:33 (4)	06:15 07:18 (3)	06:23	05:44	05:33	05:50	06:22	06:55 08:01 (3)	07:28	07:07	07:36 09:34 (5)
	17:08	17:48 12 08:45 (4)	18:22 16 07:34 (3)	19:57	20:29	20:51	20:44	20:07	19:13 20 08:21 (3)	18:22	16:44	16:39 14 09:48 (5)
21	07:35	07:00 08:36 (4)	06:13 07:17 (3)	06:21	05:44	05:33	05:51	06:23	06:56 08:00 (3)	07:30 09:05 (4)	07:08	07:36 09:35 (5)
	17:09	17:49 6 08:42 (4)	18:23 20 07:37 (3)	19:58	20:30	20:51	20:43	20:05	19:11 22 08:22 (3)	18:20 8 09:13 (4)	16:44	16:40 14 09:49 (5)
22	07:34	06:58	06:12 07:15 (3)	06:19	05:43	05:33	05:52	06:24	06:57 08:01 (3)	07:31 09:02 (4)	07:09	07:37 09:35 (5)
	17:10	17:51	18:24 20 07:35 (3)	19:59	20:31	20:51	20:42	20:04	19:09 20 08:21 (3)	18:18 14 09:16 (4)	16:43	16:40 14 09:49 (5)
23	07:33	06:57	06:10 07:15 (3)	06:18	05:42	05:33	05:53	06:25	06:58 08:02 (3)	07:32 09:01 (4)	07:11	07:38 09:36 (5)
	17:12	17:52	18:25 20 07:35 (3)	20:01	20:32	20:51	20:41	20:02	19:07 18 08:20 (3)	18:17 16 09:17 (4)	16:42	16:41 14 09:50 (5)
24	07:32	06:55	06:08 07:15 (3)	06:16	05:41	05:34	05:54	06:26	06:59 08:01 (3)	07:33 09:00 (4)	07:12	07:38 09:36 (5)
	17:13	17:53	18:26 20 07:35 (3)	20:01	20:33	20:52	20:40	20:01	19:05 18 08:19 (3)	18:16 18 09:18 (4)	16:42	16:42 14 09:50 (5)
25	07:32	06:54	06:06 07:16 (3)	06:15	05:40	05:34	05:55	06:27	07:00 08:02 (3)	06:34 07:58 (4)	07:13	07:38 09:36 (5)
	17:14	17:54	18:28 18 07:34 (3)	20:02	20:34	20:52	20:39	19:57	19:04 14 08:16 (3)	17:14 22 08:20 (4)	16:41	16:42 14 09:50 (5)
26	07:31	06:52	06:05 07:16 (3)	06:13	05:40	05:34	05:56	06:28	07:01 08:05 (3)	06:36 07:59 (4)	07:14	07:39 09:39 (5)
	17:15	17:56	18:29 18 07:34 (3)	20:03	20:35	20:52	20:38	19:56	19:02 8 08:13 (3)	17:13 20 08:19 (4)	16:41	16:43 12 09:51 (5)
27	07:30	06:50	06:03 07:16 (3)	06:12	05:39	05:35	05:57	06:29	07:02	06:37 07:58 (4)	07:15	07:39 09:39 (5)
	17:17	17:57	18:30 16 07:32 (3)	20:04	20:36	20:52	20:38	19:54	19:00	17:11 22 08:20 (4)	16:40	16:43 12 09:51 (5)
28	07:29	06:49	06:01 07:16 (3)	06:11	05:38	05:35	05:58	06:30	07:03	06:38 07:58 (4)	07:16	07:39 09:39 (5)
	17:18	17:58	18:31 14 07:30 (3)	20:05	20:37	20:52	20:37	19:53	18:58	17:10 22 08:20 (4)	16:40	16:44 12 09:51 (5)
29	07:28		05:59 07:19 (3)	06:09	05:38	05:35	05:59	06:31	07:04	06:39 07:57 (4)	07:17	07:40 09:39 (5)
	17:19		18:32 10 07:29 (3)	20:06	20:37	20:52	20:36	19:51	18:57	17:08 24 08:21 (4)	16:39	16:45 12 09:51 (5)
30	07:27		05:58	06:08	05:37	05:36	06:00	06:32	07:06	06:41 07:58 (4)	07:19	07:40 09:41 (5)
	17:21		18:33	20:07	20:38	20:52	20:34	19:49	18:55	17:07 22 08:20 (4)	16:39	16:46 10 09:51 (5)
31	07:26		05:56		05:36		06:01	06:33		06:42 07:58 (4)		07:40 09:42 (5)
	17:22		18:34		20:39		20:33	19:48		17:06 22 08:20 (4)		16:46 8 09:50 (5)
Potential sun hours	293	295	370	209	-292	-263	-280	-145	375	343	294	283
Total, worst case	6	284	206						214	210	78	242
Sun reduction	0.35	0.45	0.45						0.55	0.45	0.35	0.30
Oper. time red.	0.86	0.86	0.86						0.86	0.86	0.86	0.86
Wind dir. red.	0.65	0.63	0.60						0.60	0.63	0.63	0.65
Total reduction	0.20	0.25	0.23						0.28	0.25	0.19	0.17
Total, real	1	70	48						61	52	15	41

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	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, Mid Western part
9 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
1000 meter max shadow distance applied along with default 3° inclination
Sunshine probabilities applied (pdf plots)
Directional run-hours applied from tab file (tower 1)
.

Licensed user:
Wind Engineers, Inc.
7660 Whitegate Avenue
US-RIVERSIDE, CA 92506

Calculated:
03/01/06 23:22/2.4.0.67

SHADOW - Calendar

Calculation: Mid Western part **Shadow receptor:** 752 - 752

Assumptions for shadow calculations

Maximum distance for influence	1,000 m
Minimum sun height over horizon for influence	3 °
Day step for calculation	1 days
Time step for calculation	2 minutes

Sun shine probabilities (part of time from sun rise to sun set with sun shine)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.35	0.45	0.45	0.55	0.55	0.55	0.65	0.55	0.55	0.45	0.35	0.30

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
475	585	238	199	220	474	1,184	813	840	1,246	803	479	7,555

	January		February		March		April		May	June
1	07:40		09:22 (5)	07:25		06:47	08:21 (4)	05:54	07:01 (3)	06:06	05:36
	16:47	24	09:46 (5)	17:23		17:59	6 08:27 (4)	18:36	20 07:21 (3)	20:08	20:40
2	07:40		09:22 (5)	07:24		06:46		05:52	07:02 (3)	06:05	05:35
	16:48	24	09:46 (5)	17:25		18:01		18:37	18 07:20 (3)	20:10	20:41
3	07:40		09:22 (5)	07:23		06:44		05:51	07:02 (3)	06:04	05:35
	16:49	24	09:46 (5)	17:26		18:02		18:38	16 07:18 (3)	20:11	20:41
4	07:40		09:21 (5)	07:22		06:42		05:49	07:04 (3)	06:02	05:35
	16:50	24	09:45 (5)	17:27		18:03		18:39	12 07:16 (3)	20:12	20:42
5	07:40		09:23 (5)	07:21		06:41		06:47	08:05 (3)	06:01	05:34
	16:51	24	09:47 (5)	17:29		18:04		19:40	10 08:15 (3)	20:13	20:43
6	07:40		09:23 (5)	07:20		06:39		06:46		06:00	05:34
	16:52	24	09:47 (5)	17:30		18:05		19:41		20:14	20:44
7	07:40		09:23 (5)	07:19		06:37		06:44		05:58	05:34
	16:53	24	09:47 (5)	17:31		18:07		19:42		20:15	20:44
8	07:40		09:25 (5)	07:17		06:36		06:42		05:57	05:33
	16:54	22	09:47 (5)	17:32		18:08		19:44		20:16	20:45
9	07:40		09:24 (5)	07:16		06:34		06:40		05:56	05:33
	16:55	22	09:46 (5)	17:34		18:09		19:45		20:17	20:46
10	07:40		09:26 (5)	07:15		06:32		06:39		05:55	05:33
	16:56	22	09:48 (5)	17:35		18:10		19:46		20:18	20:46
11	07:39		09:26 (5)	07:14		06:31		06:37		05:54	05:33
	16:57	22	09:48 (5)	17:36		18:11		19:47		20:20	20:47
12	07:39		09:27 (5)	07:12		06:29		06:35		05:53	05:32
	16:58	20	09:47 (5)	17:38		18:13		19:48		20:21	20:47
13	07:39		09:29 (5)	07:11		06:27		06:34		05:51	05:32
	17:00	18	09:47 (5)	17:39		18:14		19:49		20:22	20:48
14	07:38		09:29 (5)	07:10		06:25		06:32		05:50	05:32
	17:01	18	09:47 (5)	17:40		18:15		19:50		20:23	20:48
15	07:38		09:30 (5)	07:08	08:20 (4)	06:24		06:31		05:49	05:32
	17:02	16	09:46 (5)	17:42	10 08:30 (4)	18:16		19:51		20:24	20:49
16	07:37		09:31 (5)	07:07	08:19 (4)	06:22		06:29		05:48	05:32
	17:03	14	09:45 (5)	17:43	14 08:33 (4)	18:17		19:53		20:25	20:49
17	07:37		09:33 (5)	07:05	08:18 (4)	06:20		06:27		05:47	05:32
	17:04	12	09:45 (5)	17:44	18 08:36 (4)	18:18		19:54		20:26	20:50
18	07:36		09:36 (5)	07:04	08:16 (4)	06:19		06:26		05:46	05:32
	17:05	6	09:42 (5)	17:45	20 08:36 (4)	18:20		19:55		20:27	20:50
19	07:36			07:03	08:15 (4)	06:17		06:24		05:45	05:33
	17:07			17:47	22 08:37 (4)	18:21		19:56		20:28	20:50
20	07:35			07:01	08:15 (4)	06:15		06:23		05:44	05:33
	17:08			17:48	22 08:37 (4)	18:22		19:57		20:29	20:51
21	07:35			07:00	08:14 (4)	06:13		06:21		05:44	05:33
	17:09			17:49	24 08:38 (4)	18:23		19:58		20:30	20:51
22	07:34			06:58	08:14 (4)	06:12		06:19		05:43	05:33
	17:10			17:51	22 08:36 (4)	18:24		19:59		20:31	20:51
23	07:33			06:57	08:15 (4)	06:10		06:18		05:42	05:33
	17:12			17:52	22 08:37 (4)	18:25		20:01		20:32	20:51
24	07:32			06:55	08:15 (4)	06:08	07:11 (3)	06:16		05:41	05:34
	17:13			17:53	20 08:35 (4)	18:26	6 07:17 (3)	20:01		20:33	20:52
25	07:32			06:54	08:15 (4)	06:06	07:08 (3)	06:15		05:40	05:34
	17:14			17:54	20 08:35 (4)	18:28	12 07:20 (3)	20:02		20:34	20:52
26	07:31			06:52	08:16 (4)	06:05	07:06 (3)	06:13		05:40	05:34
	17:15			17:56	18 08:34 (4)	18:29	16 07:22 (3)	20:03		20:35	20:52
27	07:30			06:50	08:16 (4)	06:03	07:04 (3)	06:12		05:39	05:35
	17:17			17:57	16 08:32 (4)	18:30	18 07:22 (3)	20:04		20:36	20:52
28	07:29			06:49	08:19 (4)	06:01	07:02 (3)	06:11		05:38	05:35
	17:18			17:58	12 08:31 (4)	18:31	20 07:22 (3)	20:05		20:37	20:52
29	07:28					05:59	07:03 (3)	06:09		05:38	05:35
	17:19					18:32	20 07:23 (3)	20:06		20:37	20:52
30	07:27					05:58	07:01 (3)	06:08		05:37	05:36
	17:21					18:33	20 07:21 (3)	20:07		20:38	20:52
31	07:26					05:56	07:01 (3)			05:36	
	17:22					18:34	20 07:21 (3)			20:39	
Potential sun hours	293		295		370		209		-292	-263	
Total, worst case		360		260		138		76			
Sun reduction		0.35		0.45		0.45		0.55			
Oper. time red.		0.86		0.86		0.86		0.86			
Wind dir. red.		0.64		0.63		0.61		0.60			
Total reduction		0.19		0.25		0.24		0.29			
Total, real		70		64		33		22			

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	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, Mid Western part
9 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
1000 meter max shadow distance applied along with default 3° inclination
Sunshine probabilities applied (pdf plots)
Directional run-hours applied from tab file (tower 1)
.

Licensed user:
Wind Engineers, Inc.
7660 Whitegate Avenue
US-RIVERSIDE, CA 92506

Calculated:
03/01/06 23:22/2.4.0.67

SHADOW - Calendar

Calculation: Mid Western part **Shadow receptor:** 752 - 752

Assumptions for shadow calculations

Maximum distance for influence	1,000	m
Minimum sun height over horizon for influence	3	°
Day step for calculation	1	days
Time step for calculation	2	minutes

Sun shine probabilities (part of time from sun rise to sun set with sun shine)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.35	0.45	0.45	0.55	0.55	0.55	0.65	0.55	0.55	0.45	0.35	0.30

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
475	585	238	199	220	474	1,184	813	840	1,246	803	479	7,555

	July		August		September		October		November		December	
1	05:36		06:02		06:35		07:07		06:43		07:20	09:08 (5)
	20:52		20:32		19:46		18:53		17:04		16:39	22 09:30 (5)
2	05:37		06:03		06:36		07:08		06:44		07:21	09:09 (5)
	20:52		20:31		19:44		18:51		17:03		16:38	22 09:31 (5)
3	05:37		06:04		06:37		07:09		06:46		07:22	09:08 (5)
	20:52		20:30		19:42		18:50		17:02		16:38	22 09:30 (5)
4	05:38		06:05		06:38		07:10		06:47		07:23	09:09 (5)
	20:51		20:29		19:41		18:48		17:01		16:38	22 09:31 (5)
5	05:39		06:06		06:39		07:11		06:48		07:24	09:08 (5)
	20:51		20:28		19:39		18:46		16:59		16:38	24 09:32 (5)
6	05:39		06:07		06:40		07:12		06:49		07:25	09:09 (5)
	20:51		20:26		19:37		18:44		16:58		16:37	24 09:33 (5)
7	05:40		06:08		06:41	08:02 (3)	07:13		06:51		07:26	09:10 (5)
	20:51		20:25		19:36	6 08:08 (3)	18:43		16:57		16:37	24 09:34 (5)
8	05:40		06:09		06:42	07:59 (3)	07:14		06:52		07:27	09:09 (5)
	20:50		20:24		19:34	12 08:11 (3)	18:41		16:56		16:37	24 09:33 (5)
9	05:41		06:10		06:43	07:56 (3)	07:16		06:53		07:28	09:10 (5)
	20:50		20:23		19:32	16 08:12 (3)	18:39		16:55		16:37	24 09:34 (5)
10	05:42		06:11		06:44	07:55 (3)	07:17		06:54		07:29	09:11 (5)
	20:50		20:21		19:30	18 08:13 (3)	18:38		16:54		16:37	24 09:35 (5)
11	05:43		06:12		06:45	07:54 (3)	07:18		06:56		07:29	09:12 (5)
	20:49		20:20		19:29	20 08:14 (3)	18:36		16:53		16:37	24 09:36 (5)
12	05:43		06:13		06:46	07:53 (3)	07:19		06:57		07:30	09:11 (5)
	20:49		20:19		19:27	20 08:13 (3)	18:34		16:52		16:37	26 09:37 (5)
13	05:44		06:14		06:47	07:52 (3)	07:20		08:53 (4)	06:58	07:31	09:12 (5)
	20:48		20:17		19:25	22 08:14 (3)	18:33	10	09:03 (4)	16:51	16:37	24 09:36 (5)
14	05:45		06:15		06:48	07:53 (3)	07:21		08:50 (4)	06:59	07:32	09:12 (5)
	20:48		20:16		19:23	20 08:13 (3)	18:31	14	09:04 (4)	16:50	16:38	24 09:36 (5)
15	05:46		06:16		06:49	07:52 (3)	07:23		08:49 (4)	07:01	07:33	09:13 (5)
	20:47		20:14		19:21	20 08:12 (3)	18:29	16	09:05 (4)	16:49	16:38	24 09:37 (5)
16	05:47		06:17		06:50	07:53 (3)	07:24		08:46 (4)	07:02	07:33	09:14 (5)
	20:46		20:13		19:20	18 08:11 (3)	18:28	20	09:06 (4)	16:48	16:38	24 09:38 (5)
17	05:47		06:18		06:52	07:54 (3)	07:25		08:46 (4)	07:03	07:34	09:14 (5)
	20:46		20:11		19:18	16 08:10 (3)	18:26	22	09:08 (4)	16:47	16:38	24 09:38 (5)
18	05:48		06:20		06:53	07:55 (3)	07:26		08:45 (4)	07:04	07:35	09:15 (5)
	20:45		20:10		19:16	12 08:07 (3)	18:25	22	09:07 (4)	16:46	16:39	24 09:39 (5)
19	05:49		06:21		06:54	07:56 (3)	07:27		08:46 (4)	07:06	07:35	09:16 (5)
	20:44		20:08		19:14	10 08:06 (3)	18:23	22	09:08 (4)	16:45	16:39	24 09:40 (5)
20	05:50		06:22		06:55		07:28		08:45 (4)	07:07	07:36	09:14 (5)
	20:44		20:07		19:13		18:22	22	09:07 (4)	16:45	16:39	26 09:40 (5)
21	05:51		06:23		06:56		07:30		08:45 (4)	07:08	07:36	09:15 (5)
	20:43		20:05		19:11		18:20	22	09:07 (4)	16:44	16:40	26 09:41 (5)
22	05:52		06:24		06:57		07:31		08:46 (4)	07:09	07:37	09:15 (5)
	20:42		20:04		19:09		18:18	22	09:08 (4)	16:43	16:40	26 09:41 (5)
23	05:53		06:25		06:58		07:32		08:45 (4)	07:11	07:38	09:16 (5)
	20:41		20:02		19:07		18:17	22	09:07 (4)	16:42	16:41	26 09:42 (5)
24	05:54		06:26		06:59		07:33		08:46 (4)	07:12	09:14 (5)	07:38 09:18 (5)
	20:40		20:01		19:05		18:16	18	09:04 (4)	16:42 6	09:20 (5)	16:42 24 09:42 (5)
25	05:55		06:27		07:00		06:34		07:48 (4)	07:13	09:11 (5)	07:38 09:18 (5)
	20:39		19:57		19:04		17:14	16	08:04 (4)	16:41 12	09:23 (5)	16:42 24 09:42 (5)
26	05:56		06:28		07:01		06:36		07:49 (4)	07:14	09:10 (5)	07:39 09:19 (5)
	20:38		19:56		19:02		17:13	14	08:03 (4)	16:41 14	09:24 (5)	16:43 24 09:43 (5)
27	05:57		06:29		07:02		06:37		07:52 (4)	07:15	09:09 (5)	07:39 09:19 (5)
	20:38		19:54		19:00		17:11	8	08:00 (4)	16:40 16	09:25 (5)	16:43 24 09:43 (5)
28	05:58		06:30		07:03		06:38			07:16	09:08 (5)	07:39 09:19 (5)
	20:37		19:53		18:58		17:10			16:40 18	09:26 (5)	16:44 24 09:43 (5)
29	05:59		06:31		07:04		06:39			07:17	09:10 (5)	07:40 09:19 (5)
	20:36		19:51		18:57		17:08			16:39 18	09:28 (5)	16:45 24 09:43 (5)
30	06:00		06:32		07:06		06:41			07:19	09:09 (5)	07:40 09:19 (5)
	20:34		19:49		18:55		17:07			16:39 20	09:29 (5)	16:46 24 09:43 (5)
31	06:01		06:33				06:42					07:40 09:20 (5)
	20:33		19:48				17:06					16:46 26 09:46 (5)
Potential sun hours	-280		-145		375		343		294		283	
Total, worst case					210		270		104		748	
Sun reduction					0.55		0.45		0.35		0.30	
Oper. time red.					0.86		0.86		0.86		0.86	
Wind dir. red.					0.60		0.63		0.64		0.64	
Total reduction					0.29		0.25		0.19		0.17	
Total, real					60		66		20		125	

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	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, Mid Western part
9 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
1000 meter max shadow distance applied along with default 3° inclination
Sunshine probabilities applied (pdf plots)
Directional run-hours applied from tab file (tower 1)
.

Licensed user:
Wind Engineers, Inc.
7660 Whitegate Avenue
US-RIVERSIDE, CA 92506

Calculated:
03/01/06 23:22/2.4.0.67

SHADOW - Calendar

Calculation: Mid Western part **Shadow receptor:** 753 - 753

Assumptions for shadow calculations

Maximum distance for influence	1,000 m
Minimum sun height over horizon for influence	3 °
Day step for calculation	1 days
Time step for calculation	2 minutes

Sun shine probabilities (part of time from sun rise to sun set with sun shine)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.35	0.45	0.45	0.55	0.55	0.55	0.65	0.55	0.55	0.45	0.35	0.30

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
475	585	238	199	220	474	1,184	813	840	1,246	803	479	7,555

	January		February		March		April		May	June
1	07:40	09:14 (5)	07:25		06:47	08:01 (4)	05:54	06:53 (3)	06:06	05:36
	16:48	14 09:28 (5)	17:23		17:59	22 08:23 (4)	18:36	14 07:07 (3)	20:08	20:40
2	07:40	09:14 (5)	07:24		06:46	08:01 (4)	05:52	06:52 (3)	06:05	05:35
	16:48	16 09:30 (5)	17:25		18:01	22 08:23 (4)	18:37	16 07:08 (3)	20:10	20:41
3	07:40	09:14 (5)	07:23		06:44	08:00 (4)	05:51	06:52 (3)	06:04	05:35
	16:49	16 09:30 (5)	17:26		18:02	24 08:24 (4)	18:38	18 07:10 (3)	20:11	20:41
4	07:40	09:13 (5)	07:22		06:42	08:00 (4)	05:49	06:50 (3)	06:02	05:35
	16:50	18 09:31 (5)	17:27		18:03	22 08:22 (4)	18:39	18 07:08 (3)	20:12	20:42
5	07:40	09:13 (5)	07:21		06:41	08:00 (4)	06:47	07:51 (3)	06:01	05:34
	16:51	18 09:31 (5)	17:29		18:04	20 08:20 (4)	19:40	18 08:09 (3)	20:13	20:43
6	07:40	09:13 (5)	07:20		06:39	08:03 (4)	06:46	07:49 (3)	06:00	05:34
	16:52	20 09:33 (5)	17:30		18:05	18 08:21 (4)	19:41	20 08:09 (3)	20:14	20:44
7	07:40	09:13 (5)	07:19		06:37	08:03 (4)	06:44	07:49 (3)	05:58	05:34
	16:53	20 09:33 (5)	17:31		18:07	16 08:19 (4)	19:42	20 08:09 (3)	20:15	20:44
8	07:40	09:13 (5)	07:17		06:36	08:05 (4)	06:42	07:49 (3)	05:57	05:33
	16:54	22 09:35 (5)	17:32		18:08	10 08:15 (4)	19:44	18 08:07 (3)	20:16	20:45
9	07:40	09:12 (5)	07:16		06:34	08:08 (4)	06:40	07:50 (3)	05:56	05:33
	16:55	22 09:34 (5)	17:34		18:09	4 08:12 (4)	19:45	16 08:06 (3)	20:17	20:46
10	07:40	09:12 (5)	07:15		06:32		06:39	07:50 (3)	05:55	05:33
	16:56	24 09:36 (5)	17:35		18:10		19:46	16 08:06 (3)	20:18	20:46
11	07:39	09:12 (5)	07:14		06:31		06:37	07:50 (3)	05:54	05:33
	16:57	24 09:36 (5)	17:36		18:11		19:47	14 08:04 (3)	20:20	20:47
12	07:39	09:13 (5)	07:12		06:29		06:35	07:53 (3)	05:53	05:32
	16:58	24 09:37 (5)	17:38		18:13		19:48	8 08:01 (3)	20:21	20:47
13	07:39	09:13 (5)	07:11		06:27		06:34		05:51	05:32
	17:00	24 09:37 (5)	17:39		18:14		19:49		20:22	20:48
14	07:38	09:13 (5)	07:10		06:25		06:32		05:50	05:32
	17:01	26 09:39 (5)	17:40		18:15		19:50		20:23	20:48
15	07:38	09:14 (5)	07:08		06:24		06:31		05:49	05:32
	17:02	24 09:38 (5)	17:42		18:16		19:51		20:24	20:49
16	07:37	09:13 (5)	07:07		06:22		06:29		05:48	05:32
	17:03	26 09:39 (5)	17:43		18:17		19:53		20:25	20:49
17	07:37	09:15 (5)	07:05		06:20		06:27		05:47	05:32
	17:04	24 09:39 (5)	17:44		18:18		19:54		20:26	20:50
18	07:36	09:14 (5)	07:04		06:19		06:26		05:46	05:32
	17:05	24 09:38 (5)	17:45		18:20		19:55		20:27	20:50
19	07:36	09:16 (5)	07:03		06:17		06:24		05:45	05:33
	17:07	24 09:40 (5)	17:47		18:21		19:56		20:28	20:50
20	07:35	09:15 (5)	07:01		06:15		06:23		05:44	05:33
	17:08	24 09:39 (5)	17:48		18:22		19:57		20:29	20:51
21	07:35	09:16 (5)	07:00		06:13		06:21		05:44	05:33
	17:09	24 09:40 (5)	17:49		18:23		19:58		20:30	20:51
22	07:34	09:15 (5)	06:58		06:12		06:19		05:43	05:33
	17:10	24 09:39 (5)	17:51		18:24		19:59		20:31	20:51
23	07:33	09:17 (5)	06:57	08:11 (4)	06:10		06:18		05:42	05:33
	17:12	22 09:39 (5)	17:52	6 08:17 (4)	18:25		20:01		20:32	20:51
24	07:32	09:18 (5)	06:55	08:07 (4)	06:08		06:16		05:41	05:34
	17:13	20 09:38 (5)	17:53	12 08:19 (4)	18:26		20:01		20:33	20:52
25	07:32	09:19 (5)	06:54	08:05 (4)	06:06		06:15		05:40	05:34
	17:14	20 09:39 (5)	17:54	16 08:21 (4)	18:28		20:02		20:34	20:52
26	07:31	09:20 (5)	06:52	08:04 (4)	06:05		06:13		05:40	05:34
	17:15	18 09:38 (5)	17:56	18 08:22 (4)	18:29		20:03		20:35	20:52
27	07:30	09:21 (5)	06:50	08:02 (4)	06:03		06:12		05:39	05:35
	17:17	16 09:37 (5)	17:57	20 08:22 (4)	18:30		20:04		20:36	20:52
28	07:29	09:22 (5)	06:49	08:03 (4)	06:01		06:11		05:38	05:35
	17:18	12 09:34 (5)	17:58	20 08:23 (4)	18:31		20:05		20:37	20:52
29	07:28	09:27 (5)			05:59		06:09		05:38	05:35
	17:19	4 09:31 (5)			18:32		20:06		20:37	20:52
30	07:27				05:58		06:08		05:37	05:36
	17:21				18:33		20:07		20:38	20:52
31	07:26				05:56	06:57 (3)			05:36	
	17:22				18:34	8 07:05 (3)			20:39	
Potential sun hours	293		295		370		209		-292	-263
Total, worst case		594		92		166		196		
Sun reduction		0.35		0.45		0.45		0.55		
Oper. time red.		0.86		0.86		0.86		0.86		
Wind dir. red.		0.64		0.62		0.62		0.61		
Total reduction		0.19		0.24		0.24		0.29		
Total, real		114		22		40		57		

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	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, Mid Western part
9 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
1000 meter max shadow distance applied along with default 3° inclination
Sunshine probabilities applied (pdf plots)
Directional run-hours applied from tab file (tower 1)
.

Licensed user:
Wind Engineers, Inc.
7660 Whitegate Avenue
US-RIVERSIDE, CA 92506

Calculated:
03/01/06 23:22/2.4.0.67

SHADOW - Calendar

Calculation: Mid Western part **Shadow receptor:** 753 - 753

Assumptions for shadow calculations

Maximum distance for influence	1,000	m
Minimum sun height over horizon for influence	3	°
Day step for calculation	1	days
Time step for calculation	2	minutes

Sun shine probabilities (part of time from sun rise to sun set with sun shine)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.35	0.45	0.45	0.55	0.55	0.55	0.65	0.55	0.55	0.45	0.35	0.30

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
475	585	238	199	220	474	1,184	813	840	1,246	803	479	7,555

	July		August			September			October			November			December		
1	05:36		06:02			06:35		07:50 (3)	07:07			06:43			07:20		08:54 (5)
	20:52		20:32			19:46	14	08:04 (3)	18:53			17:04			16:39	24	09:18 (5)
2	05:37		06:03			06:36		07:49 (3)	07:08			06:44			07:21		08:55 (5)
	20:52		20:31			19:44	16	08:05 (3)	18:51			17:03			16:38	24	09:19 (5)
3	05:37		06:04			06:37		07:48 (3)	07:09			06:46			07:22		08:56 (5)
	20:52		20:30			19:42	16	08:04 (3)	18:50			17:02			16:38	22	09:18 (5)
4	05:38		06:05			06:38		07:47 (3)	07:10			06:47			07:23		08:57 (5)
	20:51		20:29			19:41	18	08:05 (3)	18:48			17:01			16:38	22	09:19 (5)
5	05:39		06:06			06:39		07:46 (3)	07:11		08:43 (4)	06:48			07:24		08:58 (5)
	20:51		20:28			19:39	20	08:06 (3)	18:46	8	08:51 (4)	16:59			16:38	20	09:18 (5)
6	05:39		06:07			06:40		07:45 (3)	07:12		08:41 (4)	06:49			07:25		08:59 (5)
	20:51		20:26			19:37	20	08:05 (3)	18:44	14	08:55 (4)	16:58			16:37	20	09:19 (5)
7	05:40		06:08			06:41		07:46 (3)	07:13		08:38 (4)	06:51			07:26		09:00 (5)
	20:51		20:25			19:36	18	08:04 (3)	18:43	18	08:56 (4)	16:57			16:37	18	09:18 (5)
8	05:40		06:09			06:42		07:45 (3)	07:15		08:37 (4)	06:52			07:27		09:01 (5)
	20:50		20:24			19:34	20	08:05 (3)	18:41	20	08:57 (4)	16:56			16:37	18	09:19 (5)
9	05:41		06:10			06:43		07:46 (3)	07:16		08:36 (4)	06:53			07:28		09:02 (5)
	20:50		20:23			19:32	18	08:04 (3)	18:39	20	08:56 (4)	16:55			16:37	16	09:18 (5)
10	05:42		06:11			06:44		07:45 (3)	07:17		08:35 (4)	06:54			07:29		09:03 (5)
	20:50		20:21			19:30	16	08:01 (3)	18:38	22	08:57 (4)	16:54			16:37	16	09:19 (5)
11	05:43		06:12			06:45		07:46 (3)	07:18		08:34 (4)	06:56			07:29		09:04 (5)
	20:49		20:20			19:29	14	08:00 (3)	18:36	22	08:56 (4)	16:53			16:37	14	09:18 (5)
12	05:43		06:13			06:46		07:49 (3)	07:19		08:34 (4)	06:57			07:30		09:05 (5)
	20:49		20:19			19:27	8	07:57 (3)	18:34	24	08:58 (4)	16:52			16:37	14	09:19 (5)
13	05:44		06:14			06:47			07:20		08:35 (4)	06:58		08:57 (5)	07:31		09:06 (5)
	20:48		20:17			19:25			18:33	22	08:57 (4)	16:51	6	09:03 (5)	16:37	12	09:18 (5)
14	05:45		06:15			06:48			07:21		08:34 (4)	06:59		08:55 (5)	07:32		09:06 (5)
	20:48		20:16			19:23			18:31	22	08:56 (4)	16:50	12	09:07 (5)	16:38	12	09:18 (5)
15	05:46		06:16			06:49			07:23		08:35 (4)	07:01		08:54 (5)	07:33		09:07 (5)
	20:47		20:14			19:21			18:29	20	08:55 (4)	16:49	16	09:10 (5)	16:38	12	09:19 (5)
16	05:47		06:17			06:50			07:24		08:36 (4)	07:02		08:53 (5)	07:33		09:08 (5)
	20:46		20:13			19:20			18:28	18	08:54 (4)	16:48	18	09:11 (5)	16:38	10	09:18 (5)
17	05:47		06:18			06:52			07:25		08:38 (4)	07:03		08:53 (5)	07:34		09:08 (5)
	20:46		20:11			19:18			18:26	14	08:52 (4)	16:47	20	09:13 (5)	16:38	10	09:18 (5)
18	05:48		06:20			06:53			07:26		08:39 (4)	07:04		08:52 (5)	07:35		09:09 (5)
	20:45		20:10			19:16			18:25	12	08:51 (4)	16:46	20	09:12 (5)	16:39	10	09:19 (5)
19	05:49		06:21			06:54			07:27		08:42 (4)	07:06		08:51 (5)	07:35		09:10 (5)
	20:44		20:08			19:14			18:23	4	08:46 (4)	16:45	22	09:13 (5)	16:39	10	09:20 (5)
20	05:50		06:22			06:55			07:28			07:07		08:50 (5)	07:36		09:10 (5)
	20:44		20:07			19:13			18:22			16:45	24	09:14 (5)	16:39	10	09:20 (5)
21	05:51		06:23			06:56			07:30			07:08		08:52 (5)	07:36		09:11 (5)
	20:43		20:05			19:11			18:20			16:44	24	09:16 (5)	16:40	8	09:19 (5)
22	05:52		06:24			06:57			07:31			07:09		08:51 (5)	07:37		09:11 (5)
	20:42		20:04			19:09			18:18			16:43	24	09:15 (5)	16:40	8	09:19 (5)
23	05:53		06:25			06:58			07:32			07:11		08:52 (5)	07:38		09:12 (5)
	20:41		20:02			19:07			18:17			16:42	24	09:16 (5)	16:41	8	09:20 (5)
24	05:54		06:26			06:59			07:33			07:12		08:52 (5)	07:38		09:12 (5)
	20:40		20:01			19:05			18:16			16:42	24	09:16 (5)	16:42	10	09:22 (5)
25	05:55		06:27			07:00			06:34			07:13		08:53 (5)	07:38		09:12 (5)
	20:39		19:57			19:04			17:14			16:41	24	09:17 (5)	16:42	10	09:22 (5)
26	05:56		06:28			07:01			06:36			07:14		08:52 (5)	07:39		09:13 (5)
	20:38		19:56			19:02			17:13			16:41	26	09:18 (5)	16:43	10	09:23 (5)
27	05:57		06:29			07:02			06:37			07:15		08:53 (5)	07:39		09:13 (5)
	20:38		19:54			19:00			17:11			16:40	24	09:17 (5)	16:43	10	09:23 (5)
28	05:58		06:30			07:03			06:38			07:16		08:52 (5)	07:39		09:13 (5)
	20:37		19:53			18:58			17:10			16:40	26	09:18 (5)	16:44	12	09:25 (5)
29	05:59		06:31			07:04			06:39			07:17		08:54 (5)	07:40		09:13 (5)
	20:36		19:51			18:57			17:08			16:39	24	09:18 (5)	16:45	12	09:25 (5)
30	06:00		06:32			07:06			06:41			07:19		08:55 (5)	07:40		09:13 (5)
	20:34		19:49			18:55			17:07			16:39	24	09:19 (5)	16:46	12	09:25 (5)
31	06:01		06:33		07:53 (3)				06:42						07:40		09:14 (5)
	20:33		19:48	8	08:01 (3)				17:06						16:46	14	09:28 (5)
Potential sun hours	-280		-145			375			343			294			283		
Total, worst case				8			198			260			382			428	
Sun reduction				0.55			0.55			0.45			0.35			0.30	
Oper. time red.				0.86			0.86			0.86			0.86			0.86	
Wind dir. red.				0.61			0.61			0.62			0.64			0.64	
Total reduction				0.29			0.29			0.24			0.19			0.16	
Total, real				2			57			63			74			71	

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	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, Mid Western part
9 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
1000 meter max shadow distance applied along with default 3° inclination
Sunshine probabilities applied (pdf plots)
Directional run-hours applied from tab file (tower 1)
.

Licensed user:
Wind Engineers, Inc.
7660 Whitegate Avenue
US-RIVERSIDE, CA 92506

Calculated:
03/01/06 23:22/2.4.0.67

SHADOW - Calendar

Calculation: Mid Western part **Shadow receptor:** 754 - 754

Assumptions for shadow calculations

Maximum distance for influence	1,000 m
Minimum sun height over horizon for influence	3 °
Day step for calculation	1 days
Time step for calculation	2 minutes

Sun shine probabilities (part of time from sun rise to sun set with sun shine)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.35	0.45	0.45	0.55	0.55	0.55	0.65	0.55	0.55	0.45	0.35	0.30

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
475	585	238	199	220	474	1,184	813	840	1,246	803	479	7,555

	January		February		March		April		May		June	
1	07:40		07:25		09:14 (5)	06:47		05:54	07:31 (4)	06:06	07:12 (3)	05:36
	16:48		17:23	26	09:40 (5)	17:59		18:36	18 07:49 (4)	20:08	22 07:34 (3)	20:40
2	07:40		07:24		09:13 (5)	06:46		05:52	07:34 (4)	06:05	07:13 (3)	05:35
	16:48		17:25	28	09:41 (5)	18:01		18:37	14 07:48 (4)	20:10	22 07:35 (3)	20:41
3	07:40		07:23		09:12 (5)	06:44		05:51	07:38 (4)	06:04	07:12 (3)	05:35
	16:49		17:26	30	09:42 (5)	18:02		18:38	4 07:42 (4)	20:11	22 07:34 (3)	20:41
4	07:40		07:22		09:13 (5)	06:42		05:49		06:02	07:13 (3)	05:35
	16:50		17:27	30	09:43 (5)	18:03		18:39		20:12	22 07:35 (3)	20:42
5	07:40		07:21		09:12 (5)	06:41		06:47		06:01	07:11 (3)	05:34
	16:51		17:29	32	09:44 (5)	18:04		19:40		20:13	22 07:33 (3)	20:43
6	07:40		07:20		09:10 (5)	06:39		06:46		06:00	07:12 (3)	05:34
	16:52		17:30	32	09:42 (5)	18:05		19:41		20:14	22 07:34 (3)	20:44
7	07:40		07:19		09:11 (5)	06:37		06:44		05:58	07:11 (3)	05:34
	16:53		17:31	32	09:43 (5)	18:07		19:42		20:15	22 07:33 (3)	20:44
8	07:40		07:17		09:12 (5)	06:36		06:42		05:57	07:12 (3)	05:33
	16:54		17:32	32	09:44 (5)	18:08		19:44		20:16	22 07:34 (3)	20:45
9	07:40		07:16		09:11 (5)	06:34		06:40		05:56	07:13 (3)	05:33
	16:55		17:34	32	09:43 (5)	18:09		19:45		20:17	20 07:33 (3)	20:46
10	07:40		07:15		09:11 (5)	06:32		06:39		05:55	07:13 (3)	05:33
	16:56		17:35	32	09:43 (5)	18:10		19:46		20:18	18 07:31 (3)	20:46
11	07:39		07:14		09:12 (5)	06:31		06:37		05:54	07:14 (3)	05:33
	16:57		17:36	30	09:42 (5)	18:11		19:47		20:20	16 07:30 (3)	20:47
12	07:39		07:12		09:13 (5)	06:29		06:35		05:53	07:15 (3)	05:32
	16:58		17:38	30	09:43 (5)	18:13		19:48		20:21	14 07:29 (3)	20:47
13	07:39		07:11		09:13 (5)	06:27		06:34		05:51	07:16 (3)	05:32
	17:00		17:39	28	09:41 (5)	18:14		19:49		20:22	12 07:28 (3)	20:48
14	07:38		07:10		09:14 (5)	06:25		06:32		05:50	07:19 (3)	05:32
	17:01		17:40	26	09:40 (5)	18:15		19:50		20:23	6 07:25 (3)	20:48
15	07:38		07:08		09:14 (5)	06:24		06:31		05:49		05:32
	17:02		17:42	24	09:38 (5)	18:16		19:51		20:24		20:49
16	07:37		07:07		09:15 (5)	06:22		06:29		05:48		05:32
	17:03		17:43	22	09:37 (5)	18:17		19:53		20:25		20:49
17	07:37		07:05		09:16 (5)	06:20	07:44 (4)	06:27		05:47		05:32
	17:04		17:44	20	09:36 (5)	18:18	6 07:50 (4)	19:54		20:26		20:50
18	07:36		07:04		09:18 (5)	06:19		07:40 (4)	06:26	05:46		05:32
	17:05		17:45	16	09:34 (5)	18:20	14 07:54 (4)	19:55		20:27		20:50
19	07:36		07:03		09:23 (5)	06:17		07:36 (4)	06:24	05:45		05:33
	17:07		17:47	6	09:29 (5)	18:21	20 07:56 (4)	19:56		20:28		20:50
20	07:35		07:01			06:15		07:34 (4)	06:23	05:44		05:33
	17:08		17:48			18:22	22 07:56 (4)	19:57		20:29		20:51
21	07:35		07:00			06:13		07:33 (4)	06:21	05:44		05:33
	17:09		17:49			18:23	24 07:57 (4)	19:58		20:30		20:51
22	07:34		06:58			06:12		07:33 (4)	06:19	05:43		05:33
	17:10		17:51			18:24	24 07:57 (4)	19:59		20:31		20:51
23	07:33		06:57			06:10		07:31 (4)	06:18	05:42		05:33
	17:12		17:52			18:25	26 07:57 (4)	20:01		20:32		20:51
24	07:32		06:55			06:08		07:31 (4)	06:16	05:41		05:34
	17:13		17:53			18:26	26 07:57 (4)	20:01		20:33		20:52
25	07:32		06:54			06:06		07:30 (4)	06:15	05:40		05:34
	17:14		17:54			18:28	28 07:58 (4)	20:02		20:34		20:52
26	07:31		09:24 (5)	06:52		06:05		07:30 (4)	06:13	07:19 (3)	05:40	05:34
	17:15	4	09:28 (5)	17:56		18:29	26 07:56 (4)	20:03	10	07:29 (3)	20:35	20:52
27	07:30		09:19 (5)	06:50		06:03		07:30 (4)	06:12	07:18 (3)	05:39	05:35
	17:17	12	09:31 (5)	17:57		18:30	26 07:56 (4)	20:04	14	07:32 (3)	20:36	20:52
28	07:29		09:18 (5)	06:49		06:01		07:30 (4)	06:11	07:16 (3)	05:38	05:35
	17:18	16	09:34 (5)	17:58		18:31	24 07:54 (4)	20:05	16	07:32 (3)	20:36	20:52
29	07:28		09:17 (5)			05:59		07:31 (4)	06:09	07:15 (3)	05:38	05:35
	17:19	18	09:35 (5)			18:32	24 07:55 (4)	20:06	18	07:33 (3)	20:37	20:52
30	07:27		09:14 (5)			05:58		07:31 (4)	06:08	07:14 (3)	05:37	05:36
	17:21	24	09:38 (5)			18:33	22 07:53 (4)	20:07	20	07:34 (3)	20:38	20:52
31	07:26		09:15 (5)			05:56		07:31 (4)			05:36	
	17:22	24	09:39 (5)			18:34	20 07:51 (4)				20:39	
Potential sun hours	293		295			370		209		-292		-263
Total, worst case		98		508		332			114		262	
Sun reduction		0.35		0.45		0.45			0.55		0.55	
Oper. time red.		0.86		0.86		0.86			0.86		0.86	
Wind dir. red.		0.62		0.62		0.59			0.60		0.60	
Total reduction		0.19		0.24		0.23			0.29		0.29	
Total, real		19		124		77			33		75	

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	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, Mid Western part
9 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
1000 meter max shadow distance applied along with default 3° inclination
Sunshine probabilities applied (pdf plots)
Directional run-hours applied from tab file (tower 1)
.

Printed/Page
03/05/06 23:05 / 15
Licensed user:
Wind Engineers, Inc.
7660 Whitegate Avenue
US-RIVERSIDE, CA 92506

Calculated:
03/01/06 23:22/2.4.0.67

SHADOW - Calendar

Calculation: Mid Western part **Shadow receptor:** 754 - 754

Assumptions for shadow calculations

Maximum distance for influence	1,000	m
Minimum sun height over horizon for influence	3	°
Day step for calculation	1	days
Time step for calculation	2	minutes

Sun shine probabilities (part of time from sun rise to sun set with sun shine)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.35	0.45	0.45	0.55	0.55	0.55	0.65	0.55	0.55	0.45	0.35	0.30

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
475	585	238	199	220	474	1,184	813	840	1,246	803	479	7,555

	July		August		September		October		November		December	
1	05:36		06:02		07:24 (3)	06:35		07:07		06:43	08:41 (5)	07:20
	20:52		20:32	16	07:40 (3)	19:46		18:53		17:04	32 09:13 (5)	16:39
2	05:37		06:03		07:23 (3)	06:36		07:08		06:44	08:40 (5)	07:21
	20:52		20:31	18	07:41 (3)	19:44		18:51		17:03	32 09:12 (5)	16:38
3	05:37		06:04		07:22 (3)	06:37		07:09		06:46	08:40 (5)	07:22
	20:52		20:30	20	07:42 (3)	19:42		18:50		17:02	34 09:14 (5)	16:38
4	05:38		06:05		07:23 (3)	06:38		07:10		06:47	08:41 (5)	07:23
	20:51		20:29	20	07:43 (3)	19:41		18:48		17:01	32 09:13 (5)	16:38
5	05:39		06:06		07:22 (3)	06:39		07:11		06:48	08:40 (5)	07:24
	20:51		20:28	22	07:44 (3)	19:39		18:46		16:59	32 09:12 (5)	16:38
6	05:39		06:07		07:21 (3)	06:40		07:12		06:49	08:42 (5)	07:25
	20:51		20:26	22	07:43 (3)	19:37		18:44		16:58	30 09:12 (5)	16:37
7	05:40		06:08		07:22 (3)	06:41		07:13		06:51	08:43 (5)	07:26
	20:51		20:25	22	07:44 (3)	19:36		18:43		16:57	30 09:13 (5)	16:37
8	05:40		06:09		07:21 (3)	06:42		07:14		06:52	08:42 (5)	07:27
	20:50		20:24	22	07:43 (3)	19:34		18:41		16:56	30 09:12 (5)	16:37
9	05:41		06:10		07:20 (3)	06:43		07:16		06:53	08:44 (5)	07:28
	20:50		20:23	24	07:44 (3)	19:32		18:39		16:55	28 09:12 (5)	16:37
10	05:42		06:11		07:21 (3)	06:44	08:27 (4)	07:17		06:54	08:45 (5)	07:29
	20:50		20:21	22	07:43 (3)	19:30	12 08:39 (4)	18:38		16:54	26 09:11 (5)	16:37
11	05:43		06:12		07:20 (3)	06:45	08:26 (4)	07:18		06:56	08:46 (5)	07:29
	20:49		20:20	22	07:42 (3)	19:29	16 08:42 (4)	18:36		16:53	24 09:10 (5)	16:37
12	05:43		06:13		07:21 (3)	06:46	08:23 (4)	07:19		06:57	08:46 (5)	07:30
	20:49		20:19	22	07:43 (3)	19:27	20 08:43 (4)	18:34		16:52	24 09:10 (5)	16:37
13	05:44		06:14		07:22 (3)	06:47	08:22 (4)	07:20		06:58	08:49 (5)	07:31
	20:48		20:17	20	07:42 (3)	19:25	22 08:44 (4)	18:33		16:51	18 09:07 (5)	16:37
14	05:45		06:15		07:23 (3)	06:48	08:21 (4)	07:21		06:59	08:51 (5)	07:32
	20:48		20:16	18	07:41 (3)	19:23	24 08:45 (4)	18:31		16:50	16 09:07 (5)	16:38
15	05:46		06:16		07:24 (3)	06:49	08:20 (4)	07:23		07:01	08:52 (5)	07:33
	20:47		20:14	16	07:40 (3)	19:21	26 08:46 (4)	18:29		16:49	12 09:04 (5)	16:38
16	05:47		06:17		07:25 (3)	06:50	08:19 (4)	07:24		07:02	08:57 (5)	07:33
	20:46		20:13	12	07:37 (3)	19:20	26 08:45 (4)	18:28		16:48	4 09:01 (5)	16:38
17	05:47		06:18		07:28 (3)	06:52	08:18 (4)	07:25		07:03		07:34
	20:46		20:11	6	07:34 (3)	19:18	28 08:46 (4)	18:26		16:47		16:38
18	05:48		06:20			06:53	08:17 (4)	07:26		07:04		07:35
	20:45		20:10			19:16	28 08:45 (4)	18:25		16:46		16:39
19	05:49		06:21			06:54	08:18 (4)	07:27		07:06		07:35
	20:44		20:08			19:14	26 08:44 (4)	18:23		16:45		16:39
20	05:50		06:22			06:55	08:17 (4)	07:28		07:07		07:36
	20:44		20:07			19:13	26 08:43 (4)	18:22		16:45		16:39
21	05:51		06:23			06:56	08:18 (4)	07:30		07:08		07:36
	20:43		20:05			19:11	26 08:44 (4)	18:20		16:44		16:40
22	05:52		06:24			06:57	08:17 (4)	07:31		07:09		07:37
	20:42		20:04			19:09	26 08:43 (4)	18:18		16:43		16:40
23	05:53		06:25			06:58	08:18 (4)	07:32	09:51 (5)	07:11		07:37
	20:41		20:02			19:07	22 08:40 (4)	18:17	10 10:01 (5)	16:42		16:41
24	05:54		06:26			06:59	08:19 (4)	07:33	09:48 (5)	07:12		07:38
	20:40		20:01			19:05	20 08:39 (4)	18:16	16 10:04 (5)	16:42		16:42
25	05:55		06:27			07:00	08:20 (4)	06:34	08:46 (5)	07:13		07:38
	20:39		19:57			19:04	16 08:36 (4)	17:14	20 09:06 (5)	16:41		16:42
26	05:56		06:28			07:01	08:23 (4)	06:36	08:45 (5)	07:14		07:39
	20:38		19:56			19:02	10 08:33 (4)	17:13	22 09:07 (5)	16:41		16:43
27	05:57		06:29			07:02		06:37	08:42 (5)	07:15		07:39
	20:38		19:54			19:00		17:11	26 09:08 (5)	16:40		16:43
28	05:58		06:30			07:03		06:38	08:42 (5)	07:16		07:39
	20:37		19:53			18:58		17:10	28 09:10 (5)	16:40		16:44
29	05:59		07:31 (3)	06:31		07:04		06:39	08:41 (5)	07:17		07:40
	20:36	4	07:35 (3)	19:51		18:57		17:08	30 09:11 (5)	16:39		16:45
30	06:00		07:28 (3)	06:32		07:06		06:41	08:40 (5)	07:19		07:40
	20:34	10	07:38 (3)	19:49		18:55		17:07	32 09:12 (5)	16:39		16:46
31	06:01		07:25 (3)	06:33				06:42	08:42 (5)			07:40
	20:33	14	07:39 (3)	19:48				17:06	30 09:12 (5)			16:46
Potential sun hours	-280		-145			375		343		294		283
Total, worst case		28		324		374		214		404		
Sun reduction		0.65		0.55		0.55		0.45		0.35		
Oper. time red.		0.86		0.86		0.86		0.86		0.86		
Wind dir. red.		0.60		0.60		0.59		0.62		0.62		
Total reduction		0.34		0.29		0.28		0.24		0.19		
Total, real		10		93		105		52		76		

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	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, Mid Western part
9 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
1000 meter max shadow distance applied along with default 3° inclination
Sunshine probabilities applied (pdf plots)
Directional run-hours applied from tab file (tower 1)
.

Licensed user:
Wind Engineers, Inc.
7660 Whitegate Avenue
US-RIVERSIDE, CA 92506

Calculated:
03/01/06 23:22/2.4.0.67

SHADOW - Calendar

Calculation: Mid Western part **Shadow receptor:** 755 - 755

Assumptions for shadow calculations

Maximum distance for influence	1,000	m
Minimum sun height over horizon for influence	3	°
Day step for calculation	1	days
Time step for calculation	2	minutes

Sun shine probabilities (part of time from sun rise to sun set with sun shine)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.35	0.45	0.45	0.55	0.55	0.55	0.65	0.55	0.55	0.45	0.35	0.30

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
475	585	238	199	220	474	1,184	813	840	1,246	803	479	7,555

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:40	07:25	06:47	05:54	07:49 (5) 06:06	07:22 (4) 05:36	05:36	06:02	07:36 (4) 06:35	07:07	06:43	07:20
	16:48	17:23	17:59	18:36 28	08:17 (5) 20:08 26	07:48 (4) 20:40	20:52	20:32 16	07:52 (4) 19:46	18:53	17:04	16:39
2	07:40	07:24	06:46	05:52	07:50 (5) 06:05	07:23 (4) 05:35	05:37	06:03	07:35 (4) 06:36	07:08	06:44	07:21
	16:48	17:25	18:01	18:37 26	08:16 (5) 20:10 26	07:49 (4) 20:41	20:52	20:31 18	07:53 (4) 19:44	18:51	17:03	16:38
3	07:40	07:23	06:44	05:51	07:50 (5) 06:04	07:22 (4) 05:35	05:37	06:04	07:34 (4) 06:37	07:09	06:46	07:22
	16:49	17:26	18:02	18:38 24	08:14 (5) 20:11 26	07:48 (4) 20:41	20:52	20:30 20	07:54 (4) 19:42	18:50	17:02	16:38
4	07:40	07:22	06:42	05:49	07:52 (5) 06:02	07:23 (4) 05:35	05:38	06:05	07:33 (4) 06:38	07:10	06:47	07:23
	16:50	17:27	18:03	18:39 20	08:12 (5) 20:12 26	07:49 (4) 20:42	20:51	20:29 22	07:55 (4) 19:41	18:48	17:01	16:38
5	07:40	07:21	06:41	06:47	08:53 (5) 06:01	07:23 (4) 05:34	05:39	06:06	07:32 (4) 06:39	07:11	06:48	07:24
	16:51	17:29	18:04	19:40 16	09:09 (5) 20:13 24	07:47 (4) 20:43	20:51	20:28 24	07:56 (4) 19:39	18:46	16:59	16:38
6	07:40	07:20	06:39	06:46	08:57 (5) 06:00	07:22 (4) 05:34	05:39	06:07	07:33 (4) 06:40	08:53 (5) 07:12	06:49	07:25
	16:52	17:30	18:05	19:41 8	09:05 (5) 20:14 24	07:46 (4) 20:44	20:51	20:26 24	07:57 (4) 19:37 8	09:01 (5) 18:44	16:58	16:37
7	07:40	07:19	06:37	06:44	05:58	07:23 (4) 05:34	05:40	06:08	07:32 (4) 06:41	08:48 (5) 07:13	06:51	07:26
	16:53	17:31	18:07	19:42	20:15 24	07:47 (4) 20:44	20:51	20:25 24	07:56 (4) 19:36 16	09:04 (5) 18:43	16:57	16:37
8	07:40	07:17	06:36	06:42	05:57	07:24 (4) 05:33	05:40	06:09	07:31 (4) 06:42	08:47 (5) 07:14	06:52	07:27
	16:54	17:32	18:08	19:44	20:16 22	07:46 (4) 20:45	20:50	20:24 26	07:57 (4) 19:34 20	09:07 (5) 18:41	16:56	16:37
9	07:40	07:16	06:34	06:40	05:56	07:25 (4) 05:33	05:41	06:10	07:32 (4) 06:43	08:44 (5) 07:16	06:53	07:28
	16:55	17:34	18:09	19:45	20:17 20	07:45 (4) 20:46	20:50	20:23 24	07:56 (4) 19:32 24	09:08 (5) 18:39	16:55	16:37
10	07:40	07:15	06:32	06:39	05:55	07:23 (4) 05:33	05:42	06:11	07:31 (4) 06:44	08:43 (5) 07:17	06:54	07:29
	16:56	17:35	18:10	19:46	20:18 20	07:43 (4) 20:46	20:50	20:21 26	07:57 (4) 19:30 26	09:09 (5) 18:38	16:54	16:37
11	07:39	07:14	06:31	06:37	05:54	07:24 (4) 05:33	05:43	06:12	07:32 (4) 06:45	08:42 (5) 07:18	06:56	07:29
	16:57	17:36	18:11	19:47	20:20 18	07:42 (4) 20:47	20:49	20:20 24	07:56 (4) 19:29 28	09:10 (5) 18:36	16:53	16:37
12	07:39	07:12	06:29	06:35	05:53	07:27 (4) 05:33	05:43	06:13	07:31 (4) 06:46	08:41 (5) 07:19	06:57	07:30
	16:58	17:38	18:13	19:48	20:21 14	07:41 (4) 20:47	20:49	20:19 26	07:57 (4) 19:27 30	09:11 (5) 18:34	16:52	16:37
13	07:39	07:11	06:27	06:34	05:51	07:28 (4) 05:32	05:44	06:14	07:32 (4) 06:47	08:40 (5) 07:20	06:58	07:31
	17:00	17:39	18:14	19:49	20:22 12	07:40 (4) 20:48	20:48	20:17 24	07:56 (4) 19:25 30	09:10 (5) 18:33	16:51	16:37
14	07:38	07:10	06:25	06:32	05:50	07:31 (4) 05:32	05:45	06:15	07:31 (4) 06:48	08:39 (5) 07:21	06:59	07:32
	17:01	17:40	18:15	19:50	20:23 6	07:37 (4) 20:48	20:48	20:16 24	07:55 (4) 19:23 32	09:11 (5) 18:31	16:50	16:38
15	07:38	07:08	06:24	06:31	05:49	05:32	05:46	06:16	07:32 (4) 06:49	08:38 (5) 07:23	07:01	07:33
	17:02	17:42	18:16	19:51	20:24	20:49	20:47	20:14 22	07:54 (4) 19:21 34	09:12 (5) 18:29	16:49	16:38
16	07:37	07:07	06:22	06:29	05:48	05:32	05:47	06:17	07:33 (4) 06:50	08:37 (5) 07:24	07:02	07:33
	17:03	17:43	18:17	19:53	20:25	20:49	20:46	20:13 20	07:53 (4) 19:20 34	09:11 (5) 18:28	16:48	16:38
17	07:37	07:05	06:20 08:04 (5)	06:27	05:47	05:32	05:47	06:18	07:34 (4) 06:52	08:38 (5) 07:25	07:03	07:34
	17:04	17:44	18:18 12	08:16 (5) 19:54	20:26	20:50	20:46	20:11 18	07:52 (4) 19:18 32	09:10 (5) 18:26	16:47	16:38
18	07:36	07:04	06:19	08:00 (5) 06:26	05:46	05:32	05:48	06:20	07:35 (4) 06:53	08:37 (5) 07:26	07:04	07:35
	17:05	17:45	18:20 18	08:18 (5) 19:55	20:27	20:50	20:45	20:10 16	07:51 (4) 19:16 34	09:11 (5) 18:25	16:46	16:39
19	07:36	07:03	06:17	07:58 (5) 06:24	05:45	05:33	05:49	06:21	07:38 (4) 06:54	08:38 (5) 07:27	07:06	07:35
	17:07	17:47	18:21 22	08:20 (5) 19:56	20:28	20:50	20:44	20:08 10	07:48 (4) 19:14 32	09:10 (5) 18:23	16:45	16:39
20	07:35	07:01	06:15	07:56 (5) 06:23	05:44	05:33	05:50	06:22	06:55	08:37 (5) 07:28	07:07	07:36
	17:08	17:48	18:22 24	08:20 (5) 19:57	20:29	20:51	20:44	20:07	19:13 32	09:09 (5) 18:22	16:45	16:40
21	07:35	07:00	06:13	07:55 (5) 06:21	05:44	05:33	05:51	06:23	06:56	08:38 (5) 07:30	07:08	07:36
	17:09	17:49	18:23 28	08:23 (5) 19:58	20:30	20:51	20:43	20:05	19:11 30	09:08 (5) 18:20	16:44	16:40
22	07:34	06:58	06:12	07:53 (5) 06:19	05:43	05:33	05:52	06:24	06:57	08:39 (5) 07:31	07:09	07:37
	17:10	17:51	18:24 30	08:23 (5) 19:59	20:31	20:51	20:42	20:04	19:09 28	09:07 (5) 18:18	16:43	16:40
23	07:33	06:57	06:10	07:51 (5) 06:18	05:42	05:33	05:53	06:25	06:58	08:40 (5) 07:32	07:11	07:37
	17:12	17:52	18:25 32	08:23 (5) 20:01	20:32	20:51	20:41	20:02	19:07 26	09:06 (5) 18:17	16:42	16:41
24	07:32	06:55	06:08	07:51 (5) 06:16 07:32 (4)	05:41	05:34	05:54	06:26	06:59	08:41 (5) 07:33	07:12	07:38
	17:13	17:53	18:26 32	08:23 (5) 20:01 10	07:42 (4) 20:33	20:52	20:40	20:01	19:05 22	09:03 (5) 18:16	16:42	16:42
25	07:32	06:54	06:06	07:50 (5) 06:15	07:29 (4) 05:40	05:34	05:55	06:27	07:00	08:42 (5) 06:34	07:13	07:38
	17:14	17:54	18:28 32	08:22 (5) 20:02 16	07:45 (4) 20:34	20:52	20:39	19:57	19:04 20	09:02 (5) 17:14	16:41	16:42
26	07:31	06:52	06:05	07:50 (5) 06:13	07:27 (4) 05:40	05:34	05:56	06:28	07:01	08:43 (5) 06:36	07:14	07:39
	17:15	17:56	18:29 32	08:22 (5) 20:03 18	07:45 (4) 20:35	20:52	20:38	19:56	19:02 16	08:59 (5) 17:13	16:41	16:43
27	07:30	06:50	06:03	07:48 (5) 06:12	07:26 (4) 05:39	05:35	05:57	06:29	07:02	08:49 (5) 06:37	07:15	07:39
	17:17	17:57	18:30 34	08:22 (5) 20:04 20	07:46 (4) 20:36	20:52	20:38	19:54	19:00 4	08:53 (5) 17:11	16:40	16:43
28	07:29	06:49	06:01	07:48 (5) 06:11	07:24 (4) 05:38	05:35	05:58	06:30	07:03	06:38	07:16	07:39
	17:18	17:58	18:31 32	08:20 (5) 20:05 22	07:46 (4) 20:36	20:52	20:37	19:53	18:58	17:10	16:40	16:44
29	07:28		05:59	07:49 (5) 06:09	07:25 (4) 05:38	05:35	05:59	06:31	07:04	06:39	07:17	07:40
	17:19		18:32 32	08:21 (5) 20:06 22	07:47 (4) 20:37	20:52	20:36	19:51	18:57	17:08	16:39	16:45
30	07:27		05:58	07:49 (5) 06:08	07:24 (4) 05:37	05:36	06:00 07:40 (4)	06:32	07:06	06:41	07:19	07:40
	17:21		18:33 30	08:19 (5) 20:07 24	07:48 (4) 20:38	20:52	20:34 10 07:50 (4)	19:49	18:55	17:07	16:39	16:46
31	07:26		05:56	07:49 (5)	05:36		06:01 07:37 (4)	06:33		06:42		07:40
	17:22		18:34 30	08:19 (5)	20:39		20:33 14 07:51 (4)	19:48		17:06		16:46
Potential sun hours	293	295	370	209	-292	-263	-280	-145	375	343	294	283
Total, worst case			420	254	288		24	408	558			
Sun reduction			0.45	0.55	0.55		0.65	0.55	0.55			
Oper. time red.			0.86	0.86	0.86		0.86	0.86	0.86			
Wind dir. red.			0.61	0.61	0.61		0.61	0.61	0.61			
Total reduction			0.24	0.29	0.29		0.34	0.29	0.29			
Total, real			99	73	83		8	117	160			

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	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, Mid Western part
9 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
1000 meter max shadow distance applied along with default 3° inclination
Sunshine probabilities applied (pdf plots)
Directional run-hours applied from tab file (tower 1)
.

Printed/Page
03/05/06 23:05 / 17
Licensed user:
Wind Engineers, Inc.
7660 Whitegate Avenue
US-RIVERSIDE, CA 92506

Calculated:
03/01/06 23:22/2.4.0.67

SHADOW - Calendar

Calculation: Mid Western part **Shadow receptor:** 756 - 756

Assumptions for shadow calculations

Maximum distance for influence	1,000	m
Minimum sun height over horizon for influence	3	°
Day step for calculation	1	days
Time step for calculation	2	minutes

Sun shine probabilities (part of time from sun rise to sun set with sun shine)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.35	0.45	0.45	0.55	0.55	0.55	0.65	0.55	0.55	0.45	0.35	0.30

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
475	585	238	199	220	474	1,184	813	840	1,246	803	479	7,555

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:40	07:25	06:47	05:54	07:11 (5)	06:06	05:36	05:36	06:02	06:35	07:07	06:43	07:20
	16:48	17:23	17:59	18:36 24	07:35 (5)	20:08	20:40	20:52	20:32	19:46	18:53	17:04	16:39
2	07:40	07:24	06:46	05:52	07:12 (5)	06:05	05:35	05:37	06:03	06:36	08:15 (5)	07:08	06:44	07:21
	16:48	17:25	18:01	18:37 24	07:36 (5)	20:10	20:41	20:52	20:31	19:44 8	08:23 (5)	18:51	17:03	16:38
3	07:40	07:23	06:44	05:51	07:12 (5)	06:04	05:35	05:37	06:04	06:37	08:12 (5)	07:09	06:46	07:22
	16:49	17:26	18:02	18:38 22	07:34 (5)	20:11	20:41	20:52	20:30	19:42 14	08:26 (5)	18:50	17:02	16:38
4	07:40	07:22	06:42	05:49	07:10 (5)	06:02	05:35	05:38	06:05	06:38	08:09 (5)	07:10	06:47	07:23
	16:50	17:27	18:03	18:39 24	07:34 (5)	20:12	20:42	20:51	20:29	19:41 18	08:27 (5)	18:48	17:01	16:38
5	07:40	07:21	06:41	06:47	08:11 (5)	06:01	05:34	05:39	06:06	06:39	08:08 (5)	07:11	06:48	07:24
	16:51	17:29	18:04	19:40 22	08:33 (5)	20:13	20:43	20:51	20:28	19:39 20	08:28 (5)	18:46	16:59	16:38
6	07:40	07:20	06:39	06:46	08:11 (5)	06:00	05:34	05:39	06:07	06:40	08:07 (5)	07:12	06:49	07:25
	16:52	17:30	18:05	19:41 22	08:33 (5)	20:14	20:44	20:51	20:26	19:37 22	08:29 (5)	18:44	16:58	16:37
7	07:40	07:19	06:37	06:44	08:11 (5)	05:58	05:34	05:40	06:08	06:41	08:06 (5)	07:13	06:51	07:26
	16:53	17:31	18:07	19:42 20	08:31 (5)	20:15	20:44	20:51	20:25	19:36 22	08:28 (5)	18:43	16:57	16:37
8	07:40	07:17	06:36	06:42	08:11 (5)	05:57	05:33	05:40	06:09	06:42	08:05 (5)	07:15	06:52	07:27
	16:54	17:33	18:08	19:44 18	08:29 (5)	20:16	20:45	20:50	20:24	19:34 24	08:29 (5)	18:41	16:56	16:37
9	07:40	07:16	06:34	06:40	08:14 (5)	05:56	05:33	05:41	06:10	06:43	08:06 (5)	07:16	06:53	07:28
	16:55	17:34	18:09	19:45 14	08:28 (5)	20:17	20:46	20:50	20:23	19:32 22	08:28 (5)	18:39	16:55	16:37
10	07:40	07:15	06:32	06:39	08:16 (5)	05:55	05:33	05:42	06:11	06:44	08:05 (5)	07:17	06:54	07:29
	16:56	17:35	18:10	19:46 8	08:24 (5)	20:18	20:46	20:50	20:21	19:30 24	08:29 (5)	18:38	16:54	16:37
11	07:39	07:14	06:31	06:37		05:54	05:33	05:43	06:12	06:45	08:04 (5)	07:18	06:56	07:29
	16:57	17:36	18:11	19:47		20:20	20:47	20:49	20:20	19:29 24	08:28 (5)	18:36	16:53	16:37
12	07:39	07:12	06:29	06:35		05:53	05:33	05:43	06:13	06:46	08:05 (5)	07:19	06:57	07:30
	16:58	17:38	18:13	19:48		20:21	20:47	20:49	20:19	19:27 22	08:27 (5)	18:34	16:52	16:37
13	07:39	07:11	06:27	06:34		05:51	05:32	05:44	06:14	06:47	08:06 (5)	07:20	06:58	07:31
	17:00	17:39	18:14	19:49		20:22	20:48	20:48	20:17	19:25 20	08:26 (5)	18:33	16:51	16:37
14	07:38	07:10	06:25	06:32		05:50	05:32	05:45	06:15	06:48	08:07 (5)	07:21	06:59	07:32
	17:01	17:40	18:15	19:50		20:23	20:48	20:48	20:16	19:23 18	08:25 (5)	18:31	16:50	16:38
15	07:38	07:08	06:24	06:31		05:49	05:32	05:46	06:16	06:49	08:08 (5)	07:23	07:01	07:33
	17:02	17:42	18:16	19:51		20:24	20:49	20:47	20:14	19:21 14	08:22 (5)	18:29	16:49	16:38
16	07:37	07:07	06:22	06:29		05:48	05:32	05:47	06:17	06:50	08:09 (5)	07:24	07:02	07:33
	17:03	17:43	18:17	19:53		20:25	20:49	20:46	20:13	19:20 12	08:21 (5)	18:28	16:48	16:38
17	07:37	07:05	06:20	06:27		05:47	05:32	05:47	06:19	06:52	07:25	07:03	07:34
	17:04	17:44	18:18	19:54		20:26	20:50	20:46	20:11	19:18	18:26	16:47	16:38
18	07:36	07:04	06:19	06:26		05:46	05:32	05:48	06:20	06:53	07:26	07:04	07:35
	17:05	17:45	18:20	19:55		20:27	20:50	20:45	20:10	19:16	18:25	16:46	16:39
19	07:36	07:03	06:17	06:24		05:45	05:33	05:49	06:21	06:54	07:27	07:06	07:35
	17:07	17:47	18:21	19:56		20:28	20:50	20:44	20:08	19:14	18:23	16:45	16:39
20	07:35	07:01	06:15	06:23		05:44	05:33	05:50	06:22	06:55	07:28	07:07	07:36
	17:08	17:48	18:22	19:57		20:29	20:51	20:44	20:07	19:13	18:22	16:45	16:40
21	07:35	07:00	06:13	06:21		05:44	05:33	05:51	06:23	06:56	07:30	07:08	07:36
	17:09	17:49	18:23	19:58		20:30	20:51	20:43	20:05	19:11	18:20	16:44	16:40
22	07:34	06:58	06:12	06:19		05:43	05:33	05:52	06:24	06:57	07:31	07:09	07:37
	17:10	17:51	18:24	19:59		20:31	20:51	20:42	20:04	19:09	18:19	16:43	16:40
23	07:33	06:57	06:10	06:18		05:42	05:33	05:53	06:25	06:58	07:32	07:11	07:38
	17:12	17:52	18:25	20:01		20:32	20:51	20:41	20:02	19:07	18:17	16:42	16:41
24	07:32	06:55	06:08	06:16		05:41	05:34	05:54	06:26	06:59	07:33	07:12	07:38
	17:13	17:53	18:26	20:01		20:33	20:52	20:40	20:01	19:05	18:16	16:42	16:42
25	07:32	06:54	06:06	06:15		05:40	05:34	05:55	06:27	07:00	06:34	07:13	07:38
	17:14	17:54	18:28	20:02		20:34	20:52	20:39	19:57	19:04	17:14	16:41	16:42
26	07:31	06:52	06:05	06:13		05:40	05:34	05:56	06:28	07:01	06:36	07:14	07:39
	17:15	17:56	18:29	20:03		20:35	20:52	20:38	19:56	19:02	17:13	16:41	16:43
27	07:30	06:50	06:03	07:20 (5)	06:12	05:39	05:35	05:57	06:29	07:02	06:37	07:15	07:39
	17:17	17:57	18:30 10	07:30 (5)	20:04	20:36	20:52	20:38	19:54	19:00	17:11	16:40	16:43
28	07:29	06:49	06:01	07:18 (5)	06:11	05:38	05:35	05:58	06:30	07:03	06:38	07:16	07:39
	17:18	17:58	18:31 14	07:32 (5)	20:05	20:37	20:52	20:37	19:53	18:58	17:10	16:40	16:44
29	07:28		05:59	07:17 (5)	06:09	05:38	05:35	05:59	06:31	07:04	06:39	07:17	07:40
	17:19		18:32 18	07:35 (5)	20:06	20:37	20:52	20:36	19:51	18:57	17:08	16:39	16:45
30	07:27		05:58	07:15 (5)	06:08	05:37	05:36	06:00	06:32	07:06	06:41	07:19	07:40
	17:21		18:33 20	07:35 (5)	20:07	20:38	20:52	20:34	19:49	18:55	17:07	16:39	16:46
31	07:26		05:56	07:13 (5)		05:36		06:01	06:33		06:42		07:40
	17:22		18:34 22	07:35 (5)		20:39		20:33	19:48		17:06		16:46
Potential sun hours	293	295	370	209		-292	-263	-280	-145	375	343	294	283
Total, worst case			84	198						284			
Sun reduction			0.45	0.55						0.55			
Oper. time red.			0.86	0.86						0.86			
Wind dir. red.			0.60	0.60						0.60			
Total reduction			0.23	0.29						0.29			
Total, real			20	57						81			

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	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, Mid Western part
9 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
1000 meter max shadow distance applied along with default 3° inclination
Sunshine probabilities applied (pdf plots)
Directional run-hours applied from tab file (tower 1)
.

Licensed user:
Wind Engineers, Inc.
7660 Whitegate Avenue
US-RIVERSIDE, CA 92506

Calculated:
03/01/06 23:22/2.4.0.67

SHADOW - Calendar

Calculation: Mid Western part **Shadow receptor:** 757 - 757

Assumptions for shadow calculations

Maximum distance for influence	1,000 m
Minimum sun height over horizon for influence	3 °
Day step for calculation	1 days
Time step for calculation	2 minutes

Sun shine probabilities (part of time from sun rise to sun set with sun shine)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.35	0.45	0.45	0.55	0.55	0.55	0.65	0.55	0.55	0.45	0.35	0.30

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
475	585	238	199	220	474	1,184	813	840	1,246	803	479	7,555

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:40	07:25	06:47	05:54	06:06	07:26 (5)	05:36	05:36	06:02	07:40 (5)	06:35	07:07	06:43	07:20
	16:48	17:23	17:59	18:36	20:08	24 07:50 (5)	20:40	20:52	20:32	14 07:54 (5)	19:46	18:53	17:04	16:39
2	07:40	07:24	06:46	05:52	06:05	07:27 (5)	05:35	05:37	06:03	07:39 (5)	06:36	07:08	06:44	07:21
	16:48	17:25	18:01	18:37	20:10	24 07:51 (5)	20:41	20:52	20:31	16 07:55 (5)	19:44	18:51	17:03	16:38
3	07:40	07:23	06:44	05:51	06:04	07:26 (5)	05:35	05:37	06:04	07:38 (5)	06:37	07:09	06:46	07:22
	16:49	17:26	18:02	18:38	20:11	24 07:50 (5)	20:41	20:52	20:30	18 07:56 (5)	19:42	18:50	17:02	16:38
4	07:40	07:22	06:42	05:49	06:02	07:27 (5)	05:35	05:38	06:05	07:37 (5)	06:38	07:10	06:47	07:23
	16:50	17:27	18:03	18:39	20:12	24 07:51 (5)	20:42	20:51	20:29	20 07:57 (5)	19:41	18:48	17:01	16:38
5	07:40	07:21	06:41	06:47	06:01	07:25 (5)	05:34	05:39	06:06	07:36 (5)	06:39	07:11	06:48	07:24
	16:51	17:29	18:04	19:40	20:13	24 07:49 (5)	20:43	20:51	20:28	22 07:58 (5)	19:39	18:46	16:59	16:38
6	07:40	07:20	06:39	06:46	06:00	07:26 (5)	05:34	05:39	06:07	07:37 (5)	06:40	07:12	06:49	07:25
	16:52	17:30	18:05	19:41	20:14	24 07:50 (5)	20:44	20:51	20:26	22 07:59 (5)	19:37	18:44	16:58	16:37
7	07:40	07:19	06:37	06:44	05:58	07:27 (5)	05:34	05:40	06:08	07:36 (5)	06:41	07:13	06:51	07:26
	16:53	17:31	18:07	19:42	20:15	22 07:49 (5)	20:44	20:51	20:25	22 07:58 (5)	19:36	18:43	16:57	16:37
8	07:40	07:17	06:36	06:42	05:57	07:28 (5)	05:33	05:40	06:09	07:35 (5)	06:42	07:15	06:52	07:27
	16:54	17:33	18:08	19:44	20:16	20 07:48 (5)	20:45	20:50	20:24	24 07:59 (5)	19:34	18:41	16:56	16:37
9	07:40	07:16	06:34	06:40	05:56	07:29 (5)	05:33	05:41	06:10	07:36 (5)	06:43	07:16	06:53	07:28
	16:55	17:34	18:09	19:45	20:17	18 07:47 (5)	20:46	20:50	20:23	24 08:00 (5)	19:32	18:39	16:55	16:37
10	07:40	07:15	06:32	06:39	05:55	07:30 (5)	05:33	05:42	06:11	07:35 (5)	06:44	07:17	06:54	07:29
	16:56	17:35	18:10	19:46	20:18	16 07:46 (5)	20:46	20:50	20:21	24 07:59 (5)	19:30	18:38	16:54	16:37
11	07:39	07:14	06:31	06:37	05:54	07:30 (5)	05:33	05:43	06:12	07:34 (5)	06:45	07:18	06:56	07:29
	16:57	17:36	18:11	19:47	20:20	14 07:44 (5)	20:47	20:49	20:20	26 08:00 (5)	19:29	18:36	16:53	16:37
12	07:39	07:12	06:29	06:35	05:53	07:31 (5)	05:33	05:43	06:13	07:35 (5)	06:46	07:19	06:57	07:30
	16:58	17:38	18:13	19:48	20:21	12 07:43 (5)	20:47	20:49	20:19	24 07:59 (5)	19:27	18:34	16:52	16:37
13	07:39	07:11	06:27	06:34	05:51	07:34 (5)	05:32	05:44	06:14	07:34 (5)	06:47	07:20	06:58	07:31
	17:00	17:39	18:14	19:49	20:22	6 07:40 (5)	20:48	20:48	20:17	24 07:58 (5)	19:25	18:33	16:51	16:37
14	07:38	07:10	06:25	06:32	05:50	05:32	05:45	06:15	07:35 (5)	06:48	07:21	06:59	07:32
	17:01	17:40	18:15	19:50	20:23	20:48	20:48	20:16	22 07:57 (5)	19:23	18:31	16:50	16:38
15	07:38	07:08	06:24	06:31	05:49	05:32	05:46	06:16	07:36 (5)	06:49	07:23	07:01	07:33
	17:02	17:42	18:16	19:51	20:24	20:49	20:47	20:14	22 07:58 (5)	19:21	18:29	16:49	16:38
16	07:37	07:07	06:22	06:29	05:48	05:32	05:47	06:17	07:37 (5)	06:50	07:24	07:02	07:33
	17:03	17:43	18:17	19:53	20:25	20:49	20:46	20:13	20 07:57 (5)	19:20	18:28	16:48	16:38
17	07:37	07:05	06:20	06:27	05:47	05:32	05:47	06:19	07:38 (5)	06:52	07:25	07:03	07:34
	17:04	17:44	18:18	19:54	20:26	20:50	20:46	20:11	16 07:54 (5)	19:18	18:26	16:47	16:38
18	07:36	07:04	06:19	06:26	05:46	05:32	05:48	06:20	07:39 (5)	06:53	07:26	07:04	07:35
	17:05	17:45	18:20	19:55	20:27	20:50	20:45	20:10	14 07:53 (5)	19:16	18:25	16:46	16:39
19	07:36	07:03	06:17	06:24	05:45	05:33	05:49	06:21	07:40 (5)	06:54	07:27	07:06	07:35
	17:07	17:47	18:21	19:56	20:28	20:50	20:44	20:08	10 07:50 (5)	19:14	18:23	16:45	16:39
20	07:35	07:01	06:15	06:23	05:44	05:33	05:50	06:22	06:55	07:28	07:07	07:36
	17:08	17:48	18:22	19:57	20:29	20:51	20:44	20:07	19:13	18:22	16:45	16:40
21	07:35	07:00	06:13	06:21	05:44	05:33	05:51	06:23	06:56	07:30	07:08	07:36
	17:09	17:49	18:23	19:58	20:30	20:51	20:43	20:05	19:11	18:20	16:44	16:40
22	07:34	06:58	06:12	06:19	05:43	05:33	05:52	06:24	06:57	07:31	07:09	07:37
	17:10	17:51	18:24	19:59	20:31	20:51	20:42	20:04	19:09	18:19	16:43	16:40
23	07:33	06:57	06:10	06:18	05:42	05:33	05:53	06:25	06:58	07:32	07:11	07:37
	17:12	17:52	18:25	20:01	20:32	20:51	20:41	20:02	19:07	18:17	16:42	16:41
24	07:32	06:55	06:08	06:16	07:34 (5)	05:41	05:34	05:54	06:26	06:59	07:33	07:12	07:38
	17:13	17:53	18:26	20:01	12 07:46 (5)	20:33	20:52	20:40	20:01	19:05	18:16	16:42	16:42
25	07:32	06:54	06:06	06:15	07:33 (5)	05:40	05:34	05:55	06:27	07:00	06:34	07:13	07:38
	17:14	17:54	18:28	20:02	14 07:47 (5)	20:34	20:52	20:39	19:57	19:04	17:14	16:41	16:42
26	07:31	06:52	06:05	06:13	07:31 (5)	05:40	05:34	05:56	06:28	07:01	06:36	07:14	07:39
	17:15	17:56	18:29	20:03	18 07:49 (5)	20:35	20:52	20:38	19:56	19:02	17:13	16:41	16:43
27	07:30	06:50	06:03	06:12	07:30 (5)	05:39	05:35	05:57	06:29	07:02	06:37	07:15	07:39
	17:17	17:57	18:30	20:04	20 07:50 (5)	20:36	20:52	20:38	19:54	19:00	17:11	16:40	16:43
28	07:29	06:49	06:01	06:11	07:28 (5)	05:38	05:35	05:58	06:30	07:03	06:38	07:16	07:39
	17:18	17:58	18:31	20:05	22 07:50 (5)	20:36	20:52	20:37	19:53	18:58	17:10	16:40	16:44
29	07:28		05:59	06:09	07:27 (5)	05:38	05:35	05:59	06:31	07:04	06:39	07:17	07:40
	17:19		18:32	20:06	24 07:51 (5)	20:37	20:52	20:36	19:51	18:57	17:08	16:39	16:45
30	07:27		05:58	06:08	07:28 (5)	05:37	05:36	06:00	06:32	07:06	06:41	07:19	07:40
	17:21		18:33	20:07	22 07:50 (5)	20:38	20:52	20:34	19:49	18:55	17:07	16:39	16:46
31	07:26		05:56		05:36		06:01	07:43 (5)	06:33		06:42		07:40
	17:22		18:34		20:39		20:33	8 07:51 (5)	19:48		17:06		16:46
Potential sun hours	293	295	370	209	-292	-263	-280	-145	375	343	294	283
Total, worst case				132	252		8	384				
Sun reduction				0.55	0.55		0.65	0.55				
Oper. time red.				0.86	0.86		0.86	0.86				
Wind dir. red.				0.61	0.61		0.61	0.61				
Total reduction				0.29	0.29		0.34	0.29				
Total, real				38	73		3	111				

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	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, Mid Western part
9 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
1000 meter max shadow distance applied along with default 3° inclination
Sunshine probabilities applied (pdf plots)
Directional run-hours applied from tab file (tower 1)
.

Licensed user:
Wind Engineers, Inc.
7660 Whitegate Avenue
US-RIVERSIDE, CA 92506

Calculated:
03/01/06 23:22/2.4.0.67

SHADOW - Calendar

Calculation: Mid Western part **Shadow receptor:** 758 - 758

Assumptions for shadow calculations

Maximum distance for influence	1,000	m
Minimum sun height over horizon for influence	3	°
Day step for calculation	1	days
Time step for calculation	2	minutes

Sun shine probabilities (part of time from sun rise to sun set with sun shine)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.35	0.45	0.45	0.55	0.55	0.55	0.65	0.55	0.55	0.45	0.35	0.30

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
475	585	238	199	220	474	1,184	813	840	1,246	803	479	7,555

	January	February	March	April	May		June	July		August		September	October	November	December
1	07:40	07:25	06:47	05:54	06:06		05:36	05:36		06:02	07:16 (5)	06:35	07:07	06:43	07:20
	16:48	17:23	17:59	18:36	20:08		20:40	20:52		20:32	20 07:36 (5)	19:46	18:53	17:04	16:39
2	07:40	07:24	06:46	05:52	06:05		05:35	05:37		06:03	07:15 (5)	06:36	07:08	06:44	07:21
	16:48	17:25	18:01	18:37	20:10		20:41	20:52		20:31	22 07:37 (5)	19:44	18:51	17:03	16:38
3	07:40	07:23	06:44	05:51	06:04		05:35	05:37		06:04	07:16 (5)	06:37	07:09	06:46	07:22
	16:49	17:26	18:02	18:38	20:11		20:41	20:52		20:30	20 07:36 (5)	19:42	18:50	17:02	16:38
4	07:40	07:22	06:42	05:49	06:02		05:35	05:38		06:05	07:17 (5)	06:38	07:10	06:47	07:23
	16:50	17:27	18:03	18:39	20:12		20:42	20:51		20:29	18 07:35 (5)	19:41	18:48	17:01	16:38
5	07:40	07:21	06:41	06:47	06:01	07:11 (5)	05:34	05:39		06:06	07:18 (5)	06:39	07:11	06:48	07:24
	16:51	17:29	18:04	19:40	20:13	10 07:21 (5)	20:43	20:51		20:28	16 07:34 (5)	19:39	18:46	16:59	16:38
6	07:40	07:20	06:39	06:46	06:00	07:10 (5)	05:34	05:39		06:07	07:19 (5)	06:40	07:12	06:49	07:25
	16:52	17:30	18:05	19:41	20:14	12 07:22 (5)	20:44	20:51		20:26	14 07:33 (5)	19:37	18:44	16:58	16:37
7	07:40	07:19	06:37	06:44	05:58	07:09 (5)	05:34	05:40		06:08	07:20 (5)	06:41	07:13	06:51	07:26
	16:53	17:31	18:07	19:42	20:15	16 07:25 (5)	20:44	20:51		20:25	12 07:32 (5)	19:36	18:43	16:57	16:37
8	07:40	07:17	06:36	06:42	05:57	07:08 (5)	05:33	05:40		06:09	07:21 (5)	06:42	07:15	06:52	07:27
	16:54	17:33	18:08	19:44	20:16	18 07:26 (5)	20:45	20:50		20:24	8 07:29 (5)	19:34	18:41	16:56	16:37
9	07:40	07:16	06:34	06:40	05:56	07:07 (5)	05:33	05:41		06:10		06:43	07:16	06:53	07:28
	16:55	17:34	18:09	19:45	20:17	20 07:27 (5)	20:46	20:50		20:23		19:32	18:39	16:55	16:37
10	07:40	07:15	06:32	06:39	05:55	07:06 (5)	05:33	05:42		06:11		06:44	07:17	06:54	07:29
	16:56	17:35	18:10	19:46	20:18	20 07:26 (5)	20:46	20:50		20:21		19:30	18:38	16:54	16:37
11	07:39	07:14	06:31	06:37	05:54	07:06 (5)	05:33	05:43		06:12		06:45	07:18	06:56	07:29
	16:57	17:36	18:11	19:47	20:20	20 07:26 (5)	20:47	20:49		20:20		19:29	18:36	16:53	16:37
12	07:39	07:12	06:29	06:35	05:53	07:05 (5)	05:33	05:43		06:13		06:46	07:19	06:57	07:30
	16:58	17:38	18:13	19:48	20:21	22 07:27 (5)	20:47	20:49		20:19		19:27	18:34	16:52	16:37
13	07:39	07:11	06:27	06:34	05:51	07:04 (5)	05:32	05:44		06:14		06:47	07:20	06:58	07:31
	17:00	17:39	18:14	19:49	20:22	22 07:26 (5)	20:48	20:48		20:17		19:25	18:33	16:51	16:37
14	07:38	07:10	06:25	06:32	05:50	07:05 (5)	05:32	05:45		06:15		06:48	07:21	06:59	07:32
	17:01	17:40	18:15	19:50	20:23	22 07:27 (5)	20:48	20:48		20:16		19:23	18:31	16:50	16:38
15	07:38	07:08	06:24	06:31	05:49	07:04 (5)	05:32	05:46		06:16		06:49	07:23	07:01	07:33
	17:02	17:42	18:16	19:51	20:24	22 07:26 (5)	20:49	20:47		20:14		19:21	18:29	16:49	16:38
16	07:37	07:07	06:22	06:29	05:48	07:05 (5)	05:32	05:47		06:17		06:50	07:24	07:02	07:33
	17:03	17:43	18:17	19:53	20:25	20 07:25 (5)	20:49	20:46		20:13		19:20	18:28	16:48	16:38
17	07:37	07:05	06:20	06:27	05:47	07:04 (5)	05:32	05:47		06:19		06:52	07:25	07:03	07:34
	17:04	17:44	18:18	19:54	20:26	22 07:26 (5)	20:50	20:46		20:11		19:18	18:26	16:47	16:38
18	07:36	07:04	06:19	06:26	05:46	07:06 (5)	05:32	05:48	07:21 (5)	06:20		06:53	07:26	07:04	07:35
	17:05	17:46	18:20	19:55	20:27	20 07:26 (5)	20:50	20:45	8 07:29 (5)	20:10		19:16	18:25	16:46	16:39
19	07:36	07:03	06:17	06:24	05:45	07:07 (5)	05:33	05:49	07:20 (5)	06:21		06:54	07:27	07:06	07:35
	17:07	17:47	18:21	19:56	20:28	18 07:25 (5)	20:50	20:44	10 07:30 (5)	20:08		19:14	18:23	16:45	16:39
20	07:35	07:01	06:15	06:23	05:44	07:06 (5)	05:33	05:50	07:19 (5)	06:22		06:55	07:28	07:07	07:36
	17:08	17:48	18:22	19:57	20:29	18 07:24 (5)	20:51	20:44	12 07:31 (5)	20:07		19:13	18:22	16:45	16:40
21	07:35	07:00	06:13	06:21	05:44	07:07 (5)	05:33	05:51	07:18 (5)	06:23		06:56	07:30	07:08	07:36
	17:09	17:49	18:23	19:58	20:30	18 07:25 (5)	20:51	20:43	16 07:34 (5)	20:05		19:11	18:20	16:44	16:40
22	07:34	06:58	06:12	06:19	05:43	07:08 (5)	05:33	05:52	07:17 (5)	06:24		06:57	07:31	07:09	07:37
	17:10	17:51	18:24	19:59	20:31	16 07:24 (5)	20:51	20:42	18 07:35 (5)	20:04		19:09	18:19	16:43	16:40
23	07:33	06:57	06:10	06:18	05:42	07:10 (5)	05:33	05:53	07:18 (5)	06:25		06:58	07:32	07:11	07:38
	17:12	17:52	18:25	20:01	20:32	14 07:24 (5)	20:51	20:41	16 07:34 (5)	20:02		19:07	18:17	16:42	16:41
24	07:32	06:55	06:08	06:16	05:41	07:11 (5)	05:34	05:54	07:17 (5)	06:26		06:59	07:33	07:12	07:38
	17:13	17:53	18:26	20:01	20:33	10 07:21 (5)	20:52	20:40	18 07:35 (5)	20:01		19:05	18:16	16:42	16:42
25	07:32	06:54	06:06	06:15	05:40	07:12 (5)	05:34	05:55	07:15 (5)	06:27		07:00	06:34	07:13	07:38
	17:14	17:54	18:28	20:02	20:34	8 07:20 (5)	20:52	20:39	20 07:35 (5)	19:57		19:04	17:14	16:41	16:42
26	07:31	06:52	06:05	06:13	05:40	07:13 (5)	05:34	05:56	07:16 (5)	06:28		07:01	06:36	07:14	07:39
	17:15	17:56	18:29	20:03	20:35	4 07:17 (5)	20:52	20:38	20 07:36 (5)	19:56		19:02	17:13	16:41	16:43
27	07:30	06:50	06:03	06:12	05:39		05:35	05:57	07:15 (5)	06:29		07:02	06:37	07:15	07:39
	17:17	17:57	18:30	20:04	20:36		20:52	20:38	22 07:37 (5)	19:54		19:00	17:11	16:40	16:43
28	07:29	06:49	06:01	06:11	05:38		05:35	05:58	07:16 (5)	06:30		07:03	06:38	07:16	07:39
	17:18	17:58	18:31	20:05	20:36		20:52	20:37	20 07:36 (5)	19:53		18:58	17:10	16:40	16:44
29	07:28		05:59	06:09	05:38		05:35	05:59	07:15 (5)	06:31		07:04	06:39	07:17	07:40
	17:19		18:32	20:06	20:37		20:52	20:36	22 07:37 (5)	19:51		18:57	17:08	16:39	16:45
30	07:27		05:58	06:08	05:37		05:36	06:00	07:16 (5)	06:32		07:06	06:41	07:19	07:40
	17:21		18:33	20:07	20:38		20:52	20:34	20 07:36 (5)	19:49		18:55	17:07	16:39	16:46
31	07:26		05:56		05:37			06:01	07:15 (5)	06:33			06:42		07:40
	17:22		18:34		20:39			20:33	22 07:37 (5)	19:48			17:06		16:46
Potential sun hours	293	295	370	209	-292		-263	-280		-145		375	343	294	283
Total, worst case						372			244		130				
Sun reduction						0.55			0.65		0.55				
Oper. time red.						0.86			0.86		0.86				
Wind dir. red.						0.60			0.60		0.60				
Total reduction						0.28			0.34		0.28				
Total, real						106			82		37				

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	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, Mid Western part
9 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
1000 meter max shadow distance applied along with default 3° inclination
Sunshine probabilities applied (pdf plots)
Directional run-hours applied from tab file (tower 1)
.

Licensed user:
Wind Engineers, Inc.
7660 Whitegate Avenue
US-RIVERSIDE, CA 92506

Calculated:
03/01/06 23:22/2.4.0.67

SHADOW - Calendar

Calculation: Mid Western part **Shadow receptor:** 826 - 826

Assumptions for shadow calculations

Maximum distance for influence	1,000 m
Minimum sun height over horizon for influence	3 °
Day step for calculation	1 days
Time step for calculation	2 minutes

Sun shine probabilities (part of time from sun rise to sun set with sun shine)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.35	0.45	0.45	0.55	0.55	0.55	0.65	0.55	0.55	0.45	0.35	0.30

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
475	585	238	199	220	474	1,184	813	840	1,246	803	479	7,555

	January		February	March	April	May	June	July	August	September	October	November		December	
1	07:40	08:33 (8)	07:25	06:47	05:54	06:06	05:36	05:36	06:02	06:34	07:07	06:43		07:20	08:18 (8)
	16:47	24 08:57 (8)	17:23	17:59	18:35	20:08	20:40	20:52	20:32	19:46	18:53	17:04		16:38	28 08:46 (8)
2	07:40	08:33 (8)	07:24	06:45	05:52	06:05	05:35	05:37	06:03	06:36	07:08	06:44		07:21	08:19 (8)
	16:48	26 08:59 (8)	17:25	18:00	18:37	20:09	20:41	20:52	20:31	19:44	18:51	17:03		16:38	28 08:47 (8)
3	07:40	08:35 (8)	07:23	06:44	05:51	06:04	05:35	05:37	06:04	06:37	07:09	06:46		07:22	08:20 (8)
	16:49	24 08:59 (8)	17:26	18:02	18:38	20:11	20:41	20:51	20:30	19:42	18:50	17:02		16:38	26 08:46 (8)
4	07:40	08:35 (8)	07:22	06:42	05:49	06:02	05:35	05:38	06:05	06:38	07:10	06:47		07:23	08:21 (8)
	16:50	24 08:59 (8)	17:27	18:03	18:39	20:12	20:42	20:51	20:29	19:41	18:48	17:00		16:38	26 08:47 (8)
5	07:40	08:35 (8)	07:21	06:41	06:47	06:01	05:34	05:38	06:06	06:39	07:11	06:48		07:24	08:20 (8)
	16:51	26 09:01 (8)	17:28	18:04	19:40	20:13	20:43	20:51	20:28	19:39	18:46	16:59		16:37	26 08:46 (8)
6	07:40	08:35 (8)	07:20	06:39	06:45	06:00	05:34	05:39	06:07	06:40	07:12	06:49		07:25	08:21 (8)
	16:52	26 09:01 (8)	17:30	18:05	19:41	20:14	20:44	20:51	20:26	19:37	18:44	16:58		16:37	26 08:47 (8)
7	07:40	08:35 (8)	07:18	06:37	06:44	05:58	05:33	05:40	06:08	06:41	07:13	06:51		07:26	08:22 (8)
	16:53	26 09:01 (8)	17:31	18:07	19:42	20:15	20:44	20:51	20:25	19:35	18:43	16:57		16:37	26 08:48 (8)
8	07:40	08:37 (8)	07:17	06:36	06:42	05:57	05:33	05:40	06:09	06:42	07:14	06:52		07:27	08:23 (8)
	16:54	26 09:03 (8)	17:32	18:08	19:43	20:16	20:45	20:50	20:24	19:34	18:41	16:56		16:37	24 08:47 (8)
9	07:40	08:36 (8)	07:16	06:34	06:40	05:56	05:33	05:41	06:10	06:43	07:16	06:53		07:28	08:24 (8)
	16:55	26 09:02 (8)	17:34	18:09	19:45	20:17	20:46	20:50	20:22	19:32	18:39	16:55		16:37	24 08:48 (8)
10	07:40	08:36 (8)	07:15	06:32	06:39	05:55	05:33	05:42	06:11	06:44	07:17	06:54		07:28	08:23 (8)
	16:56	28 09:04 (8)	17:35	18:10	19:46	20:18	20:46	20:49	20:21	19:30	18:38	16:54		16:37	26 08:49 (8)
11	07:39	08:36 (8)	07:13	06:31	06:37	05:54	05:33	05:43	06:12	06:45	07:18	06:56		07:29	08:24 (8)
	16:57	28 09:04 (8)	17:36	18:11	19:47	20:19	20:47	20:49	20:20	19:28	18:36	16:53		16:37	24 08:48 (8)
12	07:39	08:37 (8)	07:12	06:29	06:35	05:52	05:32	05:43	06:13	06:46	07:19	06:57		07:30	08:25 (8)
	16:58	26 09:03 (8)	17:38	18:12	19:48	20:21	20:47	20:49	20:18	19:27	18:34	16:51		16:37	24 08:49 (8)
13	07:39	08:37 (8)	07:11	06:27	06:34	05:51	05:32	05:44	06:14	06:47	07:20	06:58		07:31	08:25 (8)
	17:00	28 09:05 (8)	17:39	18:14	19:49	20:22	20:48	20:48	20:17	19:25	18:33	16:50		16:37	24 08:49 (8)
14	07:38	08:38 (8)	07:10	06:25	06:32	05:50	05:32	05:45	06:15	06:48	07:21	06:59		07:32	08:26 (8)
	17:01	26 09:04 (8)	17:40	18:15	19:50	20:23	20:48	20:47	20:16	19:23	18:31	16:50		16:38	22 08:48 (8)
15	07:38	08:38 (8)	07:08	06:24	06:30	05:49	05:32	05:46	06:16	06:49	07:22	07:01	08:22 (8)	07:33	08:27 (8)
	17:02	28 09:06 (8)	17:42	18:16	19:51	20:24	20:49	20:47	20:14	19:21	18:29	16:49	10 08:32 (8)	16:38	22 08:49 (8)
16	07:37	08:37 (8)	07:07	06:22	06:29	05:48	05:32	05:46	06:17	06:50	07:24	07:02	08:21 (8)	07:33	08:28 (8)
	17:03	28 09:05 (8)	17:43	18:17	19:53	20:25	20:49	20:46	20:13	19:20	18:28	16:48	14 08:35 (8)	16:38	22 08:50 (8)
17	07:37	08:39 (8)	07:05	06:20	06:27	05:47	05:32	05:47	06:18	06:51	07:25	07:03	08:18 (8)	07:34	08:28 (8)
	17:04	26 09:05 (8)	17:44	18:18	19:54	20:26	20:50	20:46	20:11	19:18	18:26	16:47	18 08:36 (8)	16:38	22 08:50 (8)
18	07:36	08:40 (8)	07:04	06:18	06:26	05:46	05:32	05:48	06:19	06:53	07:26	07:04	08:18 (8)	07:35	08:29 (8)
	17:05	26 09:06 (8)	17:45	18:19	19:55	20:27	20:50	20:45	20:10	19:16	18:25	16:46	20 08:38 (8)	16:39	22 08:51 (8)
19	07:36	08:40 (8)	07:02	06:17	06:24	05:45	05:32	05:49	06:21	06:54	07:27	07:06	08:17 (8)	07:35	08:29 (8)
	17:07	26 09:06 (8)	17:47	18:21	19:56	20:28	20:50	20:44	20:08	19:14	18:23	16:45	22 08:39 (8)	16:39	22 08:51 (8)
20	07:35	08:41 (8)	07:01	06:15	06:22	05:44	05:33	05:50	06:22	06:55	07:28	07:07	08:16 (8)	07:36	08:30 (8)
	17:08	24 09:05 (8)	17:48	18:22	19:57	20:29	20:51	20:44	20:07	19:12	18:21	16:44	24 08:40 (8)	16:39	22 08:52 (8)
21	07:34	08:42 (8)	07:00	06:13	06:21	05:43	05:33	05:51	06:23	06:56	07:30	07:08	08:18 (8)	07:36	08:31 (8)
	17:09	24 09:06 (8)	17:49	18:23	19:58	20:30	20:51	20:43	20:05	19:11	18:20	16:44	24 08:42 (8)	16:40	20 08:51 (8)
22	07:34	08:41 (8)	06:58	06:11	06:19	05:43	05:33	05:52	06:24	06:57	07:31	07:09	08:17 (8)	07:37	08:31 (8)
	17:10	24 09:05 (8)	17:50	18:24	19:59	20:31	20:51	20:42	20:04	19:09	18:18	16:43	24 08:41 (8)	16:40	20 08:51 (8)
23	07:33	08:43 (8)	06:57	06:10	06:18	05:42	05:33	05:53	06:25	06:58	07:32	07:10	08:16 (8)	07:37	08:31 (8)
	17:12	22 09:05 (8)	17:52	18:25	20:00	20:32	20:51	20:41	20:02	19:07	18:17	16:42	26 08:42 (8)	16:41	22 08:53 (8)
24	07:32	08:44 (8)	06:55	06:08	06:16	05:41	05:33	05:54	06:26	06:59	07:33	07:12	08:17 (8)	07:38	08:32 (8)
	17:13	20 09:04 (8)	17:53	18:26	20:00	20:33	20:51	20:40	20:01	19:05	18:15	16:42	26 08:43 (8)	16:41	22 08:54 (8)
25	07:32	08:45 (8)	06:53	06:06	06:15	05:40	05:34	05:55	06:27	07:00	06:34	07:13	08:17 (8)	07:38	08:32 (8)
	17:14	18 09:03 (8)	17:54	18:28	20:02	20:34	20:52	20:39	19:57	19:04	17:14	16:41	26 08:43 (8)	16:42	22 08:54 (8)
26	07:31	08:48 (8)	06:52	06:04	06:13	05:40	05:34	05:56	06:28	07:01	06:36	07:14	08:18 (8)	07:39	08:33 (8)
	17:15	14 09:02 (8)	17:55	18:29	20:03	20:35	20:52	20:38	19:56	19:02	17:13	16:41	26 08:44 (8)	16:43	22 08:55 (8)
27	07:30	08:49 (8)	06:50	06:03	06:12	05:39	05:34	05:57	06:29	07:02	06:37	07:15	08:17 (8)	07:39	08:33 (8)
	17:17	10 08:59 (8)	17:57	18:30	20:04	20:36	20:52	20:37	19:54	19:00	17:11	16:40	28 08:45 (8)	16:43	22 08:55 (8)
28	07:29		06:49	06:01	06:10	05:38	05:35	05:58	06:30	07:03	06:38	07:16	08:18 (8)	07:39	08:33 (8)
	17:18		17:58	18:31	20:05	20:36	20:52	20:36	19:52	18:58	17:10	16:40	26 08:44 (8)	16:44	22 08:55 (8)
29	07:28			05:59	06:09	05:38	05:35	05:59	06:31	07:04	06:39	07:17	08:18 (8)	07:40	08:33 (8)
	17:19			18:32	20:06	20:37	20:52	20:35	19:51	18:57	17:08	16:39	28 08:46 (8)	16:45	22 08:55 (8)
30	07:27			05:58	06:08	05:37	05:36	06:00	06:32	07:05	06:41	07:18	08:19 (8)	07:40	08:33 (8)
	17:21			18:33	20:07	20:38	20:52	20:34	19:49	18:55	17:07	16:39	26 08:45 (8)	16:46	24 08:57 (8)
31	07:26			05:56		05:36		06:01	06:33		06:42			07:40	08:33 (8)
	17:22			18:34		20:39		20:33	19:47		17:06			16:46	24 08:57 (8)
Potential sun hours	293		295	370	209	-292	-263	-280	-145	375	343	294		283	
Total, worst case		654											368		728
Sun reduction		0.35											0.35		0.30
Oper. time red.		0.86											0.86		0.86
Wind dir. red.		0.62											0.62		0.62
Total reduction		0.19											0.19		0.16
Total, real		123											69		117

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	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, Mid Western part
9 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
1000 meter max shadow distance applied along with default 3° inclination
Sunshine probabilities applied (pdf plots)
Directional run-hours applied from tab file (tower 1)
.

Licensed user:
Wind Engineers, Inc.
7660 Whitegate Avenue
US-RIVERSIDE, CA 92506

Calculated:
03/01/06 23:22/2.4.0.67

SHADOW - Calendar

Calculation: Mid Western part **Shadow receptor:** 827 - 827

Assumptions for shadow calculations

Maximum distance for influence	1,000	m
Minimum sun height over horizon for influence	3	°
Day step for calculation	1	days
Time step for calculation	2	minutes

Sun shine probabilities (part of time from sun rise to sun set with sun shine)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.35	0.45	0.45	0.55	0.55	0.55	0.65	0.55	0.55	0.45	0.35	0.30

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
475	585	238	199	220	474	1,184	813	840	1,246	803	479	7,555

	January		February		March	April	May	June	July	August	September	October	November		December	
1	07:40		07:25	08:32 (8)	06:47	05:54	06:06	05:36	05:36	06:02	06:34	07:07	06:43		07:20	08:08 (8)
	16:47		17:23	8 08:40 (8)	17:59	18:36	20:08	20:40	20:52	20:32	19:46	18:53	17:04		16:38	10 08:18 (8)
2	07:40		07:24		06:45	05:52	06:05	05:35	05:37	06:03	06:36	07:08	06:44		07:21	08:09 (8)
	16:48		17:25		18:00	18:37	20:09	20:41	20:52	20:31	19:44	18:51	17:03		16:38	8 08:17 (8)
3	07:40		07:23		06:44	05:51	06:04	05:35	05:37	06:04	06:37	07:09	06:46		07:22	08:10 (8)
	16:49		17:26		18:02	18:38	20:11	20:41	20:51	20:30	19:42	18:50	17:02		16:38	6 08:16 (8)
4	07:40		07:22		06:42	05:49	06:02	05:35	05:38	06:05	06:38	07:10	06:47		07:23	
	16:50		17:27		18:03	18:39	20:12	20:42	20:51	20:29	19:41	18:48	17:00		16:38	
5	07:40		07:21		06:41	06:47	06:01	05:34	05:38	06:06	06:39	07:11	06:48		07:24	
	16:51		17:28		18:04	19:40	20:13	20:43	20:51	20:28	19:39	18:46	16:59		16:37	
6	07:40		07:20		06:39	06:45	06:00	05:34	05:39	06:07	06:40	07:12	06:49		07:25	
	16:52		17:30		18:05	19:41	20:14	20:44	20:51	20:26	19:37	18:44	16:58		16:37	
7	07:40		07:18		06:37	06:44	05:58	05:33	05:40	06:08	06:41	07:13	06:51		07:26	
	16:53		17:31		18:07	19:42	20:15	20:44	20:51	20:25	19:35	18:43	16:57		16:37	
8	07:40		07:17		06:36	06:42	05:57	05:33	05:40	06:09	06:42	07:14	06:52		07:27	
	16:54		17:32		18:08	19:43	20:16	20:45	20:50	20:24	19:34	18:41	16:56		16:37	
9	07:40	08:26 (8)	07:16		06:34	06:40	05:56	05:33	05:41	06:10	06:43	07:16	06:53		07:28	
	16:55	6 08:32 (8)	17:34		18:09	19:45	20:17	20:46	20:50	20:22	19:32	18:39	16:55		16:37	
10	07:40	08:26 (8)	07:15		06:32	06:39	05:55	05:33	05:42	06:11	06:44	07:17	06:54	08:03 (8)	07:28	
	16:56	8 08:34 (8)	17:35		18:10	19:46	20:18	20:46	20:49	20:21	19:30	18:38	16:54	8 08:11 (8)	16:37	
11	07:39	08:26 (8)	07:13		06:31	06:37	05:54	05:33	05:43	06:12	06:45	07:18	06:56	08:00 (8)	07:29	
	16:57	10 08:36 (8)	17:36		18:11	19:47	20:19	20:47	20:49	20:20	19:28	18:36	16:53	14 08:14 (8)	16:37	
12	07:39	08:23 (8)	07:12		06:29	06:35	05:52	05:32	05:43	06:13	06:46	07:19	06:57	08:00 (8)	07:30	
	16:58	14 08:37 (8)	17:38		18:12	19:48	20:21	20:47	20:49	20:18	19:27	18:34	16:52	16 08:16 (8)	16:37	
13	07:39	08:23 (8)	07:11		06:27	06:34	05:51	05:32	05:44	06:14	06:47	07:20	06:58	07:59 (8)	07:31	
	17:00	16 08:39 (8)	17:39		18:14	19:49	20:22	20:48	20:48	20:17	19:25	18:33	16:51	18 08:17 (8)	16:37	
14	07:38	08:22 (8)	07:10		06:25	06:32	05:50	05:32	05:45	06:15	06:48	07:21	06:59	07:58 (8)	07:32	
	17:01	18 08:40 (8)	17:40		18:15	19:50	20:23	20:48	20:47	20:16	19:23	18:31	16:50	18 08:16 (8)	16:38	
15	07:38	08:24 (8)	07:08		06:24	06:30	05:49	05:32	05:46	06:16	06:49	07:22	07:01	07:58 (8)	07:33	
	17:02	16 08:40 (8)	17:42		18:16	19:51	20:24	20:49	20:47	20:14	19:21	18:29	16:49	20 08:18 (8)	16:38	
16	07:37	08:23 (8)	07:07		06:22	06:29	05:48	05:32	05:46	06:17	06:50	07:24	07:02	07:57 (8)	07:33	
	17:03	18 08:41 (8)	17:43		18:17	19:53	20:25	20:49	20:46	20:13	19:20	18:28	16:48	22 08:19 (8)	16:38	
17	07:37	08:23 (8)	07:05		06:20	06:27	05:47	05:32	05:47	06:18	06:51	07:25	07:03	07:56 (8)	07:34	
	17:04	20 08:43 (8)	17:44		18:18	19:54	20:26	20:50	20:46	20:11	19:18	18:26	16:47	22 08:18 (8)	16:38	
18	07:36	08:22 (8)	07:04		06:18	06:26	05:46	05:32	05:48	06:19	06:53	07:26	07:04	07:58 (8)	07:35	
	17:05	22 08:44 (8)	17:45		18:19	19:55	20:27	20:50	20:45	20:10	19:16	18:25	16:46	22 08:20 (8)	16:39	
19	07:36	08:22 (8)	07:02		06:17	06:24	05:45	05:32	05:49	06:21	06:54	07:27	07:06	07:57 (8)	07:35	
	17:07	22 08:44 (8)	17:47		18:21	19:56	20:28	20:50	20:44	20:08	19:14	18:23	16:45	22 08:19 (8)	16:39	
20	07:35	08:23 (8)	07:01		06:15	06:22	05:44	05:33	05:50	06:22	06:55	07:28	07:07	07:58 (8)	07:36	
	17:08	22 08:45 (8)	17:48		18:22	19:57	20:29	20:51	20:44	20:07	19:12	18:21	16:44	22 08:20 (8)	16:39	
21	07:34	08:22 (8)	07:00		06:13	06:21	05:43	05:33	05:51	06:23	06:56	07:30	07:08	07:58 (8)	07:36	
	17:09	22 08:44 (8)	17:49		18:23	19:58	20:30	20:51	20:43	20:05	19:11	18:20	16:44	22 08:20 (8)	16:40	
22	07:34	08:23 (8)	06:58		06:11	06:19	05:43	05:33	05:52	06:24	06:57	07:31	07:09	07:59 (8)	07:37	
	17:10	22 08:45 (8)	17:50		18:24	19:59	20:31	20:51	20:42	20:04	19:09	18:18	16:43	22 08:21 (8)	16:40	
23	07:33	08:23 (8)	06:57		06:10	06:18	05:42	05:33	05:53	06:25	06:58	07:32	07:10	07:58 (8)	07:37	
	17:12	22 08:45 (8)	17:52		18:25	20:00	20:32	20:51	20:41	20:02	19:07	18:17	16:42	22 08:20 (8)	16:41	
24	07:32	08:24 (8)	06:55		06:08	06:16	05:41	05:33	05:54	06:26	06:59	07:33	07:12	07:59 (8)	07:38	
	17:13	22 08:46 (8)	17:53		18:26	20:00	20:33	20:52	20:40	20:01	19:05	18:15	16:42	22 08:21 (8)	16:41	
25	07:32	08:23 (8)	06:53		06:06	06:15	05:40	05:34	05:55	06:27	07:00	06:34	07:13	08:01 (8)	07:38	
	17:14	22 08:45 (8)	17:54		18:28	20:02	20:34	20:52	20:39	19:57	19:04	17:14	16:41	20 08:21 (8)	16:42	
26	07:31	08:24 (8)	06:52		06:04	06:13	05:40	05:34	05:56	06:28	07:01	06:36	07:14	08:02 (8)	07:39	
	17:15	22 08:46 (8)	17:56		18:29	20:03	20:35	20:52	20:38	19:56	19:02	17:13	16:41	18 08:20 (8)	16:43	
27	07:30	08:25 (8)	06:50		06:03	06:12	05:39	05:34	05:57	06:29	07:02	06:37	07:15	08:03 (8)	07:39	
	17:17	20 08:45 (8)	17:57		18:30	20:04	20:36	20:52	20:37	19:54	19:00	17:11	16:40	18 08:21 (8)	16:43	
28	07:29	08:26 (8)	06:49		06:01	06:10	05:38	05:35	05:58	06:30	07:03	06:38	07:16	08:02 (8)	07:39	
	17:18	18 08:44 (8)	17:58		18:31	20:05	20:36	20:52	20:36	19:52	18:58	17:10	16:40	18 08:20 (8)	16:44	
29	07:28	08:27 (8)			05:59	06:09	05:38	05:35	05:59	06:31	07:04	06:39	07:17	08:04 (8)	07:40	
	17:19	18 08:45 (8)			18:32	20:06	20:37	20:52	20:35	19:51	18:57	17:08	16:39	16 08:20 (8)	16:45	
30	07:27	08:28 (8)			05:58	06:08	05:37	05:36	06:00	06:32	07:05	06:41	07:19	08:05 (8)	07:40	
	17:21	16 08:44 (8)			18:33	20:07	20:38	20:52	20:34	19:49	18:55	17:07	16:39	14 08:19 (8)	16:46	
31	07:26	08:29 (8)			05:56		05:36		06:01	06:33		06:42			07:40	
	17:22	14 08:43 (8)			18:34		20:39		20:33	19:47		17:06			16:46	
Potential sun hours	293		295		370	209	-292	-263	-280	-145	375	343	294		283	
Total, worst case		410		8										396		24
Sun reduction		0.35		0.45										0.35		0.30
Oper. time red.		0.86		0.86										0.86		0.86
Wind dir. red.		0.63		0.63										0.63		0.63
Total reduction		0.19		0.24										0.19		0.16
Total, real		78		2										75		4

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	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, Mid Western part
9 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
1000 meter max shadow distance applied along with default 3° inclination
Sunshine probabilities applied (pdf plots)
Directional run-hours applied from tab file (tower 1)
.

Licensed user:
Wind Engineers, Inc.
7660 Whitegate Avenue
US-RIVERSIDE, CA 92506

Calculated:
03/01/06 23:22/2.4.0.67

SHADOW - Calendar

Calculation: Mid Western part **Shadow receptor:** 828 - 828

Assumptions for shadow calculations

Maximum distance for influence	1,000	m
Minimum sun height over horizon for influence	3	°
Day step for calculation	1	days
Time step for calculation	2	minutes

Sun shine probabilities (part of time from sun rise to sun set with sun shine)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.35	0.45	0.45	0.55	0.55	0.55	0.65	0.55	0.55	0.45	0.35	0.30

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
475	585	238	199	220	474	1,184	813	840	1,246	803	479	7,555

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:40	07:25	06:47	05:54	06:06	05:36	19:30 (5) 05:36	19:38 (5) 06:02	06:34	07:07	06:43	07:20
	16:47	17:23	17:59	18:36	20:08	20:40 26	19:56 (5) 20:52 22	20:00 (5) 20:32	19:46	18:53	17:04	16:38
2	07:40	07:24	06:46	05:52	06:05	05:35	19:30 (5) 05:37	19:38 (5) 06:03	06:36	07:08	06:44	07:21
	16:48	17:25	18:00	18:37	20:09	20:41 26	19:56 (5) 20:52 22	20:00 (5) 20:31	19:44	18:51	17:03	16:38
3	07:40	07:23	06:44	05:51	06:04	05:35	19:31 (5) 05:37	19:39 (5) 06:04	06:37	07:09	06:46	07:22
	16:49	17:26	18:02	18:38	20:11	20:41 24	19:55 (5) 20:51 22	20:01 (5) 20:30	19:42	18:50	17:02	16:38
4	07:40	07:22	06:42	05:49	06:02	05:35	19:31 (5) 05:38	19:37 (5) 06:05	06:38	07:10	06:47	07:23
	16:50	17:27	18:03	18:39	20:12	20:42 24	19:55 (5) 20:51 24	20:01 (5) 20:29	19:41	18:48	17:01	16:38
5	07:40	07:21	06:41	06:47	06:01	05:34	19:31 (5) 05:38	19:38 (5) 06:06	06:39	07:11	06:48	07:24
	16:51	17:28	18:04	19:40	20:13	20:43 24	19:55 (5) 20:51 24	20:02 (5) 20:28	19:39	18:46	16:59	16:37
6	07:40	07:20	06:39	06:45	06:00	05:34	19:32 (5) 05:39	19:38 (5) 06:07	06:40	07:12	06:49	07:25
	16:52	17:30	18:05	19:41	20:14	20:44 24	19:56 (5) 20:51 24	20:02 (5) 20:26	19:37	18:44	16:58	16:37
7	07:40	07:18	06:37	06:44	05:58	05:34	19:32 (5) 05:40	19:39 (5) 06:08	06:41	07:13	06:51	07:26
	16:53	17:31	18:07	19:42	20:15	20:44 24	19:56 (5) 20:51 24	20:03 (5) 20:25	19:35	18:43	16:57	16:37
8	07:40	07:17	06:36	06:42	05:57	05:33	19:32 (5) 05:40	19:38 (5) 06:09	06:42	07:14	06:52	07:27
	16:54	17:32	18:08	19:43	20:16	20:45 24	19:56 (5) 20:50 24	20:02 (5) 20:24	19:34	18:41	16:56	16:37
9	07:40	07:16	06:34	06:40	05:56	05:33	19:34 (5) 05:41	19:38 (5) 06:10	06:43	07:16	06:53	07:28
	16:55	17:34	18:09	19:45	20:17	20:46 22	19:56 (5) 20:50 24	20:02 (5) 20:22	19:32	18:39	16:55	16:37
10	07:40	07:15	06:32	06:39	05:55	05:33	19:34 (5) 05:42	19:39 (5) 06:11	06:44	07:17	06:54	07:29
	16:56	17:35	18:10	19:46	20:18	20:46 22	19:56 (5) 20:49 24	20:03 (5) 20:21	19:30	18:38	16:54	16:37
11	07:39	07:13	06:31	06:37	05:54	05:33	19:33 (5) 05:43	19:38 (5) 06:12	06:45	07:18	06:56	07:29
	16:57	17:36	18:11	19:47	20:19	20:47 22	19:55 (5) 20:49 26	20:04 (5) 20:20	19:28	18:36	16:53	16:37
12	07:39	07:12	06:29	06:35	05:52	05:32	19:33 (5) 05:43	19:38 (5) 06:13	06:46	07:19	06:57	07:30
	16:58	17:38	18:12	19:48	20:21	20:47 22	19:55 (5) 20:49 26	20:04 (5) 20:18	19:27	18:34	16:52	16:37
13	07:39	07:11	06:27	06:34	05:51	05:32	19:35 (5) 05:44	19:37 (5) 06:14	06:47	07:20	06:58	07:31
	17:00	17:39	18:14	19:49	20:22	20:48 20	19:55 (5) 20:48 26	20:03 (5) 20:17	19:25	18:33	16:51	16:37
14	07:38	07:10	06:25	06:32	05:50	19:37 (5) 05:32	19:35 (5) 05:45	19:38 (5) 06:15	06:48	07:21	06:59	07:32
	17:01	17:40	18:15	19:50	20:23 8	19:45 (5) 20:48 20	19:55 (5) 20:47 26	20:04 (5) 20:16	19:23	18:31	16:50	16:38
15	07:38	07:08	06:24	06:30	05:49	19:34 (5) 05:32	19:35 (5) 05:46	19:39 (5) 06:16	06:49	07:22	07:01	07:33
	17:02	17:42	18:16	19:51	20:24 14	19:48 (5) 20:49 20	19:55 (5) 20:47 26	20:05 (5) 20:14	19:21	18:29	16:49	16:38
16	07:37	07:07	06:22	06:29	05:48	19:33 (5) 05:32	19:35 (5) 05:47	19:38 (5) 06:17	06:50	07:24	07:02	07:33
	17:03	17:43	18:17	19:53	20:25 16	19:49 (5) 20:49 20	19:55 (5) 20:46 26	20:04 (5) 20:13	19:20	18:28	16:48	16:38
17	07:37	07:05	06:20	06:27	05:47	19:32 (5) 05:32	19:35 (5) 05:47	19:38 (5) 06:18	06:51	07:25	07:03	07:34
	17:04	17:44	18:18	19:54	20:26 18	19:50 (5) 20:50 20	19:55 (5) 20:46 26	20:04 (5) 20:11	19:18	18:26	16:47	16:38
18	07:36	07:04	06:18	06:26	05:46	19:31 (5) 05:32	19:35 (5) 05:48	19:39 (5) 06:20	06:53	07:26	07:04	07:35
	17:05	17:45	18:19	19:55	20:27 20	19:51 (5) 20:50 20	19:55 (5) 20:45 24	20:03 (5) 20:10	19:16	18:25	16:46	16:39
19	07:36	07:02	06:17	06:24	05:45	19:31 (5) 05:32	19:38 (5) 05:49	19:38 (5) 06:21	06:54	07:27	07:06	07:35
	17:07	17:47	18:21	19:56	20:28 22	19:53 (5) 20:50 18	19:56 (5) 20:44 26	20:04 (5) 20:08	19:14	18:23	16:45	16:39
20	07:35	07:01	06:15	06:22	05:44	19:30 (5) 05:33	19:38 (5) 05:50	19:39 (5) 06:22	06:55	07:28	07:07	07:36
	17:08	17:48	18:22	19:57	20:29 22	19:52 (5) 20:51 18	19:56 (5) 20:44 26	20:05 (5) 20:07	19:13	18:21	16:44	16:39
21	07:34	07:00	06:13	06:21	05:43	19:29 (5) 05:33	19:38 (5) 05:51	19:40 (5) 06:23	06:56	07:30	07:08	07:36
	17:09	17:49	18:23	19:58	20:30 24	19:53 (5) 20:51 18	19:56 (5) 20:43 24	20:04 (5) 20:05	19:11	18:20	16:44	16:40
22	07:34	06:58	06:11	06:19	05:43	19:30 (5) 05:33	19:38 (5) 05:52	19:41 (5) 06:24	06:57	07:31	07:09	07:37
	17:10	17:51	18:24	19:59	20:31 24	19:54 (5) 20:51 18	19:56 (5) 20:42 22	20:03 (5) 20:04	19:09	18:18	16:43	16:40
23	07:33	06:57	06:10	06:18	05:42	19:29 (5) 05:33	19:38 (5) 05:53	19:40 (5) 06:25	06:58	07:32	07:10	07:37
	17:12	17:52	18:25	20:00	20:32 24	19:53 (5) 20:51 18	19:56 (5) 20:41 24	20:04 (5) 20:02	19:07	18:17	16:42	16:41
24	07:32	06:55	06:08	06:16	05:41	19:29 (5) 05:34	19:37 (5) 05:54	19:40 (5) 06:26	06:59	07:33	07:12	07:38
	17:13	17:53	18:26	20:00	20:33 26	19:55 (5) 20:52 20	19:57 (5) 20:40 22	20:02 (5) 20:01	19:05	18:15	16:42	16:41
25	07:32	06:53	06:06	06:15	05:40	19:30 (5) 05:34	19:37 (5) 05:55	19:41 (5) 06:27	07:00	06:34	07:13	07:38
	17:14	17:54	18:28	20:02	20:34 24	19:54 (5) 20:52 20	19:57 (5) 20:39 20	20:01 (5) 19:57	19:04	17:14	16:41	16:42
26	07:31	06:52	06:05	06:13	05:40	19:29 (5) 05:34	19:37 (5) 05:56	19:42 (5) 06:28	07:01	06:36	07:14	07:39
	17:15	17:56	18:29	20:03	20:35 26	19:55 (5) 20:52 20	19:57 (5) 20:38 18	20:00 (5) 19:56	19:02	17:13	16:41	16:43
27	07:30	06:50	06:03	06:12	05:39	19:29 (5) 05:35	19:38 (5) 05:57	19:43 (5) 06:29	07:02	06:37	07:15	07:39
	17:17	17:57	18:30	20:04	20:36 26	19:55 (5) 20:52 20	19:58 (5) 20:37 16	19:59 (5) 19:54	19:00	17:11	16:40	16:43
28	07:29	06:49	06:01	06:10	05:38	19:30 (5) 05:35	19:38 (5) 05:58	19:44 (5) 06:30	07:03	06:38	07:16	07:39
	17:18	17:58	18:31	20:05	20:36 24	19:54 (5) 20:52 20	19:58 (5) 20:36 14	19:58 (5) 19:52	18:58	17:10	16:40	16:44
29	07:28		05:59	06:09	05:38	19:30 (5) 05:35	19:39 (5) 05:59	19:47 (5) 06:31	07:04	06:39	07:17	07:40
	17:19		18:32	20:06	20:37 26	19:56 (5) 20:52 20	19:59 (5) 20:35 10	19:57 (5) 19:51	18:57	17:08	16:39	16:45
30	07:27		05:58	06:08	05:37	19:29 (5) 05:36	19:39 (5) 06:00	19:50 (5) 06:32	07:06	06:41	07:19	07:40
	17:21		18:33	20:07	20:38 26	19:55 (5) 20:52 20	19:59 (5) 20:34 4	19:54 (5) 19:49	18:55	17:07	16:39	16:46
31	07:26		05:56		05:36	19:31 (5)	06:01	06:33		06:42		07:40
	17:22		18:34		20:39 24	19:55 (5)	20:33	19:47		17:06		16:46
Potential sun hours	293	295	370	209	-292	-263	-280	-145	375	343	294	283
Total, worst case					394	634	666					
Sun reduction					0.55	0.55	0.65					
Oper. time red.					0.86	0.86	0.86					
Wind dir. red.					0.62	0.62	0.62					
Total reduction					0.29	0.29	0.35					
Total, real					115	186	230					

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	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, Mid Western part
9 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
1000 meter max shadow distance applied along with default 3° inclination
Sunshine probabilities applied (pdf plots)
Directional run-hours applied from tab file (tower 1)
.

Licensed user:
Wind Engineers, Inc.
7660 Whitegate Avenue
US-RIVERSIDE, CA 92506

Calculated:
03/01/06 23:22/2.4.0.67

SHADOW - Calendar

Calculation: Mid Western part **Shadow receptor:** 829 - 829

Assumptions for shadow calculations

Maximum distance for influence	1,000	m
Minimum sun height over horizon for influence	3	°
Day step for calculation	1	days
Time step for calculation	2	minutes

Sun shine probabilities (part of time from sun rise to sun set with sun shine)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.35	0.45	0.45	0.55	0.55	0.55	0.65	0.55	0.55	0.45	0.35	0.30

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
475	585	238	199	220	474	1,184	813	840	1,246	803	479	7,555

	January		February		March	April	May	June	July	August	September	October	November		December	
1	07:40		07:25	08:42 (9)	06:47	05:54	06:06	05:36	05:36	06:02	06:34	07:07	06:43		07:20	08:20 (9)
	16:47		17:23	22 09:04 (9)	17:59	18:36	20:08	20:40	20:52	20:32	19:46	18:53	17:04		16:39	20 08:40 (9)
2	07:40		07:24	08:43 (9)	06:46	05:52	06:05	05:35	05:37	06:03	06:36	07:08	06:44		07:21	08:21 (9)
	16:48		17:25	20 09:03 (9)	18:00	18:37	20:09	20:41	20:52	20:31	19:44	18:51	17:03		16:38	18 08:39 (9)
3	07:40		07:23	08:46 (9)	06:44	05:51	06:04	05:35	05:37	06:04	06:37	07:09	06:46		07:22	08:24 (9)
	16:49		17:26	16 09:02 (9)	18:02	18:38	20:11	20:41	20:51	20:30	19:42	18:50	17:02		16:38	14 08:38 (9)
4	07:40		07:22	08:49 (9)	06:42	05:49	06:02	05:35	05:38	06:05	06:38	07:10	06:47		07:23	08:25 (9)
	16:50		17:27	10 08:59 (9)	18:03	18:39	20:12	20:42	20:51	20:29	19:41	18:48	17:01		16:38	12 08:37 (9)
5	07:40		07:21		06:41	06:47	06:01	05:34	05:39	06:06	06:39	07:11	06:48		07:24	08:26 (9)
	16:51		17:28		18:04	19:40	20:13	20:43	20:51	20:28	19:39	18:46	16:59		16:37	10 08:36 (9)
6	07:40	08:43 (9)	07:20		06:39	06:45	06:00	05:34	05:39	06:07	06:40	07:12	06:49		07:25	08:27 (9)
	16:52	6 08:49 (9)	17:30		18:05	19:41	20:14	20:44	20:51	20:26	19:37	18:44	16:58		16:37	8 08:35 (9)
7	07:40	08:41 (9)	07:18		06:37	06:44	05:58	05:34	05:40	06:08	06:41	07:13	06:51	08:17 (9)	07:26	08:32 (9)
	16:53	10 08:51 (9)	17:31		18:07	19:42	20:15	20:44	20:51	20:25	19:35	18:43	16:57	12 08:29 (9)	16:37	4 08:36 (9)
8	07:40	08:41 (9)	07:17		06:36	06:42	05:57	05:33	05:40	06:09	06:42	07:14	06:52	08:16 (9)	07:27	
	16:54	12 08:53 (9)	17:32		18:08	19:43	20:16	20:45	20:50	20:24	19:34	18:41	16:56	16 08:32 (9)	16:37	
9	07:40	08:40 (9)	07:16		06:34	06:40	05:56	05:33	05:41	06:10	06:43	07:16	06:53	08:14 (9)	07:28	
	16:55	14 08:54 (9)	17:34		18:09	19:45	20:17	20:46	20:50	20:22	19:32	18:39	16:55	20 08:34 (9)	16:37	
10	07:40	08:38 (9)	07:15		06:32	06:39	05:55	05:33	05:42	06:11	06:44	07:17	06:54	08:13 (9)	07:29	
	16:56	18 08:56 (9)	17:35		18:10	19:46	20:18	20:46	20:49	20:21	19:30	18:38	16:54	22 08:35 (9)	16:37	
11	07:39	08:38 (9)	07:14		06:31	06:37	05:54	05:33	05:43	06:12	06:45	07:18	06:56	08:12 (9)	07:29	
	16:57	20 08:58 (9)	17:36		18:11	19:47	20:19	20:47	20:49	20:20	19:28	18:36	16:53	24 08:36 (9)	16:37	
12	07:39	08:37 (9)	07:12		06:29	06:35	05:52	05:32	05:43	06:13	06:46	07:19	06:57	08:12 (9)	07:30	
	16:58	20 08:57 (9)	17:38		18:12	19:48	20:21	20:47	20:49	20:18	19:27	18:34	16:52	26 08:38 (9)	16:37	
13	07:39	08:37 (9)	07:11		06:27	06:34	05:51	05:32	05:44	06:14	06:47	07:20	06:58	08:11 (9)	07:31	
	17:00	22 08:59 (9)	17:39		18:14	19:49	20:22	20:48	20:48	20:17	19:25	18:33	16:51	26 08:37 (9)	16:37	
14	07:38	08:38 (9)	07:10		06:25	06:32	05:50	05:32	05:45	06:15	06:48	07:21	06:59	08:12 (9)	07:32	
	17:01	22 09:00 (9)	17:40		18:15	19:50	20:23	20:48	20:48	20:16	19:23	18:31	16:50	26 08:38 (9)	16:38	
15	07:38	08:38 (9)	07:08		06:24	06:30	05:49	05:32	05:46	06:16	06:49	07:22	07:01	08:12 (9)	07:33	
	17:02	24 09:02 (9)	17:42		18:16	19:51	20:24	20:49	20:47	20:14	19:21	18:29	16:49	28 08:40 (9)	16:38	
16	07:37	08:37 (9)	07:07		06:22	06:29	05:48	05:32	05:47	06:17	06:50	07:24	07:02	08:11 (9)	07:33	
	17:03	24 09:01 (9)	17:43		18:17	19:53	20:25	20:49	20:46	20:13	19:20	18:28	16:48	28 08:39 (9)	16:38	
17	07:37	08:37 (9)	07:05		06:20	06:27	05:47	05:32	05:47	06:18	06:51	07:25	07:03	08:12 (9)	07:34	
	17:04	26 09:03 (9)	17:44		18:18	19:54	20:26	20:50	20:46	20:11	19:18	18:26	16:47	28 08:40 (9)	16:38	
18	07:36	08:36 (9)	07:04		06:18	06:26	05:46	05:32	05:48	06:20	06:53	07:26	07:04	08:12 (9)	07:35	
	17:05	28 09:04 (9)	17:45		18:20	19:55	20:27	20:50	20:45	20:10	19:16	18:25	16:46	28 08:40 (9)	16:39	
19	07:36	08:38 (9)	07:02		06:17	06:24	05:45	05:32	05:49	06:21	06:54	07:27	07:06	08:11 (9)	07:35	
	17:07	26 09:04 (9)	17:47		18:21	19:56	20:28	20:50	20:44	20:08	19:14	18:23	16:45	30 08:41 (9)	16:39	
20	07:35	08:37 (9)	07:01		06:15	06:22	05:44	05:33	05:50	06:22	06:55	07:28	07:07	08:12 (9)	07:36	
	17:08	28 09:05 (9)	17:48		18:22	19:57	20:29	20:51	20:44	20:07	19:13	18:21	16:44	28 08:40 (9)	16:39	
21	07:34	08:36 (9)	07:00		06:13	06:21	05:43	05:33	05:51	06:23	06:56	07:30	07:08	08:12 (9)	07:36	
	17:09	28 09:04 (9)	17:49		18:23	19:58	20:30	20:51	20:43	20:05	19:11	18:20	16:44	28 08:40 (9)	16:40	
22	07:34	08:37 (9)	06:58		06:12	06:19	05:43	05:33	05:52	06:24	06:57	07:31	07:09	08:13 (9)	07:37	
	17:10	28 09:05 (9)	17:51		18:24	19:59	20:31	20:51	20:42	20:04	19:09	18:18	16:43	28 08:41 (9)	16:40	
23	07:33	08:37 (9)	06:57		06:10	06:18	05:42	05:33	05:53	06:25	06:58	07:32	07:10	08:14 (9)	07:37	
	17:12	30 09:07 (9)	17:52		18:25	20:00	20:32	20:51	20:41	20:02	19:07	18:17	16:42	26 08:40 (9)	16:41	
24	07:32	08:38 (9)	06:55		06:08	06:16	05:41	05:34	05:54	06:26	06:59	07:33	07:12	08:13 (9)	07:38	
	17:13	28 09:06 (9)	17:53		18:26	20:00	20:33	20:52	20:40	20:01	19:05	18:15	16:42	28 08:41 (9)	16:41	
25	07:32	08:39 (9)	06:53		06:06	06:15	05:40	05:34	05:55	06:27	07:00	06:34	07:13	08:15 (9)	07:38	
	17:14	28 09:07 (9)	17:54		18:28	20:02	20:34	20:52	20:39	19:57	19:04	17:14	16:41	26 08:41 (9)	16:42	
26	07:31	08:38 (9)	06:52		06:05	06:13	05:40	05:34	05:56	06:28	07:01	06:36	07:14	08:16 (9)	07:39	
	17:15	28 09:06 (9)	17:56		18:29	20:03	20:35	20:52	20:38	19:56	19:02	17:13	16:41	24 08:40 (9)	16:43	
27	07:30	08:39 (9)	06:50		06:03	06:12	05:39	05:35	05:57	06:29	07:02	06:37	07:15	08:17 (9)	07:39	
	17:17	28 09:07 (9)	17:57		18:30	20:04	20:36	20:52	20:37	19:54	19:00	17:11	16:40	24 08:41 (9)	16:43	
28	07:29	08:40 (9)	06:49		06:01	06:10	05:38	05:35	05:58	06:30	07:03	06:38	07:16	08:18 (9)	07:39	
	17:18	26 09:06 (9)	17:58		18:31	20:05	20:36	20:52	20:36	19:52	18:58	17:10	16:40	22 08:40 (9)	16:44	
29	07:28	08:39 (9)			05:59	06:09	05:38	05:35	05:59	06:31	07:04	06:39	07:17	08:18 (9)	07:40	
	17:19	26 09:05 (9)			18:32	20:06	20:37	20:52	20:35	19:51	18:57	17:08	16:39	22 08:40 (9)	16:45	
30	07:27	08:40 (9)			05:58	06:08	05:37	05:36	06:00	06:32	07:06	06:41	07:19	08:19 (9)	07:40	
	17:21	26 09:06 (9)			18:33	20:07	20:38	20:52	20:34	19:49	18:55	17:07	16:39	22 08:41 (9)	16:46	
31	07:26	08:41 (9)			05:56		05:36		06:01	06:33		06:42			07:40	
	17:22	24 09:05 (9)			18:34		20:39		20:33	19:47		17:06			16:46	
Potential sun hours	293		295		370	209	-292	-263	-280	-145	375	343	294		283	
Total, worst case		600		68										592		86
Sun reduction		0.35		0.45										0.35		0.30
Oper. time red.		0.86		0.86										0.86		0.86
Wind dir. red.		0.63		0.63										0.63		0.63
Total reduction		0.19		0.24										0.19		0.16
Total, real		113		17										112		14

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	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, Mid Western part
9 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
1000 meter max shadow distance applied along with default 3° inclination
Sunshine probabilities applied (pdf plots)
Directional run-hours applied from tab file (tower 1)
.

Licensed user:
Wind Engineers, Inc.
7660 Whitegate Avenue
US-RIVERSIDE, CA 92506

Calculated:
03/01/06 23:22/2.4.0.67

SHADOW - Calendar

Calculation: Mid Western part **Shadow receptor:** 830 - 830

Assumptions for shadow calculations

Maximum distance for influence	1,000 m
Minimum sun height over horizon for influence	3 °
Day step for calculation	1 days
Time step for calculation	2 minutes

Sun shine probabilities (part of time from sun rise to sun set with sun shine)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.35	0.45	0.45	0.55	0.55	0.55	0.65	0.55	0.55	0.45	0.35	0.30

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
475	585	238	199	220	474	1,184	813	840	1,246	803	479	7,555

	January			February	March	April	May	June	July	August	September	October	November			December		
1	07:40		08:35 (9)	07:25	06:47	05:54	06:06	05:36	05:36	06:02	06:34	07:07	06:43			07:20		08:20 (9)
	16:47	22	08:57 (9)	17:23	17:59	18:36	20:08	20:40	20:52	20:32	19:46	18:53	17:04			16:39	26	08:46 (9)
2	07:40		08:35 (9)	07:24	06:46	05:52	06:05	05:35	05:37	06:03	06:36	07:08	06:44			07:21		08:21 (9)
	16:48	22	08:57 (9)	17:25	18:00	18:37	20:09	20:41	20:52	20:31	19:44	18:51	17:03			16:38	24	08:45 (9)
3	07:40		08:35 (9)	07:23	06:44	05:51	06:04	05:35	05:37	06:04	06:37	07:09	06:46			07:22		08:20 (9)
	16:49	22	08:57 (9)	17:26	18:02	18:38	20:11	20:41	20:51	20:30	19:42	18:50	17:02			16:38	26	08:46 (9)
4	07:40		08:35 (9)	07:22	06:42	05:49	06:02	05:35	05:38	06:05	06:38	07:10	06:47			07:23		08:21 (9)
	16:50	24	08:59 (9)	17:27	18:03	18:39	20:12	20:42	20:51	20:29	19:41	18:48	17:01			16:38	26	08:47 (9)
5	07:40		08:37 (9)	07:21	06:41	06:47	06:01	05:34	05:39	06:06	06:39	07:11	06:48			07:24		08:22 (9)
	16:51	22	08:59 (9)	17:28	18:04	19:40	20:13	20:43	20:51	20:28	19:39	18:46	16:59			16:37	24	08:46 (9)
6	07:40		08:37 (9)	07:20	06:39	06:45	06:00	05:34	05:39	06:07	06:40	07:12	06:49			07:25		08:23 (9)
	16:52	24	09:01 (9)	17:30	18:05	19:41	20:14	20:44	20:51	20:26	19:37	18:44	16:58			16:37	24	08:47 (9)
7	07:40		08:37 (9)	07:18	06:37	06:44	05:58	05:34	05:40	06:08	06:41	07:13	06:51			07:26		08:24 (9)
	16:53	24	09:01 (9)	17:31	18:07	19:42	20:15	20:44	20:51	20:25	19:35	18:43	16:57			16:37	22	08:46 (9)
8	07:40		08:37 (9)	07:17	06:36	06:42	05:57	05:33	05:40	06:09	06:42	07:14	06:52			07:27		08:23 (9)
	16:54	24	09:01 (9)	17:32	18:08	19:43	20:16	20:45	20:50	20:24	19:34	18:41	16:56			16:37	24	08:47 (9)
9	07:40		08:36 (9)	07:16	06:34	06:40	05:56	05:33	05:41	06:10	06:43	07:16	06:53			07:28		08:24 (9)
	16:55	26	09:02 (9)	17:34	18:09	19:45	20:17	20:46	20:50	20:22	19:32	18:39	16:55			16:37	22	08:46 (9)
10	07:40		08:38 (9)	07:15	06:32	06:39	05:55	05:33	05:42	06:11	06:44	07:17	06:54			07:29		08:25 (9)
	16:56	24	09:02 (9)	17:35	18:10	19:46	20:18	20:46	20:49	20:21	19:30	18:38	16:54			16:37	22	08:47 (9)
11	07:39		08:38 (9)	07:14	06:31	06:37	05:54	05:33	05:43	06:12	06:45	07:18	06:56			07:29		08:26 (9)
	16:57	26	09:04 (9)	17:36	18:11	19:47	20:19	20:47	20:49	20:20	19:28	18:36	16:53			16:37	22	08:48 (9)
12	07:39		08:37 (9)	07:12	06:29	06:35	05:52	05:32	05:43	06:13	06:46	07:19	06:57			07:30		08:27 (9)
	16:58	26	09:03 (9)	17:38	18:12	19:48	20:21	20:47	20:49	20:18	19:27	18:34	16:52			16:37	20	08:47 (9)
13	07:39		08:39 (9)	07:11	06:27	06:34	05:51	05:32	05:44	06:14	06:47	07:20	06:58			07:31		08:27 (9)
	17:00	26	09:05 (9)	17:39	18:14	19:49	20:22	20:48	20:48	20:17	19:25	18:33	16:51			16:37	20	08:47 (9)
14	07:38		08:38 (9)	07:10	06:25	06:32	05:50	05:32	05:45	06:15	06:48	07:21	06:59		08:22 (9)	07:32		08:28 (9)
	17:01	26	09:04 (9)	17:40	18:15	19:50	20:23	20:48	20:48	20:16	19:23	18:31	16:50	10	08:32 (9)	16:38	20	08:48 (9)
15	07:38		08:38 (9)	07:08	06:24	06:30	05:49	05:32	05:46	06:16	06:49	07:22	07:01		08:20 (9)	07:33		08:29 (9)
	17:02	28	09:06 (9)	17:42	18:16	19:51	20:24	20:49	20:47	20:14	19:21	18:29	16:49	14	08:34 (9)	16:38	18	08:47 (9)
16	07:37		08:39 (9)	07:07	06:22	06:29	05:48	05:32	05:47	06:17	06:50	07:24	07:02		08:19 (9)	07:33		08:30 (9)
	17:03	26	09:05 (9)	17:43	18:17	19:53	20:25	20:49	20:46	20:13	19:20	18:28	16:48	18	08:37 (9)	16:38	18	08:48 (9)
17	07:37		08:39 (9)	07:05	06:20	06:27	05:47	05:32	05:47	06:18	06:51	07:25	07:03		08:18 (9)	07:34		08:30 (9)
	17:04	26	09:05 (9)	17:44	18:18	19:54	20:26	20:50	20:46	20:11	19:18	18:26	16:47	20	08:38 (9)	16:38	18	08:48 (9)
18	07:36		08:40 (9)	07:04	06:18	06:26	05:46	05:32	05:48	06:20	06:53	07:26	07:04		08:18 (9)	07:35		08:31 (9)
	17:05	26	09:06 (9)	17:45	18:20	19:55	20:27	20:50	20:45	20:10	19:16	18:25	16:46	22	08:40 (9)	16:39	18	08:49 (9)
19	07:36		08:40 (9)	07:02	06:17	06:24	05:45	05:32	05:49	06:21	06:54	07:27	07:06		08:17 (9)	07:35		08:32 (9)
	17:07	26	09:06 (9)	17:47	18:21	19:56	20:28	20:50	20:44	20:08	19:14	18:23	16:45	22	08:39 (9)	16:39	18	08:50 (9)
20	07:35		08:41 (9)	07:01	06:15	06:22	05:44	05:33	05:50	06:22	06:55	07:28	07:07		08:16 (9)	07:36		08:32 (9)
	17:08	26	09:07 (9)	17:48	18:22	19:57	20:29	20:51	20:44	20:07	19:13	18:21	16:44	24	08:40 (9)	16:39	18	08:50 (9)
21	07:34		08:42 (9)	07:00	06:13	06:21	05:43	05:33	05:51	06:23	06:56	07:30	07:08		08:18 (9)	07:36		08:33 (9)
	17:09	24	09:06 (9)	17:49	18:23	19:58	20:30	20:51	20:43	20:05	19:11	18:20	16:44	24	08:42 (9)	16:40	18	08:51 (9)
22	07:34		08:41 (9)	06:58	06:12	06:19	05:43	05:33	05:52	06:24	06:57	07:31	07:09		08:17 (9)	07:37		08:33 (9)
	17:10	24	09:05 (9)	17:51	18:24	19:59	20:31	20:51	20:42	20:04	19:09	18:18	16:43	26	08:43 (9)	16:40	18	08:51 (9)
23	07:33		08:43 (9)	06:57	06:10	06:18	05:42	05:33	05:53	06:25	06:58	07:32	07:10		08:16 (9)	07:37		08:33 (9)
	17:12	22	09:05 (9)	17:52	18:25	20:00	20:32	20:51	20:41	20:02	19:07	18:17	16:42	26	08:42 (9)	16:41	18	08:51 (9)
24	07:32		08:44 (9)	06:55	06:08	06:16	05:41	05:34	05:54	06:26	06:59	07:33	07:12		08:17 (9)	07:38		08:34 (9)
	17:13	22	09:06 (9)	17:53	18:26	20:00	20:33	20:52	20:40	20:01	19:05	18:15	16:42	26	08:43 (9)	16:41	18	08:52 (9)
25	07:32		08:45 (9)	06:53	06:06	06:15	05:40	05:34	05:55	06:27	07:00	06:34	07:13		08:17 (9)	07:38		08:34 (9)
	17:14	20	09:05 (9)	17:54	18:28	20:02	20:34	20:52	20:39	19:57	19:04	17:14	16:41	26	08:43 (9)	16:42	18	08:52 (9)
26	07:31		08:46 (9)	06:52	06:05	06:13	05:40	05:34	05:56	06:28	07:01	06:36	07:14		08:18 (9)	07:39		08:35 (9)
	17:15	18	09:04 (9)	17:56	18:29	20:03	20:35	20:52	20:38	19:56	19:02	17:13	16:41	26	08:44 (9)	16:43	18	08:53 (9)
27	07:30		08:47 (9)	06:50	06:03	06:12	05:39	05:35	05:57	06:29	07:02	06:37	07:15		08:17 (9)	07:39		08:35 (9)
	17:17	14	09:01 (9)	17:57	18:30	20:04	20:36	20:52	20:37	19:54	19:00	17:11	16:40	28	08:45 (9)	16:43	18	08:53 (9)
28	07:29		08:50 (9)	06:49	06:01	06:10	05:38	05:35	05:58	06:30	07:03	06:38	07:16		08:18 (9)	07:39		08:35 (9)
	17:18	10	09:00 (9)	17:58	18:31	20:05	20:36	20:52	20:36	19:52	18:58	17:10	16:40	26	08:44 (9)	16:44	18	08:53 (9)
29	07:28				05:59	06:09	05:38	05:35	05:59	06:31	07:04	06:39	07:17		08:20 (9)	07:40		08:35 (9)
	17:19				18:32	20:06	20:37	20:52	20:35	19:51	18:57	17:08	16:39	26	08:46 (9)	16:45	20	08:55 (9)
30	07:27				05:58	06:08	05:37	05:36	06:00	06:32	07:06	06:41	07:19		08:19 (9)	07:40		08:35 (9)
	17:21				18:33	20:07	20:38	20:52	20:34	19:49	18:55	17:07	16:39	26	08:45 (9)	16:46	20	08:55 (9)
31	07:26				05:56		05:36		06:01	06:33		06:42				07:40		08:35 (9)
	17:22				18:34		20:39		20:33	19:47		17:06				16:46	20	08:55 (9)
Potential sun hours	293			295	370	209	-292	-263	-280	-145	375	343	294			283		
Total, worst case		650												390			634	
Sun reduction		0.35												0.35			0.30	
Oper. time red.		0.86												0.86			0.86	
Wind dir. red.		0.62												0.62			0.62	
Total reduction		0.19												0.19			0.16	
Total, real		122												73			102	

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	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, Mid Western part
9 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
1000 meter max shadow distance applied along with default 3° inclination
Sunshine probabilities applied (pdf plots)
Directional run-hours applied from tab file (tower 1)
.

Printed/Page
03/05/06 23:05 / 25
Licensed user:
Wind Engineers, Inc.
7660 Whitegate Avenue
US-RIVERSIDE, CA 92506

Calculated:
03/01/06 23:22/2.4.0.67

SHADOW - Calendar

Calculation: Mid Western part **Shadow receptor:** 831 - 831

Assumptions for shadow calculations

Maximum distance for influence	1,000	m
Minimum sun height over horizon for influence	3	°
Day step for calculation	1	days
Time step for calculation	2	minutes

Sun shine probabilities (part of time from sun rise to sun set with sun shine)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.35	0.45	0.45	0.55	0.55	0.55	0.65	0.55	0.55	0.45	0.35	0.30

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
475	585	238	199	220	474	1,184	813	840	1,246	803	479	7,555

	January		February		March	April	May	June	July	August	September	October	November		December
1	07:40		07:25	08:22 (9)	06:47	05:54	06:06	05:36	05:36	06:02	06:34	07:07	06:43		07:20
	16:47		17:23 24	08:46 (9)	17:59	18:36	20:08	20:40	20:52	20:32	19:46	18:53	17:04		16:39
2	07:40		07:24	08:23 (9)	06:46	05:52	06:05	05:35	05:37	06:03	06:36	07:08	06:44	07:58 (9)	07:21
	16:48		17:25 24	08:47 (9)	18:00	18:37	20:09	20:41	20:52	20:31	19:44	18:51	17:03 12	08:10 (9)	16:38
3	07:40		07:23	08:24 (9)	06:44	05:51	06:04	05:35	05:37	06:04	06:37	07:09	06:46	07:58 (9)	07:22
	16:49		17:26 22	08:46 (9)	18:02	18:38	20:11	20:41	20:51	20:30	19:42	18:50	17:02 14	08:12 (9)	16:38
4	07:40		07:22	08:23 (9)	06:42	05:49	06:02	05:35	05:38	06:05	06:38	07:10	06:47	07:55 (9)	07:23
	16:50		17:27 24	08:47 (9)	18:03	18:39	20:12	20:42	20:51	20:29	19:41	18:48	17:01 18	08:13 (9)	16:38
5	07:40		07:21	08:23 (9)	06:41	06:47	06:01	05:34	05:39	06:06	06:39	07:11	06:48	07:54 (9)	07:24
	16:51		17:29 22	08:45 (9)	18:04	19:40	20:13	20:43	20:51	20:28	19:39	18:46	16:59 20	08:14 (9)	16:37
6	07:40		07:20	08:24 (9)	06:39	06:45	06:00	05:34	05:39	06:07	06:40	07:12	06:49	07:54 (9)	07:25
	16:52		17:30 20	08:44 (9)	18:05	19:41	20:14	20:44	20:51	20:26	19:37	18:44	16:58 22	08:16 (9)	16:37
7	07:40		07:18	08:27 (9)	06:37	06:44	05:58	05:34	05:40	06:08	06:41	07:13	06:51	07:53 (9)	07:26
	16:53		17:31 16	08:43 (9)	18:07	19:42	20:15	20:44	20:51	20:25	19:35	18:43	16:57 24	08:17 (9)	16:37
8	07:40		07:17	08:28 (9)	06:36	06:42	05:57	05:33	05:40	06:09	06:42	07:14	06:52	07:52 (9)	07:27
	16:54		17:32 14	08:42 (9)	18:08	19:43	20:16	20:45	20:50	20:24	19:34	18:41	16:56 24	08:16 (9)	16:37
9	07:40		07:16	08:31 (9)	06:34	06:40	05:56	05:33	05:41	06:10	06:43	07:16	06:53	07:54 (9)	07:28
	16:55		17:34 10	08:41 (9)	18:09	19:45	20:17	20:46	20:50	20:22	19:32	18:39	16:55 24	08:18 (9)	16:37
10	07:40		07:15		06:32	06:39	05:55	05:33	05:42	06:11	06:44	07:17	06:54	07:53 (9)	07:29
	16:56		17:35		18:10	19:46	20:18	20:46	20:49	20:21	19:30	18:38	16:54 24	08:17 (9)	16:37
11	07:39		07:14		06:31	06:37	05:54	05:33	05:43	06:12	06:45	07:18	06:56	07:52 (9)	07:29
	16:57		17:36		18:11	19:47	20:19	20:47	20:49	20:20	19:28	18:36	16:53 26	08:18 (9)	16:37
12	07:39		07:12		06:29	06:35	05:52	05:32	05:43	06:13	06:46	07:19	06:57	07:54 (9)	07:30
	16:58		17:38		18:13	19:48	20:21	20:47	20:49	20:18	19:27	18:34	16:52 24	08:18 (9)	16:37
13	07:39		07:11		06:27	06:34	05:51	05:32	05:44	06:14	06:47	07:20	06:58	07:53 (9)	07:31
	17:00		17:39		18:14	19:49	20:22	20:48	20:48	20:17	19:25	18:33	16:51 24	08:17 (9)	16:37
14	07:38		07:10		06:25	06:32	05:50	05:32	05:45	06:15	06:48	07:21	06:59	07:54 (9)	07:32
	17:01		17:40		18:15	19:50	20:23	20:48	20:48	20:16	19:23	18:31	16:50 24	08:18 (9)	16:38
15	07:38		07:08		06:24	06:30	05:49	05:32	05:46	06:16	06:49	07:22	07:01	07:56 (9)	07:33
	17:02		17:42		18:16	19:51	20:24	20:49	20:47	20:14	19:21	18:29	16:49 22	08:18 (9)	16:38
16	07:37		07:07		06:22	06:29	05:48	05:32	05:47	06:17	06:50	07:24	07:02	07:55 (9)	07:33
	17:03		17:43		18:17	19:53	20:25	20:49	20:46	20:13	19:20	18:28	16:48 22	08:17 (9)	16:38
17	07:37		07:05		06:20	06:27	05:47	05:32	05:47	06:18	06:51	07:25	07:03	07:56 (9)	07:34
	17:04		17:44		18:18	19:54	20:26	20:50	20:46	20:11	19:18	18:26	16:47 20	08:16 (9)	16:38
18	07:36		07:04		06:18	06:26	05:46	05:32	05:48	06:20	06:53	07:26	07:04	07:58 (9)	07:35
	17:05		17:45		18:20	19:55	20:27	20:50	20:45	20:10	19:16	18:25	16:46 18	08:16 (9)	16:39
19	07:36		07:02		06:17	06:24	05:45	05:32	05:49	06:21	06:54	07:27	07:06	07:59 (9)	07:35
	17:07		17:47		18:21	19:56	20:28	20:50	20:44	20:08	19:14	18:23	16:45 16	08:15 (9)	16:39
20	07:35	08:29 (9)	07:01		06:15	06:22	05:44	05:33	05:50	06:22	06:55	07:28	07:07	08:00 (9)	07:36
	17:08 6	08:35 (9)	17:48		18:22	19:57	20:29	20:51	20:44	20:07	19:13	18:22	16:44 14	08:14 (9)	16:39
21	07:35	08:26 (9)	07:00		06:13	06:21	05:44	05:33	05:51	06:23	06:56	07:30	07:08	08:02 (9)	07:36
	17:09 12	08:38 (9)	17:49		18:23	19:58	20:30	20:51	20:43	20:05	19:11	18:20	16:44 12	08:14 (9)	16:40
22	07:34	08:25 (9)	06:58		06:12	06:19	05:43	05:33	05:52	06:24	06:57	07:31	07:09	08:05 (9)	07:37
	17:10 14	08:39 (9)	17:51		18:24	19:59	20:31	20:51	20:42	20:04	19:09	18:18	16:43 6	08:11 (9)	16:40
23	07:33	08:25 (9)	06:57		06:10	06:18	05:42	05:33	05:53	06:25	06:58	07:32	07:10		07:37
	17:12 16	08:41 (9)	17:52		18:25	20:00	20:32	20:51	20:41	20:02	19:07	18:17	16:42		16:41
24	07:32	08:24 (9)	06:55		06:08	06:16	05:41	05:34	05:54	06:26	06:59	07:33	07:12		07:38
	17:13 18	08:42 (9)	17:53		18:26	20:00	20:33	20:52	20:40	20:01	19:05	18:15	16:42		16:41
25	07:32	08:23 (9)	06:53		06:06	06:15	05:40	05:34	05:55	06:27	07:00	06:34	07:13		07:38
	17:14 20	08:43 (9)	17:54		18:28	20:02	20:34	20:52	20:39	19:57	19:04	17:14	16:41		16:42
26	07:31	08:22 (9)	06:52		06:05	06:13	05:40	05:34	05:56	06:28	07:01	06:36	07:14		07:39
	17:15 22	08:44 (9)	17:56		18:29	20:03	20:35	20:52	20:38	19:56	19:02	17:13	16:41		16:43
27	07:30	08:23 (9)	06:50		06:03	06:12	05:39	05:35	05:57	06:29	07:02	06:37	07:15		07:39
	17:17 22	08:45 (9)	17:57		18:30	20:04	20:36	20:52	20:37	19:54	19:00	17:11	16:40		16:43
28	07:29	08:22 (9)	06:49		06:01	06:10	05:38	05:35	05:58	06:30	07:03	06:38	07:16		07:39
	17:18 24	08:46 (9)	17:58		18:31	20:05	20:36	20:52	20:36	19:52	18:58	17:10	16:40		16:44
29	07:28	08:21 (9)			05:59	06:09	05:38	05:35	05:59	06:31	07:04	06:39	07:17		07:40
	17:19 24	08:45 (9)			18:32	20:06	20:37	20:52	20:35	19:51	18:57	17:08	16:39		16:45
30	07:27	08:22 (9)			05:58	06:08	05:37	05:36	06:00	06:32	07:06	06:41	07:19		07:40
	17:21 24	08:46 (9)			18:33	20:07	20:38	20:52	20:34	19:49	18:55	17:07	16:39		16:46
31	07:26	08:21 (9)			05:56		05:36		06:01	06:33		06:42			07:40
	17:22 26	08:47 (9)			18:34		20:39		20:33	19:47		17:06			16:46
Potential sun hours	293		295		370	209	-292	-263	-280	-145	375	343	294		283
Total, worst case	228		176										410		
Sun reduction	0.35		0.45										0.35		
Oper. time red.	0.86		0.86										0.86		
Wind dir. red.	0.63		0.63										0.63		
Total reduction	0.19		0.24										0.19		
Total, real	43		43										78		

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	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, Mid Western part
9 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
1000 meter max shadow distance applied along with default 3° inclination
Sunshine probabilities applied (pdf plots)
Directional run-hours applied from tab file (tower 1)
.

Licensed user:
Wind Engineers, Inc.
7660 Whitegate Avenue
US-RIVERSIDE, CA 92506

Calculated:
03/01/06 23:22/2.4.0.67

SHADOW - Calendar

Calculation: Mid Western part **Shadow receptor:** 832 - 832

Assumptions for shadow calculations

Maximum distance for influence	1,000	m
Minimum sun height over horizon for influence	3	°
Day step for calculation	1	days
Time step for calculation	2	minutes

Sun shine probabilities (part of time from sun rise to sun set with sun shine)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.35	0.45	0.45	0.55	0.55	0.55	0.65	0.55	0.55	0.45	0.35	0.30

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
475	585	238	199	220	474	1,184	813	840	1,246	803	479	7,555

	January	February	March		April	May	June	July	August	September		October		November	December
1	07:40	07:25	06:47		05:54	06:06	05:36	05:36	06:02	06:34		07:07	07:59 (9)	06:43	07:20
	16:48	17:23	17:59		18:36	20:08	20:40	20:52	20:32	19:46		18:53	16 08:15 (9)	17:04	16:39
2	07:40	07:24	06:46	07:29 (9)	05:52	06:05	05:35	05:37	06:03	06:36		07:08	07:58 (9)	06:44	07:21
	16:48	17:25	18:00	4 07:33 (9)	18:37	20:10	20:41	20:52	20:31	19:44		18:51	18 08:16 (9)	17:03	16:38
3	07:40	07:23	06:44	07:24 (9)	05:51	06:04	05:35	05:37	06:04	06:37		07:09	07:57 (9)	06:46	07:22
	16:49	17:26	18:02	12 07:36 (9)	18:38	20:11	20:41	20:51	20:30	19:42		18:50	18 08:15 (9)	17:02	16:38
4	07:40	07:22	06:42	07:22 (9)	05:49	06:02	05:35	05:38	06:05	06:38		07:10	07:56 (9)	06:47	07:23
	16:50	17:27	18:03	14 07:36 (9)	18:39	20:12	20:42	20:51	20:29	19:41		18:48	20 08:16 (9)	17:01	16:38
5	07:40	07:21	06:41	07:20 (9)	06:47	06:01	05:34	05:39	06:06	06:39		07:11	07:55 (9)	06:48	07:24
	16:51	17:29	18:04	18 07:38 (9)	19:40	20:13	20:43	20:51	20:28	19:39		18:46	20 08:15 (9)	16:59	16:38
6	07:40	07:20	06:39	07:19 (9)	06:45	06:00	05:34	05:39	06:07	06:40		07:12	07:55 (9)	06:49	07:25
	16:52	17:30	18:05	20 07:39 (9)	19:41	20:14	20:44	20:51	20:26	19:37		18:44	20 08:15 (9)	16:58	16:37
7	07:40	07:18	06:37	07:19 (9)	06:44	05:58	05:34	05:40	06:08	06:41		07:13	07:56 (9)	06:51	07:26
	16:53	17:31	18:07	20 07:39 (9)	19:42	20:15	20:44	20:51	20:25	19:36		18:43	18 08:14 (9)	16:57	16:37
8	07:40	07:17	06:36	07:19 (9)	06:42	05:57	05:33	05:40	06:09	06:42		07:14	07:55 (9)	06:52	07:27
	16:54	17:32	18:08	20 07:39 (9)	19:43	20:16	20:45	20:50	20:24	19:34		18:41	18 08:13 (9)	16:56	16:37
9	07:40	07:16	06:34	07:18 (9)	06:40	05:56	05:33	05:41	06:10	06:43		07:16	07:56 (9)	06:53	07:28
	16:55	17:34	18:09	20 07:38 (9)	19:45	20:17	20:46	20:50	20:22	19:32		18:39	16 08:12 (9)	16:55	16:37
10	07:40	07:15	06:32	07:18 (9)	06:39	05:55	05:33	05:42	06:11	06:44		07:17	07:57 (9)	06:54	07:29
	16:56	17:35	18:10	20 07:38 (9)	19:46	20:18	20:46	20:49	20:21	19:30		18:38	14 08:11 (9)	16:54	16:37
11	07:39	07:14	06:31	07:18 (9)	06:37	05:54	05:33	05:43	06:12	06:45		07:18	08:00 (9)	06:56	07:29
	16:57	17:36	18:11	18 07:36 (9)	19:47	20:19	20:47	20:49	20:20	19:28		18:36	8 08:08 (9)	16:53	16:37
12	07:39	07:12	06:29	07:18 (9)	06:35	05:52	05:32	05:43	06:13	06:46		07:19		06:57	07:30
	16:58	17:38	18:13	18 07:36 (9)	19:48	20:21	20:47	20:49	20:18	19:27		18:34		16:52	16:37
13	07:39	07:11	06:27	07:21 (9)	06:34	05:51	05:32	05:44	06:14	06:47		07:20		06:58	07:31
	17:00	17:39	18:14	14 07:35 (9)	19:49	20:22	20:48	20:48	20:17	19:25		18:33		16:51	16:37
14	07:38	07:10	06:25	07:21 (9)	06:32	05:50	05:32	05:45	06:15	06:48		07:21		06:59	07:32
	17:01	17:40	18:15	10 07:31 (9)	19:50	20:23	20:48	20:48	20:16	19:23		18:31		16:50	16:38
15	07:38	07:08	06:24		06:30	05:49	05:32	05:46	06:16	06:49		07:22		07:01	07:33
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16	07:37	07:07	06:22		06:29	05:48	05:32	05:47	06:17	06:50		07:24		07:02	07:33
	17:03	17:43	18:17		19:53	20:25	20:49	20:46	20:13	19:20		18:28		16:48	16:38
17	07:37	07:05	06:20		06:27	05:47	05:32	05:47	06:18	06:51		07:25		07:03	07:34
	17:04	17:44	18:18		19:54	20:26	20:50	20:46	20:11	19:18		18:26		16:47	16:38
18	07:36	07:04	06:18		06:26	05:46	05:32	05:48	06:20	06:53		07:26		07:04	07:35
	17:05	17:45	18:20		19:55	20:27	20:50	20:45	20:10	19:16		18:25		16:46	16:39
19	07:36	07:03	06:17		06:24	05:45	05:33	05:49	06:21	06:54		07:27		07:06	07:35
	17:07	17:47	18:21		19:56	20:28	20:50	20:44	20:08	19:14		18:23		16:45	16:39
20	07:35	07:01	06:15		06:23	05:44	05:33	05:50	06:22	06:55		07:28		07:07	07:36
	17:08	17:48	18:22		19:57	20:29	20:51	20:44	20:07	19:13		18:22		16:44	16:39
21	07:35	07:00	06:13		06:21	05:44	05:33	05:51	06:23	06:56		07:30		07:08	07:36
	17:09	17:49	18:23		19:58	20:30	20:51	20:43	20:05	19:11		18:20		16:44	16:40
22	07:34	06:58	06:12		06:19	05:43	05:33	05:52	06:24	06:57		07:31		07:09	07:37
	17:10	17:51	18:24		19:59	20:31	20:51	20:42	20:04	19:09		18:18		16:43	16:40
23	07:33	06:57	06:10		06:18	05:42	05:33	05:53	06:25	06:58		07:32		07:10	07:37
	17:12	17:52	18:25		20:00	20:32	20:51	20:41	20:02	19:07		18:17		16:42	16:41
24	07:32	06:55	06:08		06:16	05:41	05:34	05:54	06:26	06:59		07:33		07:12	07:38
	17:13	17:53	18:26		20:00	20:33	20:52	20:40	20:01	19:05		18:15		16:42	16:42
25	07:32	06:53	06:06		06:15	05:40	05:34	05:55	06:27	07:00		06:34		07:13	07:38
	17:14	17:54	18:28		20:02	20:34	20:52	20:39	19:57	19:04		17:14		16:41	16:42
26	07:31	06:52	06:05		06:13	05:40	05:34	05:56	06:28	07:01		06:36		07:14	07:39
	17:15	17:56	18:29		20:03	20:35	20:52	20:38	19:56	19:02		17:13		16:41	16:43
27	07:30	06:50	06:03		06:12	05:39	05:35	05:57	06:29	07:02		06:37		07:15	07:39
	17:17	17:57	18:30		20:04	20:36	20:52	20:37	19:54	19:00		17:11		16:40	16:43
28	07:29	06:49	06:01		06:10	05:38	05:35	05:58	06:30	07:03		06:38		07:16	07:39
	17:18	17:58	18:31		20:05	20:36	20:52	20:36	19:52	18:58		17:10		16:40	16:44
29	07:28		05:59		06:09	05:38	05:35	05:59	06:31	07:04	08:03 (9)	06:39		07:17	07:40
	17:19		18:32		20:06	20:37	20:52	20:35	19:51	18:57	8 08:11 (9)	17:08		16:39	16:45
30	07:27		05:58		06:08	05:37	05:36	06:00	06:32	07:06	08:00 (9)	06:41		07:19	07:40
	17:21		18:33		20:07	20:38	20:52	20:34	19:49	18:55	14 08:14 (9)	17:07		16:39	16:46
31	07:26		05:56			05:36		06:01	06:33			06:42			07:40
	17:22		18:34			20:39		20:33	19:47			17:06			16:46
Potential sun hours	293	295	370		209	-292	-263	-280	-145	375		343		294	283
Total, worst case				208							22		186		
Sun reduction				0.45							0.55		0.45		
Oper. time red.				0.86							0.86		0.86		
Wind dir. red.				0.60							0.60		0.60		
Total reduction				0.23							0.28		0.23		
Total, real				48							6		43		

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	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, Mid Western part
9 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
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Window properties: 1m2 horizontal, 1m above ground
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.

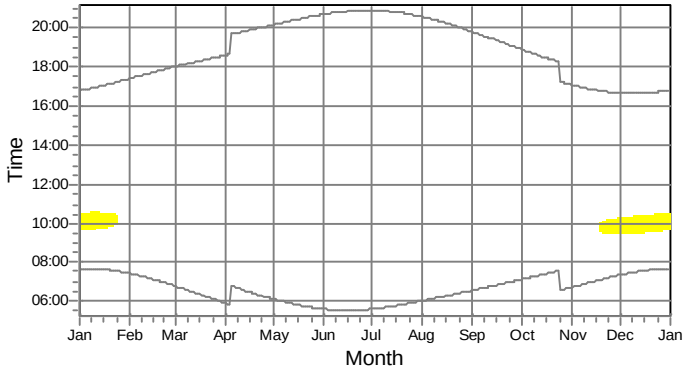
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03/05/06 23:05 / 27
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7660 Whitegate Avenue
US-RIVERSIDE, CA 92506

Calculated:
03/01/06 23:22/2.4.0.67

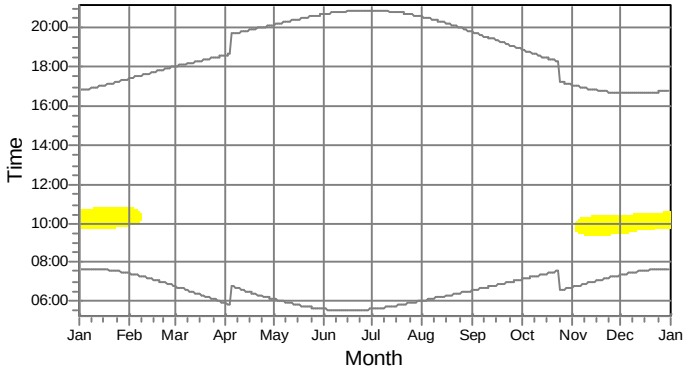
SHADOW - Calendar, graphical

Calculation: Mid Western part

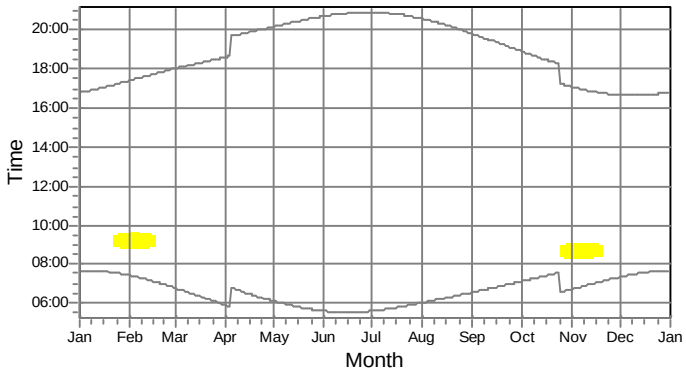
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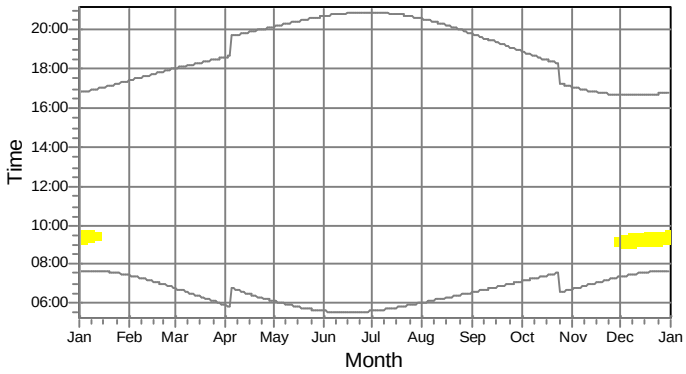
746: 746



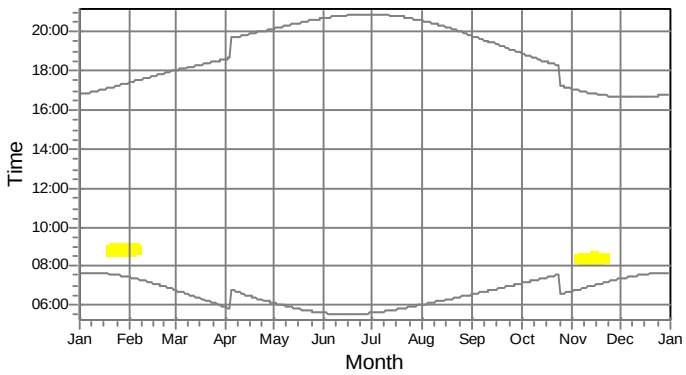
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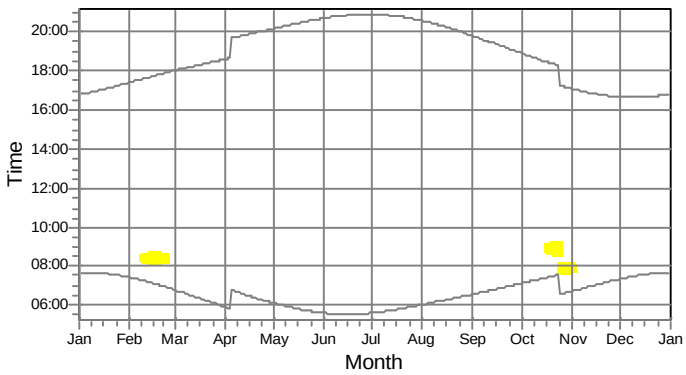
748: 748



749: 749



750: 750



WTGs

26

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, Mid Western part
9 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
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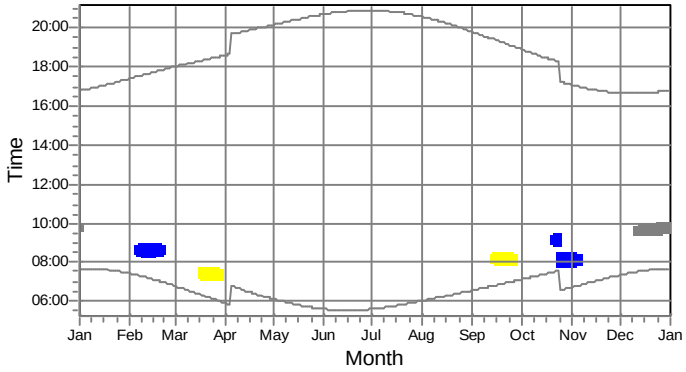
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US-RIVERSIDE, CA 92506

Calculated:
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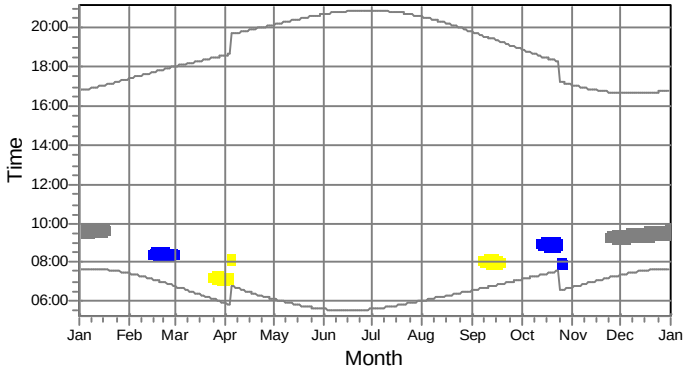
SHADOW - Calendar, graphical

Calculation: Mid Western part

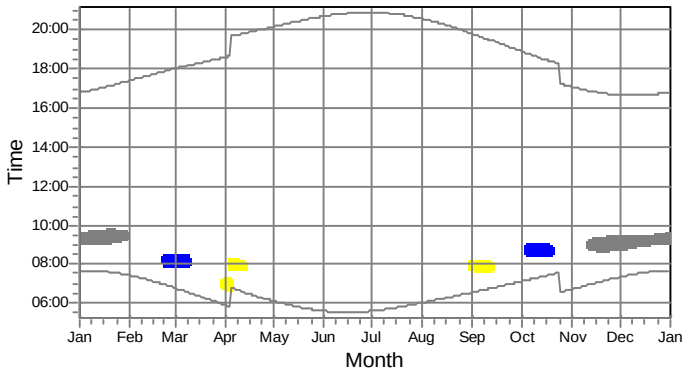
751: 751



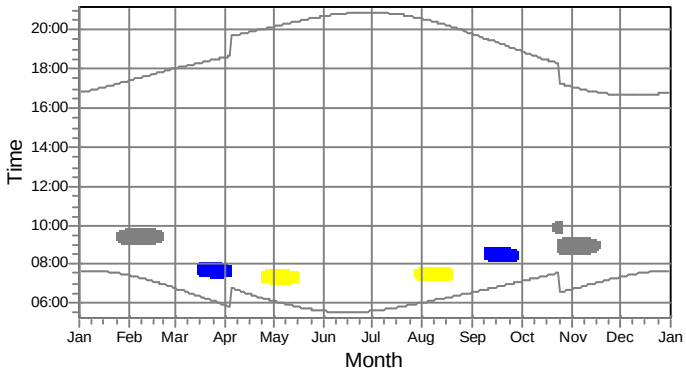
752: 752



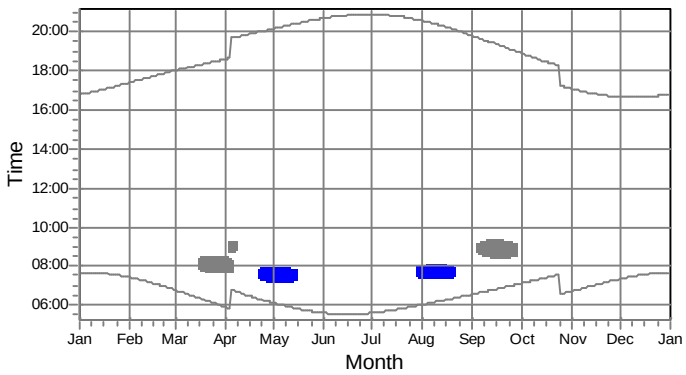
753: 753



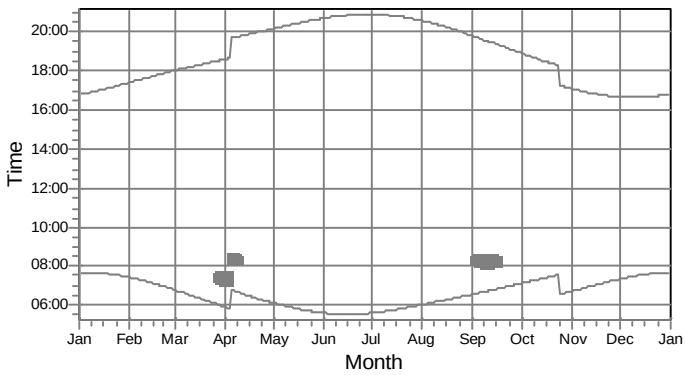
754: 754



755: 755



756: 756



WTGs

26 27 28

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, Mid Western part
9 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
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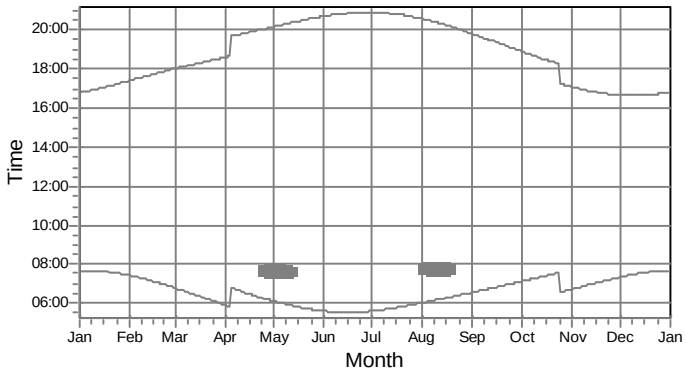
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US-RIVERSIDE, CA 92506

Calculated:
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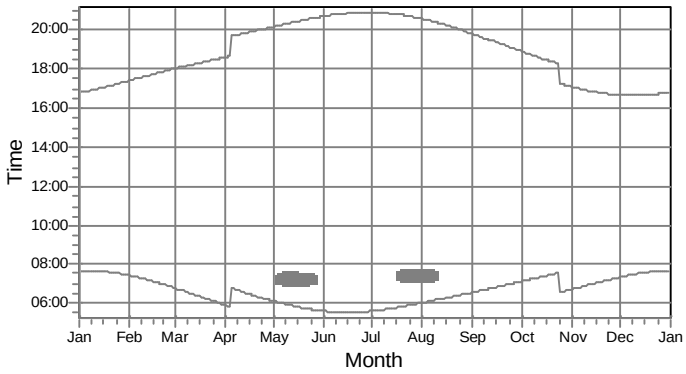
SHADOW - Calendar, graphical

Calculation: Mid Western part

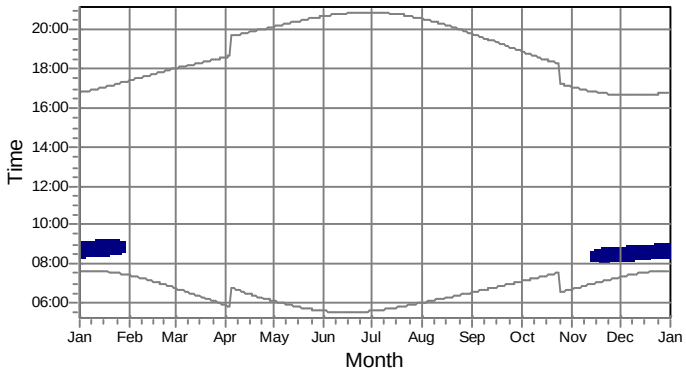
757: 757



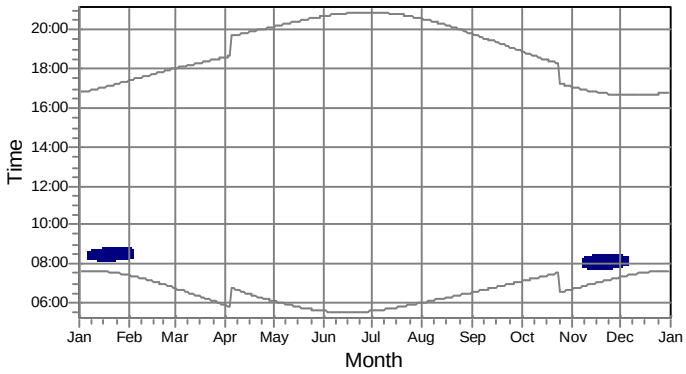
758: 758



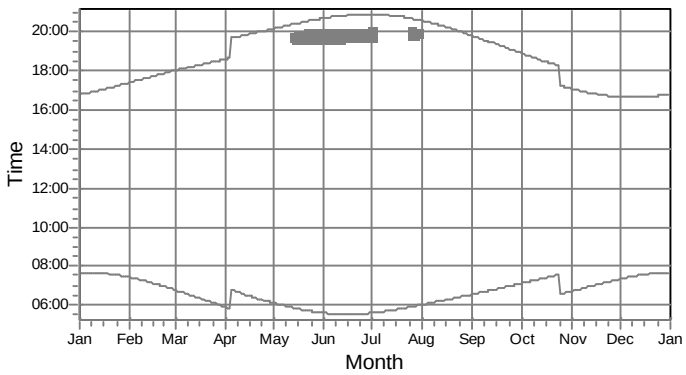
826: 826



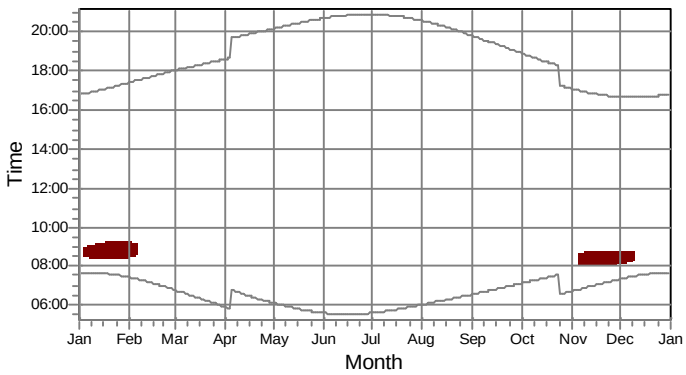
827: 827



828: 828



829: 829



WTGs

28 30 29

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, Mid Western part
9 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
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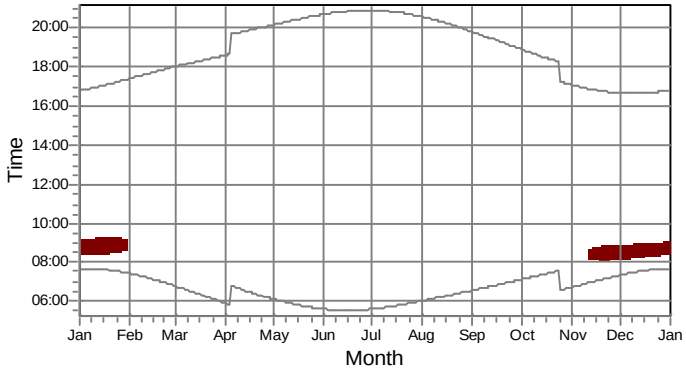
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US-RIVERSIDE, CA 92506

Calculated:
03/01/06 23:22/2.4.0.67

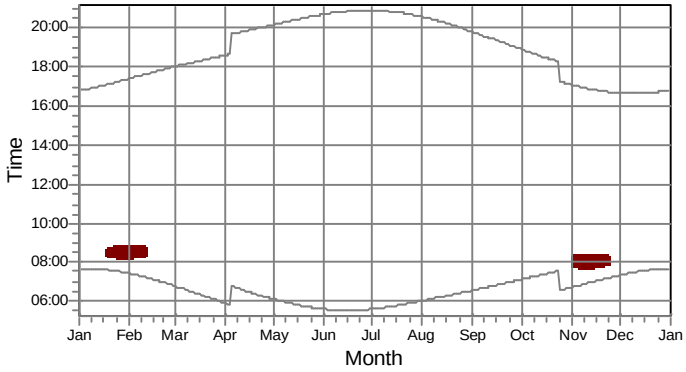
SHADOW - Calendar, graphical

Calculation: Mid Western part

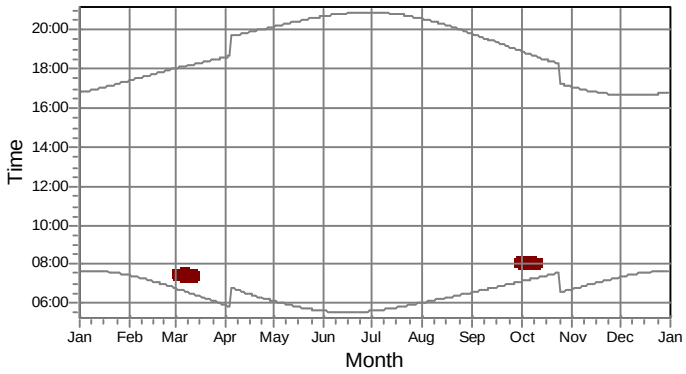
830: 830



831: 831



832: 832



WTGs

29

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, Mid Western part
9 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
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Directional run-hours applied from tab file (tower 1)
.

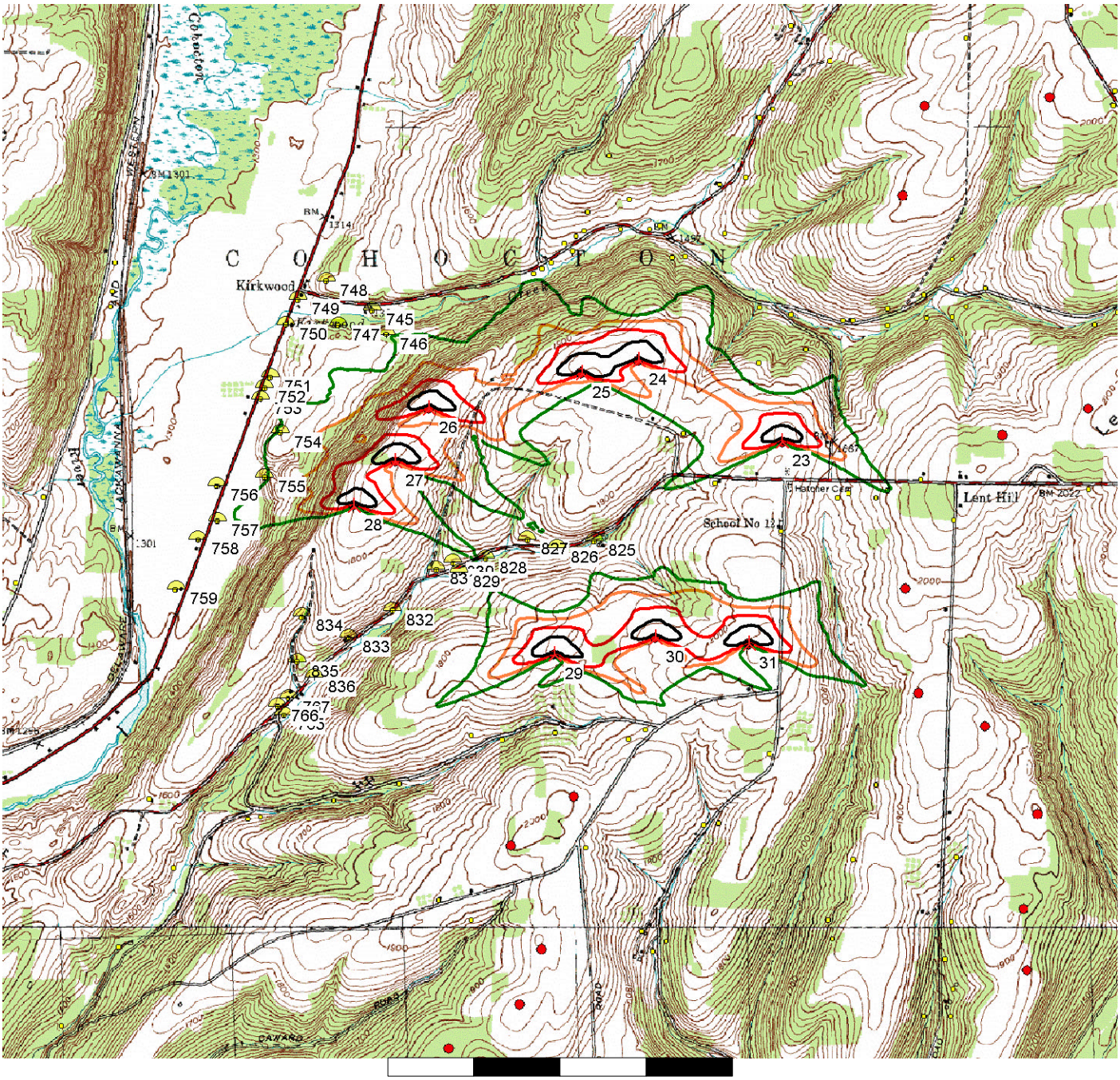
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Calculated:
03/01/06 23:22/2.4.0.67

SHADOW - 060226 Cohocton USGS z13 w, 50k, 30x30

Calculation: Mid Western part **File:** 060226 Cohocton USGS z13 w, 50k, 30x30.bmi



Map: 060226 Cohocton USGS z13 w, 50k, 30x30 , Print scale 1:35,000, Map center UTM NAD27 Zone: 18 East: 299,067 North: 4,710,354

New WTG Shadow receptor

Isolines showing shadow in Shadow hours|per year. Real value calculation.

10 25 50 100

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, North part
16 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
1000 meter max shadow distance applied along with default 3° inclination
Sunshine probabilities applied (pdf plots)
Directional run-hours applied from tab file (tower 1)
.

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03/06/06 12:29 / 1
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US-RIVERSIDE, CA 92506

Calculated:
03/02/06 05:47/2.4.0.67

SHADOW - Main Result

Calculation: North part

Assumptions for shadow calculations

Maximum distance for influence	1,000	m
Minimum sun height over horizon for influence	3	°
Day step for calculation	1	days
Time step for calculation	2	minutes

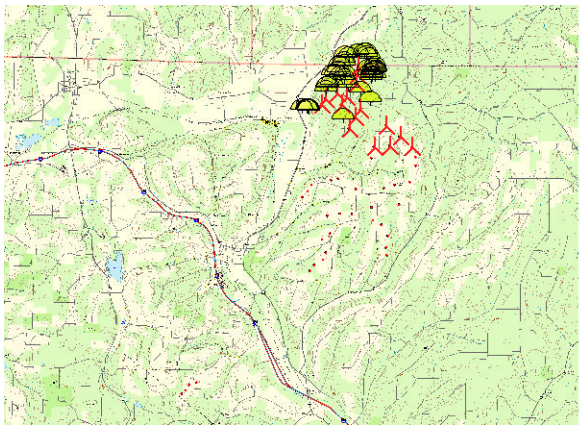
Sun shine probabilities (part of time from sun rise to sun set with sun shine)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.35	0.45	0.45	0.55	0.55	0.55	0.65	0.55	0.55	0.45	0.35	0.30

Operational hours are calculated from WTGs in calculation and wind distribution:
'Cohocton-1 80m LT projection'

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
475	585	238	199	220	474	1,184	813	840	1,246	803	479	7,555



Scale 1:350,000
New WTG Shadow receptor

WTGs

	UTM NAD27 Zone: 18					WTG type						
	East	North	Z [m]	Row data/Description	Valid	Manufact.	Type	Power [kW]	Diam. [m]	Height [m]	RPM [RPM]
01	300,550	4,716,386	580	01	Yes	GAMESA	G87/2000	2,000	87.0	78.0	16.7
02	300,470	4,716,031	580	02	Yes	GAMESA	G87/2000	2,000	87.0	78.0	16.7
03	300,446	4,715,621	580	03	Yes	GAMESA	G87/2000	2,000	87.0	78.0	16.7
04	299,551	4,715,218	600	04	Yes	GAMESA	G87/2000	2,000	87.0	78.0	16.7
05	298,976	4,714,941	591	05	Yes	GAMESA	G87/2000	2,000	87.0	78.0	16.7
06	298,790	4,714,710	580	06	Yes	GAMESA	G87/2000	2,000	87.0	78.0	16.7
07	299,958	4,715,025	613	07	Yes	GAMESA	G87/2000	2,000	87.0	78.0	16.7
08	299,718	4,714,674	600	08	Yes	GAMESA	G87/2000	2,000	87.0	78.0	16.7
09	300,562	4,714,399	615	09	Yes	GAMESA	G87/2000	2,000	87.0	78.0	16.7
10	300,358	4,714,050	606	10	Yes	GAMESA	G87/2000	2,000	87.0	78.0	16.7
11	300,047	4,713,553	598	11	Yes	GAMESA	G87/2000	2,000	87.0	78.0	16.7
12	301,753	4,713,638	600	12	Yes	GAMESA	G87/2000	2,000	87.0	78.0	16.7
13	301,182	4,712,667	620	13	Yes	GAMESA	G87/2000	2,000	87.0	78.0	16.7
15	302,394	4,713,102	600	15	Yes	GAMESA	G87/2000	2,000	87.0	78.0	16.7
16	301,911	4,712,694	600	16	Yes	GAMESA	G87/2000	2,000	87.0	78.0	16.7
17	302,937	4,712,598	620	17	Yes	GAMESA	G87/2000	2,000	87.0	78.0	16.7

Shadow receptor-Input

		UTM NAD27 Zone: 18							
No.	Name	East	North	Z [m]	Width [m]	Height [m]	Height a.g.l. [m]	Degrees from south cw [°]	Slope of window [°]
643	643	299,925	4,716,879	414	1.0	1.0	1.0	0.0	0.0
644	644	300,106	4,716,840	422	1.0	1.0	1.0	0.0	0.0
645	645	300,515	4,716,929	420	1.0	1.0	1.0	0.0	0.0
646	646	300,832	4,716,977	415	1.0	1.0	1.0	0.0	0.0
647	647	300,904	4,716,980	408	1.0	1.0	1.0	0.0	0.0
648	648	300,906	4,716,865	420	1.0	1.0	1.0	0.0	0.0
649	649	301,046	4,716,751	430	1.0	1.0	1.0	0.0	0.0
650	650	299,879	4,716,627	473	1.0	1.0	1.0	0.0	0.0
651	651	299,865	4,716,470	486	1.0	1.0	1.0	0.0	0.0
652	652	299,673	4,716,457	444	1.0	1.0	1.0	0.0	0.0
653	653	299,603	4,716,192	475	1.0	1.0	1.0	0.0	0.0
654	654	299,900	4,716,000	520	1.0	1.0	1.0	0.0	0.0
655	655	299,690	4,715,963	513	1.0	1.0	1.0	0.0	0.0
656	656	299,463	4,716,055	500	1.0	1.0	1.0	0.0	0.0

Continued on next page...

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, North part
16 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
1000 meter max shadow distance applied along with default 3° inclination
Sunshine probabilities applied (pdf plots)
Directional run-hours applied from tab file (tower 1)
.

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SHADOW - Main Result

Calculation: North part

...continued from previous page

UTM NAD27 Zone: 18

No.	Name	East	North	Z	Width	Height	Height a.g.l.	Degrees from south cw	Slope of window
				[m]	[m]	[m]	[m]	[°]	[°]
657	657	299,348	4,716,049	486	1.0	1.0	1.0	0.0	0.0
658	658	299,868	4,715,817	545	1.0	1.0	1.0	0.0	0.0
659	659	300,988	4,716,216	511	1.0	1.0	1.0	0.0	0.0
660	660	301,305	4,716,343	454	1.0	1.0	1.0	0.0	0.0
661	661	301,240	4,716,250	467	1.0	1.0	1.0	0.0	0.0
662	662	301,227	4,716,145	473	1.0	1.0	1.0	0.0	0.0
663	663	301,282	4,716,134	464	1.0	1.0	1.0	0.0	0.0
664	664	301,309	4,716,150	459	1.0	1.0	1.0	0.0	0.0
665	665	301,345	4,716,170	455	1.0	1.0	1.0	0.0	0.0
666	666	301,160	4,716,045	484	1.0	1.0	1.0	0.0	0.0
667	667	301,046	4,716,017	503	1.0	1.0	1.0	0.0	0.0
668	668	301,144	4,715,907	487	1.0	1.0	1.0	0.0	0.0
669	669	301,138	4,715,871	483	1.0	1.0	1.0	0.0	0.0
670	670	301,293	4,715,864	468	1.0	1.0	1.0	0.0	0.0
671	671	301,092	4,715,770	497	1.0	1.0	1.0	0.0	0.0
672	672	299,926	4,715,601	590	1.0	1.0	1.0	0.0	0.0
673	673	300,025	4,715,457	604	1.0	1.0	1.0	0.0	0.0
674	674	300,614	4,715,225	542	1.0	1.0	1.0	0.0	0.0
675	675	299,287	4,715,605	580	1.0	1.0	1.0	0.0	0.0
676	676	299,094	4,715,534	568	1.0	1.0	1.0	0.0	0.0
677	677	299,026	4,715,498	563	1.0	1.0	1.0	0.0	0.0
678	678	299,002	4,715,322	589	1.0	1.0	1.0	0.0	0.0
679	679	301,025	4,714,753	600	1.0	1.0	1.0	0.0	0.0
680	680	297,853	4,714,511	416	1.0	1.0	1.0	0.0	0.0
681	681	298,088	4,714,500	419	1.0	1.0	1.0	0.0	0.0
682	682	298,121	4,714,499	420	1.0	1.0	1.0	0.0	0.0
683	683	298,188	4,714,497	422	1.0	1.0	1.0	0.0	0.0
684	684	298,181	4,714,435	420	1.0	1.0	1.0	0.0	0.0
685	685	299,759	4,714,012	600	1.0	1.0	1.0	0.0	0.0

Calculation Results

		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]
643	643	11:10	35	0:26	2:39
644	644	17:32	45	0:30	3:58
645	645	32:30	60	0:38	5:56
646	646	27:10	60	0:32	5:04
647	647	30:36	70	0:30	5:48
648	648	25:14	60	0:34	5:17
649	649	30:30	86	0:32	6:40
650	650	34:20	112	0:28	7:02
651	651	27:58	78	0:28	7:04
652	652	17:00	59	0:22	4:31
653	653	18:44	67	0:22	5:10
654	654	42:04	101	0:34	10:56
655	655	22:46	69	0:26	6:04
656	656	0:00	0	0:00	0:00
657	657	0:00	0	0:00	0:00
658	658	56:34	122	0:34	16:10
659	659	59:18	136	0:40	15:38
660	660	20:46	67	0:26	5:34
661	661	29:02	85	0:28	7:59
662	662	50:58	138	0:30	14:10
663	663	47:24	135	0:28	13:26
664	664	36:42	113	0:26	10:49
665	665	25:38	82	0:26	7:22

Continued on next page...

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, North part
16 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
1000 meter max shadow distance applied along with default 3° inclination
Sunshine probabilities applied (pdf plots)
Directional run-hours applied from tab file (tower 1)
.

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SHADOW - Main Result

Calculation: North part

...continued from previous page

No.	Name	Shadow, worst case: Shadow hours per year [h/year]	Shadow, worst case: Shadow days per year [days/year]	Shadow, worst case: Max shadow hours per day [h/day]	Shadow, expected values: Shadow hours per year [h/year]
666	666	25:36	74	0:28	6:45
667	667	37:34	92	0:34	9:44
668	668	30:30	84	0:30	8:14
669	669	34:26	94	0:30	9:30
670	670	20:58	70	0:24	5:33
671	671	37:46	94	0:30	10:47
672	672	53:30	107	0:40	12:26
673	673	93:04	160	0:48	26:11
674	674	13:44	37	0:30	3:14
675	675	45:54	64	1:00	8:01
676	676	27:48	59	0:38	6:03
677	677	20:44	48	0:34	4:58
678	678	31:58	83	0:36	7:12
679	679	45:16	88	0:38	8:27
680	680	13:06	48	0:22	3:59
681	681	11:36	38	0:22	3:24
682	682	3:10	19	0:12	0:53
683	683	0:00	0	0:00	0:00
684	684	0:00	0	0:00	0:00
685	685	37:48	98	0:34	11:20

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, North part
16 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
1000 meter max shadow distance applied along with default 3° inclination
Sunshine probabilities applied (pdf plots)
Directional run-hours applied from tab file (tower 1)
.

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SHADOW - Calendar

Calculation: North part **Shadow receptor:** 643 - 643

Assumptions for shadow calculations

Maximum distance for influence	1,000	m
Minimum sun height over horizon for influence	3	°
Day step for calculation	1	days
Time step for calculation	2	minutes

Sun shine probabilities (part of time from sun rise to sun set with sun shine)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.35	0.45	0.45	0.55	0.55	0.55	0.65	0.55	0.55	0.45	0.35	0.30

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
475	585	238	199	220	474	1,184	813	840	1,246	803	479	7,555

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:40	07:25	06:47	05:54	06:06	05:36	05:36	06:01	06:34	07:07	06:43	07:20
	16:47	17:23	17:59	18:36	20:08	20:40	20:52	20:32	19:46	18:53	17:04 20 08:35 (13)	16:38
2	07:40	07:24	06:46	05:52	06:05	05:35	05:37	06:02	06:35	07:08	06:44	07:21
	16:48	17:24	18:00	18:37	20:10	20:41	20:52	20:31	19:44	18:51	17:03 18 08:34 (13)	16:38
3	07:40	07:23	06:44	05:51	06:03	05:35	05:37	06:03	06:36	07:09	06:46	07:22
	16:49	17:26	18:02	18:38	20:11	20:42	20:52	20:30	19:42	18:49	17:02 16 08:34 (13)	16:38
4	07:40	07:22	06:42	05:49	06:02	05:34	05:38	06:04	06:38	07:10	06:47	07:23
	16:50	17:27	18:03	18:39	20:12	20:42	20:51	20:29	19:41	18:48	17:00 14 08:33 (13)	16:37
5	07:40	07:21	06:41	06:47	06:01	05:34	05:38	06:06	06:39	07:11	06:48	07:24
	16:51	17:28	18:04	19:40	20:13	20:43	20:51	20:28	19:39	18:46	16:59 8 08:30 (13)	16:37
6	07:40	07:20 08:50 (13)	06:39	06:45	05:59	05:34	05:39	06:07	06:40	07:12	06:49	07:25
	16:52	17:30 10 09:00 (13)	18:05	19:41	20:14	20:44	20:51	20:26	19:37	18:44	16:58	16:37
7	07:40	07:19 08:49 (13)	06:37	06:44	05:58	05:33	05:39	06:08	06:41	07:13	06:51	07:26
	16:53	17:31 14 09:03 (13)	18:06	19:42	20:15	20:44	20:51	20:25	19:35	18:43	16:57	16:37
8	07:40	07:17 08:48 (13)	06:36	06:42	05:57	05:33	05:40	06:09	06:42	07:14	06:52	07:27
	16:54	17:32 16 09:04 (13)	18:08	19:43	20:16	20:45	20:50	20:24	19:34	18:41	16:56	16:37
9	07:40	07:16 08:47 (13)	06:34	06:40	05:56	05:33	05:41	06:10	06:43	07:16	06:53	07:28
	16:55	17:34 20 09:07 (13)	18:09	19:45	20:17	20:46	20:50	20:23	19:32	18:39	16:54	16:37
10	07:40	07:15 08:45 (13)	06:32	06:39	05:55	05:32	05:42	06:11	06:44	07:17	06:54	07:29
	16:56	17:35 22 09:07 (13)	18:10	19:46	20:18	20:46	20:50	20:21	19:30	18:38	16:53	16:37
11	07:39	07:14 08:44 (13)	06:30	06:37	05:53	05:32	05:42	06:12	06:45	07:18	06:56	07:30
	16:57	17:36 24 09:08 (13)	18:11	19:47	20:20	20:47	20:49	20:20	19:28	18:36	16:52	16:37
12	07:39	07:12 08:45 (13)	06:29	06:35	05:52	05:32	05:43	06:13	06:46	07:19	06:57	07:30
	16:58	17:38 24 09:09 (13)	18:12	19:48	20:21	20:47	20:49	20:19	19:27	18:34	16:51	16:37
13	07:39	07:11 08:43 (13)	06:27	06:34	05:51	05:32	05:44	06:14	06:47	07:20	06:58	07:31
	16:59	17:39 24 09:07 (13)	18:14	19:49	20:22	20:48	20:48	20:17	19:25	18:33	16:50	16:37
14	07:38	07:10 08:44 (13)	06:25	06:32	05:50	05:32	05:45	06:15	06:48	07:21	06:59	07:32
	17:00	17:40 24 09:08 (13)	18:15	19:50	20:23	20:48	20:48	20:16	19:23	18:31	16:49	16:37
15	07:38	07:08 08:42 (13)	06:24	06:30	05:49	05:32	05:45	06:16	06:49	07:22	07:01	07:33
	17:02	17:41 26 09:08 (13)	18:16	19:51	20:24	20:49	20:47	20:14	19:21	18:29	16:48	16:38
16	07:37	07:07 08:43 (13)	06:22	06:29	05:48	05:32	05:46	06:17	06:50	07:24	07:02	07:33
	17:03	17:43 24 09:07 (13)	18:17	19:53	20:25	20:49	20:46	20:13	19:20	18:28	16:48	16:38
17	07:37	07:05 08:44 (13)	06:20	06:27	05:47	05:32	05:47	06:18	06:51	07:25	07:03	07:34
	17:04	17:44 24 09:08 (13)	18:18	19:54	20:26	20:50	20:46	20:11	19:18	18:26	16:47	16:38
18	07:36	07:04 08:44 (13)	06:18	06:25	05:46	05:32	05:48	06:19	06:52	07:26	07:04	07:35
	17:05	17:45 22 09:06 (13)	18:19	19:55	20:27	20:50	20:45	20:10	19:16	18:24	16:46	16:38
19	07:36	07:03 08:45 (13)	06:17	06:24	05:45	05:32	05:49	06:20	06:54	07:27 09:24 (13)	07:06	07:35
	17:06	17:47 20 09:05 (13)	18:21	19:56	20:28	20:50	20:44	20:08	19:14	18:23 4 09:28 (13)	16:45	16:39
20	07:35	07:01 08:45 (13)	06:15	06:22	05:44	05:32	05:50	06:21	06:55	07:28 09:19 (13)	07:07	07:36
	17:08	17:48 18 09:03 (13)	18:22	19:57	20:29	20:51	20:44	20:07	19:12	18:21 12 09:31 (13)	16:44	16:39
21	07:35	07:00 08:48 (13)	06:13	06:21	05:43	05:33	05:51	06:23	06:56	07:30 09:17 (13)	07:08	07:37
	17:09	17:49 14 09:02 (13)	18:23	19:58	20:30	20:51	20:43	20:05	19:11	18:20 16 09:33 (13)	16:44	16:40
22	07:34	06:58 08:50 (13)	06:11	06:19	05:42	05:33	05:52	06:24	06:57	07:31 09:16 (13)	07:09	07:37
	17:10	17:50 10 09:00 (13)	18:24	19:59	20:31	20:51	20:42	20:04	19:09	18:18 18 09:34 (13)	16:43	16:40
23	07:33	06:57 06:10	06:18	05:42	05:33	05:52	06:25	06:58	07:32	09:15 (13)	07:11	07:38
	17:11	17:52 18:25	20:01	20:32	20:52	20:41	20:02	19:07	18:17 20	09:35 (13)	16:42	16:41
24	07:32	06:55 06:08	06:16	05:41	05:33	05:53	06:26	06:59	07:33	09:14 (13)	07:12	07:38
	17:13	17:53 18:26	20:01	20:33	20:52	20:40	20:01	19:05	18:15 22	09:36 (13)	16:42	16:41
25	07:32	06:53 06:06	06:15	05:40	05:34	05:54	06:27	07:00	06:34	08:14 (13)	07:13	07:38
	17:14	17:54 18:28	20:02	20:34	20:52	20:39	19:57	19:04	17:14 24	08:38 (13)	16:41	16:42
26	07:31	06:52 06:04	06:13	05:39	05:34	05:55	06:28	07:01	06:36	08:13 (13)	07:14	07:39
	17:15	17:55 18:29	20:03	20:35	20:52	20:39	19:56	19:02	17:12 24	08:37 (13)	16:40	16:42
27	07:30	06:50 06:03	06:12	05:39	05:34	05:56	06:29	07:02	06:37	08:12 (13)	07:15	07:39
	17:16	17:57 18:30	20:04	20:36	20:52	20:38	19:54	19:00	17:11 26	08:38 (13)	16:40	16:43
28	07:29	06:49 06:01	06:10	05:38	05:35	05:57	06:30	07:03	06:38	08:14 (13)	07:16	07:39
	17:18	17:58 18:31	20:05	20:37	20:52	20:37	19:52	18:58	17:10 24	08:38 (13)	16:39	16:44
29	07:28	05:59	06:09	05:37	05:35	05:58	06:31	07:04	06:39	08:13 (13)	07:18	07:40
	17:19	18:32	20:06	20:37	20:52	20:36	19:51	18:56	17:08 24	08:37 (13)	16:39	16:45
30	07:27	05:57	06:07	05:37	05:36	05:59	06:32	07:05	06:41	08:14 (13)	07:19	07:40
	17:20	18:33	20:07	20:38	20:52	20:35	19:49	18:55	17:07 22	08:36 (13)	16:39	16:45
31	07:26	05:56		05:36		06:00	06:33		06:42	08:14 (13)		07:40
	17:22	18:34		20:39		20:33	19:47		17:05 22	08:36 (13)		16:46
Potential sun hours	293	295	370	209	-292	-263	-280	-145	375	343	294	283
Total, worst case		336								258	76	
Sun reduction		0.45								0.45	0.35	
Oper. time red.		0.86								0.86	0.86	
Wind dir. red.		0.63								0.63	0.63	
Total reduction		0.24								0.24	0.19	
Total, real		82								63	14	

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	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, North part
16 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
1000 meter max shadow distance applied along with default 3° inclination
Sunshine probabilities applied (pdf plots)
Directional run-hours applied from tab file (tower 1)
.

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03/02/06 05:47/2.4.0.67

SHADOW - Calendar

Calculation: North part **Shadow receptor:** 644 - 644

Assumptions for shadow calculations

Maximum distance for influence	1,000	m
Minimum sun height over horizon for influence	3	°
Day step for calculation	1	days
Time step for calculation	2	minutes

Sun shine probabilities (part of time from sun rise to sun set with sun shine)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.35	0.45	0.45	0.55	0.55	0.55	0.65	0.55	0.55	0.45	0.35	0.30

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
475	585	238	199	220	474	1,184	813	840	1,246	803	479	7,555

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:40	07:25 09:18 (13)	06:47	05:54	06:06	05:36	05:36	06:01	06:34	07:07	06:43 08:41 (13)	07:20
	16:47	17:23 18 09:36 (13)	17:59	18:35	20:08	20:40	20:52	20:32	19:46	18:53	17:04 30 09:11 (13)	16:38
2	07:40	07:24 09:17 (13)	06:45	05:52	06:05	05:35	05:37	06:02	06:35	07:08	06:44 08:42 (13)	07:21
	16:48	17:24 20 09:37 (13)	18:00	18:37	20:10	20:41	20:52	20:31	19:44	18:51	17:03 30 09:12 (13)	16:38
3	07:40	07:23 09:16 (13)	06:44	05:50	06:03	05:35	05:37	06:03	06:36	07:09	06:46 08:42 (13)	07:22
	16:49	17:26 22 09:38 (13)	18:02	18:38	20:11	20:42	20:52	20:30	19:42	18:49	17:02 30 09:12 (13)	16:38
4	07:40	07:22 09:15 (13)	06:42	05:49	06:02	05:34	05:38	06:04	06:38	07:10	06:47 08:43 (13)	07:23
	16:50	17:27 24 09:39 (13)	18:03	18:39	20:12	20:42	20:51	20:29	19:41	18:48	17:00 28 09:11 (13)	16:37
5	07:40	07:21 09:14 (13)	06:41	06:47	06:01	05:34	05:38	06:06	06:39	07:11	06:48 08:42 (13)	07:24
	16:51	17:28 26 09:40 (13)	18:04	19:40	20:13	20:43	20:51	20:28	19:39	18:46	16:59 28 09:10 (13)	16:37
6	07:40	07:20 09:12 (13)	06:39	06:45	05:59	05:34	05:39	06:07	06:40	07:12	06:49 08:44 (13)	07:25
	16:52	17:30 28 09:40 (13)	18:05	19:41	20:14	20:44	20:51	20:26	19:37	18:44	16:58 26 09:10 (13)	16:37
7	07:40	07:19 09:13 (13)	06:37	06:44	05:58	05:33	05:39	06:08	06:41	07:13	06:51 08:45 (13)	07:26
	16:53	17:31 28 09:41 (13)	18:06	19:42	20:15	20:44	20:51	20:25	19:35	18:43	16:57 24 09:09 (13)	16:37
8	07:40	07:17 09:12 (13)	06:36	06:42	05:57	05:33	05:40	06:09	06:42	07:14	06:52 08:46 (13)	07:27
	16:54	17:32 30 09:42 (13)	18:08	19:43	20:16	20:45	20:50	20:24	19:34	18:41	16:56 22 09:08 (13)	16:37
9	07:40	07:16 09:13 (13)	06:34	06:40	05:56	05:33	05:41	06:10	06:43	07:16	06:53 08:48 (13)	07:28
	16:55	17:34 30 09:43 (13)	18:09	19:45	20:17	20:46	20:50	20:23	19:32	18:39	16:54 20 09:08 (13)	16:37
10	07:40	07:15 09:11 (13)	06:32	06:39	05:55	05:32	05:42	06:11	06:44	07:17	06:54 08:49 (13)	07:29
	16:56	17:35 30 09:41 (13)	18:10	19:46	20:18	20:46	20:50	20:21	19:30	18:38	16:53 18 09:07 (13)	16:37
11	07:39	07:14 09:12 (13)	06:30	06:37	05:53	05:32	05:42	06:12	06:45	07:18	06:56 08:51 (13)	07:30
	16:57	17:36 30 09:42 (13)	18:11	19:47	20:20	20:47	20:49	20:20	19:28	18:36	16:52 14 09:05 (13)	16:37
12	07:39	07:12 09:13 (13)	06:29	06:35	05:52	05:32	05:43	06:13	06:46	07:19	06:57 08:54 (13)	07:30
	16:58	17:37 30 09:43 (13)	18:12	19:48	20:21	20:47	20:49	20:19	19:27	18:34	16:51 8 09:02 (13)	16:37
13	07:39	07:11 09:13 (13)	06:27	06:34	05:51	05:32	05:44	06:14	06:47	07:20	06:58	07:31
	16:59	17:39 28 09:41 (13)	18:14	19:49	20:22	20:48	20:48	20:17	19:25	18:33	16:50	16:37
14	07:38	07:10 09:12 (13)	06:25	06:32	05:50	05:32	05:45	06:15	06:48	07:21	06:59	07:32
	17:00	17:40 30 09:42 (13)	18:15	19:50	20:23	20:48	20:48	20:16	19:23	18:31	16:49	16:37
15	07:38	07:08 09:12 (13)	06:24	06:30	05:49	05:32	05:45	06:16	06:49	07:22	07:01	07:33
	17:02	17:41 28 09:40 (13)	18:16	19:51	20:24	20:49	20:47	20:14	19:21	18:29	16:48	16:38
16	07:37	07:07 09:13 (13)	06:22	06:29	05:48	05:32	05:46	06:17	06:50	07:24	07:02	07:33
	17:03	17:43 26 09:39 (13)	18:17	19:53	20:25	20:49	20:46	20:13	19:20	18:28	16:48	16:38
17	07:37	07:05 09:16 (13)	06:20	06:27	05:47	05:32	05:47	06:18	06:51	07:25	07:03	07:34
	17:04	17:44 22 09:38 (13)	18:18	19:54	20:26	20:50	20:46	20:11	19:18	18:26	16:47	16:38
18	07:36	07:04 09:16 (13)	06:18	06:25	05:46	05:32	05:48	06:19	06:52	07:26	07:04	07:35
	17:05	17:45 20 09:36 (13)	18:19	19:55	20:27	20:50	20:45	20:10	19:16	18:24	16:46	16:38
19	07:36	07:03 09:17 (13)	06:17	06:24	05:45	05:32	05:49	06:20	06:54	07:27	07:06	07:35
	17:06	17:47 18 09:35 (13)	18:21	19:56	20:28	20:50	20:44	20:08	19:14	18:23	16:45	16:39
20	07:35	07:01 09:19 (13)	06:15	06:22	05:44	05:32	05:50	06:21	06:55	07:28	07:07	07:36
	17:08	17:48 12 09:31 (13)	18:22	19:57	20:29	20:51	20:44	20:07	19:12	18:21	16:44	16:39
21	07:35	07:00	06:13	06:21	05:43	05:33	05:51	06:23	06:56	07:30 09:55 (13)	07:08	07:37
	17:09	17:49	18:23	19:58	20:30	20:51	20:43	20:05	19:11	18:20 4 09:59 (13)	16:44	16:40
22	07:34	06:58	06:11	06:19	05:42	05:33	05:52	06:24	06:57	07:31 09:50 (13)	07:09	07:37
	17:10	17:50	18:24	19:59	20:31	20:51	20:42	20:04	19:09	18:18 12 10:02 (13)	16:43	16:40
23	07:33	06:57	06:10	06:18	05:42	05:33	05:52	06:25	06:58	07:32 09:47 (13)	07:11	07:38
	17:11	17:52	18:25	20:01	20:32	20:51	20:41	20:02	19:07	18:17 18 10:05 (13)	16:42	16:41
24	07:32	06:55	06:08	06:16	05:41	05:33	05:53	06:26	06:59	07:33 09:44 (13)	07:12	07:38
	17:13	17:53	18:26	20:01	20:33	20:52	20:40	20:01	19:05	18:15 22 10:06 (13)	16:42	16:41
25	07:32	06:53	06:06	06:15	05:40	05:34	05:54	06:27	07:00	06:34 08:44 (13)	07:13	07:38
	17:14	17:54	18:27	20:02	20:34	20:52	20:39	19:57	19:04	17:14 24 09:08 (13)	16:41	16:42
26	07:31	06:52	06:04	06:13	05:39	05:34	05:55	06:28	07:01	06:36 08:43 (13)	07:14	07:39
	17:15	17:55	18:29	20:03	20:35	20:52	20:39	19:56	19:02	17:12 26 09:09 (13)	16:40	16:42
27	07:30	06:50	06:03	06:12	05:39	05:34	05:56	06:29	07:02	06:37 08:42 (13)	07:15	07:39
	17:16	17:57	18:30	20:04	20:36	20:52	20:38	19:54	19:00	17:11 28 09:10 (13)	16:40	16:43
28	07:29	06:49	06:01	06:10	05:38	05:35	05:57	06:30	07:03	06:38 08:42 (13)	07:16	07:39
	17:18	17:58	18:31	20:05	20:37	20:52	20:37	19:52	18:58	17:10 28 09:10 (13)	16:39	16:44
29	07:28		05:59	06:09	05:37	05:35	05:58	06:31	07:04	06:39 08:41 (13)	07:18	07:40
	17:19		18:32	20:06	20:37	20:52	20:36	19:51	18:56	17:08 30 09:11 (13)	16:39	16:45
30	07:27 09:22 (13)		05:57	06:07	05:37	05:36	05:59	06:32	07:05	06:41 08:42 (13)	07:19	07:40
	17:20 8 09:30 (13)		18:33	20:07	20:38	20:52	20:34	19:49	18:55	17:07 30 09:12 (13)	16:39	16:45
31	07:26 09:19 (13)		05:56		05:36		06:00	06:33		06:42 08:42 (13)		07:40
	17:22 14 09:33 (13)		18:34		20:39		20:33	19:47		17:05 30 09:12 (13)		16:46
Potential sun hours	293	295	370	209	-292	-263	-280	-145	375	343	294	283
Total, worst case	22	500								252	278	
Sun reduction	0.35	0.45								0.45	0.35	
Oper. time red.	0.86	0.86								0.86	0.86	
Wind dir. red.	0.62	0.62								0.62	0.62	
Total reduction	0.19	0.24								0.24	0.19	
Total, real	4	121								61	52	

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	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, North part
16 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
1000 meter max shadow distance applied along with default 3° inclination
Sunshine probabilities applied (pdf plots)
Directional run-hours applied from tab file (tower 1)
.

Printed/Page
03/05/06 23:47 / 6
Licensed user:
Wind Engineers, Inc.
7660 Whitegate Avenue
US-RIVERSIDE, CA 92506

Calculated:
03/02/06 05:47/2.4.0.67

SHADOW - Calendar

Calculation: North part **Shadow receptor:** 645 - 645

Assumptions for shadow calculations

Maximum distance for influence	1,000	m
Minimum sun height over horizon for influence	3	°
Day step for calculation	1	days
Time step for calculation	2	minutes

Sun shine probabilities (part of time from sun rise to sun set with sun shine)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.35	0.45	0.45	0.55	0.55	0.55	0.65	0.55	0.55	0.45	0.35	0.30

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
475	585	238	199	220	474	1,184	813	840	1,246	803	479	7,555

	January		February	March	April	May	June	July	August	September	October	November		December	
1	07:40	11:34 (13)	07:25	06:47	05:54	06:06	05:36	05:36	06:01	06:34	07:07	06:43		07:20	11:22 (13)
	16:47	36 12:10 (13)	17:23	17:59	18:35	20:08	20:40	20:52	20:32	19:46	18:53	17:04		16:38	32 11:54 (13)
2	07:40	11:34 (13)	07:24	06:45	05:52	06:05	05:35	05:36	06:02	06:35	07:08	06:44		07:21	11:21 (13)
	16:48	36 12:10 (13)	17:24	18:00	18:37	20:10	20:41	20:52	20:31	19:44	18:51	17:03		16:38	34 11:55 (13)
3	07:40	11:34 (13)	07:23	06:44	05:50	06:03	05:35	05:37	06:03	06:36	07:09	06:46		07:22	11:20 (13)
	16:49	36 12:10 (13)	17:26	18:02	18:38	20:11	20:42	20:52	20:30	19:42	18:49	17:02		16:38	34 11:54 (13)
4	07:40	11:33 (13)	07:22	06:42	05:49	06:02	05:34	05:38	06:04	06:38	07:10	06:47		07:23	11:21 (13)
	16:50	36 12:09 (13)	17:27	18:03	18:39	20:12	20:42	20:51	20:29	19:41	18:48	17:00		16:37	34 11:55 (13)
5	07:40	11:35 (13)	07:21	06:41	06:47	06:01	05:34	05:38	06:05	06:39	07:11	06:48		07:24	11:22 (13)
	16:51	36 12:11 (13)	17:28	18:04	19:40	20:13	20:43	20:51	20:28	19:39	18:46	16:59		16:37	34 11:56 (13)
6	07:40	11:35 (13)	07:20	06:39	06:45	05:59	05:34	05:39	06:07	06:40	07:12	06:49		07:25	11:21 (13)
	16:52	36 12:11 (13)	17:30	18:05	19:41	20:14	20:44	20:51	20:26	19:37	18:44	16:58		16:37	36 11:57 (13)
7	07:40	11:35 (13)	07:18	06:37	06:44	05:58	05:33	05:39	06:08	06:41	07:13	06:51		07:26	11:22 (13)
	16:53	36 12:11 (13)	17:31	18:06	19:42	20:15	20:44	20:51	20:25	19:35	18:43	16:57		16:37	36 11:58 (13)
8	07:40	11:37 (13)	07:17	06:36	06:42	05:57	05:33	05:40	06:09	06:42	07:14	06:52		07:27	11:21 (13)
	16:54	34 12:11 (13)	17:32	18:08	19:43	20:16	20:45	20:50	20:24	19:34	18:41	16:56		16:37	36 11:57 (13)
9	07:40	11:37 (13)	07:16	06:34	06:40	05:56	05:33	05:41	06:10	06:43	07:16	06:53		07:28	11:22 (13)
	16:55	34 12:11 (13)	17:34	18:09	19:45	20:17	20:46	20:50	20:23	19:32	18:39	16:54		16:37	36 11:58 (13)
10	07:40	11:38 (13)	07:15	06:32	06:39	05:55	05:32	05:42	06:11	06:44	07:17	06:54		07:29	11:23 (13)
	16:56	32 12:10 (13)	17:35	18:10	19:46	20:18	20:46	20:50	20:21	19:30	18:37	16:53		16:37	36 11:59 (13)
11	07:39	11:38 (13)	07:14	06:30	06:37	05:53	05:32	05:42	06:12	06:45	07:18	06:56		07:29	11:24 (13)
	16:57	34 12:12 (13)	17:36	18:11	19:47	20:20	20:47	20:49	20:20	19:28	18:36	16:52		16:37	36 12:00 (13)
12	07:39	11:39 (13)	07:12	06:29	06:35	05:52	05:32	05:43	06:13	06:46	07:19	06:57		07:30	11:23 (13)
	16:58	32 12:11 (13)	17:37	18:12	19:48	20:21	20:47	20:49	20:18	19:27	18:34	16:51		16:37	38 12:01 (13)
13	07:39	11:41 (13)	07:11	06:27	06:34	05:51	05:32	05:44	06:14	06:47	07:20	06:58		07:31	11:24 (13)
	16:59	30 12:11 (13)	17:39	18:14	19:49	20:22	20:48	20:48	20:17	19:25	18:33	16:50		16:37	36 12:00 (13)
14	07:38	11:43 (13)	07:10	06:25	06:32	05:50	05:32	05:45	06:15	06:48	07:21	06:59		07:32	11:24 (13)
	17:00	28 12:11 (13)	17:40	18:15	19:50	20:23	20:48	20:48	20:16	19:23	18:31	16:49		16:37	36 12:00 (13)
15	07:38	11:42 (13)	07:08	06:24	06:30	05:49	05:32	05:45	06:16	06:49	07:22	07:01		07:33	11:25 (13)
	17:02	28 12:10 (13)	17:41	18:16	19:51	20:24	20:49	20:47	20:14	19:21	18:29	16:48		16:37	36 12:01 (13)
16	07:37	11:44 (13)	07:07	06:22	06:29	05:48	05:32	05:46	06:17	06:50	07:24	07:02		07:33	11:26 (13)
	17:03	26 12:10 (13)	17:43	18:17	19:53	20:25	20:49	20:46	20:13	19:20	18:28	16:47		16:38	36 12:02 (13)
17	07:37	11:45 (13)	07:05	06:20	06:27	05:47	05:32	05:47	06:18	06:51	07:25	07:03		07:34	11:26 (13)
	17:04	24 12:09 (13)	17:44	18:18	19:54	20:26	20:50	20:46	20:11	19:18	18:26	16:47		16:38	36 12:02 (13)
18	07:36	11:46 (13)	07:04	06:18	06:25	05:46	05:32	05:48	06:19	06:52	07:26	07:04		07:35	11:25 (13)
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19	07:36	11:50 (13)	07:02	06:17	06:24	05:45	05:32	05:49	06:20	06:53	07:27	07:06		07:35	11:26 (13)
	17:06	16 12:06 (13)	17:47	18:21	19:56	20:28	20:50	20:44	20:08	19:14	18:23	16:45		16:39	38 12:04 (13)
20	07:35	11:51 (13)	07:01	06:15	06:22	05:44	05:32	05:50	06:21	06:55	07:28	07:07		07:36	11:26 (13)
	17:08	14 12:05 (13)	17:48	18:22	19:57	20:29	20:51	20:44	20:07	19:12	18:21	16:44		16:39	38 12:04 (13)
21	07:35		07:00	06:13	06:21	05:43	05:32	05:51	06:23	06:56	07:30	07:08		07:37	11:27 (13)
	17:09		17:49	18:23	19:58	20:30	20:51	20:43	20:05	19:11	18:20	16:43		16:40	38 12:05 (13)
22	07:34		06:58	06:11	06:19	05:42	05:33	05:52	06:24	06:57	07:31	07:09	11:27 (13)	07:37	11:27 (13)
	17:10		17:50	18:24	19:59	20:31	20:51	20:42	20:04	19:09	18:18	16:43	12 11:39 (13)	16:40	38 12:05 (13)
23	07:33		06:57	06:10	06:18	05:42	05:33	05:52	06:25	06:58	07:32	07:11	11:26 (13)	07:38	11:28 (13)
	17:11		17:52	18:25	20:00	20:32	20:51	20:41	20:02	19:07	18:17	16:42	16 11:42 (13)	16:41	38 12:06 (13)
24	07:32		06:55	06:08	06:16	05:41	05:33	05:53	06:26	06:59	07:33	07:12	11:24 (13)	07:38	11:28 (13)
	17:13		17:53	18:26	20:00	20:33	20:52	20:40	20:01	19:05	18:15	16:42	22 11:46 (13)	16:41	38 12:06 (13)
25	07:32		06:53	06:06	06:15	05:40	05:33	05:54	06:27	07:00	06:34	07:13	11:23 (13)	07:38	11:28 (13)
	17:14		17:54	18:27	20:02	20:34	20:52	20:39	19:57	19:04	17:14	16:41	24 11:47 (13)	16:42	38 12:06 (13)
26	07:31		06:52	06:04	06:13	05:39	05:34	05:55	06:28	07:01	06:36	07:14	11:22 (13)	07:39	11:29 (13)
	17:15		17:55	18:29	20:03	20:35	20:52	20:38	19:56	19:02	17:12	16:40	26 11:48 (13)	16:42	38 12:07 (13)
27	07:30		06:50	06:03	06:12	05:39	05:34	05:56	06:29	07:02	06:37	07:15	11:21 (13)	07:39	11:31 (13)
	17:16		17:57	18:30	20:04	20:36	20:52	20:38	19:54	19:00	17:11	16:40	28 11:49 (13)	16:43	36 12:07 (13)
28	07:29		06:49	06:01	06:10	05:38	05:35	05:57	06:30	07:03	06:38	07:16	11:22 (13)	07:39	11:31 (13)
	17:18		17:58	18:31	20:05	20:37	20:52	20:37	19:52	18:58	17:10	16:39	28 11:50 (13)	16:44	36 12:07 (13)
29	07:28			05:59	06:09	05:37	05:35	05:58	06:31	07:04	06:39	07:18	11:22 (13)	07:40	11:31 (13)
	17:19			18:32	20:06	20:37	20:52	20:36	19:51	18:56	17:08	16:39	30 11:52 (13)	16:45	36 12:07 (13)
30	07:27			05:57	06:07	05:37	05:35	05:59	06:32	07:05	06:41	07:19	11:21 (13)	07:40	11:32 (13)
	17:20			18:33	20:07	20:38	20:52	20:34	19:49	18:55	17:07	16:39	32 11:53 (13)	16:45	36 12:08 (13)
31	07:26			05:56		05:36		06:00	06:33		06:42			07:40	11:32 (13)
	17:22			18:34		20:39		20:33	19:47		17:05			16:46	38 12:10 (13)
Potential sun hours	293		295	370	209	-292	-263	-280	-145	375	343	294		283	
Total, worst case		606											218		1126
Sun reduction		0.35											0.35		0.30
Oper. time red.		0.86											0.86		0.86
Wind dir. red.		0.66											0.66		0.66
Total reduction		0.20											0.20		0.17
Total, real		121											43		192

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	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, North part
16 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
1000 meter max shadow distance applied along with default 3° inclination
Sunshine probabilities applied (pdf plots)
Directional run-hours applied from tab file (tower 1)
.

Printed/Page
03/05/06 23:47 / 7
Licensed user:
Wind Engineers, Inc.
7660 Whitegate Avenue
US-RIVERSIDE, CA 92506

Calculated:
03/02/06 05:47/2.4.0.67

SHADOW - Calendar

Calculation: North part **Shadow receptor:** 646 - 646

Assumptions for shadow calculations

Maximum distance for influence	1,000	m
Minimum sun height over horizon for influence	3	°
Day step for calculation	1	days
Time step for calculation	2	minutes

Sun shine probabilities (part of time from sun rise to sun set with sun shine)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.35	0.45	0.45	0.55	0.55	0.55	0.65	0.55	0.55	0.45	0.35	0.30

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
475	585	238	199	220	474	1,184	813	840	1,246	803	479	7,555

	January		February	March	April	May	June	July	August	September	October	November		December	
1	07:40	13:34 (13)	07:25	06:47	05:54	06:06	05:36	05:36	06:01	06:34	07:07	06:43		07:20	13:24 (13)
	16:47 32	14:06 (13)	17:23	17:59	18:35	20:08	20:40	20:52	20:32	19:46	18:53	17:04		16:38 26	13:50 (13)
2	07:40	13:36 (13)	07:24	06:45	05:52	06:05	05:35	05:36	06:02	06:35	07:08	06:44		07:21	13:23 (13)
	16:48 30	14:06 (13)	17:24	18:00	18:37	20:10	20:41	20:52	20:31	19:44	18:51	17:03		16:38 28	13:51 (13)
3	07:40	13:36 (13)	07:23	06:44	05:50	06:03	05:35	05:37	06:03	06:36	07:09	06:46		07:22	13:22 (13)
	16:49 30	14:06 (13)	17:26	18:02	18:38	20:11	20:41	20:52	20:30	19:42	18:49	17:02		16:38 30	13:52 (13)
4	07:40	13:35 (13)	07:22	06:42	05:49	06:02	05:34	05:38	06:04	06:37	07:10	06:47		07:23	13:23 (13)
	16:50 32	14:07 (13)	17:27	18:03	18:39	20:12	20:42	20:51	20:29	19:41	18:48	17:00		16:37 30	13:53 (13)
5	07:40	13:37 (13)	07:21	06:41	06:47	06:01	05:34	05:38	06:05	06:39	07:11	06:48		07:24	13:24 (13)
	16:51 30	14:07 (13)	17:28	18:04	19:40	20:13	20:43	20:51	20:28	19:39	18:46	16:59		16:37 28	13:52 (13)
6	07:40	13:37 (13)	07:20	06:39	06:45	05:59	05:33	05:39	06:07	06:40	07:12	06:49		07:25	13:23 (13)
	16:52 30	14:07 (13)	17:30	18:05	19:41	20:14	20:44	20:51	20:26	19:37	18:44	16:58		16:37 30	13:53 (13)
7	07:40	13:37 (13)	07:18	06:37	06:44	05:58	05:33	05:39	06:08	06:41	07:13	06:51		07:26	13:24 (13)
	16:53 30	14:07 (13)	17:31	18:06	19:42	20:15	20:44	20:51	20:25	19:35	18:43	16:57		16:37 30	13:54 (13)
8	07:40	13:39 (13)	07:17	06:36	06:42	05:57	05:33	05:40	06:09	06:42	07:14	06:52		07:27	13:23 (13)
	16:54 30	14:09 (13)	17:32	18:08	19:43	20:16	20:45	20:50	20:24	19:34	18:41	16:56		16:37 32	13:55 (13)
9	07:40	13:39 (13)	07:16	06:34	06:40	05:56	05:33	05:41	06:10	06:43	07:16	06:53		07:28	13:24 (13)
	16:55 30	14:09 (13)	17:34	18:09	19:45	20:17	20:46	20:50	20:23	19:32	18:39	16:54		16:37 30	13:54 (13)
10	07:40	13:40 (13)	07:15	06:32	06:39	05:55	05:32	05:42	06:11	06:44	07:17	06:54		07:29	13:25 (13)
	16:56 28	14:08 (13)	17:35	18:10	19:46	20:18	20:46	20:50	20:21	19:30	18:37	16:53		16:37 30	13:55 (13)
11	07:39	13:42 (13)	07:14	06:30	06:37	05:53	05:32	05:42	06:12	06:45	07:18	06:56		07:29	13:26 (13)
	16:57 26	14:08 (13)	17:36	18:11	19:47	20:19	20:47	20:49	20:20	19:28	18:36	16:52		16:37 30	13:56 (13)
12	07:39	13:41 (13)	07:12	06:29	06:35	05:52	05:32	05:43	06:13	06:46	07:19	06:57		07:30	13:25 (13)
	16:58 26	14:07 (13)	17:37	18:12	19:48	20:21	20:47	20:49	20:18	19:27	18:34	16:51		16:37 32	13:57 (13)
13	07:39	13:43 (13)	07:11	06:27	06:34	05:51	05:32	05:44	06:14	06:47	07:20	06:58		07:31	13:26 (13)
	16:59 26	14:09 (13)	17:39	18:14	19:49	20:22	20:48	20:48	20:17	19:25	18:32	16:50		16:37 32	13:58 (13)
14	07:38	13:45 (13)	07:10	06:25	06:32	05:50	05:32	05:45	06:15	06:48	07:21	06:59		07:32	13:26 (13)
	17:00 24	14:09 (13)	17:40	18:15	19:50	20:23	20:48	20:48	20:16	19:23	18:31	16:49		16:37 32	13:58 (13)
15	07:38	13:44 (13)	07:08	06:24	06:30	05:49	05:32	05:45	06:16	06:49	07:22	07:01		07:33	13:27 (13)
	17:02 24	14:08 (13)	17:41	18:16	19:51	20:24	20:49	20:47	20:14	19:21	18:29	16:48		16:37 30	13:57 (13)
16	07:37	13:45 (13)	07:07	06:22	06:29	05:48	05:32	05:46	06:17	06:50	07:24	07:02		07:33	13:28 (13)
	17:03 22	14:07 (13)	17:43	18:17	19:53	20:25	20:49	20:46	20:13	19:20	18:28	16:47		16:38 30	13:58 (13)
17	07:37	13:47 (13)	07:05	06:20	06:27	05:47	05:32	05:47	06:18	06:51	07:25	07:03		07:34	13:26 (13)
	17:04 20	14:07 (13)	17:44	18:18	19:54	20:26	20:50	20:46	20:11	19:18	18:26	16:47		16:38 32	13:58 (13)
18	07:36	13:50 (13)	07:04	06:18	06:25	05:46	05:32	05:48	06:19	06:52	07:26	07:04		07:35	13:27 (13)
	17:05 16	14:06 (13)	17:45	18:19	19:55	20:27	20:50	20:45	20:10	19:16	18:24	16:46		16:38 32	13:59 (13)
19	07:36	13:52 (13)	07:02	06:17	06:24	05:45	05:32	05:49	06:20	06:53	07:27	07:06		07:35	13:28 (13)
	17:06 12	14:04 (13)	17:47	18:21	19:56	20:28	20:50	20:44	20:08	19:14	18:23	16:45		16:39 32	14:00 (13)
20	07:35	13:55 (13)	07:01	06:15	06:22	05:44	05:32	05:50	06:21	06:55	07:28	07:07		07:36	13:28 (13)
	17:08 6	14:01 (13)	17:48	18:22	19:57	20:29	20:51	20:44	20:07	19:12	18:21	16:44		16:39 32	14:00 (13)
21	07:35		07:00	06:13	06:21	05:43	05:32	05:51	06:23	06:56	07:30	07:08		07:37	13:29 (13)
	17:09		17:49	18:23	19:58	20:30	20:51	20:43	20:05	19:11	18:20	16:43		16:40 32	14:01 (13)
22	07:34		06:58	06:11	06:19	05:42	05:33	05:52	06:24	06:57	07:31	07:09	13:33 (13)	07:37	13:29 (13)
	17:10		17:50	18:24	19:59	20:31	20:51	20:42	20:04	19:09	18:18	16:43 4	13:37 (13)	16:40 32	14:01 (13)
23	07:33		06:56	06:10	06:18	05:42	05:33	05:52	06:25	06:58	07:32	07:11	13:28 (13)	07:38	13:30 (13)
	17:11		17:52	18:25	20:00	20:32	20:51	20:41	20:02	19:07	18:17	16:42 12	13:40 (13)	16:41 32	14:02 (13)
24	07:32		06:55	06:08	06:16	05:41	05:33	05:53	06:26	06:59	07:33	07:12	13:28 (13)	07:38	13:30 (13)
	17:13		17:53	18:26	20:00	20:33	20:52	20:40	20:01	19:05	18:15	16:41 16	13:44 (13)	16:41 32	14:02 (13)
25	07:32		06:53	06:06	06:15	05:40	05:33	05:54	06:27	07:00	06:34	07:13	13:25 (13)	07:38	13:30 (13)
	17:14		17:54	18:27	20:02	20:34	20:52	20:39	19:57	19:04	17:14	16:41 20	13:45 (13)	16:42 32	14:02 (13)
26	07:31		06:52	06:04	06:13	05:39	05:34	05:55	06:28	07:01	06:36	07:14	13:24 (13)	07:39	13:31 (13)
	17:15		17:55	18:29	20:03	20:35	20:52	20:38	19:56	19:02	17:12	16:40 22	13:46 (13)	16:42 32	14:03 (13)
27	07:30		06:50	06:03	06:12	05:39	05:34	05:56	06:29	07:02	06:37	07:15	13:25 (13)	07:39	13:33 (13)
	17:16		17:57	18:30	20:04	20:36	20:52	20:38	19:54	19:00	17:11	16:40 22	13:47 (13)	16:43 30	14:03 (13)
28	07:29		06:49	06:01	06:10	05:38	05:35	05:57	06:30	07:03	06:38	07:16	13:24 (13)	07:39	13:33 (13)
	17:18		17:58	18:31	20:05	20:37	20:52	20:37	19:52	18:58	17:10	16:39 24	13:48 (13)	16:44 30	14:03 (13)
29	07:28			05:59	06:09	05:37	05:35	05:58	06:31	07:04	06:39	07:17	13:24 (13)	07:40	13:33 (13)
	17:19			18:32	20:06	20:37	20:52	20:36	19:51	18:56	17:08	16:39 26	13:50 (13)	16:45 30	14:03 (13)
30	07:27			05:57	06:07	05:37	05:35	05:59	06:32	07:05	06:41	07:19	13:23 (13)	07:40	13:34 (13)
	17:20			18:33	20:07	20:38	20:52	20:34	19:49	18:55	17:07	16:39 26	13:49 (13)	16:45 32	14:06 (13)
31	07:26			05:56		05:36		06:00	06:33		06:42			07:40	13:34 (13)
	17:22			18:34		20:39		20:33	19:47		17:05			16:46 32	14:06 (13)
Potential sun hours	293		295	370	209	-292	-263	-280	-145	375	343	294		283	
Total, worst case		504											172		954
Sun reduction		0.35											0.35		0.30
Oper. time red.		0.86											0.86		0.86
Wind dir. red.		0.67											0.67		0.67
Total reduction		0.20											0.20		0.17
Total, real		103											35		166

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	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, North part
16 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
1000 meter max shadow distance applied along with default 3° inclination
Sunshine probabilities applied (pdf plots)
Directional run-hours applied from tab file (tower 1)
.

Licensed user:
Wind Engineers, Inc.
7660 Whitegate Avenue
US-RIVERSIDE, CA 92506

Calculated:
03/02/06 05:47/2.4.0.67

SHADOW - Calendar

Calculation: North part **Shadow receptor:** 647 - 647

Assumptions for shadow calculations

Maximum distance for influence	1,000	m
Minimum sun height over horizon for influence	3	°
Day step for calculation	1	days
Time step for calculation	2	minutes

Sun shine probabilities (part of time from sun rise to sun set with sun shine)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.35	0.45	0.45	0.55	0.55	0.55	0.65	0.55	0.55	0.45	0.35	0.30

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
475	585	238	199	220	474	1,184	813	840	1,246	803	479	7,555

	January		February	March	April	May	June	July	August	September	October	November		December	
1	07:40	13:56 (13)	07:25	06:47	05:54	06:06	05:36	05:36	06:01	06:34	07:07	06:43		07:20	13:42 (13)
	16:47	30 14:26 (13)	17:23	17:59	18:35	20:08	20:40	20:52	20:32	19:46	18:53	17:04		16:38	30 14:12 (13)
2	07:40	13:58 (13)	07:24	06:45	05:52	06:05	05:35	05:36	06:02	06:35	07:08	06:44		07:21	13:43 (13)
	16:48	28 14:26 (13)	17:24	18:00	18:37	20:10	20:41	20:52	20:31	19:44	18:51	17:03		16:38	30 14:13 (13)
3	07:40	13:58 (13)	07:23	06:44	05:50	06:03	05:35	05:37	06:03	06:36	07:09	06:46		07:22	13:44 (13)
	16:49	28 14:26 (13)	17:26	18:02	18:38	20:11	20:41	20:52	20:30	19:42	18:49	17:02		16:38	28 14:12 (13)
4	07:40	13:57 (13)	07:22	06:42	05:49	06:02	05:34	05:38	06:04	06:37	07:10	06:47		07:23	13:43 (13)
	16:50	30 14:27 (13)	17:27	18:03	18:39	20:12	20:42	20:51	20:29	19:41	18:48	17:00		16:37	30 14:13 (13)
5	07:40	13:57 (13)	07:21	06:41	06:47	06:01	05:34	05:38	06:05	06:39	07:11	06:48		07:24	13:44 (13)
	16:51	30 14:27 (13)	17:28	18:04	19:40	20:13	20:43	20:51	20:28	19:39	18:46	16:59		16:37	30 14:14 (13)
6	07:40	13:59 (13)	07:20	06:39	06:45	05:59	05:33	05:39	06:07	06:40	07:12	06:49		07:25	13:45 (13)
	16:52	28 14:27 (13)	17:30	18:05	19:41	20:14	20:44	20:51	20:26	19:37	18:44	16:58		16:37	28 14:13 (13)
7	07:40	13:59 (13)	07:18	06:37	06:44	05:58	05:33	05:39	06:08	06:41	07:13	06:51		07:26	13:44 (13)
	16:53	30 14:29 (13)	17:31	18:06	19:42	20:15	20:44	20:51	20:25	19:35	18:43	16:57		16:37	30 14:14 (13)
8	07:40	13:59 (13)	07:17	06:36	06:42	05:57	05:33	05:40	06:09	06:42	07:14	06:52		07:27	13:45 (13)
	16:54	30 14:29 (13)	17:32	18:08	19:43	20:16	20:45	20:50	20:24	19:34	18:41	16:56		16:37	30 14:15 (13)
9	07:40	14:01 (13)	07:16	06:34	06:40	05:56	05:33	05:41	06:10	06:43	07:16	06:53		07:28	13:46 (13)
	16:55	28 14:29 (13)	17:34	18:09	19:45	20:17	20:46	20:50	20:23	19:32	18:39	16:54		16:37	28 14:14 (13)
10	07:40	14:00 (13)	07:15	06:32	06:39	05:54	05:32	05:42	06:11	06:44	07:17	06:54		07:29	13:47 (13)
	16:56	30 14:30 (13)	17:35	18:10	19:46	20:18	20:46	20:50	20:21	19:30	18:37	16:53		16:37	28 14:15 (13)
11	07:39	14:00 (13)	07:14	06:30	06:37	05:53	05:32	05:42	06:12	06:45	07:18	06:56		07:29	13:46 (13)
	16:57	30 14:30 (13)	17:36	18:11	19:47	20:19	20:47	20:49	20:20	19:28	18:36	16:52		16:37	30 14:16 (13)
12	07:39	14:01 (13)	07:12	06:29	06:35	05:52	05:32	05:43	06:13	06:46	07:19	06:57		07:30	13:47 (13)
	16:58	28 14:29 (13)	17:37	18:12	19:48	20:21	20:47	20:49	20:18	19:27	18:34	16:51		16:37	28 14:15 (13)
13	07:39	14:01 (13)	07:11	06:27	06:34	05:51	05:32	05:44	06:14	06:47	07:20	06:58		07:31	13:48 (13)
	16:59	30 14:31 (13)	17:39	18:14	19:49	20:22	20:48	20:48	20:17	19:25	18:32	16:50		16:37	28 14:16 (13)
14	07:38	14:03 (13)	07:10	06:25	06:32	05:50	05:32	05:45	06:15	06:48	07:21	06:59		07:32	13:48 (13)
	17:00	28 14:31 (13)	17:40	18:15	19:50	20:23	20:48	20:48	20:16	19:23	18:31	16:49		16:37	28 14:16 (13)
15	07:38	14:02 (13)	07:08	06:24	06:30	05:49	05:32	05:45	06:16	06:49	07:22	07:01		07:33	13:49 (13)
	17:02	28 14:30 (13)	17:41	18:16	19:51	20:24	20:49	20:47	20:14	19:21	18:29	16:48		16:37	28 14:17 (13)
16	07:37	14:03 (13)	07:07	06:22	06:29	05:48	05:32	05:46	06:17	06:50	07:24	07:02		07:33	13:50 (13)
	17:03	28 14:31 (13)	17:43	18:17	19:53	20:25	20:49	20:46	20:13	19:20	18:28	16:47		16:38	28 14:18 (13)
17	07:37	14:05 (13)	07:05	06:20	06:27	05:47	05:32	05:47	06:18	06:51	07:25	07:03	13:51 (13)	07:34	13:50 (13)
	17:04	26 14:31 (13)	17:44	18:18	19:54	20:26	20:50	20:46	20:11	19:18	18:26	16:47	8 13:59 (13)	16:38	26 14:16 (13)
18	07:36	14:04 (13)	07:04	06:18	06:25	05:46	05:32	05:48	06:19	06:52	07:26	07:04	13:48 (13)	07:35	13:51 (13)
	17:05	26 14:30 (13)	17:45	18:19	19:55	20:27	20:50	20:45	20:10	19:16	18:24	16:46	14 14:02 (13)	16:38	26 14:17 (13)
19	07:36	14:06 (13)	07:02	06:17	06:24	05:45	05:32	05:49	06:20	06:53	07:27	07:06	13:45 (13)	07:35	13:52 (13)
	17:06	26 14:32 (13)	17:47	18:21	19:56	20:28	20:50	20:44	20:08	19:14	18:23	16:45	18 14:03 (13)	16:39	26 14:18 (13)
20	07:35	14:07 (13)	07:01	06:15	06:22	05:44	05:32	05:50	06:21	06:55	07:28	07:07	13:44 (13)	07:36	13:52 (13)
	17:08	24 14:31 (13)	17:48	18:22	19:57	20:29	20:51	20:44	20:07	19:12	18:21	16:44	20 14:04 (13)	16:39	26 14:18 (13)
21	07:35	14:08 (13)	07:00	06:13	06:21	05:43	05:32	05:51	06:23	06:56	07:30	07:08	13:44 (13)	07:37	13:53 (13)
	17:09	22 14:30 (13)	17:49	18:23	19:58	20:30	20:51	20:43	20:05	19:11	18:20	16:43	22 14:06 (13)	16:40	26 14:19 (13)
22	07:34	14:09 (13)	06:58	06:11	06:19	05:42	05:33	05:52	06:24	06:57	07:31	07:09	13:43 (13)	07:37	13:53 (13)
	17:10	20 14:29 (13)	17:50	18:24	19:59	20:31	20:51	20:42	20:04	19:09	18:18	16:43	24 14:07 (13)	16:40	26 14:19 (13)
23	07:33	14:11 (13)	06:56	06:10	06:18	05:42	05:33	05:52	06:25	06:58	07:32	07:11	13:42 (13)	07:38	13:54 (13)
	17:11	18 14:29 (13)	17:52	18:25	20:00	20:32	20:51	20:41	20:02	19:07	18:17	16:42	26 14:08 (13)	16:41	26 14:20 (13)
24	07:32	14:14 (13)	06:55	06:08	06:16	05:41	05:33	05:53	06:26	06:59	07:33	07:12	13:42 (13)	07:38	13:54 (13)
	17:13	14 14:28 (13)	17:53	18:26	20:00	20:33	20:52	20:40	20:01	19:05	18:15	16:41	26 14:08 (13)	16:41	26 14:20 (13)
25	07:32	14:17 (13)	06:53	06:06	06:15	05:40	05:33	05:54	06:27	07:00	06:34	07:13	13:43 (13)	07:38	13:54 (13)
	17:14	8 14:25 (13)	17:54	18:27	20:02	20:34	20:52	20:39	19:57	19:04	17:14	16:41	26 14:09 (13)	16:42	26 14:20 (13)
26	07:31		06:52	06:04	06:13	05:39	05:34	05:55	06:28	07:01	06:36	07:14	13:42 (13)	07:39	13:55 (13)
	17:15		17:55	18:29	20:03	20:35	20:52	20:38	19:56	19:02	17:12	16:40	28 14:10 (13)	16:42	26 14:21 (13)
27	07:30		06:50	06:03	06:12	05:39	05:34	05:56	06:29	07:02	06:37	07:15	13:41 (13)	07:39	13:55 (13)
	17:16		17:57	18:30	20:04	20:36	20:52	20:38	19:54	19:00	17:11	16:40	28 14:09 (13)	16:43	28 14:23 (13)
28	07:29		06:49	06:01	06:10	05:38	05:35	05:57	06:30	07:03	06:38	07:16	13:42 (13)	07:39	13:55 (13)
	17:18		17:58	18:31	20:05	20:37	20:52	20:37	19:52	18:58	17:10	16:39	28 14:10 (13)	16:44	28 14:23 (13)
29	07:28			05:59	06:09	05:37	05:35	05:58	06:31	07:04	06:39	07:17	13:42 (13)	07:40	13:55 (13)
	17:19			18:32	20:06	20:37	20:52	20:36	19:51	18:56	17:08	16:39	30 14:12 (13)	16:44	28 14:23 (13)
30	07:27			05:57	06:07	05:37	05:35	05:59	06:32	07:05	06:41	07:19	13:43 (13)	07:40	13:56 (13)
	17:20			18:33	20:07	20:38	20:52	20:34	19:49	18:55	17:07	16:39	28 14:11 (13)	16:45	28 14:24 (13)
31	07:26			05:56		05:36		06:00	06:33		06:42			07:40	13:56 (13)
	17:22			18:34		20:39		20:33	19:47		17:05			16:46	28 14:24 (13)
Potential sun hours	293		295	370	209	-292	-263	-280	-145	375	343	294		283	
Total, worst case		648											326		862
Sun reduction		0.35											0.35		0.30
Oper. time red.		0.86											0.86		0.86
Wind dir. red.		0.67											0.67		0.67
Total reduction		0.20											0.20		0.17
Total, real		132											66		150

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	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, North part
16 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
1000 meter max shadow distance applied along with default 3° inclination
Sunshine probabilities applied (pdf plots)
Directional run-hours applied from tab file (tower 1)
.

Printed/Page
03/05/06 23:47 / 9
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7660 Whitegate Avenue
US-RIVERSIDE, CA 92506

Calculated:
03/02/06 05:47/2.4.0.67

SHADOW - Calendar

Calculation: North part **Shadow receptor:** 648 - 648

Assumptions for shadow calculations

Maximum distance for influence	1,000	m
Minimum sun height over horizon for influence	3	°
Day step for calculation	1	days
Time step for calculation	2	minutes

Sun shine probabilities (part of time from sun rise to sun set with sun shine)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.35	0.45	0.45	0.55	0.55	0.55	0.65	0.55	0.55	0.45	0.35	0.30

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
475	585	238	199	220	474	1,184	813	840	1,246	803	479	7,555

	January		February		March	April	May	June	July	August	September	October	November		December	
1	07:40		07:25	14:24 (13)	06:47	05:54	06:06	05:36	05:36	06:01	06:34	07:07	06:43		07:20	14:12 (13)
	16:47		17:23	30 14:54 (13)	17:59	18:35	20:08	20:40	20:52	20:32	19:46	18:53	17:04		16:38	6 14:18 (13)
2	07:40		07:24	14:25 (13)	06:45	05:52	06:05	05:35	05:36	06:02	06:35	07:08	06:44	14:04 (13)	07:21	
	16:48		17:24	30 14:55 (13)	18:00	18:37	20:10	20:41	20:52	20:31	19:44	18:51	17:03	12 14:16 (13)	16:38	
3	07:40		07:23	14:26 (13)	06:44	05:50	06:03	05:35	05:37	06:03	06:36	07:09	06:46	14:02 (13)	07:22	
	16:49		17:26	28 14:54 (13)	18:02	18:38	20:11	20:41	20:52	20:30	19:42	18:49	17:02	18 14:20 (13)	16:38	
4	07:40		07:22	14:27 (13)	06:42	05:49	06:02	05:34	05:38	06:04	06:37	07:10	06:47	14:01 (13)	07:23	
	16:50		17:27	28 14:55 (13)	18:03	18:39	20:12	20:42	20:51	20:29	19:41	18:48	17:00	20 14:21 (13)	16:37	
5	07:40		07:21	14:28 (13)	06:41	06:47	06:01	05:34	05:38	06:05	06:39	07:11	06:48	13:58 (13)	07:24	
	16:51		17:28	26 14:54 (13)	18:04	19:40	20:13	20:43	20:51	20:28	19:39	18:46	16:59	24 14:22 (13)	16:37	
6	07:40		07:20	14:28 (13)	06:39	06:45	05:59	05:33	05:39	06:07	06:40	07:12	06:49	13:58 (13)	07:25	
	16:52		17:30	24 14:52 (13)	18:05	19:41	20:14	20:44	20:51	20:26	19:37	18:44	16:58	26 14:24 (13)	16:37	
7	07:40		07:18	14:31 (13)	06:37	06:44	05:58	05:33	05:39	06:08	06:41	07:13	06:51	13:57 (13)	07:26	
	16:53		17:31	20 14:51 (13)	18:06	19:42	20:15	20:44	20:51	20:25	19:35	18:43	16:57	28 14:25 (13)	16:37	
8	07:40		07:17	14:32 (13)	06:36	06:42	05:57	05:33	05:40	06:09	06:42	07:14	06:52	13:56 (13)	07:27	
	16:54		17:32	18 14:50 (13)	18:08	19:43	20:16	20:45	20:50	20:24	19:34	18:41	16:56	28 14:24 (13)	16:37	
9	07:40		07:16	14:37 (13)	06:34	06:40	05:56	05:33	05:41	06:10	06:43	07:16	06:53	13:56 (13)	07:28	
	16:55		17:34	10 14:47 (13)	18:09	19:45	20:17	20:46	20:50	20:23	19:32	18:39	16:54	30 14:26 (13)	16:37	
10	07:40		07:15		06:32	06:39	05:55	05:32	05:42	06:11	06:44	07:17	06:54	13:55 (13)	07:29	
	16:56		17:35		18:10	19:46	20:18	20:46	20:50	20:21	19:30	18:37	16:53	30 14:25 (13)	16:37	
11	07:39	14:30 (13)	07:14		06:30	06:37	05:53	05:32	05:42	06:12	06:45	07:18	06:56	13:54 (13)	07:29	
	16:57	6 14:36 (13)	17:36		18:11	19:47	20:19	20:47	20:49	20:20	19:28	18:36	16:52	32 14:26 (13)	16:37	
12	07:39	14:27 (13)	07:12		06:29	06:35	05:52	05:32	05:43	06:13	06:46	07:19	06:57	13:54 (13)	07:30	
	16:58	10 14:37 (13)	17:37		18:12	19:48	20:21	20:47	20:49	20:18	19:27	18:34	16:51	32 14:26 (13)	16:37	
13	07:39	14:25 (13)	07:11		06:27	06:34	05:51	05:32	05:44	06:14	06:47	07:20	06:58	13:53 (13)	07:31	
	16:59	16 14:41 (13)	17:39		18:14	19:49	20:22	20:48	20:48	20:17	19:25	18:32	16:50	34 14:27 (13)	16:37	
14	07:38	14:25 (13)	07:10		06:25	06:32	05:50	05:32	05:45	06:15	06:48	07:21	06:59	13:55 (13)	07:32	
	17:00	18 14:43 (13)	17:40		18:15	19:50	20:23	20:48	20:48	20:16	19:23	18:31	16:49	32 14:27 (13)	16:37	
15	07:38	14:24 (13)	07:08		06:24	06:30	05:49	05:32	05:45	06:16	06:49	07:22	07:01	13:54 (13)	07:33	
	17:02	20 14:44 (13)	17:41		18:16	19:51	20:24	20:49	20:47	20:14	19:21	18:29	16:48	32 14:26 (13)	16:37	
16	07:37	14:23 (13)	07:07		06:22	06:29	05:48	05:32	05:46	06:17	06:50	07:24	07:02	13:55 (13)	07:33	
	17:03	22 14:45 (13)	17:43		18:17	19:53	20:25	20:49	20:46	20:13	19:20	18:28	16:47	32 14:27 (13)	16:38	
17	07:37	14:23 (13)	07:05		06:20	06:27	05:47	05:32	05:47	06:18	06:51	07:25	07:03	13:55 (13)	07:34	
	17:04	24 14:47 (13)	17:44		18:18	19:54	20:26	20:50	20:46	20:11	19:18	18:26	16:47	32 14:27 (13)	16:38	
18	07:36	14:22 (13)	07:04		06:18	06:25	05:46	05:32	05:48	06:19	06:52	07:26	07:04	13:56 (13)	07:35	
	17:05	26 14:48 (13)	17:45		18:19	19:55	20:27	20:50	20:45	20:10	19:16	18:24	16:46	30 14:26 (13)	16:38	
19	07:36	14:22 (13)	07:02		06:17	06:24	05:45	05:32	05:49	06:20	06:53	07:27	07:06	13:55 (13)	07:35	
	17:06	26 14:48 (13)	17:47		18:21	19:56	20:28	20:50	20:44	20:08	19:14	18:23	16:45	32 14:27 (13)	16:39	
20	07:35	14:21 (13)	07:01		06:15	06:22	05:44	05:32	05:50	06:21	06:55	07:28	07:07	13:56 (13)	07:36	
	17:08	28 14:49 (13)	17:48		18:22	19:57	20:29	20:51	20:44	20:07	19:12	18:21	16:44	30 14:26 (13)	16:39	
21	07:35	14:22 (13)	07:00		06:13	06:21	05:43	05:32	05:51	06:23	06:56	07:30	07:08	13:58 (13)	07:37	
	17:09	28 14:50 (13)	17:49		18:23	19:58	20:30	20:51	20:43	20:05	19:11	18:20	16:43	28 14:26 (13)	16:40	
22	07:34	14:21 (13)	06:58		06:11	06:19	05:42	05:33	05:52	06:24	06:57	07:31	07:09	13:57 (13)	07:37	
	17:10	30 14:51 (13)	17:50		18:24	19:59	20:31	20:51	20:42	20:04	19:09	18:18	16:43	28 14:25 (13)	16:40	
23	07:33	14:21 (13)	06:56		06:10	06:18	05:42	05:33	05:52	06:25	06:58	07:32	07:11	13:58 (13)	07:38	
	17:11	32 14:53 (13)	17:52		18:25	20:00	20:32	20:51	20:41	20:02	19:07	18:17	16:42	26 14:24 (13)	16:41	
24	07:32	14:22 (13)	06:55		06:08	06:16	05:41	05:33	05:53	06:26	06:59	07:33	07:12	14:00 (13)	07:38	
	17:13	30 14:52 (13)	17:53		18:26	20:00	20:33	20:52	20:40	20:01	19:05	18:15	16:41	26 14:26 (13)	16:41	
25	07:32	14:21 (13)	06:53		06:06	06:15	05:40	05:33	05:54	06:27	07:00	06:34	07:13	14:01 (13)	07:38	
	17:14	32 14:53 (13)	17:54		18:27	20:02	20:34	20:52	20:39	19:57	19:04	17:14	16:41	24 14:25 (13)	16:42	
26	07:31	14:22 (13)	06:52		06:04	06:13	05:39	05:34	05:55	06:28	07:01	06:36	07:14	14:02 (13)	07:39	
	17:15	32 14:54 (13)	17:55		18:29	20:03	20:35	20:52	20:38	19:56	19:02	17:12	16:40	22 14:24 (13)	16:42	
27	07:30	14:21 (13)	06:50		06:03	06:12	05:39	05:34	05:56	06:29	07:02	06:37	07:15	14:03 (13)	07:39	
	17:16	32 14:53 (13)	17:57		18:30	20:04	20:36	20:52	20:38	19:54	19:00	17:11	16:40	20 14:23 (13)	16:43	
28	07:29	14:22 (13)	06:49		06:01	06:10	05:38	05:35	05:57	06:30	07:03	06:38	07:16	14:04 (13)	07:39	
	17:18	32 14:54 (13)	17:58		18:31	20:05	20:37	20:52	20:37	19:52	18:58	17:10	16:39	18 14:22 (13)	16:44	
29	07:28	14:21 (13)			05:59	06:09	05:37	05:35	05:58	06:31	07:04	06:39	07:17	14:06 (13)	07:40	
	17:19	34 14:55 (13)			18:32	20:06	20:37	20:52	20:36	19:51	18:56	17:08	16:39	16 14:22 (13)	16:45	
30	07:27	14:22 (13)			05:57	06:07	05:37	05:35	05:59	06:32	07:05	06:41	07:19	14:09 (13)	07:40	
	17:20	32 14:54 (13)			18:33	20:07	20:38	20:52	20:34	19:49	18:55	17:07	16:39	10 14:19 (13)	16:45	
31	07:26	14:23 (13)			05:56		05:36		06:00	06:33		06:42			07:40	
	17:22	32 14:55 (13)			18:34		20:39		20:33	19:47		17:05			16:46	
Potential sun hours	293		295		370	209	-292	-263	-280	-145	375	343	294		283	
Total, worst case		542		214										752		6
Sun reduction		0.35		0.45										0.35		0.30
Oper. time red.		0.86		0.86										0.86		0.86
Wind dir. red.		0.67		0.67										0.67		0.67
Total reduction		0.20		0.26										0.20		0.17
Total, real		109		55										152		1

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	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, North part
16 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
1000 meter max shadow distance applied along with default 3° inclination
Sunshine probabilities applied (pdf plots)
Directional run-hours applied from tab file (tower 1)
.

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03/05/06 23:47 / 10

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Wind Engineers, Inc.
7660 Whitegate Avenue
US-RIVERSIDE, CA 92506

Calculated:
03/02/06 05:47/2.4.0.67

SHADOW - Calendar

Calculation: North part **Shadow receptor:** 649 - 649

Assumptions for shadow calculations

Maximum distance for influence	1,000	m
Minimum sun height over horizon for influence	3	°
Day step for calculation	1	days
Time step for calculation	2	minutes

Sun shine probabilities (part of time from sun rise to sun set with sun shine)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.35	0.45	0.45	0.55	0.55	0.55	0.65	0.55	0.55	0.45	0.35	0.30

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
475	585	238	199	220	474	1,184	813	840	1,246	803	479	7,555

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:40 14:42 (12)	07:25	06:47 15:33 (13)	05:54	06:06	05:36	05:36	06:01	06:34	07:07	06:43 15:01 (13)	07:20 14:34 (12)
	16:47 20 15:02 (12)	17:23	17:59 12 15:45 (13)	18:35	20:08	20:40	20:52	20:32	19:46	18:53	17:04 12 15:13 (13)	16:38 10 14:44 (12)
2	07:40 14:42 (12)	07:24	06:45	05:52	06:05	05:35	05:36	06:02	06:35	07:08	06:44	07:21 14:33 (12)
	16:48 20 15:02 (12)	17:24	18:00	18:37	20:10	20:41	20:52	20:31	19:44	18:51	17:03	16:38 12 14:45 (12)
3	07:40 14:44 (12)	07:23	06:44	05:50	06:03	05:35	05:37	06:03	06:36	07:09	06:46	07:22 14:32 (12)
	16:49 18 15:02 (12)	17:26	18:02	18:38	20:11	20:41	20:52	20:30	19:42	18:49	17:02	16:38 14 14:46 (12)
4	07:40 14:43 (12)	07:22	06:42	05:49	06:02	05:34	05:38	06:04	06:37	07:10	06:47	07:23 14:31 (12)
	16:50 20 15:03 (12)	17:27	18:03	18:39	20:12	20:42	20:51	20:29	19:41	18:48	17:00	16:37 16 14:47 (12)
5	07:40 14:43 (12)	07:21	06:41	06:47	06:01	05:34	05:38	06:05	06:39	07:11	06:48	07:24 14:32 (12)
	16:51 20 15:03 (12)	17:28	18:04	19:40	20:13	20:43	20:51	20:28	19:39	18:46	16:59	16:37 16 14:48 (12)
6	07:40 14:45 (12)	07:20	06:39	06:45	05:59	05:33	05:39	06:07	06:40	07:12	06:49	07:25 14:31 (12)
	16:52 18 15:03 (12)	17:30	18:05	19:41	20:14	20:44	20:51	20:26	19:37	18:44	16:58	16:37 18 14:49 (12)
7	07:40 14:45 (12)	07:18	06:37	06:44	05:58	05:33	05:39	06:08	06:41	07:13	06:51	07:26 14:30 (12)
	16:53 18 15:03 (12)	17:31	18:06	19:42	20:15	20:44	20:51	20:25	19:35	18:43	16:57	16:37 20 14:50 (12)
8	07:40 14:47 (12)	07:17	06:36	06:42	05:57	05:33	05:40	06:09	06:42	07:14	06:52	07:27 14:31 (12)
	16:54 16 15:03 (12)	17:32	18:08	19:43	20:16	20:45	20:50	20:24	19:34	18:41	16:56	16:37 20 14:51 (12)
9	07:40 14:49 (12)	07:16 15:37 (13)	06:34	06:40	05:56	05:33	05:41	06:10	06:43	07:15	06:53	07:28 14:32 (12)
	16:55 14 15:03 (12)	17:34 4 15:41 (13)	18:09	19:45	20:17	20:46	20:50	20:23	19:32	18:39	16:54	16:37 18 14:50 (12)
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	16:57 10 15:02 (12)	17:36 18 15:48 (13)	18:11	19:47	20:19	20:47	20:49	20:20	19:28	18:36	16:52	16:37 20 14:52 (12)
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	16:58 6 14:59 (12)	17:37 20 15:49 (13)	18:12	19:48	20:21	20:47	20:49	20:18	19:27	18:34 6 16:15 (13)	16:51	16:37 20 14:53 (12)
13	07:39	07:11 15:27 (13)	06:27	06:34	05:51	05:32	05:44	06:14	06:47	07:20 16:05 (13)	06:58	07:31 14:32 (12)
	16:59	17:39 24 15:51 (13)	18:14	19:49	20:22	20:48	20:48	20:17	19:25	18:32 14 16:19 (13)	16:50	16:37 22 14:54 (12)
14	07:38	07:10 15:26 (13)	06:25	06:32	05:50	05:32	05:45	06:15	06:48	07:21 16:02 (13)	06:59	07:32 14:32 (12)
	17:00	17:40 26 15:52 (13)	18:15	19:50	20:23	20:48	20:48	20:16	19:23	18:31 20 16:22 (13)	16:49	16:37 22 14:54 (12)
15	07:38	07:08 15:24 (13)	06:24	06:30	05:49	05:32	05:45	06:16	06:49	07:22 16:01 (13)	07:01	07:33 14:33 (12)
	17:02	17:41 28 15:52 (13)	18:16	19:51	20:24	20:49	20:47	20:14	19:21	18:29 22 16:23 (13)	16:48	16:37 22 14:55 (12)
16	07:37	07:07 15:25 (13)	06:22	06:29	05:48	05:32	05:46	06:17	06:50	07:24 15:58 (13)	07:02	07:33 14:34 (12)
	17:03	17:43 28 15:53 (13)	18:17	19:53	20:25	20:49	20:46	20:13	19:20	18:28 24 16:22 (13)	16:47	16:38 22 14:56 (12)
17	07:37	07:05 15:24 (13)	06:20	06:27	05:47	05:32	05:47	06:18	06:51	07:25 15:58 (13)	07:03	07:34 14:34 (12)
	17:04	17:44 30 15:54 (13)	18:18	19:54	20:26	20:50	20:46	20:11	19:18	18:26 26 16:24 (13)	16:47	16:38 22 14:56 (12)
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	17:05	17:45 30 15:54 (13)	18:19	19:55	20:27	20:50	20:45	20:10	19:16	18:24 28 16:25 (13)	16:46	16:38 24 14:57 (12)
19	07:36	07:02 15:23 (13)	06:17	06:24	05:45	05:32	05:49	06:20	06:53	07:27 15:56 (13)	07:06	07:35 14:34 (12)
	17:06	17:47 32 15:55 (13)	18:21	19:56	20:28	20:50	20:44	20:08	19:14	18:23 28 16:24 (13)	16:45	16:39 22 14:56 (12)
20	07:35	07:01 15:23 (13)	06:15	06:22	05:44	05:32	05:50	06:21	06:55	07:28 15:55 (13)	07:07	07:36 14:34 (12)
	17:08	17:48 32 15:55 (13)	18:22	19:57	20:29	20:51	20:44	20:07	19:12	18:21 30 16:25 (13)	16:44	16:39 22 14:56 (12)
21	07:35	07:00 15:24 (13)	06:13	06:21	05:43	05:32	05:51	06:22	06:56	07:30 15:55 (13)	07:08	07:36 14:35 (12)
	17:09	17:49 30 15:54 (13)	18:23	19:58	20:30	20:51	20:43	20:05	19:11	18:20 30 16:25 (13)	16:43	16:40 22 14:57 (12)
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	17:10	17:50 30 15:54 (13)	18:24	19:59	20:31	20:51	20:42	20:04	19:09	18:18 30 16:24 (13)	16:43	16:40 22 14:57 (12)
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	17:13	17:53 28 15:53 (13)	18:26	20:00	20:33	20:52	20:40	20:01	19:05	18:15 30 16:24 (13)	16:41	16:41 22 14:58 (12)
25	07:32	06:53 15:25 (13)	06:06	06:15	05:40	05:33	05:54	06:27	07:00	06:34 14:54 (13)	07:13	07:38 14:36 (12)
	17:14	17:54 26 15:51 (13)	18:27	20:02	20:34	20:52	20:39	19:57	19:04	17:14 30 15:24 (13)	16:41	16:42 24 15:00 (12)
26	07:31	06:52 15:28 (13)	06:04	06:13	05:39	05:34	05:55	06:28	07:01	06:36 14:55 (13)	07:14	07:39 14:39 (12)
	17:15	17:55 24 15:52 (13)	18:29	20:03	20:35	20:52	20:38	19:56	19:02	17:12 28 15:23 (13)	16:40	16:42 22 15:01 (12)
27	07:30	06:50 15:28 (13)	06:03	06:12	05:39	05:34	05:56	06:29	07:02	06:37 14:54 (13)	07:15	07:39 14:39 (12)
	17:16	17:57 22 15:50 (13)	18:30	20:04	20:36	20:52	20:38	19:54	19:00	17:11 28 15:22 (13)	16:40	16:43 22 15:01 (12)
28	07:29	06:49 15:31 (13)	06:01	06:10	05:38	05:35	05:57	06:30	07:03	06:38 14:56 (13)	07:16	07:39 14:39 (12)
	17:18	17:58 18 15:49 (13)	18:31	20:05	20:36	20:52	20:37	19:52	18:58	17:10 26 15:22 (13)	16:39	16:44 22 15:01 (12)
29	07:28		05:59	06:09	05:37	05:35	05:58	06:31	07:04	06:39 14:57 (13)	07:17	07:40 14:39 (12)
	17:19		18:32	20:06	20:37	20:52	20:35	19:51	18:56	17:08 22 15:19 (13)	16:39	16:44 22 15:01 (12)
30	07:27		05:57	06:07	05:37	05:35	05:59	06:32	07:05	06:41 14:58 (13)	07:19 14:35 (12)	07:40 14:39 (12)
	17:20		18:33	20:07	20:38	20:52	20:34	19:49	18:55	17:07 20 15:18 (13)	16:39 6 14:41 (12)	16:45 22 15:01 (12)
31	07:26		05:56		05:36		06:00	06:33		06:42 15:00 (13)		07:40 14:40 (12)
	17:22		18:34		20:39		20:33	19:47		17:05 16 15:16 (13)		16:46 22 15:02 (12)
Potential sun hours	293	295	370	209	-292	-263	-280	-145	375	343	294	283
Total, worst case	192	492	12							490	18	626
Sun reduction	0.35	0.45	0.45							0.45	0.35	0.30
Oper. time red.	0.86	0.86	0.86							0.86	0.86	0.86
Wind dir. red.	0.66	0.65	0.65							0.65	0.65	0.66
Total reduction	0.20	0.25	0.25							0.25	0.20	0.17
Total, real	39	124	3							123	4	108

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	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, North part
16 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
1000 meter max shadow distance applied along with default 3° inclination
Sunshine probabilities applied (pdf plots)
Directional run-hours applied from tab file (tower 1)
.

Printed/Page
03/05/06 23:47 / 11
Licensed user:
Wind Engineers, Inc.
7660 Whitegate Avenue
US-RIVERSIDE, CA 92506

Calculated:
03/02/06 05:47/2.4.0.67

SHADOW - Calendar

Calculation: North part **Shadow receptor:** 650 - 650

Assumptions for shadow calculations

Maximum distance for influence	1,000	m
Minimum sun height over horizon for influence	3	°
Day step for calculation	1	days
Time step for calculation	2	minutes

Sun shine probabilities (part of time from sun rise to sun set with sun shine)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.35	0.45	0.45	0.55	0.55	0.55	0.65	0.55	0.55	0.45	0.35	0.30

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
475	585	238	199	220	474	1,184	813	840	1,246	803	479	7,555

	January		February	March		April	May	June	July	August	September		October		November		December	
1	07:40	08:50 (12)	07:25	06:47		05:54	06:06	05:36	05:36	06:01	06:34		07:07	08:17 (13)	06:43		07:20	08:32 (12)
	16:47 14	09:04 (12)	17:23	17:59		18:36	20:08	20:40	20:52	20:32	19:46		18:53 26	08:43 (13)	17:04		16:38 22	08:54 (12)
2	07:40	08:50 (12)	07:24	06:46		05:52	06:05	05:35	05:37	06:02	06:35		07:08	08:16 (13)	06:44		07:21	08:31 (12)
	16:48 14	09:04 (12)	17:24	18:00		18:37	20:10	20:41	20:52	20:31	19:44		18:51 28	08:44 (13)	17:03		16:38 22	08:53 (12)
3	07:40	08:50 (12)	07:23	06:44		05:51	06:03	05:35	05:37	06:03	06:36		07:09	08:17 (13)	06:46		07:22	08:32 (12)
	16:49 16	09:06 (12)	17:26	18:02		18:38	20:11	20:42	20:52	20:30	19:42		18:49 26	08:43 (13)	17:02		16:38 22	08:54 (12)
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5	07:40	08:49 (12)	07:21	06:41	07:46 (13)	06:47	06:01	05:34	05:38	06:06	06:39		07:11	08:17 (13)	06:48		07:24	08:34 (12)
	16:51 18	09:07 (12)	17:28	18:04 12	07:58 (13)	19:40	20:13	20:43	20:51	20:28	19:39		18:46 24	08:41 (13)	16:59		16:37 20	08:54 (12)
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	16:52 18	09:07 (12)	17:30	18:05 16	08:01 (13)	19:41	20:14	20:44	20:51	20:26	19:37		18:44 22	08:40 (13)	16:58		16:37 18	08:53 (12)
7	07:40	08:49 (12)	07:19	06:37	07:43 (13)	06:44	05:58	05:33	05:39	06:08	06:41		07:13	08:20 (13)	06:51		07:26	08:36 (12)
	16:53 20	09:09 (12)	17:31	18:06 20	08:03 (13)	19:42	20:15	20:44	20:51	20:25	19:35		18:43 18	08:38 (13)	16:57		16:37 18	08:54 (12)
8	07:40	08:49 (12)	07:17	06:36	07:41 (13)	06:42	05:57	05:33	05:40	06:09	06:42		07:14	08:21 (13)	06:52		07:27	08:37 (12)
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	16:56 22	09:10 (12)	17:35	18:10 24	08:04 (13)	19:46	20:18	20:46	20:50	20:21	19:30		18:38		16:53		16:37 14	08:53 (12)
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	17:02 24	09:14 (12)	17:41	18:16 26	08:03 (13)	19:51	20:24	20:49	20:47	20:14	19:21		18:29		16:48 16	08:46 (12)	16:38 10	08:53 (12)
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	17:03 24	09:14 (12)	17:43	18:17 24	08:01 (13)	19:53	20:25	20:49	20:46	20:13	19:20		18:28		16:48 18	08:47 (12)	16:38 10	08:54 (12)
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	17:04 26	09:15 (12)	17:44	18:18 24	08:02 (13)	19:54	20:26	20:50	20:46	20:11	19:18		18:26		16:47 20	08:49 (12)	16:38 6	08:52 (12)
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	17:05 24	09:14 (12)	17:45	18:19 22	08:00 (13)	19:55	20:27	20:50	20:45	20:10	19:16		18:24		16:46 22	08:50 (12)	16:38 6	08:53 (12)
19	07:36	08:50 (12)	07:03	06:17	07:40 (13)	06:24	05:45	05:32	05:49	06:20	06:54		07:27		07:06	08:27 (12)	07:35	08:48 (12)
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	17:09 24	09:16 (12)	17:49	18:23 6	07:51 (13)	19:58	20:30	20:51	20:43	20:05	19:11		18:20		16:44 24	08:52 (12)	16:40 4	08:53 (12)
22	07:34	08:51 (12)	06:58	06:11		06:19	05:42	05:33	05:52	06:24	06:57		07:31		07:09	08:27 (12)	07:37	08:49 (12)
	17:10 24	09:15 (12)	17:50	18:24		19:59	20:31	20:51	20:42	20:04	19:09		18:18		16:43 24	08:51 (12)	16:40 4	08:53 (12)
23	07:33	08:53 (12)	06:57	06:10		06:18	05:42	05:33	05:53	06:25	06:58	08:26 (13)	07:32		07:11	08:26 (12)	07:38	08:50 (12)
	17:11 22	09:15 (12)	17:52	18:25		20:01	20:32	20:51	20:41	20:02	19:07 12	08:38 (13)	18:17		16:42 26	08:52 (12)	16:41 4	08:54 (12)
24	07:32	08:54 (12)	06:55	06:08		06:16	05:41	05:33	05:53	06:26	06:59	08:23 (13)	07:33		07:12	08:28 (12)	07:38	08:50 (12)
	17:13 22	09:16 (12)	17:53	18:26		20:01	20:33	20:52	20:40	20:01	19:05 18	08:41 (13)	18:15		16:42 24	08:52 (12)	16:41 4	08:54 (12)
25	07:32	08:55 (12)	06:53	06:06		06:15	05:40	05:34	05:54	06:27	07:00	08:22 (13)	06:34		07:13	08:27 (12)	07:38	08:50 (12)
	17:14 20	09:15 (12)	17:54	18:28		20:02	20:34	20:52	20:39	19:57	19:04 20	08:42 (13)	17:14		16:41 26	08:53 (12)	16:42 6	08:56 (12)
26	07:31	08:56 (12)	06:52	06:04		06:13	05:39	05:34	05:55	06:28	07:01	08:19 (13)	06:36		07:14	08:28 (12)	07:39	08:51 (12)
	17:15 18	09:14 (12)	17:55	18:29		20:03	20:35	20:52	20:39	19:56	19:02 24	08:43 (13)	17:12		16:40 24	08:52 (12)	16:42 6	08:57 (12)
27	07:30	08:57 (12)	06:50	06:03		06:12	05:39	05:34	05:56	06:29	07:02	08:18 (13)	06:37		07:15	08:29 (12)	07:39	08:51 (12)
	17:17 16	09:13 (12)	17:57	18:30		20:04	20:36	20:52	20:38	19:54	19:00 24	08:42 (13)	17:11		16:40 24	08:53 (12)	16:43 6	08:57 (12)
28	07:29	08:58 (12)	06:49	06:01		06:10	05:38	05:35	05:57	06:30	07:03	08:18 (13)	06:38		07:16	08:29 (12)	07:39	08:49 (12)
	17:18 14	09:12 (12)	17:58	18:31		20:05	20:37	20:52	20:37	19:52	18:58 26	08:44 (13)	17:10		16:39 24	08:53 (12)	16:44 10	08:59 (12)
29	07:28	08:59 (12)		05:59		06:09	05:37	05:35	05:58	06:31	07:04	08:17 (13)	06:39		07:18	08:30 (12)	07:40	08:49 (12)
	17:19 10	09:09 (12)		18:32		20:06	20:37	20:52	20:36	19:51	18:56 28	08:45 (13)	17:08		16:39 24	08:54 (12)	16:45 10	08:59 (12)
30	07:27			05:57		06:07	05:37	05:36	05:59	06:32	07:05	08:18 (13)	06:41		07:19	08:31 (12)	07:40	08:50 (12)
	17:20			18:33		20:07	20:38	20:52	20:34	19:49	18:55 26	08:44 (13)	17:07		16:39 22	08:53 (12)	16:45 12	09:02 (12)
31	07:26			05:56			05:36		06:00	06:33			06:42				07:40	08:50 (12)
	17:22			18:34			20:39		20:33	19:47			17:05				16:46 12	09:02 (12)
Potential sun hours	293		295	370		209	-292	-263	-280	-145	375		343		294		283	
Total, worst case		590			358							178		192		388		354
Sun reduction		0.35			0.45							0.55		0.45		0.35		0.30
Oper. time red.		0.86			0.86							0.86		0.86		0.86		0.86
Wind dir. red.		0.62			0.61							0.61		0.61		0.62		0.62
Total reduction		0.19			0.24							0.29		0.24		0.19		0.16
Total, real		111			85							51		45		73		57

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	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, North part
16 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
1000 meter max shadow distance applied along with default 3° inclination
Sunshine probabilities applied (pdf plots)
Directional run-hours applied from tab file (tower 1)
.

Licensed user:
Wind Engineers, Inc.
7660 Whitegate Avenue
US-RIVERSIDE, CA 92506

Calculated:
03/02/06 05:47/2.4.0.67

SHADOW - Calendar

Calculation: North part **Shadow receptor:** 651 - 651

Assumptions for shadow calculations

Maximum distance for influence	1,000	m
Minimum sun height over horizon for influence	3	°
Day step for calculation	1	days
Time step for calculation	2	minutes

Sun shine probabilities (part of time from sun rise to sun set with sun shine)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.35	0.45	0.45	0.55	0.55	0.55	0.65	0.55	0.55	0.45	0.35	0.30

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
475	585	238	199	220	474	1,184	813	840	1,246	803	479	7,555

	January		February		March		April		May		June	
1	07:40		07:25		08:28 (12)		06:47		05:54		06:55 (13)	06:06	05:36
	16:47		17:23	18	08:46 (12)		17:59		18:36	28	07:23 (13)	20:08	20:40
2	07:40		07:24		08:27 (12)		06:46		05:52		06:56 (13)	06:05	05:35
	16:48		17:24	20	08:47 (12)		18:00		18:37	28	07:24 (13)	20:10	20:41
3	07:40		07:23		08:26 (12)		06:44		05:51		06:54 (13)	06:03	05:35
	16:49		17:26	22	08:48 (12)		18:02		18:38	28	07:22 (13)	20:11	20:42
4	07:40		07:22		08:27 (12)		06:42		05:49		06:54 (13)	06:02	05:34
	16:50		17:27	22	08:49 (12)		18:03		18:39	28	07:22 (13)	20:12	20:42
5	07:40		07:21		08:26 (12)		06:41		06:47		07:54 (13)	06:01	05:34
	16:51		17:28	24	08:50 (12)		18:04		19:40	28	08:22 (13)	20:13	20:43
6	07:40		07:20		08:24 (12)		06:39		06:45		07:55 (13)	05:59	05:34
	16:52		17:30	26	08:50 (12)		18:05		19:41	26	08:21 (13)	20:14	20:44
7	07:40		07:19		08:25 (12)		06:37		06:44		07:53 (13)	05:58	05:33
	16:53		17:31	26	08:51 (12)		18:06		19:42	26	08:19 (13)	20:15	20:44
8	07:40		07:17		08:24 (12)		06:36		06:42		07:55 (13)	05:57	05:33
	16:54		17:32	28	08:52 (12)		18:08		19:43	24	08:19 (13)	20:16	20:45
9	07:40		07:16		08:25 (12)		06:34		06:40		07:56 (13)	05:56	05:33
	16:55		17:34	26	08:51 (12)		18:09		19:45	22	08:18 (13)	20:17	20:46
10	07:40		07:15		08:25 (12)		06:32		06:39		07:56 (13)	05:55	05:33
	16:56		17:35	26	08:51 (12)		18:10		19:46	20	08:16 (13)	20:18	20:46
11	07:39		07:14		08:24 (12)		06:30		06:37		07:56 (13)	05:53	05:32
	16:57		17:36	28	08:52 (12)		18:11		19:47	18	08:14 (13)	20:20	20:47
12	07:39		07:12		08:25 (12)		06:29		06:35		07:59 (13)	05:52	05:32
	16:58		17:38	26	08:51 (12)		18:12		19:48	12	08:11 (13)	20:21	20:47
13	07:39		07:11		08:25 (12)		06:27		06:34			05:51	05:32
	16:59		17:39	24	08:49 (12)		18:14		19:49			20:22	20:48
14	07:38		07:10		08:26 (12)		06:25		06:32			05:50	05:32
	17:00		17:40	24	08:50 (12)		18:15		19:50			20:23	20:48
15	07:38		07:08		08:28 (12)		06:24		06:30			05:49	05:32
	17:02		17:41	20	08:48 (12)		18:16		19:51			20:24	20:49
16	07:37		07:07		08:29 (12)		06:22		06:29			05:48	05:32
	17:03		17:43	18	08:47 (12)		18:17		19:53			20:25	20:49
17	07:37		07:05		08:30 (12)		06:20		06:27			05:47	05:32
	17:04		17:44	16	08:46 (12)		18:18		19:54			20:26	20:50
18	07:36		07:04		08:34 (12)		06:18		06:25			05:46	05:32
	17:05		17:45	8	08:42 (12)		18:19		19:55			20:27	20:50
19	07:36		07:03				06:17		06:24			05:45	05:32
	17:06		17:47				18:21		19:56			20:28	20:50
20	07:35		07:01				06:15		06:22			05:44	05:32
	17:08		17:48				18:22		19:57			20:29	20:51
21	07:35		07:00				06:13		06:21			05:43	05:33
	17:09		17:49				18:23		19:58			20:30	20:51
22	07:34		06:58				06:11		06:19			05:42	05:33
	17:10		17:50				18:24		19:59			20:31	20:51
23	07:33		06:57				06:10		06:18			05:42	05:33
	17:11		17:52				18:25		20:01			20:32	20:51
24	07:32		06:55				06:08		06:16			05:41	05:33
	17:13		17:53				18:26		20:01			20:33	20:52
25	07:32		06:53				06:06		06:15			05:40	05:34
	17:14		17:54				18:28		20:02			20:34	20:52
26	07:31		06:52				06:04		07:08 (13)		06:13	05:39	05:34
	17:15		17:55				18:29	8	07:16 (13)		20:03	20:35	20:52
27	07:30		06:50				06:03		07:04 (13)		06:12	05:39	05:34
	17:17		17:57				18:30	14	07:18 (13)		20:04	20:36	20:52
28	07:29		06:49				06:01		07:00 (13)		06:10	05:38	05:35
	17:18		17:58				18:31	20	07:20 (13)		20:05	20:37	20:52
29	07:28						05:59		06:59 (13)		06:09	05:37	05:35
	17:19	4					18:32	22	07:21 (13)		20:06	20:37	20:52
30	07:27						05:57		06:59 (13)		06:07	05:37	05:36
	17:20	10					18:33	24	07:23 (13)		20:07	20:38	20:52
31	07:26						05:56		06:57 (13)			05:36	
	17:22	16					18:34	26	07:23 (13)			20:39	
Potential sun hours	293		295		370		209					-292	-263
Total, worst case		30		402		114		288					
Sun reduction		0.35		0.45		0.45		0.55					
Oper. time red.		0.86		0.86		0.86		0.86					
Wind dir. red.		0.63		0.63		0.61		0.61					
Total reduction		0.19		0.25		0.24		0.29					
Total, real		6		99		27		83					

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	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, North part
16 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
1000 meter max shadow distance applied along with default 3° inclination
Sunshine probabilities applied (pdf plots)
Directional run-hours applied from tab file (tower 1)
.

Printed/Page
03/05/06 23:47 / 13
Licensed user:
Wind Engineers, Inc.
7660 Whitegate Avenue
US-RIVERSIDE, CA 92506

Calculated:
03/02/06 05:47/2.4.0.67

SHADOW - Calendar

Calculation: North part **Shadow receptor:** 651 - 651

Assumptions for shadow calculations

Maximum distance for influence	1,000	m
Minimum sun height over horizon for influence	3	°
Day step for calculation	1	days
Time step for calculation	2	minutes

Sun shine probabilities (part of time from sun rise to sun set with sun shine)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.35	0.45	0.45	0.55	0.55	0.55	0.65	0.55	0.55	0.45	0.35	0.30

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
475	585	238	199	220	474	1,184	813	840	1,246	803	479	7,555

	July		August		September			October			November			December	
1	05:36		06:01		06:34		07:55 (13)	07:07			06:43		07:55 (12)	07:20	
	20:52		20:32		19:46	18	08:13 (13)	18:53			17:04	26	08:21 (12)	16:38	
2	05:37		06:02		06:35		07:54 (13)	07:08			06:44		07:54 (12)	07:21	
	20:52		20:31		19:44	20	08:14 (13)	18:51			17:03	26	08:20 (12)	16:38	
3	05:37		06:03		06:36		07:53 (13)	07:09			06:46		07:54 (12)	07:22	
	20:52		20:30		19:42	22	08:15 (13)	18:50			17:02	28	08:22 (12)	16:38	
4	05:38		06:04		06:38		07:52 (13)	07:10			06:47		07:55 (12)	07:23	
	20:51		20:29		19:41	24	08:16 (13)	18:48			17:00	26	08:21 (12)	16:37	
5	05:38		06:06		06:39		07:51 (13)	07:11			06:48		07:54 (12)	07:24	
	20:51		20:28		19:39	24	08:15 (13)	18:46			16:59	26	08:20 (12)	16:37	
6	05:39		06:07		06:40		07:50 (13)	07:12			06:49		07:56 (12)	07:25	
	20:51		20:26		19:37	26	08:16 (13)	18:44			16:58	24	08:20 (12)	16:37	
7	05:40		06:08		06:41		07:50 (13)	07:13			06:51		07:57 (12)	07:26	
	20:51		20:25		19:35	28	08:18 (13)	18:43			16:57	22	08:19 (12)	16:37	
8	05:40		06:09		06:42		07:49 (13)	07:14			06:52		07:56 (12)	07:27	
	20:50		20:24		19:34	28	08:17 (13)	18:41			16:56	22	08:18 (12)	16:37	
9	05:41		06:10		06:43		07:48 (13)	07:16			06:53		07:58 (12)	07:28	
	20:50		20:23		19:32	28	08:16 (13)	18:39			16:54	20	08:18 (12)	16:37	
10	05:42		06:11		06:44		07:49 (13)	07:17			06:54		07:59 (12)	07:29	
	20:50		20:21		19:30	28	08:17 (13)	18:38			16:53	18	08:17 (12)	16:37	
11	05:42		06:12		06:45		07:48 (13)	07:18			06:56		08:01 (12)	07:30	
	20:49		20:20		19:28	28	08:16 (13)	18:36			16:52	16	08:17 (12)	16:37	
12	05:43		06:13		06:46		07:49 (13)	07:19			06:57		08:04 (12)	07:30	
	20:49		20:19		19:27	26	08:15 (13)	18:34			16:51	10	08:14 (12)	16:37	
13	05:44		06:14		06:47		07:50 (13)	07:20			06:58			07:31	
	20:48		20:17		19:25	24	08:14 (13)	18:33			16:50			16:37	
14	05:45		06:15		06:48		07:49 (13)	07:21			06:59			07:32	
	20:48		20:16		19:23	24	08:13 (13)	18:31			16:49			16:37	
15	05:45		06:16		06:49		07:50 (13)	07:22			07:01			07:33	
	20:47		20:14		19:21	20	08:10 (13)	18:29			16:48			16:38	
16	05:46		06:17		06:50		07:53 (13)	07:24			07:02			07:33	
	20:46		20:13		19:20	16	08:09 (13)	18:28			16:48			16:38	
17	05:47		06:18		06:51		07:54 (13)	07:25			07:03			07:34	
	20:46		20:11		19:18	10	08:04 (13)	18:26			16:47			16:38	
18	05:48		06:19		06:52			07:26			07:04			07:35	
	20:45		20:10		19:16			18:24			16:46			16:38	
19	05:49		06:20		06:54			07:27			07:06			07:35	
	20:44		20:08		19:14			18:23			16:45			16:39	
20	05:50		06:21		06:55			07:28			07:07			07:36	
	20:44		20:07		19:12			18:21			16:44			16:39	
21	05:51		06:23		06:56			07:30			07:08			07:37	
	20:43		20:05		19:11			18:20			16:44			16:40	
22	05:52		06:24		06:57			07:31			07:09			07:37	
	20:42		20:04		19:09			18:18			16:43			16:40	
23	05:53		06:25		06:58			07:32			07:11			07:38	
	20:41		20:02		19:07			18:17			16:42			16:41	
24	05:53		06:26		06:59			07:33		09:02 (12)	07:12			07:38	
	20:40		20:01		19:05			18:15	10	09:12 (12)	16:42			16:41	
25	05:54		06:27		07:00			06:34		08:00 (12)	07:13			07:38	
	20:39		19:57		19:04			17:14	16	08:16 (12)	16:41			16:42	
26	05:55		06:28		07:01			06:36		07:57 (12)	07:14			07:39	
	20:39		19:56		19:02			17:12	20	08:17 (12)	16:40			16:42	
27	05:56		06:29		07:02			06:37		07:56 (12)	07:15			07:39	
	20:38		19:54		19:00			17:11	22	08:18 (12)	16:40			16:43	
28	05:57		06:30		07:03			06:38		07:56 (12)	07:16			07:39	
	20:37		19:52		18:58			17:10	24	08:20 (12)	16:39			16:44	
29	05:58		06:31		07:04			06:39		07:55 (12)	07:18			07:40	
	20:36		19:51		18:56			17:08	24	08:19 (12)	16:39			16:45	
30	05:59		06:32		07:05			06:41		07:54 (12)	07:19			07:40	
	20:34		19:49	4	08:07 (13)	18:55		17:07	26	08:20 (12)	16:39			16:45	
31	06:00		06:33		07:58 (13)			06:42		07:54 (12)				07:40	
	20:33		19:47	12	08:10 (13)			17:05	28	08:22 (12)				16:46	
Potential sun hours	-280		-145		375			343			294			283	
Total, worst case				16			394			170			264		
Sun reduction				0.55			0.55			0.45			0.35		
Oper. time red.				0.86			0.86			0.86			0.86		
Wind dir. red.				0.61			0.61			0.63			0.63		
Total reduction				0.29			0.29			0.25			0.19		
Total, real				5			114			42			50		

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	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, North part
16 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
1000 meter max shadow distance applied along with default 3° inclination
Sunshine probabilities applied (pdf plots)
Directional run-hours applied from tab file (tower 1)
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03/05/06 23:47 / 14
Licensed user:
Wind Engineers, Inc.
7660 Whitegate Avenue
US-RIVERSIDE, CA 92506

Calculated:
03/02/06 05:47/2.4.0.67

SHADOW - Calendar

Calculation: North part **Shadow receptor:** 652 - 652

Assumptions for shadow calculations

Maximum distance for influence	1,000	m
Minimum sun height over horizon for influence	3	°
Day step for calculation	1	days
Time step for calculation	2	minutes

Sun shine probabilities (part of time from sun rise to sun set with sun shine)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.35	0.45	0.45	0.55	0.55	0.55	0.65	0.55	0.55	0.45	0.35	0.30

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
475	585	238	199	220	474	1,184	813	840	1,246	803	479	7,555

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:40	07:25	06:47	05:54	06:06	05:36	05:36	06:01	06:34	07:07	06:43	07:20
	16:47	17:23	17:59 14	08:07 (12) 18:36 10	06:57 (13) 20:08	20:40	20:52	20:32	07:47 (13) 19:46 20	07:07 18:53	17:04	16:38
2	07:40	07:24	06:46	08:07 (12) 05:52	06:54 (13) 06:05	05:35	05:37	06:02	06:35	07:46 (13) 07:08	06:44	07:21
	16:48	17:24	18:00 12	08:19 (12) 18:37 16	07:10 (13) 20:10	20:41	20:52	20:31	08:07 (13) 19:44 22	08:08 (13) 18:51	17:03	16:38
3	07:40	07:23	06:44	08:12 (12) 05:51	06:52 (13) 06:03	05:35	05:37	06:03	07:45 (13) 06:36	07:09	06:46	07:22
	16:49	17:26	18:02 4	08:16 (12) 18:38 18	07:10 (13) 20:11	20:42	20:52	20:30	08:07 (13) 19:42 22	08:07 (13) 18:50	17:02	16:38
4	07:40	07:22	06:42	05:49	06:52 (13) 06:02	05:34	05:38	06:05	07:46 (13) 06:38	07:10	06:47	07:23
	16:50	17:27	18:03	18:39 18	07:10 (13) 20:12	20:42	20:51	20:29	08:08 (13) 19:41 22	08:08 (13) 18:48	17:00	16:37
5	07:40	07:21	06:41	06:47	07:50 (13) 06:01	05:34	05:38	06:06	07:45 (13) 06:39	07:11	06:48	07:24
	16:51	17:28	18:04	19:40 20	08:10 (13) 20:13	20:43	20:51	20:28	08:07 (13) 19:39 22	08:07 (13) 18:46	16:59	16:37
6	07:40	07:20	06:39	06:45	07:49 (13) 05:59	05:34	05:39	06:07	07:44 (13) 06:40	07:12	06:49	07:25
	16:52	17:30	18:05	19:41 22	08:11 (13) 20:14	20:44	20:51	20:26	08:06 (13) 19:37 22	08:06 (13) 18:44	16:58	16:37
7	07:40	07:19	06:37	06:44	07:49 (13) 05:58	05:33	05:40	06:08	07:46 (13) 06:41	07:13	06:51	07:26
	16:53	17:31	18:06	19:42 22	08:11 (13) 20:15	20:44	20:51	20:25	08:06 (13) 19:35 20	08:06 (13) 18:43	16:57	16:37
8	07:40	07:17	06:36	06:42	07:49 (13) 05:57	05:33	05:40	06:09	07:47 (13) 06:42	07:14	06:52	07:27
	16:54	17:32	18:08	19:43 22	08:11 (13) 20:16	20:45	20:50	20:24	08:05 (13) 19:34 18	08:05 (13) 18:41	16:56	16:37
9	07:40	07:16	06:34	06:40	07:48 (13) 05:56	05:33	05:41	06:10	07:46 (13) 06:43	07:16	06:53	07:28
	16:55	17:34	18:09	19:45 22	08:10 (13) 20:17	20:46	20:50	20:23	08:04 (13) 19:32 18	08:04 (13) 18:39	16:55	16:37
10	07:40	07:15	06:32	06:39	07:48 (13) 05:55	05:33	05:42	06:11	07:47 (13) 06:44	07:17	06:54	07:29
	16:56	17:35	18:10	19:46 22	08:10 (13) 20:18	20:46	20:50	20:21	08:03 (13) 19:30 16	08:03 (13) 18:38	16:53	16:37
11	07:39	07:14	06:31	06:37	07:48 (13) 05:53	05:32	05:42	06:12	07:50 (13) 06:45	07:18 08:42 (12)	06:56	07:30
	16:57	17:36	18:11	19:47 20	08:08 (13) 20:20	20:47	20:49	20:20	08:00 (13) 19:28 10	18:36 8 08:50 (12)	16:52	16:37
12	07:39	07:12	06:29	06:35	07:49 (13) 05:52	05:32	05:43	06:13	06:46	07:19 08:40 (12)	06:57	07:30
	16:58	17:38	18:12	19:48 18	08:07 (13) 20:21	20:47	20:49	20:19	19:27	18:34 14 08:54 (12)	16:51	16:37
13	07:39	07:11	06:27	06:34	07:51 (13) 05:51	05:32	05:44	06:14	06:47	07:20 08:39 (12)	06:58	07:31
	16:59	17:39	18:14	19:49 14	08:05 (13) 20:22	20:48	20:48	20:17	19:25	18:33 16 08:55 (12)	16:50	16:37
14	07:38	07:10	06:25	06:32	07:51 (13) 05:50	05:32	05:45	06:15	06:48	07:21 08:38 (12)	06:59	07:32
	17:00	17:40	18:15	19:50 12	08:03 (13) 20:23	20:48	20:48	20:16	19:23	18:31 18 08:56 (12)	16:49	16:37
15	07:38	07:08	06:24	06:30	05:49	05:32	05:45	06:16	06:49	07:22 08:37 (12)	07:01	07:33
	17:02	17:41	18:16	19:51	20:24	20:49	20:47	20:14	19:21	18:29 20 08:57 (12)	16:48	16:38
16	07:37	07:07	06:22	06:29	05:48	05:32	05:46	06:17	06:50	07:24 08:36 (12)	07:02	07:33
	17:03	17:43	18:17	19:53	20:25	20:49	20:46	20:13	19:20	18:28 20 08:56 (12)	16:48	16:38
17	07:37	07:05 08:12 (12)	06:20	06:27	05:47	05:32	05:47	06:18	06:51	07:25 08:36 (12)	07:03	07:34
	17:04	17:44 8 08:20 (12)	18:18	19:54	20:26	20:50	20:46	20:11	19:18	18:26 22 08:58 (12)	16:47	16:38
18	07:36	07:04 08:08 (12)	06:18	06:25	05:46	05:32	05:48	06:19	06:52	07:26 08:35 (12)	07:04	07:35
	17:05	17:45 14 08:22 (12)	18:19	19:55	20:27	20:50	20:45	20:10	19:16	18:24 22 08:57 (12)	16:46	16:38
19	07:36	07:03 08:07 (12)	06:17	06:24	05:45	05:32	05:49	06:20	06:54	07:27 08:36 (12)	07:06	07:35
	17:06	17:47 16 08:23 (12)	18:21	19:56	20:28	20:50	20:44	20:08	19:14	18:23 20 08:56 (12)	16:45	16:39
20	07:35	07:01 08:05 (12)	06:15	06:22	05:44	05:32	05:50	06:21	06:55	07:28 08:35 (12)	07:07	07:36
	17:08	17:48 20 08:25 (12)	18:22	19:57	20:29	20:51	20:44	20:07	19:12	18:21 20 08:55 (12)	16:44	16:39
21	07:35	07:00 08:06 (12)	06:13	06:21	05:43	05:33	05:51	06:23	06:56	07:30 08:37 (12)	07:08	07:37
	17:09	17:49 20 08:26 (12)	18:23	19:58	20:30	20:51	20:43	20:05	19:11	18:20 18 08:55 (12)	16:44	16:40
22	07:34	06:58 08:04 (12)	06:11	06:19	05:42	05:33	05:52	06:24	06:57	07:31 08:36 (12)	07:09	07:37
	17:10	17:50 22 08:26 (12)	18:24	19:59	20:31	20:51	20:42	20:04	19:09	18:18 18 08:54 (12)	16:43	16:40
23	07:33	06:57 08:05 (12)	06:10	06:18	05:42	05:33	05:53	06:25	06:58	07:32 08:37 (12)	07:11	07:38
	17:11	17:52 22 08:27 (12)	18:25	20:01	20:32	20:51	20:41	20:02	19:07	18:17 16 08:53 (12)	16:42	16:41
24	07:32	06:55 08:03 (12)	06:08	06:16	05:41	05:33	05:53	06:26	06:59	07:33 08:38 (12)	07:12	07:38
	17:13	17:53 22 08:25 (12)	18:26	20:01	20:33	20:52	20:40	20:01	19:05	18:15 12 08:50 (12)	16:42	16:41
25	07:32	06:53 08:03 (12)	06:06	06:15	05:40	05:34	05:54	06:27	07:00	06:34 07:42 (12)	07:13	07:38
	17:14	17:54 22 08:25 (12)	18:28	20:02	20:34	20:52	20:39	19:57	19:04	17:14 6 07:48 (12)	16:41	16:42
26	07:31	06:52 08:04 (12)	06:04	06:13	05:39	05:34	05:55	06:28	07:01	06:36	07:14	07:39
	17:15	17:55 20 08:24 (12)	18:29	20:03	20:35	20:52	20:39	19:56	19:02	17:12	16:40	16:42
27	07:30	06:50 08:04 (12)	06:03	06:12	05:39	05:34	05:56	06:29	07:02	06:37	07:15	07:39
	17:17	17:57 20 08:24 (12)	18:30	20:04	20:36	20:52	20:38	19:54	19:00	17:11	16:40	16:43
28	07:29	06:49 08:05 (12)	06:01	06:10	05:38	05:35	05:57	06:30 07:57 (13)	07:03	06:38	07:16	07:39
	17:18	17:58 18 08:23 (12)	18:31	20:05	20:37	20:52	20:37	19:52 4 08:01 (13)	18:58	17:10	16:39	16:44
29	07:28		05:59	06:09	05:37	05:35	05:58	06:31 07:52 (13)	07:04	06:39	07:18	07:40
	17:19		18:32	20:06	20:37	20:52	20:36	19:51 12 08:04 (13)	18:57	17:08	16:39	16:45
30	07:27		05:57	06:07	05:37	05:36	05:59	06:32 07:51 (13)	07:05	06:41	07:19	07:40
	17:20		18:33	20:07	20:38	20:52	20:35	19:49 14 08:05 (13)	18:55	17:07	16:39	16:45
31	07:26		05:56		05:36		06:00	06:33 07:48 (13)		06:42		07:40
	17:22		18:34		20:39		20:33	19:47 18 08:06 (13)		17:05		16:46
Potential sun hours	293	295	370	209	-292	-263	-280	-145	375	343	294	283
Total, worst case		224	30	256				48	212	250		
Sun reduction		0.45	0.45	0.55				0.55	0.55	0.45		
Oper. time red.		0.86	0.86	0.86				0.86	0.86	0.86		
Wind dir. red.		0.63	0.63	0.61				0.61	0.61	0.63		
Total reduction		0.24	0.24	0.29				0.29	0.29	0.24		
Total, real		54	7	74				14	61	61		

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	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, North part
16 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
1000 meter max shadow distance applied along with default 3° inclination
Sunshine probabilities applied (pdf plots)
Directional run-hours applied from tab file (tower 1)
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03/05/06 23:47 / 15

Licensed user:
Wind Engineers, Inc.
7660 Whitegate Avenue
US-RIVERSIDE, CA 92506

Calculated:
03/02/06 05:47/2.4.0.67

SHADOW - Calendar

Calculation: North part **Shadow receptor:** 653 - 653

Assumptions for shadow calculations

Maximum distance for influence	1,000	m
Minimum sun height over horizon for influence	3	°
Day step for calculation	1	days
Time step for calculation	2	minutes

Sun shine probabilities (part of time from sun rise to sun set with sun shine)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.35	0.45	0.45	0.55	0.55	0.55	0.65	0.55	0.55	0.45	0.35	0.30

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
475	585	238	199	220	474	1,184	813	840	1,246	803	479	7,555

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:40 - 16:47	07:25 - 17:23	06:47 - 17:59	05:54 - 18:36	06:06 - 20:08 (14) 06:56 (13) - 07:10 (13)	05:36 - 20:40	05:36 - 20:52	06:01 - 20:32 (20) 07:02 (13) - 07:22 (13)	06:34 - 19:46	07:07 - 18:53	06:43 - 17:04	07:20 - 16:38
2	07:40 - 16:48	07:24 - 17:24	06:46 - 18:00	05:52 - 18:37	06:05 - 20:10 (16) 06:55 (13) - 07:11 (13)	05:35 - 20:41	05:37 - 20:52	06:02 - 20:31 (20) 07:01 (13) - 07:21 (13)	06:35 - 19:44	07:08 - 18:51	06:44 - 17:03	07:21 - 16:38
3	07:40 - 16:49	07:23 - 17:26	06:44 - 18:02	05:51 - 18:38	06:03 - 20:11 (18) 06:54 (13) - 07:12 (13)	05:35 - 20:42	05:37 - 20:52	06:03 - 20:30 (20) 07:02 (13) - 07:22 (13)	06:36 - 19:42	07:09 - 18:50	06:46 - 17:02	07:22 - 16:38
4	07:40 - 16:50	07:22 - 17:27	06:42 - 18:03	05:49 - 18:39	06:02 - 20:12 (20) 06:52 (13) - 07:12 (13)	05:34 - 20:42	05:38 - 20:51	06:05 - 20:29 (22) 07:01 (13) - 07:23 (13)	06:38 - 19:41	07:10 - 18:48	06:47 - 17:00	07:23 - 16:37
5	07:40 - 16:51	07:21 - 17:28	06:41 - 18:04	06:47 - 19:40	06:01 - 20:13 (22) 06:51 (13) - 07:13 (13)	05:34 - 20:43	05:38 - 20:51	06:06 - 20:28 (20) 07:02 (13) - 07:22 (13)	06:39 - 19:39	07:11 - 18:46	06:48 - 16:59	07:24 - 16:37
6	07:40 - 16:52	07:20 - 17:30	06:39 - 18:05	06:45 - 19:41	05:59 - 20:14 (20) 06:52 (13) - 07:12 (13)	05:34 - 20:44	05:39 - 20:51	06:07 - 20:26 (22) 07:01 (13) - 07:23 (13)	06:40 - 19:37	07:12 - 18:44	06:49 - 16:58	07:25 - 16:37
7	07:40 - 16:53	07:19 - 17:31	06:37 - 18:06	06:44 - 19:42	05:58 - 20:15 (22) 06:51 (13) - 07:13 (13)	05:33 - 20:44	05:40 - 20:51	06:08 - 20:25 (20) 07:02 (13) - 07:22 (13)	06:41 - 19:35	07:13 - 18:43	06:51 - 16:57	07:26 - 16:37
8	07:40 - 16:54	07:17 - 17:32	06:36 - 18:08	06:42 - 19:43	05:57 - 20:16 (20) 06:52 (13) - 07:12 (13)	05:33 - 20:45	05:40 - 20:50	06:09 - 20:24 (20) 07:01 (13) - 07:21 (13)	06:42 - 19:34	07:14 - 18:41	06:52 - 16:56	07:27 - 16:37
9	07:40 - 16:55	07:16 - 17:34	06:34 - 18:09	06:40 - 19:45	05:56 - 20:17 (22) 06:50 (13) - 07:12 (13)	05:33 - 20:46	05:41 - 20:50	06:10 - 20:23 (20) 07:02 (13) - 07:22 (13)	06:43 - 19:32	07:16 - 18:39	06:53 - 16:55	07:28 - 16:37
10	07:40 - 16:56	07:15 - 17:35	06:32 - 18:10	06:39 - 19:46	05:55 - 20:18 (20) 06:51 (13) - 07:11 (13)	05:33 - 20:46	05:42 - 20:50	06:11 - 20:21 (18) 07:03 (13) - 07:21 (13)	06:44 - 19:30	07:17 - 18:38	06:54 - 16:53	07:29 - 16:37
11	07:39 - 16:57	07:14 - 17:36	06:31 - 18:11	06:37 - 19:47	05:53 - 20:20 (20) 06:52 (13) - 07:12 (13)	05:32 - 20:47	05:42 - 20:49	06:12 - 20:20 (16) 07:04 (13) - 07:20 (13)	06:45 - 19:28	07:18 - 18:36	06:56 - 16:52	07:30 - 16:37
12	07:39 - 16:58	07:12 - 17:38	06:29 - 18:12	06:35 - 19:48	05:52 - 20:21 (20) 06:51 (13) - 07:11 (13)	05:32 - 20:47	05:43 - 20:49	06:13 - 20:19 (12) 07:05 (13) - 07:17 (13)	08:03 (12) - 19:27 (4)	07:19 - 18:34	06:57 - 16:51	07:30 - 16:37
13	07:39 - 16:59	07:11 - 17:39	06:27 - 18:14	06:34 - 19:49	05:51 - 20:22 (18) 06:52 (13) - 07:10 (13)	05:32 - 20:48	05:44 - 20:48	06:14 - 20:17 (10) 07:06 (13) - 07:16 (13)	08:07 (12) - 19:25 (12)	07:20 - 18:33	06:58 - 16:50	07:31 - 16:37
14	07:38 - 17:00	07:10 - 17:40	06:25 - 18:15	06:32 - 19:50	05:50 - 20:23 (16) 06:53 (13) - 07:09 (13)	05:32 - 20:48	05:45 - 20:48	06:15 - 20:16	08:10 (12) - 19:23 (16)	07:21 - 18:31	06:59 - 16:49	07:32 - 16:37
15	07:38 - 17:02	07:08 - 17:41	06:24 - 18:16	06:30 - 19:51	05:49 - 20:24 (14) 06:54 (13) - 07:08 (13)	05:32 - 20:49	05:45 - 20:47	06:16 - 20:14	08:11 (12) - 19:21 (18)	07:22 - 18:29	07:01 - 16:48	07:33 - 16:38
16	07:37 - 17:03	07:07 - 17:43	06:22 - 18:17	06:29 - 19:53	05:48 - 20:25 (12) 06:55 (13) - 07:07 (13)	05:32 - 20:49	05:46 - 20:46	06:17 - 20:13	08:12 (12) - 19:20 (20)	07:24 - 18:28	07:02 - 16:48	07:33 - 16:38
17	07:37 - 17:04	07:05 - 17:44	06:20 - 18:18	06:27 - 19:54	05:47 - 20:26 (6) 06:58 (13) - 07:04 (13)	05:32 - 20:50	05:47 - 20:46	06:18 - 20:11	08:13 (12) - 19:18 (20)	07:25 - 18:26	07:03 - 16:47	07:34 - 16:38
18	07:36 - 17:05	07:04 - 17:45	06:18 - 18:19 (10) 07:12 (12) - 07:22 (12)	06:26 - 19:55	05:46 - 20:27	05:32 - 20:50	05:48 - 20:45	06:19 - 20:10	08:14 (12) - 19:16 (22)	07:26 - 18:24	07:04 - 16:46	07:35 - 16:38
19	07:36 - 17:06	07:03 - 17:47	06:17 - 18:21 (16) 07:08 (12) - 07:24 (12)	06:24 - 19:56	05:45 - 20:28	05:32 - 20:50	05:49 - 20:44	06:20 - 20:08	08:15 (12) - 19:14 (22)	07:27 - 18:23	07:06 - 16:45	07:35 - 16:39
20	07:35 - 17:08	07:01 - 17:48	06:15 - 18:22 (18) 07:06 (12) - 07:24 (12)	06:22 - 19:57	05:44 - 20:29	05:32 - 20:51	05:50 - 20:44	06:22 - 20:07	08:16 (12) - 19:12 (22)	07:28 - 18:21	07:07 - 16:44	07:36 - 16:39
21	07:35 - 17:09	07:00 - 17:49	06:13 - 18:23 (20) 07:05 (12) - 07:25 (12)	06:21 - 19:58	05:43 - 20:30	05:33 - 20:51	05:51 - 20:43	06:23 - 20:05	08:17 (12) - 19:11 (22)	07:30 - 18:20	07:08 - 16:44	07:37 - 16:40
22	07:34 - 17:10	06:58 - 17:50	06:11 - 18:24 (20) 07:05 (12) - 07:25 (12)	06:19 - 19:59	05:42 - 20:31	05:33 - 20:51	05:52 - 20:42	06:24 - 20:04	08:18 (12) - 19:09 (20)	07:31 - 18:18	07:09 - 16:43	07:37 - 16:40
23	07:33 - 17:11	06:57 - 17:52	06:10 - 18:25 (22) 07:03 (12) - 07:25 (12)	06:18 - 20:01	05:42 - 20:32	05:33 - 20:51	05:53 - 20:41	06:25 - 20:02	08:19 (12) - 19:07 (20)	07:32 - 18:17	07:11 - 16:42	07:38 - 16:41
24	07:32 - 17:13	06:55 - 17:53	06:08 - 18:26 (22) 07:03 (12) - 07:25 (12)	06:16 - 20:01	05:41 - 20:33	05:33 - 20:52	05:53 - 20:40	06:26 - 20:01	08:20 (12) - 19:05 (16)	07:33 - 18:15	07:12 - 16:42	07:38 - 16:41
25	07:32 - 17:14	06:53 - 17:54	06:06 - 18:28 (22) 07:04 (12) - 07:26 (12)	06:15 - 20:02	05:40 - 20:34	05:34 - 20:52	05:54 - 20:39	06:27 - 19:57	08:21 (12) - 19:04 (14)	07:34 - 17:14	07:13 - 16:41	07:38 - 16:42
26	07:31 - 17:15	06:52 - 17:55	06:04 - 18:29 (20) 07:04 (12) - 07:24 (12)	06:13 - 20:03	05:39 - 20:35	05:34 - 20:52	05:55 - 20:39 (4) 07:10 (13) - 07:14 (13)	06:28 - 19:56	08:06 (12) - 19:02 (6)	07:36 - 17:12	07:14 - 16:40	07:39 - 16:42
27	07:30 - 17:17	06:50 - 17:57	06:03 - 18:30 (20) 07:04 (12) - 07:24 (12)	06:12 - 20:04	05:39 - 20:36	05:34 - 20:52	05:56 - 20:38 (10) 07:07 (13) - 07:17 (13)	06:29 - 19:54	08:01 (12) - 19:00	06:37 - 17:11	07:15 - 16:40	07:39 - 16:43
28	07:29 - 17:18	06:49 - 17:58	06:01 - 18:31 (18) 07:04 (12) - 07:22 (12)	06:10 - 20:05	05:38 - 20:37	05:35 - 20:52	05:57 - 20:37 (12) 07:06 (13) - 07:18 (13)	06:30 - 19:52	07:03 - 18:58	06:38 - 17:10	07:16 - 16:39	07:39 - 16:44
29	07:28 - 17:19		05:59 - 18:32 (16) 07:05 (12) - 07:21 (12)	06:09 - 20:06 (4) 07:01 (13) - 07:05 (13)	05:37 - 20:37	05:35 - 20:52	05:58 - 20:36 (14) 07:05 (13) - 07:19 (13)	06:31 - 19:51	07:04 - 18:57	06:39 - 17:08	07:18 - 16:39	07:40 - 16:45
30	07:27 - 17:20		05:57 - 18:33 (12) 07:07 (12) - 07:19 (12)	06:07 - 20:07 (10) 06:58 (13) - 07:08 (13)	05:37 - 20:38	05:36 - 20:52	05:59 - 20:34 (16) 07:04 (13) - 07:20 (13)	06:32 - 19:49	07:05 - 18:55	06:41 - 17:07	07:19 - 16:39	07:40 - 16:45
31	07:26 - 17:22		05:56 - 18:34 (6) 07:09 (12) - 07:15 (12)		05:36 - 20:39		06:00 - 20:33 (18) 07:03 (13) - 07:21 (13)	06:33 - 19:47		06:42 - 17:05		07:40 - 16:46
Potential sun hours	293	295	370	209	-292	-263	-280	-145	375	343	294	283
Total, worst case			242	14	300		74	240	254			
Sun reduction			0.45	0.55	0.55		0.65	0.55	0.55			
Oper. time red.			0.86	0.86	0.86		0.86	0.86	0.86			
Wind dir. red.			0.60	0.60	0.60		0.60	0.60	0.60			
Total reduction			0.23	0.28	0.28		0.33	0.28	0.29			
Total, real			56	4	85		25	68	72			

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	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, North part
16 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
1000 meter max shadow distance applied along with default 3° inclination
Sunshine probabilities applied (pdf plots)
Directional run-hours applied from tab file (tower 1)
.

Printed/Page
03/05/06 23:47 / 16
Licensed user:
Wind Engineers, Inc.
7660 Whitegate Avenue
US-RIVERSIDE, CA 92506

Calculated:
03/02/06 05:47/2.4.0.67

SHADOW - Calendar

Calculation: North part **Shadow receptor:** 654 - 654

Assumptions for shadow calculations

Maximum distance for influence	1,000	m
Minimum sun height over horizon for influence	3	°
Day step for calculation	1	days
Time step for calculation	2	minutes

Sun shine probabilities (part of time from sun rise to sun set with sun shine)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.35	0.45	0.45	0.55	0.55	0.55	0.65	0.55	0.55	0.45	0.35	0.30

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
475	585	238	199	220	474	1,184	813	840	1,246	803	479	7,555

	January		February			March	April			May			June
1	07:40		07:25		08:18 (11)	06:47	05:54			06:06		07:20 (12)	05:36
	16:47		17:23	24	08:42 (11)	17:59	18:35			20:08	26	07:46 (12)	20:40
2	07:40		07:24		08:17 (11)	06:45	05:52			06:05		07:21 (12)	05:35
	16:48		17:24	26	08:43 (11)	18:00	18:37			20:10	24	07:45 (12)	20:41
3	07:40		07:23		08:16 (11)	06:44	05:51			06:03		07:22 (12)	05:35
	16:49		17:26	28	08:44 (11)	18:02	18:38			20:11	22	07:44 (12)	20:42
4	07:40		07:22		08:17 (11)	06:42	05:49			06:02		07:22 (12)	05:34
	16:50		17:27	28	08:45 (11)	18:03	18:39			20:12	20	07:42 (12)	20:42
5	07:40		07:21		08:16 (11)	06:41	06:47			06:01		07:25 (12)	05:34
	16:51		17:28	30	08:46 (11)	18:04	19:40			20:13	16	07:41 (12)	20:43
6	07:40		07:20		08:16 (11)	06:39	06:45			05:59		07:28 (12)	05:34
	16:52		17:30	30	08:46 (11)	18:05	19:41			20:14	10	07:38 (12)	20:44
7	07:40		07:19		08:15 (11)	06:37	06:44			05:58			05:33
	16:53		17:31	30	08:45 (11)	18:06	19:42			20:15			20:44
8	07:40		07:17		08:16 (11)	06:36	06:42			05:57			05:33
	16:54		17:32	30	08:46 (11)	18:08	19:43			20:16			20:45
9	07:40		07:16		08:15 (11)	06:34	06:40			05:56			05:33
	16:55		17:34	32	08:47 (11)	18:09	19:45			20:17			20:46
10	07:40		07:15		08:15 (11)	06:32	06:39			05:55			05:33
	16:56		17:35	30	08:45 (11)	18:10	19:46			20:18			20:46
11	07:39		07:14		08:16 (11)	06:30	06:37		07:36 (12)	05:53			05:32
	16:57		17:36	30	08:46 (11)	18:11	19:47	4	07:40 (12)	20:20			20:47
12	07:39		07:12		08:17 (11)	06:29	06:35		07:31 (12)	05:52			05:32
	16:58		17:38	28	08:45 (11)	18:12	19:48	16	07:47 (12)	20:21			20:47
13	07:39		07:11		08:17 (11)	06:27	06:34		07:27 (12)	05:51			05:32
	16:59		17:39	28	08:45 (11)	18:14	19:49	20	07:47 (12)	20:22			20:48
14	07:38		07:10		08:18 (11)	06:25	06:32		07:25 (12)	05:50			05:32
	17:00		17:40	26	08:44 (11)	18:15	19:50	24	07:49 (12)	20:23			20:48
15	07:38		07:08		08:18 (11)	06:24	06:30		07:24 (12)	05:49			05:32
	17:02		17:41	24	08:42 (11)	18:16	19:51	26	07:50 (12)	20:24			20:49
16	07:37		07:07		08:19 (11)	06:22	06:29		07:22 (12)	05:48			05:32
	17:03		17:43	22	08:41 (11)	18:17	19:53	30	07:52 (12)	20:25			20:49
17	07:37		07:05		08:22 (11)	06:20	06:27		07:21 (12)	05:47			05:32
	17:04		17:44	18	08:40 (11)	18:18	19:54	32	07:53 (12)	20:26			20:50
18	07:36		07:04		08:24 (11)	06:18	06:25		07:21 (12)	05:46			05:32
	17:05		17:45	12	08:36 (11)	18:19	19:55	32	07:53 (12)	20:27			20:50
19	07:36		07:03		08:29 (11)	06:17	06:24		07:19 (12)	05:45			05:32
	17:06		17:47	4	08:33 (11)	18:21	19:56	34	07:53 (12)	20:28			20:50
20	07:35		07:01			06:15	06:22		07:20 (12)	05:44			05:32
	17:08		17:48			18:22	19:57	32	07:52 (12)	20:29			20:51
21	07:35		07:00			06:13	06:21		07:18 (12)	05:43			05:33
	17:09		17:49			18:23	19:58	34	07:52 (12)	20:30			20:51
22	07:34		06:58			06:11	06:19		07:19 (12)	05:42			05:33
	17:10		17:50			18:24	19:59	34	07:53 (12)	20:31			20:51
23	07:33		06:57			06:10	06:18		07:17 (12)	05:42			05:33
	17:11		17:52			18:25	20:00	34	07:51 (12)	20:32			20:51
24	07:32		06:55			06:08	06:16		07:18 (12)	05:41			05:33
	17:13		17:53			18:26	20:00	34	07:52 (12)	20:33			20:52
25	07:32		06:53			06:06	06:15		07:19 (12)	05:40			05:34
	17:14		17:54			18:28	20:02	34	07:53 (12)	20:34			20:52
26	07:31		06:52			06:04	06:13		07:17 (12)	05:39			05:34
	17:15		17:55			18:29	20:03	34	07:51 (12)	20:35			20:52
27	07:30		06:50			06:03	06:12		07:18 (12)	05:39			05:34
	17:17	8	17:57			18:30	20:04	32	07:50 (12)	20:36			20:52
28	07:29		06:49			06:01	06:10		07:18 (12)	05:38			05:35
	17:18	14	17:58			18:31	20:05	32	07:50 (12)	20:37			20:52
29	07:28					05:59	06:09		07:19 (12)	05:37			05:35
	17:19	18				18:32	20:06	30	07:49 (12)	20:37			20:52
30	07:27					05:57	06:07		07:20 (12)	05:37			05:36
	17:20	20				18:33	20:07	28	07:48 (12)	20:38			20:52
31	07:26					05:56				05:36			
	17:22	22				18:34				20:39			
Potential sun hours	293		295			370	209			-292			-263
Total, worst case		82		480				576			118		
Sun reduction		0.35		0.45				0.55			0.55		
Oper. time red.		0.86		0.86				0.86			0.86		
Wind dir. red.		0.63		0.63				0.61			0.61		
Total reduction		0.19		0.25				0.29			0.29		
Total, real		16		118				167			34		

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	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, North part
16 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
1000 meter max shadow distance applied along with default 3° inclination
Sunshine probabilities applied (pdf plots)
Directional run-hours applied from tab file (tower 1)
.

Printed/Page
03/05/06 23:47 / 17
Licensed user:
Wind Engineers, Inc.
7660 Whitegate Avenue
US-RIVERSIDE, CA 92506

Calculated:
03/02/06 05:47/2.4.0.67

SHADOW - Calendar

Calculation: North part **Shadow receptor:** 654 - 654

Assumptions for shadow calculations

Maximum distance for influence	1,000	m
Minimum sun height over horizon for influence	3	°
Day step for calculation	1	days
Time step for calculation	2	minutes

Sun shine probabilities (part of time from sun rise to sun set with sun shine)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.35	0.45	0.45	0.55	0.55	0.55	0.65	0.55	0.55	0.45	0.35	0.30

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
475	585	238	199	220	474	1,184	813	840	1,246	803	479	7,555

	July		August		September		October		November		December
1	05:36		06:01		06:34	07:35 (12)	07:07		06:43	07:45 (11)	07:20
	20:52		20:32		19:46	4 07:39 (12)	18:53		17:04	30 08:15 (11)	16:38
2	05:37		06:02		06:35		07:08		06:44	07:44 (11)	07:21
	20:52		20:31		19:44		18:51		17:03	32 08:16 (11)	16:38
3	05:37		06:03		06:36		07:09		06:46	07:46 (11)	07:22
	20:52		20:30		19:42		18:49		17:02	30 08:16 (11)	16:38
4	05:38		06:05		06:38		07:10		06:47	07:45 (11)	07:23
	20:51		20:29		19:41		18:48		17:00	30 08:15 (11)	16:37
5	05:38		06:06		06:39		07:11		06:48	07:46 (11)	07:24
	20:51		20:28		19:39		18:46		16:59	30 08:16 (11)	16:37
6	05:39		06:07	07:41 (12)	06:40		07:12		06:49	07:46 (11)	07:25
	20:51		20:26	4 07:45 (12)	19:37		18:44		16:58	30 08:16 (11)	16:37
7	05:40		06:08	07:36 (12)	06:41		07:13		06:51	07:47 (11)	07:26
	20:51		20:25	12 07:48 (12)	19:35		18:43		16:57	28 08:15 (11)	16:37
8	05:40		06:09	07:33 (12)	06:42		07:14		06:52	07:46 (11)	07:27
	20:50		20:24	18 07:51 (12)	19:34		18:41		16:56	28 08:14 (11)	16:37
9	05:41		06:10	07:32 (12)	06:43		07:16		06:53	07:48 (11)	07:28
	20:50		20:23	20 07:52 (12)	19:32		18:39		16:55	26 08:14 (11)	16:37
10	05:42		06:11	07:31 (12)	06:44		07:17		06:54	07:49 (11)	07:29
	20:50		20:21	22 07:53 (12)	19:30		18:38		16:53	24 08:13 (11)	16:37
11	05:42		06:12	07:28 (12)	06:45		07:18		06:56	07:51 (11)	07:29
	20:49		20:20	26 07:54 (12)	19:28		18:36		16:52	22 08:13 (11)	16:37
12	05:43		06:13	07:27 (12)	06:46		07:19		06:57	07:52 (11)	07:30
	20:49		20:18	28 07:55 (12)	19:27		18:34		16:51	20 08:12 (11)	16:37
13	05:44		06:14	07:26 (12)	06:47		07:20		06:58	07:53 (11)	07:31
	20:48		20:17	30 07:56 (12)	19:25		18:33		16:50	18 08:11 (11)	16:37
14	05:45		06:15	07:27 (12)	06:48		07:21		06:59	07:55 (11)	07:32
	20:48		20:16	30 07:57 (12)	19:23		18:31		16:49	14 08:09 (11)	16:37
15	05:45		06:16	07:26 (12)	06:49		07:22		07:01	07:58 (11)	07:33
	20:47		20:14	32 07:58 (12)	19:21		18:29		16:48	8 08:06 (11)	16:38
16	05:46		06:17	07:25 (12)	06:50		07:24		07:02		07:33
	20:46		20:13	32 07:57 (12)	19:20		18:28		16:48		16:38
17	05:47		06:18	07:24 (12)	06:51		07:25		07:03		07:34
	20:46		20:11	34 07:58 (12)	19:18		18:26		16:47		16:38
18	05:48		06:19	07:23 (12)	06:52		07:26		07:04		07:35
	20:45		20:10	34 07:57 (12)	19:16		18:24		16:46		16:38
19	05:49		06:20	07:24 (12)	06:54		07:27		07:06		07:35
	20:44		20:08	34 07:58 (12)	19:14		18:23		16:45		16:39
20	05:50		06:21	07:23 (12)	06:55		07:28		07:07		07:36
	20:44		20:07	34 07:57 (12)	19:12		18:21		16:44		16:39
21	05:51		06:23	07:24 (12)	06:56		07:30		07:08		07:37
	20:43		20:05	34 07:58 (12)	19:11		18:20		16:44		16:40
22	05:52		06:24	07:23 (12)	06:57		07:31		07:09		07:37
	20:42		20:04	34 07:57 (12)	19:09		18:18		16:43		16:40
23	05:53		06:25	07:24 (12)	06:58		07:32	08:57 (11)	07:11		07:38
	20:41		20:02	32 07:56 (12)	19:07		18:17	6 09:03 (11)	16:42		16:41
24	05:53		06:26	07:23 (12)	06:59		07:33	08:52 (11)	07:12		07:38
	20:40		20:01	32 07:55 (12)	19:05		18:15	16 09:08 (11)	16:42		16:41
25	05:54		06:27	07:24 (12)	07:00		06:34	07:52 (11)	07:13		07:38
	20:39		19:57	32 07:56 (12)	19:04		17:14	18 08:10 (11)	16:41		16:42
26	05:55		06:28	07:23 (12)	07:01		06:36	07:49 (11)	07:14		07:39
	20:39		19:56	32 07:55 (12)	19:02		17:12	22 08:11 (11)	16:40		16:42
27	05:56		06:29	07:24 (12)	07:02		06:37	07:48 (11)	07:15		07:39
	20:38		19:54	28 07:52 (12)	19:00		17:11	24 08:12 (11)	16:40		16:43
28	05:57		06:30	07:25 (12)	07:03		06:38	07:48 (11)	07:16		07:39
	20:37		19:52	26 07:51 (12)	18:58		17:10	26 08:14 (11)	16:39		16:44
29	05:58		06:31	07:26 (12)	07:04		06:39	07:47 (11)	07:18		07:40
	20:36		19:51	24 07:50 (12)	18:56		17:08	26 08:13 (11)	16:39		16:45
30	05:59		06:32	07:27 (12)	07:05		06:41	07:46 (11)	07:19		07:40
	20:34		19:49	20 07:47 (12)	18:55		17:07	28 08:14 (11)	16:39		16:45
31	06:00		06:33	07:30 (12)			06:42	07:46 (11)			07:40
	20:33		19:47	14 07:44 (12)			17:05	30 08:16 (11)			16:46
Potential sun hours	-280		-145		375		343		294		283
Total, worst case				698		4		196		370	
Sun reduction				0.55		0.55		0.45		0.35	
Oper. time red.				0.86		0.86		0.86		0.86	
Wind dir. red.				0.61		0.61		0.63		0.63	
Total reduction				0.29		0.29		0.25		0.19	
Total, real				202		1		48		71	

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	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, North part
16 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
1000 meter max shadow distance applied along with default 3° inclination
Sunshine probabilities applied (pdf plots)
Directional run-hours applied from tab file (tower 1)
.

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03/05/06 23:47 / 18
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Wind Engineers, Inc.
7660 Whitegate Avenue
US-RIVERSIDE, CA 92506

Calculated:
03/02/06 05:47/2.4.0.67

SHADOW - Calendar

Calculation: North part **Shadow receptor:** 655 - 655

Assumptions for shadow calculations

Maximum distance for influence	1,000	m
Minimum sun height over horizon for influence	3	°
Day step for calculation	1	days
Time step for calculation	2	minutes

Sun shine probabilities (part of time from sun rise to sun set with sun shine)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.35	0.45	0.45	0.55	0.55	0.55	0.65	0.55	0.55	0.45	0.35	0.30

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
475	585	238	199	220	474	1,184	813	840	1,246	803	479	7,555

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:40 - 16:47	07:25 - 17:23	06:47 - 17:59	07:43 (11) - 08:03 (11)	05:54 - 18:36	06:06 - 20:08	05:36 - 20:40	05:36 - 20:52	06:01 - 20:32	06:34 - 19:46	07:07 - 18:53	06:43 - 17:04	07:20 - 16:38
2	07:40 - 16:48	07:24 - 17:24	06:46 - 18:00	07:45 (11) - 08:01 (11)	05:52 - 18:37	06:05 - 20:10	05:35 - 20:41	05:37 - 20:52	06:02 - 20:31	06:35 - 19:44	07:08 - 18:51	06:44 - 17:03	07:21 - 16:38
3	07:40 - 16:49	07:23 - 17:26	06:44 - 18:02	07:48 (11) - 07:58 (11)	05:51 - 18:38	06:03 - 20:11	05:35 - 20:42	05:37 - 20:52	06:03 - 20:30	06:36 - 19:42	07:09 - 18:50	06:46 - 17:02	07:22 - 16:38
4	07:40 - 16:50	07:22 - 17:27	06:42 - 18:03		05:49 - 18:39	06:02 - 20:12	05:34 - 20:42	05:38 - 20:51	06:05 - 20:29	06:38 - 19:41	07:10 - 18:48	06:47 - 17:00	07:23 - 16:37
5	07:40 - 16:51	07:21 - 17:28	06:41 - 18:04		06:47 - 19:40	06:01 - 20:13	05:34 - 20:43	05:38 - 20:51	06:06 - 20:28	06:39 - 19:39	07:11 - 18:46	06:48 - 16:59	07:24 - 16:37
6	07:40 - 16:52	07:20 - 17:30	06:39 - 18:05		06:45 - 19:41	05:59 - 20:14	05:34 - 20:44	05:39 - 20:51	06:07 - 20:26	06:40 - 19:37	07:12 - 18:44	06:49 - 16:58	07:25 - 16:37
7	07:40 - 16:53	07:19 - 17:31	06:37 - 18:06		06:44 - 19:42	05:58 - 20:15	05:33 - 20:44	05:40 - 20:51	06:08 - 20:25	06:41 - 19:35	07:13 - 18:43	06:51 - 16:57	07:26 - 16:37
8	07:40 - 16:54	07:17 - 17:32	06:36 - 18:08		06:42 - 19:43	05:57 - 20:16	05:33 - 20:45	05:40 - 20:50	06:09 - 20:24	06:42 - 19:34	07:14 - 18:41	06:52 - 16:56	07:27 - 16:37
9	07:40 - 16:55	07:16 - 17:34	06:34 - 18:09		06:40 - 19:45	05:56 - 20:17	05:33 - 20:46	05:41 - 20:50	06:10 - 20:23	06:43 - 19:32	07:16 - 18:39	06:53 - 16:55	07:28 - 16:37
10	07:40 - 16:56	07:15 - 17:35	06:32 - 18:10		06:39 - 19:46	05:55 - 20:18	05:33 - 20:46	05:42 - 20:50	06:11 - 20:21	06:44 - 19:30	07:17 - 18:38	08:23 (11) - 06:54	07:29 - 16:37
11	07:39 - 16:57	07:14 - 17:36	06:31 - 18:11		06:37 - 19:47	05:53 - 20:20	05:32 - 20:47	05:42 - 20:49	06:12 - 20:20	06:45 - 19:28	07:18 - 18:36	08:31 (11) - 16:53	07:30 - 16:37
12	07:39 - 16:58	07:12 - 17:38	06:29 - 18:12		06:35 - 19:48	05:52 - 20:21	05:32 - 20:47	05:43 - 20:49	06:13 - 20:19	07:27 (12) - 07:31 (12)	06:46 - 19:27	08:20 (11) - 16:52	07:30 - 16:37
13	07:39 - 16:59	07:11 - 17:39	06:27 - 18:14	07:17 (12) - 07:29 (12)	05:51 - 20:22	05:32 - 20:48	05:44 - 20:48	06:14 - 20:17	07:22 (12) - 07:32 (12)	06:47 - 19:25	07:20 - 18:34	08:34 (11) - 16:51	07:31 - 16:37
14	07:38 - 17:00	07:10 - 17:40	06:25 - 18:15	07:15 (12) - 07:31 (12)	05:50 - 20:23	05:32 - 20:48	05:45 - 20:48	06:15 - 20:16	07:19 (12) - 07:35 (12)	06:48 - 19:23	07:21 - 18:33	08:17 (11) - 16:50	07:32 - 16:37
15	07:38 - 17:02	07:08 - 17:41	06:24 - 18:16	07:14 (12) - 07:32 (12)	05:49 - 20:24	05:32 - 20:48	05:45 - 20:48	06:16 - 20:14	07:18 (12) - 07:36 (12)	06:49 - 19:21	07:22 - 18:31	08:16 (11) - 16:49	07:33 - 16:37
16	07:37 - 17:03	07:07 - 17:43 (4)	07:53 (11) - 07:57 (11)	07:12 (12) - 07:34 (12)	05:48 - 20:25	05:32 - 20:49	05:46 - 20:46	06:17 - 20:13	07:17 (12) - 07:37 (12)	06:50 - 19:20	07:24 - 18:28	08:15 (11) - 16:48	07:33 - 16:38
17	07:37 - 17:04	07:05 - 17:44 (12)	07:50 (11) - 08:02 (11)	07:11 (12) - 07:35 (12)	05:47 - 20:26	05:32 - 20:50	05:47 - 20:46	06:18 - 20:11	07:16 (12) - 07:38 (12)	06:51 - 19:18	07:25 - 18:26	08:14 (11) - 16:47	07:34 - 16:38
18	07:36 - 17:05	07:04 - 17:45 (16)	07:46 (11) - 08:02 (11)	07:09 (12) - 07:35 (12)	05:46 - 20:27	05:32 - 20:50	05:48 - 20:45	06:19 - 20:10	07:15 (12) - 07:39 (12)	06:52 - 19:16	07:26 - 18:24	08:13 (11) - 16:46	07:35 - 16:38
19	07:36 - 17:06	07:03 - 17:47 (20)	07:45 (11) - 08:05 (11)	07:10 (12) - 07:34 (12)	05:45 - 20:28	05:32 - 20:50	05:49 - 20:44	06:20 - 20:08	07:14 (12) - 07:38 (12)	06:54 - 19:14	07:27 - 18:23	08:14 (11) - 16:45	07:36 - 16:39
20	07:35 - 17:08	07:01 - 17:48 (20)	07:45 (11) - 08:05 (11)	07:08 (12) - 07:34 (12)	05:44 - 20:29	05:32 - 20:51	05:50 - 20:44	06:22 - 20:07	07:13 (12) - 07:39 (12)	06:55 - 19:12	07:28 - 18:21	08:13 (11) - 16:44	07:36 - 16:39
21	07:35 - 17:09	07:00 - 17:49 (22)	07:44 (11) - 08:06 (11)	07:08 (12) - 07:34 (12)	05:43 - 20:30	05:33 - 20:51	05:51 - 20:43	06:23 - 20:05	07:14 (12) - 07:38 (12)	06:56 - 19:11	07:30 - 18:20	08:15 (11) - 16:44	07:37 - 16:40
22	07:34 - 17:10	06:58 - 17:50 (24)	07:42 (11) - 08:06 (11)	07:09 (12) - 07:33 (12)	05:42 - 20:31	05:33 - 20:51	05:52 - 20:42	06:24 - 20:04	07:13 (12) - 07:39 (12)	06:57 - 19:09	07:31 - 18:18	08:14 (11) - 16:43	07:37 - 16:40
23	07:33 - 17:11	06:57 - 17:52 (24)	07:43 (11) - 08:07 (11)	07:07 (12) - 07:33 (12)	05:42 - 20:32	05:33 - 20:51	05:53 - 20:41	06:25 - 20:02	07:12 (12) - 07:38 (12)	06:58 - 19:07	07:32 - 18:17	08:15 (11) - 16:42	07:38 - 16:41
24	07:32 - 17:13	06:55 - 17:53 (24)	07:43 (11) - 08:07 (11)	07:08 (12) - 07:32 (12)	05:41 - 20:33	05:33 - 20:52	05:53 - 20:40	06:26 - 20:01	07:13 (12) - 07:37 (12)	06:59 - 19:05	07:33 - 18:15	08:16 (11) - 16:42	07:38 - 16:41
25	07:32 - 17:14	06:53 - 17:54 (24)	07:41 (11) - 08:05 (11)	07:09 (12) - 07:32 (12)	05:40 - 20:34	05:34 - 20:52	05:54 - 20:39	06:27 - 19:57	07:12 (12) - 07:36 (12)	07:00 - 19:04	06:34 - 17:14	07:20 (11) - 16:41	07:38 - 16:42
26	07:31 - 17:15	06:52 - 17:55 (24)	07:42 (11) - 08:06 (11)	07:09 (12) - 07:31 (12)	05:39 - 20:35	05:34 - 20:52	05:55 - 20:39	06:28 - 19:56	07:13 (12) - 07:35 (12)	07:01 - 19:02	06:36 - 17:12	07:30 (11) - 16:40	07:39 - 16:42
27	07:30 - 17:17	06:50 - 17:57 (22)	07:42 (11) - 08:04 (11)	07:10 (12) - 07:30 (12)	05:39 - 20:36	05:34 - 20:52	05:56 - 20:38	06:29 - 19:54	07:14 (12) - 07:34 (12)	07:02 - 19:00	06:37 - 17:11	07:15 - 16:40	07:39 - 16:43
28	07:29 - 17:18	06:49 - 17:58 (22)	07:43 (11) - 08:05 (11)	07:10 (12) - 07:28 (12)	05:38 - 20:37	05:35 - 20:52	05:57 - 20:37	06:30 - 19:52	07:15 (12) - 07:33 (12)	07:03 - 18:58	06:38 - 17:10	07:16 - 16:39	07:39 - 16:44
29	07:28 - 17:19		05:59 - 18:32	07:13 (12) - 07:27 (12)	05:37 - 20:37	05:35 - 20:52	05:58 - 20:36	06:31 - 19:51	07:16 (12) - 07:32 (12)	07:04 - 18:57	06:39 - 17:08	07:18 - 16:39	07:40 - 16:45
30	07:27 - 17:20		05:57 - 18:33	07:14 (12) - 07:24 (12)	05:37 - 20:38	05:36 - 20:52	05:59 - 20:34	06:32 - 19:49	07:17 (12) - 07:29 (12)	07:05 - 18:55	06:41 - 17:07	07:19 - 16:39	07:40 - 16:45
31	07:26 - 17:22		05:56 - 18:34		05:36 - 20:39		06:00 - 20:33	06:33 - 19:47		06:42 - 17:05			07:40 - 16:46
Potential sun hours	293	295	370	209	-292	-263	-280	-145	375	343	294	283	
Total, worst case		258	46	376				376		310			
Sun reduction		0.45	0.45	0.55				0.55		0.45			
Oper. time red.		0.86	0.86	0.86				0.86		0.86			
Wind dir. red.		0.62	0.62	0.61				0.61		0.62			
Total reduction		0.24	0.24	0.29				0.29		0.24			
Total, real		62	11	108				108		75			

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	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, North part
16 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
1000 meter max shadow distance applied along with default 3° inclination
Sunshine probabilities applied (pdf plots)
Directional run-hours applied from tab file (tower 1)
.

Licensed user:
Wind Engineers, Inc.
7660 Whitegate Avenue
US-RIVERSIDE, CA 92506

Calculated:
03/02/06 05:47/2.4.0.67

SHADOW - Calendar

Calculation: North part **Shadow receptor:** 658 - 658

Assumptions for shadow calculations

Maximum distance for influence	1,000	m
Minimum sun height over horizon for influence	3	°
Day step for calculation	1	days
Time step for calculation	2	minutes

Sun shine probabilities (part of time from sun rise to sun set with sun shine)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.35	0.45	0.45	0.55	0.55	0.55	0.65	0.55	0.55	0.45	0.35	0.30

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
475	585	238	199	220	474	1,184	813	840	1,246	803	479	7,555

	January		February			March			April		May			June		
1	07:40	16:47	07:25	17:23		06:47	17:59	26	07:27 (11)	07:53 (11)	05:54	18:35	06:06	20:08		05:36	20:40	32	06:22 (12)	06:54 (12)
2	07:40	16:48	07:24	17:24		06:45	18:00	28	07:25 (11)	07:53 (11)	05:52	18:37	06:05	20:10		05:35	20:41	34	06:22 (12)	06:56 (12)
3	07:40	16:49	07:23	17:26		06:44	18:02	30	07:24 (11)	07:54 (11)	05:51	18:38	06:03	20:11		05:35	20:42	34	06:21 (12)	06:55 (12)
4	07:40	16:50	07:22	17:27		06:42	18:03	30	07:24 (11)	07:54 (11)	05:49	18:39	06:02	20:12		05:34	20:42	32	06:23 (12)	06:55 (12)
5	07:40	16:51	07:21	17:28		06:41	18:04	32	07:22 (11)	07:54 (11)	06:47	19:40	06:01	20:13		05:34	20:43	32	06:22 (12)	06:54 (12)
6	07:40	16:52	07:20	17:30		06:39	18:05	32	07:23 (11)	07:55 (11)	06:45	19:41	05:59	20:14		05:34	20:44	34	06:22 (12)	06:56 (12)
7	07:40	16:53	07:19	17:31		06:37	18:06	32	07:21 (11)	07:53 (11)	06:44	19:42	05:58	20:15		05:33	20:44	34	06:22 (12)	06:56 (12)
8	07:40	16:54	07:17	17:32		06:36	18:08	32	07:21 (11)	07:53 (11)	06:42	19:43	05:57	20:16		05:33	20:45	32	06:24 (12)	06:56 (12)
9	07:40	16:55	07:16	17:34		06:34	18:09	32	07:22 (11)	07:54 (11)	06:40	19:45	05:56	20:17		05:33	20:46	32	06:23 (12)	06:55 (12)
10	07:40	16:56	07:15	17:35		06:32	18:10	30	07:22 (11)	07:52 (11)	06:39	19:46	05:55	20:18		05:33	20:46	32	06:23 (12)	06:55 (12)
11	07:39	16:57	07:14	17:36		06:30	18:11	30	07:22 (11)	07:52 (11)	06:37	19:47	05:53	20:20		05:32	20:47	32	06:23 (12)	06:55 (12)
12	07:39	16:58	07:12	17:38		06:29	18:12	28	07:22 (11)	07:50 (11)	06:35	19:48	05:52	20:21		05:32	20:47	34	06:23 (12)	06:57 (12)
13	07:39	16:59	07:11	17:39		06:27	18:14	26	07:23 (11)	07:49 (11)	06:34	19:49	05:51	20:22	4	06:36 (12)	05:32	20:48	32	06:25 (12)	06:57 (12)
14	07:38	17:00	07:10	17:40		06:25	18:15	24	07:23 (11)	07:47 (11)	06:32	19:50	05:50	20:23	12	06:40 (12)	06:31 (12)	20:48	32	06:25 (12)	06:57 (12)
15	07:38	17:02	07:08	17:41		06:24	18:16	20	07:25 (11)	07:45 (11)	06:30	19:51	05:49	20:24	16	06:43 (12)	06:30 (12)	20:49	32	06:25 (12)	06:57 (12)
16	07:37	17:03	07:07	17:43		06:22	18:17	16	07:27 (11)	07:43 (11)	06:29	19:53	05:48	20:25	20	06:46 (12)	06:27 (12)	20:49	32	06:25 (12)	06:57 (12)
17	07:37	17:04	07:05	17:44		06:20	18:18	10	07:30 (11)	07:40 (11)	06:27	19:54	05:47	20:26	22	06:47 (12)	06:26 (12)	20:50	32	06:25 (12)	06:57 (12)
18	07:36	17:05	07:04	17:45		06:18	18:19				06:25	19:55	05:46	20:27	24	06:48 (12)	06:25 (12)	20:50	32	06:25 (12)	06:57 (12)
19	07:36	17:06	07:03	17:47		06:17	18:21				06:24	19:56	05:45	20:28	26	06:49 (12)	06:24 (12)	20:50	32	06:25 (12)	06:57 (12)
20	07:35	17:08	07:01	17:48		06:15	18:22				06:22	19:57	05:44	20:29	28	06:50 (12)	06:24 (12)	20:51	32	06:26 (12)	06:58 (12)
21	07:35	17:09	07:00	17:49		06:13	18:23				06:21	19:58	05:43	20:30	28	06:52 (12)	06:23 (12)	20:51	32	06:26 (12)	06:58 (12)
22	07:34	17:10	06:58	17:50		06:11	18:24				06:19	19:59	05:42	20:31	30	06:51 (12)	06:22 (12)	20:51	32	06:26 (12)	06:58 (12)
23	07:33	17:11	06:57	17:52		06:10	18:25				06:18	20:00	05:42	20:32	30	06:52 (12)	06:23 (12)	20:51	32	06:26 (12)	06:58 (12)
24	07:32	17:13	06:55	17:53		06:08	18:26				06:16	20:00	05:41	20:33	30	06:53 (12)	06:23 (12)	20:52	32	06:26 (12)	06:58 (12)
25	07:32	17:14	06:53	17:54	8	07:35 (11)	06:06	18:28			06:15	20:02	05:40	20:34	32	06:53 (12)	06:22 (12)	20:52	32	06:27 (12)	06:59 (12)
26	07:31	17:15	06:52	17:55	16	07:32 (11)	06:04	18:29			06:13	20:03	05:39	20:35	32	06:54 (12)	06:21 (12)	20:52	32	06:27 (12)	06:59 (12)
27	07:30	17:17	06:50	17:57	20	07:48 (11)	06:03	18:30			06:12	20:04	05:39	20:36	32	06:53 (12)	06:23 (12)	20:52	32	06:28 (12)	07:00 (12)
28	07:29	17:18	06:49	17:58	24	07:50 (11)	06:01	18:31			06:10	20:05	05:38	20:37	32	06:55 (12)	06:22 (12)	20:52	32	06:28 (12)	07:00 (12)
29	07:28	17:19				07:27 (11)	05:59	18:32			06:09	20:06	05:37	20:37	32	06:54 (12)	06:21 (12)	20:52	32	06:28 (12)	07:00 (12)
30	07:27	17:20				07:51 (11)	05:57	18:33			06:07	20:07	05:37	20:38	34	06:53 (12)	06:21 (12)	20:52	34	06:27 (12)	07:01 (12)
31	07:26	17:22					05:56	18:34					05:36	20:39	32	06:55 (12)	06:22 (12)				
Potential sun hours	293		295			370			209		-292			-263		06:54 (12)					
Total, worst case				68			458					496			972						
Sun reduction				0.45			0.45					0.55			0.55						
Oper. time red.				0.86			0.86					0.86			0.86						
Wind dir. red.				0.60			0.60					0.61			0.61						
Total reduction				0.23			0.23					0.29			0.29						
Total, real				16			107					143			280						

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	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, North part
16 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
1000 meter max shadow distance applied along with default 3° inclination
Sunshine probabilities applied (pdf plots)
Directional run-hours applied from tab file (tower 1)
.

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Wind Engineers, Inc.
7660 Whitegate Avenue
US-RIVERSIDE, CA 92506

Calculated:
03/02/06 05:47/2.4.0.67

SHADOW - Calendar

Calculation: North part **Shadow receptor:** 658 - 658

Assumptions for shadow calculations

Maximum distance for influence	1,000	m
Minimum sun height over horizon for influence	3	°
Day step for calculation	1	days
Time step for calculation	2	minutes

Sun shine probabilities (part of time from sun rise to sun set with sun shine)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.35	0.45	0.45	0.55	0.55	0.55	0.65	0.55	0.55	0.45	0.35	0.30

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
475	585	238	199	220	474	1,184	813	840	1,246	803	479	7,555

	July		August		September		October		November	December
1	05:36	06:27 (12)	06:01		06:34		07:07	08:01 (11)	06:43	07:20
	20:52	34 07:01 (12)	20:32		19:46		18:53	28 08:29 (11)	17:04	16:38
2	05:37	06:28 (12)	06:02		06:35		07:08	08:00 (11)	06:44	07:21
	20:52	32 07:00 (12)	20:31		19:44		18:51	30 08:30 (11)	17:03	16:38
3	05:37	06:28 (12)	06:03		06:36		07:09	07:59 (11)	06:46	07:22
	20:52	32 07:00 (12)	20:30		19:42		18:50	30 08:29 (11)	17:02	16:38
4	05:38	06:29 (12)	06:05		06:38		07:10	07:58 (11)	06:47	07:23
	20:51	32 07:01 (12)	20:29		19:41		18:48	32 08:30 (11)	17:00	16:37
5	05:38	06:30 (12)	06:06		06:39		07:11	07:57 (11)	06:48	07:24
	20:51	32 07:02 (12)	20:28		19:39		18:46	32 08:29 (11)	16:59	16:37
6	05:39	06:28 (12)	06:07		06:40		07:12	07:58 (11)	06:49	07:25
	20:51	34 07:02 (12)	20:26		19:37		18:44	32 08:30 (11)	16:58	16:37
7	05:40	06:29 (12)	06:08		06:41		07:13	07:58 (11)	06:51	07:26
	20:51	34 07:03 (12)	20:25		19:35		18:43	32 08:30 (11)	16:57	16:37
8	05:40	06:29 (12)	06:09		06:42		07:14	07:57 (11)	06:52	07:27
	20:50	32 07:01 (12)	20:24		19:34		18:41	32 08:29 (11)	16:56	16:37
9	05:41	06:30 (12)	06:10		06:43		07:16	07:58 (11)	06:53	07:28
	20:50	32 07:02 (12)	20:23		19:32		18:39	30 08:28 (11)	16:55	16:37
10	05:42	06:29 (12)	06:11		06:44		07:17	07:57 (11)	06:54	07:29
	20:50	34 07:03 (12)	20:21		19:30		18:38	32 08:29 (11)	16:53	16:37
11	05:42	06:30 (12)	06:12		06:45		07:18	07:58 (11)	06:56	07:29
	20:49	34 07:04 (12)	20:20		19:28		18:36	30 08:28 (11)	16:52	16:37
12	05:43	06:30 (12)	06:13		06:46		07:19	08:00 (11)	06:57	07:30
	20:49	32 07:02 (12)	20:18		19:27		18:34	26 08:26 (11)	16:51	16:37
13	05:44	06:29 (12)	06:14		06:47		07:20	07:59 (11)	06:58	07:31
	20:48	34 07:03 (12)	20:17		19:25		18:33	26 08:25 (11)	16:50	16:37
14	05:45	06:30 (12)	06:15		06:48		07:21	08:00 (11)	06:59	07:32
	20:48	34 07:04 (12)	20:16		19:23		18:31	24 08:24 (11)	16:49	16:37
15	05:45	06:31 (12)	06:16		06:49		07:22	08:03 (11)	07:01	07:33
	20:47	32 07:03 (12)	20:14		19:21		18:29	18 08:21 (11)	16:48	16:38
16	05:46	06:31 (12)	06:17		06:50		07:24	08:04 (11)	07:02	07:33
	20:46	32 07:03 (12)	20:13		19:20		18:28	14 08:18 (11)	16:48	16:38
17	05:47	06:30 (12)	06:18		06:51		07:25	08:10 (11)	07:03	07:34
	20:46	32 07:02 (12)	20:11		19:18		18:26	4 08:14 (11)	16:47	16:38
18	05:48	06:31 (12)	06:19		06:52		07:26		07:04	07:35
	20:45	32 07:03 (12)	20:10		19:16		18:24		16:46	16:38
19	05:49	06:32 (12)	06:20		06:54		07:27		07:06	07:35
	20:44	30 07:02 (12)	20:08		19:14		18:23		16:45	16:39
20	05:50	06:33 (12)	06:21		06:55		07:28		07:07	07:36
	20:44	30 07:03 (12)	20:07		19:12		18:21		16:44	16:39
21	05:51	06:34 (12)	06:23		06:56		07:30		07:08	07:37
	20:43	28 07:02 (12)	20:05		19:11		18:20		16:44	16:40
22	05:52	06:32 (12)	06:24		06:57		07:31		07:09	07:37
	20:42	30 07:02 (12)	20:04		19:09		18:18		16:43	16:40
23	05:53	06:33 (12)	06:25		06:58		07:32		07:11	07:38
	20:41	28 07:01 (12)	20:02		19:07		18:17		16:42	16:41
24	05:53	06:34 (12)	06:26		06:59		07:33		07:12	07:38
	20:40	26 07:00 (12)	20:01		19:05		18:15		16:42	16:41
25	05:54	06:35 (12)	06:27		07:00		06:34		07:13	07:38
	20:39	24 06:59 (12)	19:57		19:04		17:14		16:41	16:42
26	05:55	06:36 (12)	06:28		07:01		08:15 (11)	06:36	07:14	07:39
	20:39	22 06:58 (12)	19:56		19:02	4	08:19 (11)	17:12	16:40	16:42
27	05:56	06:37 (12)	06:29		07:02		08:10 (11)	06:37	07:15	07:39
	20:38	20 06:57 (12)	19:54		19:00	12	08:22 (11)	17:11	16:40	16:43
28	05:57	06:38 (12)	06:30		07:03		08:08 (11)	06:38	07:16	07:39
	20:37	18 06:56 (12)	19:52		18:58	18	08:26 (11)	17:10	16:39	16:44
29	05:58	06:41 (12)	06:31		07:04		08:05 (11)	06:39	07:18	07:40
	20:36	14 06:55 (12)	19:51		18:56	22	08:27 (11)	17:08	16:39	16:45
30	05:59	06:44 (12)	06:32		07:05		08:04 (11)	06:41	07:19	07:40
	20:34	8 06:52 (12)	19:49		18:55	24	08:28 (11)	17:07	16:39	16:45
31	06:00		06:33					06:42		07:40
	20:33		19:47					17:05		16:46
Potential sun hours	-280		-145		375			343	294	283
Total, worst case		868				80		452		
Sun reduction		0.65				0.55		0.45		
Oper. time red.		0.86				0.86		0.86		
Wind dir. red.		0.61				0.60		0.60		
Total reduction		0.34				0.29		0.23		
Total, real		296				23		106		

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	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, North part
16 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
1000 meter max shadow distance applied along with default 3° inclination
Sunshine probabilities applied (pdf plots)
Directional run-hours applied from tab file (tower 1)
.

Printed/Page
03/05/06 23:47 / 21
Licensed user:
Wind Engineers, Inc.
7660 Whitegate Avenue
US-RIVERSIDE, CA 92506

Calculated:
03/02/06 05:47/2.4.0.67

SHADOW - Calendar

Calculation: North part **Shadow receptor:** 659 - 659

Assumptions for shadow calculations

Maximum distance for influence	1,000	m
Minimum sun height over horizon for influence	3	°
Day step for calculation	1	days
Time step for calculation	2	minutes

Sun shine probabilities (part of time from sun rise to sun set with sun shine)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.35	0.45	0.45	0.55	0.55	0.55	0.65	0.55	0.55	0.45	0.35	0.30

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
475	585	238	199	220	474	1,184	813	840	1,246	803	479	7,555

	January		February		March		April		May		June	
1	07:40	15:06 (11)	07:25		06:47	16:27 (12)	05:54		06:06		05:36	18:52 (13)
	16:47	16 15:22 (11)	17:23		17:59	28 16:55 (12)	18:35		20:08		20:40	28 19:20 (13)
2	07:40	15:06 (11)	07:24		06:45	16:25 (12)	05:52		06:05		05:35	18:51 (13)
	16:48	16 15:22 (11)	17:24		18:00	30 16:55 (12)	18:37		20:09		20:41	30 19:21 (13)
3	07:40	15:08 (11)	07:23		06:44	16:24 (12)	05:50		06:03		05:35	18:51 (13)
	16:49	14 15:22 (11)	17:26		18:02	32 16:56 (12)	18:38		20:11		20:41	30 19:21 (13)
4	07:40	15:07 (11)	07:22		06:42	16:24 (12)	05:49		06:02		05:34	18:51 (13)
	16:50	14 15:21 (11)	17:27		18:03	32 16:56 (12)	18:39		20:12		20:42	32 19:23 (13)
5	07:40	15:09 (11)	07:21		06:41	16:22 (12)	06:47		06:01		05:34	18:50 (13)
	16:51	12 15:21 (11)	17:28		18:04	34 16:56 (12)	19:40		20:13		20:43	32 19:22 (13)
6	07:40	15:11 (11)	07:20		06:39	16:23 (12)	06:45		05:59		05:34	18:50 (13)
	16:52	8 15:19 (11)	17:30		18:05	34 16:57 (12)	19:41		20:14		20:44	34 19:24 (13)
7	07:40	15:13 (11)	07:18		06:37	16:23 (12)	06:44		05:58		05:33	18:50 (13)
	16:53	6 15:19 (11)	17:31		18:06	34 16:57 (12)	19:42		20:15		20:44	34 19:24 (13)
8	07:40		07:17		06:36	16:21 (12)	06:42		05:57		05:33	18:50 (13)
	16:54		17:32		18:08	36 16:57 (12)	19:43		20:16		20:45	34 19:24 (13)
9	07:40		07:16		06:34	16:21 (12)	06:40		05:56		05:33	18:49 (13)
	16:55		17:34		18:09	36 16:57 (12)	19:45		20:17		20:46	36 19:25 (13)
10	07:40		07:15		06:32	16:22 (12)	06:39		05:55		05:32	18:49 (13)
	16:56		17:35		18:10	34 16:56 (12)	19:46		20:18		20:46	36 19:25 (13)
11	07:39		07:13		06:30	16:22 (12)	06:37		05:53		05:32	18:49 (13)
	16:57		17:36		18:11	34 16:56 (12)	19:47		20:19		20:47	36 19:25 (13)
12	07:39		07:12		06:29	16:22 (12)	06:35		05:52		05:32	18:49 (13)
	16:58		17:37		18:12	32 16:54 (12)	19:48		20:21		20:47	38 19:27 (13)
13	07:39		07:11		06:27	16:23 (12)	06:34		05:51		05:32	18:49 (13)
	16:59		17:39		18:14	32 16:55 (12)	19:49		20:22		20:48	38 19:27 (13)
14	07:38		07:10		06:25	16:23 (12)	06:32		05:50		05:32	18:49 (13)
	17:00		17:40		18:15	30 16:53 (12)	19:50		20:23		20:48	38 19:27 (13)
15	07:38		07:08		06:24	16:25 (12)	06:30		05:49		05:32	18:49 (13)
	17:02		17:41		18:16	26 16:51 (12)	19:51		20:24		20:49	38 19:27 (13)
16	07:37		07:07		06:22	16:25 (12)	06:29		05:48		05:32	18:49 (13)
	17:03		17:43		18:17	24 16:49 (12)	19:53		20:25		20:49	38 19:27 (13)
17	07:37		07:05		06:20	16:28 (12)	06:27		05:47		05:32	18:49 (13)
	17:04		17:44		18:18	20 16:48 (12)	19:54		20:26		20:50	38 19:27 (13)
18	07:36		07:04		06:18	16:30 (12)	06:25		05:46		05:32	18:49 (13)
	17:05		17:45		18:19	14 16:44 (12)	19:55		20:27		20:50	40 19:29 (13)
19	07:36		07:02		06:17	16:36 (12)	06:24		05:45		05:32	18:49 (13)
	17:06		17:47		18:21	4 16:40 (12)	19:56		20:28		20:50	40 19:29 (13)
20	07:35		07:01		06:15		06:22		05:44		05:32	18:49 (13)
	17:08		17:48		18:22		19:57		20:29		20:51	40 19:29 (13)
21	07:35		07:00		06:13		06:21		05:43		05:32	18:50 (13)
	17:09		17:49		18:23		19:58		20:30		20:51	40 19:30 (13)
22	07:34		06:58		06:11		06:19		05:42		05:33	18:50 (13)
	17:10		17:50		18:24		19:59		20:31		20:51	40 19:30 (13)
23	07:33		06:56		06:10		06:18		05:42		05:33	18:50 (13)
	17:11		17:52		18:25		20:00		20:32		20:51	40 19:30 (13)
24	07:32		06:55		06:08		06:16		05:41		05:33	18:50 (13)
	17:13		17:53		18:26		20:00		20:33		20:52	40 19:30 (13)
25	07:32		06:53	16:37 (12)	06:06		06:15		05:40	19:00 (13)	05:33	18:51 (13)
	17:14		17:54	8 16:45 (12)	18:27		20:02		20:34	10 19:10 (13)	20:52	38 19:29 (13)
26	07:31		06:52	16:32 (12)	06:04		06:13		05:39	18:57 (13)	05:34	18:51 (13)
	17:15		17:55	18 16:50 (12)	18:29		20:03		20:35	14 19:11 (13)	20:52	38 19:29 (13)
27	07:30		06:50	16:30 (12)	06:03		06:12		05:39	18:55 (13)	05:34	18:51 (13)
	17:16		17:57	22 16:52 (12)	18:30		20:04		20:36	20 19:15 (13)	20:52	38 19:29 (13)
28	07:29		06:49	16:29 (12)	06:01		06:10		05:38	18:54 (13)	05:35	18:52 (13)
	17:18		17:58	24 16:53 (12)	18:31		20:05		20:36	22 19:16 (13)	20:52	38 19:30 (13)
29	07:28				05:59		06:09		05:37	18:53 (13)	05:35	18:52 (13)
	17:19				18:32		20:06		20:37	24 19:17 (13)	20:52	38 19:30 (13)
30	07:27				05:57		06:07		05:37	18:53 (13)	05:35	18:53 (13)
	17:20				18:33		20:07		20:38	26 19:19 (13)	20:52	38 19:31 (13)
31	07:26				05:56				05:36	18:52 (13)		
	17:22				18:34				20:39	26 19:18 (13)		
Potential sun hours	293		295		370		209		-292		-263	
Total, worst case		86		72		546				142		1098
Sun reduction		0.35		0.45		0.45				0.55		0.55
Oper. time red.		0.86		0.86		0.86				0.86		0.86
Wind dir. red.		0.65		0.61		0.61				0.61		0.61
Total reduction		0.20		0.24		0.24				0.29		0.29
Total, real		17		17		129				41		320

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	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, North part
16 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
1000 meter max shadow distance applied along with default 3° inclination
Sunshine probabilities applied (pdf plots)
Directional run-hours applied from tab file (tower 1)
.

Printed/Page
03/05/06 23:47 / 22
Licensed user:
Wind Engineers, Inc.
7660 Whitegate Avenue
US-RIVERSIDE, CA 92506

Calculated:
03/02/06 05:47/2.4.0.67

SHADOW - Calendar

Calculation: North part **Shadow receptor:** 659 - 659

Assumptions for shadow calculations

Maximum distance for influence	1,000	m
Minimum sun height over horizon for influence	3	°
Day step for calculation	1	days
Time step for calculation	2	minutes

Sun shine probabilities (part of time from sun rise to sun set with sun shine)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.35	0.45	0.45	0.55	0.55	0.55	0.65	0.55	0.55	0.45	0.35	0.30

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
475	585	238	199	220	474	1,184	813	840	1,246	803	479	7,555

	July			August		September			October			November	December		
1	05:36		18:53 (13)	06:01		06:34			07:07		17:01 (12)	06:43	07:20		
	20:52	36	19:29 (13)	20:32		19:46			18:53	32	17:33 (12)	17:04	16:38		
2	05:36		18:54 (13)	06:02		06:35			07:08		17:00 (12)	06:44	07:21		
	20:52	36	19:30 (13)	20:31		19:44			18:51	34	17:34 (12)	17:03	16:38		
3	05:37		18:54 (13)	06:03		06:36			07:09		16:59 (12)	06:46	07:22		
	20:52	36	19:30 (13)	20:30		19:42			18:49	34	17:33 (12)	17:02	16:38		
4	05:38		18:55 (13)	06:04		06:37			07:10		16:58 (12)	06:47	07:23		
	20:51	36	19:31 (13)	20:29		19:41			18:48	36	17:34 (12)	17:00	16:37		
5	05:38		18:55 (13)	06:05		06:39			07:11		16:59 (12)	06:48	07:24		15:00 (11)
	20:51	34	19:29 (13)	20:28		19:39			18:46	34	17:33 (12)	16:59	16:37	4	15:04 (11)
6	05:39		18:56 (13)	06:07		06:40			07:12		16:58 (12)	06:49	07:25		14:57 (11)
	20:51	34	19:30 (13)	20:26		19:37			18:44	34	17:32 (12)	16:58	16:37	8	15:05 (11)
7	05:39		18:57 (13)	06:08		06:41			07:13		16:58 (12)	06:51	07:26		14:56 (11)
	20:51	32	19:29 (13)	20:25		19:35			18:43	36	17:34 (12)	16:57	16:37	12	15:08 (11)
8	05:40		18:57 (13)	06:09		06:42			07:14		16:59 (12)	06:52	07:27		14:55 (11)
	20:50	32	19:29 (13)	20:24		19:34			18:41	34	17:33 (12)	16:56	16:37	14	15:09 (11)
9	05:41		18:58 (13)	06:10		06:43			07:15		16:58 (12)	06:53	07:28		14:56 (11)
	20:50	30	19:28 (13)	20:22		19:32			18:39	34	17:32 (12)	16:54	16:37	14	15:10 (11)
10	05:42		18:59 (13)	06:11		06:44			07:17		16:59 (12)	06:54	07:29		14:55 (11)
	20:50	30	19:29 (13)	20:21		19:30			18:37	32	17:31 (12)	16:53	16:37	16	15:11 (11)
11	05:42		18:59 (13)	06:12		06:45			07:18		16:58 (12)	06:56	07:29		14:56 (11)
	20:49	28	19:27 (13)	20:20		19:28			18:36	32	17:30 (12)	16:52	16:37	16	15:12 (11)
12	05:43		19:00 (13)	06:13		06:46			07:19		16:59 (12)	06:57	07:30		14:55 (11)
	20:49	28	19:28 (13)	20:18		19:27			18:34	28	17:27 (12)	16:51	16:37	18	15:13 (11)
13	05:44		19:01 (13)	06:14		06:47			07:20		17:01 (12)	06:58	07:31		14:56 (11)
	20:48	26	19:27 (13)	20:17		19:25			18:32	26	17:27 (12)	16:50	16:37	18	15:14 (11)
14	05:45		19:02 (13)	06:15		06:48			07:21		17:02 (12)	06:59	07:32		14:56 (11)
	20:48	24	19:26 (13)	20:16		19:23			18:31	24	17:26 (12)	16:49	16:37	18	15:14 (11)
15	05:45		19:02 (13)	06:16		06:49			07:22		17:03 (12)	07:01	07:33		14:55 (11)
	20:47	22	19:24 (13)	20:14		19:21			18:29	20	17:23 (12)	16:48	16:37	20	15:15 (11)
16	05:46		19:03 (13)	06:17		06:50			07:24		17:06 (12)	07:02	07:33		14:56 (11)
	20:46	20	19:23 (13)	20:13		19:20			18:28	14	17:20 (12)	16:47	16:38	20	15:16 (11)
17	05:47		19:06 (13)	06:18		06:51			07:25		17:12 (12)	07:03	07:34		14:56 (11)
	20:46	16	19:22 (13)	20:11		19:18			18:26	4	17:16 (12)	16:47	16:38	20	15:16 (11)
18	05:48		19:07 (13)	06:19		06:52			07:26			07:04	07:35		14:57 (11)
	20:45	14	19:21 (13)	20:10		19:16			18:24			16:46	16:38	20	15:17 (11)
19	05:49		19:12 (13)	06:20		06:53			07:27			07:06	07:35		14:58 (11)
	20:44	4	19:16 (13)	20:08		19:14			18:23			16:45	16:39	20	15:18 (11)
20	05:50			06:21		06:55			07:28			07:07	07:36		14:58 (11)
	20:44			20:07		19:12			18:21			16:44	16:39	20	15:18 (11)
21	05:51			06:23		06:56			07:30			07:08	07:36		14:59 (11)
	20:43			20:05		19:11			18:20			16:43	16:40	20	15:19 (11)
22	05:52			06:24		06:57			07:31			07:09	07:37		14:59 (11)
	20:42			20:04		19:09			18:18			16:43	16:40	20	15:19 (11)
23	05:52			06:25		06:58			07:32			07:10	07:37		15:00 (11)
	20:41			20:02		19:07			18:17			16:42	16:41	20	15:20 (11)
24	05:53			06:26		06:59			07:33			07:12	07:38		15:00 (11)
	20:40			20:01		19:05			18:15			16:41	16:41	20	15:20 (11)
25	05:54			06:27		07:00		17:14 (12)	06:34			07:13	07:38		15:00 (11)
	20:39			19:57		19:04	12	17:26 (12)	17:14			16:41	16:42	20	15:20 (11)
26	05:55			06:28		07:01		17:11 (12)	06:36			07:14	07:39		15:01 (11)
	20:38			19:56		19:02	18	17:29 (12)	17:12			16:40	16:42	20	15:21 (11)
27	05:56			06:29		07:02		17:08 (12)	06:37			07:15	07:39		15:01 (11)
	20:37			19:54		19:00	22	17:30 (12)	17:11			16:40	16:43	20	15:21 (11)
28	05:57			06:30		07:03		17:05 (12)	06:38			07:16	07:39		15:01 (11)
	20:37			19:52		18:58	26	17:31 (12)	17:10			16:39	16:44	20	15:21 (11)
29	05:58			06:31		07:04		17:05 (12)	06:39			07:17	07:40		15:03 (11)
	20:35			19:51		18:56	28	17:33 (12)	17:08			16:39	16:45	18	15:21 (11)
30	05:59			06:32		07:05		17:04 (12)	06:41			07:19	07:40		15:03 (11)
	20:34			19:49		18:55	30	17:34 (12)	17:07			16:39	16:45	18	15:21 (11)
31	06:00			06:33					06:42				07:40		15:04 (11)
	20:33			19:47					17:05				16:46	18	15:22 (11)
Potential sun hours	-280			-145		375			343			294	283		
Total, worst case		518					136			488				472	
Sun reduction		0.65					0.55			0.45				0.30	
Oper. time red.		0.86					0.86			0.86				0.86	
Wind dir. red.		0.61					0.61			0.61				0.65	
Total reduction		0.34					0.29			0.24				0.17	
Total, real		178					39			116				80	

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	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, North part
16 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
1000 meter max shadow distance applied along with default 3° inclination
Sunshine probabilities applied (pdf plots)
Directional run-hours applied from tab file (tower 1)
.

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03/05/06 23:47 / 23

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7660 Whitegate Avenue
US-RIVERSIDE, CA 92506

Calculated:
03/02/06 05:47/2.4.0.67

SHADOW - Calendar

Calculation: North part **Shadow receptor:** 660 - 660

Assumptions for shadow calculations

Maximum distance for influence	1,000	m
Minimum sun height over horizon for influence	3	°
Day step for calculation	1	days
Time step for calculation	2	minutes

Sun shine probabilities (part of time from sun rise to sun set with sun shine)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.35	0.45	0.45	0.55	0.55	0.55	0.65	0.55	0.55	0.45	0.35	0.30

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
475	585	238	199	220	474	1,184	813	840	1,246	803	479	7,555

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:40	07:25	06:47	16:33 (12) 05:54	06:06	05:36	05:36	06:01	06:34	18:25 (13) 07:07	06:43	07:20
	16:47	17:23	17:59	22 16:55 (12) 18:35	20:08	20:40	20:52	20:32	19:46	8 18:33 (13) 18:53	17:04	16:38
2	07:40	07:24	06:45	16:33 (12) 05:52	06:05	05:35	05:36	06:02	06:35	07:08	06:44	07:21
	16:48	17:24	18:00	22 16:55 (12) 18:37	20:09	20:41	20:52	20:31	19:44	18:51	17:03	16:38
3	07:40	07:23	06:44	16:34 (12) 05:50	06:03	05:35	05:37	06:03	06:36	07:09	06:46	07:22
	16:49	17:26	18:02	20 16:54 (12) 18:38	20:11	20:41	20:52	20:30	19:42	18:49	17:02	16:38
4	07:40	07:22	06:42	16:32 (12) 05:49	06:02	05:34	05:38	06:04	06:37	07:10	17:16 (12) 06:47	07:23
	16:50	17:27	18:03	22 16:54 (12) 18:39	20:12	20:42	20:51	20:29	19:41	18:48	8 17:24 (12) 17:00	16:37
5	07:40	07:21	06:41	16:32 (12) 06:47	06:01	05:34	05:38	06:05	06:39	07:11	17:13 (12) 06:48	07:24
	16:51	17:28	18:04	22 16:54 (12) 19:40	20:13	20:43	20:51	20:28	19:39	18:46	12 17:25 (12) 16:59	16:37
6	07:40	07:20	06:39	16:33 (12) 06:45	05:59	05:33	05:39	06:07	06:40	07:12	17:10 (12) 06:49	07:25
	16:52	17:30	18:05	20 16:53 (12) 19:41	20:14	20:44	20:51	20:26	19:37	18:44	16 17:26 (12) 16:58	16:37
7	07:40	07:18	06:37	16:35 (12) 06:44	05:58	05:33	05:39	06:08	06:41	07:13	17:10 (12) 06:51	07:26
	16:53	17:31	18:06	16 16:51 (12) 19:42	20:15	20:44	20:51	20:25	19:35	18:43	18 17:28 (12) 16:57	16:37
8	07:40	07:17	06:36	16:35 (12) 06:42	05:57	05:33	05:40	06:09	06:42	07:14	17:09 (12) 06:52	07:27
	16:54	17:32	18:08	14 16:49 (12) 19:43	20:16	20:45	20:50	20:24	19:34	18:41	20 17:29 (12) 16:56	16:37
9	07:40	07:16	06:34	16:37 (12) 06:40	05:56	05:33	05:41	06:10	06:43	07:15	17:08 (12) 06:53	07:28
	16:55	17:34	18:09	10 16:47 (12) 19:45	20:17	20:46	20:50	20:22	19:32	18:39	20 17:28 (12) 16:54	16:37
10	07:40	07:15	06:32	06:39	05:54	05:32	05:42	06:11	06:44	07:17	17:07 (12) 06:54	07:29
	16:56	17:35	18:10	19:46	20:18	20:46	20:50	20:21	19:30	18:37	22 17:29 (12) 16:53	16:37
11	07:39	07:13	06:30	06:37 18:26 (13)	05:53	05:32	05:42	06:12	06:45	07:18	17:06 (12) 06:56	07:29
	16:57	17:36	18:11	19:47 8 18:34 (13)	20:19	20:47	20:49	20:20	19:28	18:36	22 17:28 (12) 16:52	16:37
12	07:39	07:12	06:29	06:35 18:23 (13)	05:52	05:32	05:43	06:13	06:46	07:19	17:05 (12) 06:57	07:30
	16:58	17:37	18:12	19:48 14 18:37 (13)	20:21	20:47	20:49	20:18	19:27	18:34	22 17:27 (12) 16:51	16:37
13	07:39	07:11	06:27	06:34 18:21 (13)	05:51	05:32	05:44	06:14	06:47	07:20	17:07 (12) 06:58	07:31
	16:59	17:39	18:14	19:49 18 18:39 (13)	20:22	20:48	20:48	20:17	19:25	18:32	20 17:27 (12) 16:50	16:37
14	07:38	07:09	06:25	06:32 18:19 (13)	05:50	05:32	05:45	06:15 18:31 (13)	06:48	07:21	17:06 (12) 06:59	07:32
	17:00	17:40	18:15	19:50 20 18:39 (13)	20:23	20:48	20:48	20:16 6 18:37 (13)	19:23	18:31	20 17:26 (12) 16:49	16:37
15	07:38	07:08	06:24	06:30 18:18 (13)	05:49	05:32	05:45	06:16 18:28 (13)	06:49	07:22	17:07 (12) 07:01	07:33
	17:02	17:41	18:16	19:51 22 18:40 (13)	20:24	20:49	20:47	20:14 12 18:40 (13)	19:21	18:29	18 17:25 (12) 16:48	16:37
16	07:37	07:07	06:22	06:29 18:16 (13)	05:48	05:32	05:46	06:17 18:25 (13)	06:50	07:24	17:08 (12) 07:02	07:33
	17:03	17:43	18:17	19:52 24 18:40 (13)	20:25	20:49	20:46	20:13 16 18:41 (13)	19:20	18:28	16 17:24 (12) 16:47	16:38
17	07:37	07:05	06:20	06:27 18:17 (13)	05:47	05:32	05:47	06:18 18:24 (13)	06:51	07:25	17:10 (12) 07:03	07:34
	17:04	17:44	18:18	19:54 24 18:41 (13)	20:26	20:50	20:46	20:11 20 18:44 (13)	19:18	18:26	12 17:22 (12) 16:47	16:38
18	07:36	07:04	06:18	06:25 18:15 (13)	05:46	05:32	05:48	06:19 18:23 (13)	06:52	07:26	17:15 (12) 07:04	07:35
	17:05	17:45	18:19	19:55 26 18:41 (13)	20:27	20:50	20:45	20:10 20 18:43 (13)	19:16	18:24	4 17:19 (12) 16:46	16:38
19	07:36	07:02	06:17	06:24 18:15 (13)	05:45	05:32	05:49	06:20 18:22 (13)	06:53	07:27	07:06	07:35
	17:06	17:46	18:21	19:56 26 18:41 (13)	20:28	20:50	20:44	20:08 22 18:44 (13)	19:14	18:23	16:45	16:39
20	07:35	07:01	06:15	06:22 18:16 (13)	05:44	05:32	05:50	06:21 18:21 (13)	06:55	07:28	07:07	07:36
	17:08	17:48	18:22	19:57 24 18:40 (13)	20:29	20:51	20:44	20:07 24 18:45 (13)	19:12	18:21	16:44	16:39
21	07:35	06:59	06:13	06:21 18:14 (13)	05:43	05:32	05:51	06:22 18:20 (13)	06:56	07:30	07:08	07:36
	17:09	17:49	18:23	19:58 26 18:40 (13)	20:30	20:51	20:43	20:05 24 18:44 (13)	19:11	18:20	16:43	16:40
22	07:34	06:58	06:11	06:19 18:15 (13)	05:42	05:33	05:52	06:24 18:19 (13)	06:57	07:31	07:09	07:37
	17:10	17:50	18:24	19:59 24 18:39 (13)	20:31	20:51	20:42	20:04 26 18:45 (13)	19:09	18:18	16:43	16:40
23	07:33	06:56	06:10	06:18 18:15 (13)	05:42	05:33	05:52	06:25 18:18 (13)	06:58	07:32	07:10	07:37
	17:11	17:52	18:25	20:00 24 18:39 (13)	20:32	20:51	20:41	20:02 26 18:44 (13)	19:07	18:17	16:42	16:41
24	07:32	06:55 16:41 (12)	06:08	06:16 18:16 (13)	05:41	05:33	05:53	06:26 18:19 (13)	06:59	07:33	07:12	07:38
	17:13	17:53 8 16:49 (12)	18:26	20:00 22 18:38 (13)	20:33	20:52	20:40	20:01 26 18:45 (13)	19:05	18:15	16:41	16:41
25	07:32	06:53 16:37 (12)	06:06	06:15 18:17 (13)	05:40	05:33	05:54	06:27 18:18 (13)	07:00	06:34	07:13	07:38
	17:14	17:54 14 16:51 (12)	18:27	20:02 20 18:36 (13)	20:34	20:52	20:39	19:57 26 18:44 (13)	19:03	17:14	16:41	16:42
26	07:31	06:52 16:36 (12)	06:04	06:13 18:17 (13)	05:39	05:34	05:55	06:28 18:19 (13)	07:01	06:36	07:14	07:39
	17:15	17:55 16 16:52 (12)	18:29	20:03 20 18:37 (13)	20:35	20:52	20:38	19:56 24 18:43 (13)	19:02	17:12	16:40	16:42
27	07:30	06:50 16:34 (12)	06:03	06:12 18:20 (13)	05:39	05:34	05:56	06:29 18:18 (13)	07:02	06:37	07:15	07:39
	17:16	17:57 20 16:54 (12)	18:30	20:04 14 18:34 (13)	20:36	20:52	20:37	19:54 24 18:42 (13)	19:00	17:11	16:40	16:43
28	07:29	06:49 16:35 (12)	06:01	06:10 18:20 (13)	05:38	05:35	05:57	06:30 18:19 (13)	07:03	06:38	07:16	07:39
	17:18	17:58 20 16:55 (12)	18:31	20:05 12 18:32 (13)	20:36	20:52	20:36	19:52 22 18:41 (13)	18:58	17:09	16:39	16:44
29	07:28		05:59	06:09 18:25 (13)	05:37	05:35	05:58	06:31 18:20 (13)	07:04	06:39	07:17	07:40
	17:19		18:32	20:06 4 18:29 (13)	20:37	20:52	20:35	19:51 20 18:40 (13)	18:56	17:08	16:39	16:44
30	07:27		05:57	06:07	05:37	05:35	05:59	06:32 18:21 (13)	07:05	06:41	07:19	07:40
	17:20		18:33	20:07	20:38	20:52	20:34	19:49 18 18:39 (13)	18:55	17:07	16:39	16:45
31	07:26		05:56		05:36		06:00	06:33 18:22 (13)		06:42		07:40
	17:22		18:34		20:39		20:33	19:47 14 18:36 (13)		17:05		16:46
Potential sun hours	293	295	370	209	-292	-263	-280	-145	375	343	294	283
Total, worst case		78	168	372				370	8	250		
Sun reduction		0.45	0.45	0.55				0.55	0.55	0.45		
Oper. time red.		0.86	0.86	0.86				0.86	0.86	0.86		
Wind dir. red.		0.61	0.61	0.61				0.61	0.61	0.61		
Total reduction		0.24	0.24	0.29				0.29	0.29	0.24		
Total, real		19	40	108				107	2	59		

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	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, North part
16 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
1000 meter max shadow distance applied along with default 3° inclination
Sunshine probabilities applied (pdf plots)
Directional run-hours applied from tab file (tower 1)
.

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Wind Engineers, Inc.
7660 Whitegate Avenue
US-RIVERSIDE, CA 92506

Calculated:
03/02/06 05:47/2.4.0.67

SHADOW - Calendar

Calculation: North part **Shadow receptor:** 661 - 661

Assumptions for shadow calculations

Maximum distance for influence	1,000	m
Minimum sun height over horizon for influence	3	°
Day step for calculation	1	days
Time step for calculation	2	minutes

Sun shine probabilities (part of time from sun rise to sun set with sun shine)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.35	0.45	0.45	0.55	0.55	0.55	0.65	0.55	0.55	0.45	0.35	0.30

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
475	585	238	199	220	474	1,184	813	840	1,246	803	479	7,555

	January		February		March		April		May		June	
1	07:40		07:25		06:47		05:54		06:06		18:34 (13)	05:36
	16:47		17:23		17:59		18:35		20:08	24	18:58 (13)	20:40
2	07:40		07:24		06:45		05:52		06:05		18:33 (13)	05:35
	16:48		17:24		18:00		18:37		20:09	26	18:59 (13)	20:41
3	07:40		07:23		06:44		05:50		06:03		18:34 (13)	05:35
	16:49		17:26		18:02		18:38		20:11	24	18:58 (13)	20:41
4	07:40		07:22		06:42		16:54 (12)	05:49	06:02		18:32 (13)	05:34
	16:50		17:27		18:03	4	16:58 (12)	18:39	20:12	26	18:58 (13)	20:42
5	07:40		07:21		06:41		16:48 (12)	06:47	06:01		18:31 (13)	05:34
	16:51		17:28		18:04	12	17:00 (12)	19:40	20:13	28	18:59 (13)	20:43
6	07:40		07:20		06:39		16:47 (12)	06:45	05:59		18:32 (13)	05:33
	16:52		17:30		18:05	16	17:03 (12)	19:41	20:14	28	19:00 (13)	20:44
7	07:40		07:18		06:37		16:45 (12)	06:44	05:58		18:31 (13)	05:33
	16:53		17:31		18:06	18	17:03 (12)	19:42	20:15	28	18:59 (13)	20:44
8	07:40		07:17		06:36		16:43 (12)	06:42	05:57		18:31 (13)	05:33
	16:54		17:32		18:08	22	17:05 (12)	19:43	20:16	28	18:59 (13)	20:45
9	07:40		07:16		06:34		16:41 (12)	06:40	05:56		18:32 (13)	05:33
	16:55		17:34		18:09	24	17:05 (12)	19:45	20:17	28	19:00 (13)	20:46
10	07:40		07:15		06:32		16:42 (12)	06:39	05:54		18:31 (13)	05:32
	16:56		17:35		18:10	24	17:06 (12)	19:46	20:18	28	18:59 (13)	20:46
11	07:39		07:13		06:30		16:42 (12)	06:37	05:53		18:32 (13)	05:32
	16:57		17:36		18:11	24	17:06 (12)	19:47	20:19	28	19:00 (13)	20:47
12	07:39		07:12		06:29		16:40 (12)	06:35	05:52		18:31 (13)	05:32
	16:58		17:37		18:12	24	17:04 (12)	19:48	20:21	28	18:59 (13)	20:47
13	07:39		07:11		06:27		16:41 (12)	06:34	05:51		18:32 (13)	05:32
	16:59		17:39		18:14	24	17:05 (12)	19:49	20:22	26	18:58 (13)	20:48
14	07:38		07:09		06:25		16:41 (12)	06:32	05:50		18:33 (13)	05:32
	17:00		17:40		18:15	24	17:05 (12)	19:50	20:23	26	18:59 (13)	20:48
15	07:38		07:08		06:24		16:41 (12)	06:30	05:49		18:34 (13)	05:32
	17:02		17:41		18:16	22	17:03 (12)	19:51	20:24	24	18:58 (13)	20:49
16	07:37		07:07		06:22		16:43 (12)	06:29	05:48		18:35 (13)	05:32
	17:03		17:43		18:17	18	17:01 (12)	19:52	20:25	22	18:57 (13)	20:49
17	07:37		07:05		06:20		16:44 (12)	06:27	05:47		18:36 (13)	05:32
	17:04		17:44		18:18	18	17:02 (12)	19:54	20:26	20	18:56 (13)	20:50
18	07:36		07:04		06:18		16:46 (12)	06:25	05:46		18:35 (13)	05:32
	17:05		17:45		18:19	12	16:58 (12)	19:55	20:27	20	18:55 (13)	20:50
19	07:36		07:02		06:17		16:48 (12)	06:24	05:45		18:36 (13)	05:32
	17:06		17:47		18:21	8	16:56 (12)	19:56	20:28	18	18:54 (13)	20:50
20	07:35		07:01		06:15			06:22	05:44		18:40 (13)	05:32
	17:08		17:48		18:22			19:57	20:29	14	18:54 (13)	20:51
21	07:35		06:59		06:13			06:21	05:43		18:41 (13)	05:32
	17:09		17:49		18:23			19:58	20:30	12	18:53 (13)	20:51
22	07:34		06:58		06:11			06:19	05:42		18:42 (13)	05:33
	17:10		17:50		18:24			19:59	20:31	8	18:50 (13)	20:51
23	07:33		06:56		06:10			06:18	05:42			05:33
	17:11		17:52		18:25			20:00	20:32			20:51
24	07:32		06:55		06:08			06:16	05:41			05:33
	17:13		17:53		18:26			20:00	20:33			20:52
25	07:32		06:53		06:06			06:15	05:40			05:33
	17:14		17:54		18:27			20:02	20:34			20:52
26	07:31		06:52		06:04			06:13	05:39			05:34
	17:15		17:55		18:29			20:03	20:35			20:52
27	07:30		06:50		06:03			06:12	18:42 (13)		05:39	05:34
	17:16		17:57		18:30			20:04	8	18:50 (13)	20:36	20:52
28	07:29		06:49		06:01			06:10	18:38 (13)		05:38	05:35
	17:18		17:58		18:31			20:05	16	18:54 (13)	20:36	20:52
29	07:28				05:59			06:09	18:37 (13)		05:37	05:35
	17:19				18:32			20:06	18	18:55 (13)	20:37	20:52
30	07:27				05:57			06:07	18:35 (13)		05:37	05:35
	17:20				18:33			20:07	20	18:55 (13)	20:38	20:52
31	07:26				05:56						05:36	
	17:22				18:34						20:39	
Potential sun hours	293		295		370			209			-292	-263
Total, worst case						294			62		514	
Sun reduction						0.45			0.55		0.55	
Oper. time red.						0.86			0.86		0.86	
Wind dir. red.						0.59			0.60		0.60	
Total reduction						0.23			0.28		0.28	
Total, real						67			18		146	

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	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, North part
16 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
1000 meter max shadow distance applied along with default 3° inclination
Sunshine probabilities applied (pdf plots)
Directional run-hours applied from tab file (tower 1)
.

Licensed user:
Wind Engineers, Inc.
7660 Whitegate Avenue
US-RIVERSIDE, CA 92506

Calculated:
03/02/06 05:47/2.4.0.67

SHADOW - Calendar

Calculation: North part **Shadow receptor:** 661 - 661

Assumptions for shadow calculations

Maximum distance for influence	1,000	m
Minimum sun height over horizon for influence	3	°
Day step for calculation	1	days
Time step for calculation	2	minutes

Sun shine probabilities (part of time from sun rise to sun set with sun shine)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.35	0.45	0.45	0.55	0.55	0.55	0.65	0.55	0.55	0.45	0.35	0.30

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
475	585	238	199	220	474	1,184	813	840	1,246	803	479	7,555

	July		August		September		October		November	December
1	05:36		06:01	18:42 (13)	06:34		07:07	17:21 (12)	06:43	07:20
	20:52		20:32	28 19:10 (13)	19:46		18:53	24 17:45 (12)	17:04	16:38
2	05:36		06:02	18:43 (13)	06:35		07:08	17:20 (12)	06:44	07:21
	20:52		20:31	26 19:09 (13)	19:44		18:51	24 17:44 (12)	17:03	16:38
3	05:37		06:03	18:42 (13)	06:36		07:09	17:19 (12)	06:46	07:22
	20:52		20:30	28 19:10 (13)	19:42		18:49	24 17:43 (12)	17:02	16:38
4	05:38		06:04	18:41 (13)	06:37		07:10	17:20 (12)	06:47	07:23
	20:51		20:29	28 19:09 (13)	19:41		18:48	22 17:42 (12)	17:00	16:37
5	05:38		06:05	18:42 (13)	06:39		07:11	17:19 (12)	06:48	07:24
	20:51		20:28	28 19:10 (13)	19:39		18:46	22 17:41 (12)	16:59	16:37
6	05:39		06:07	18:41 (13)	06:40		07:12	17:20 (12)	06:49	07:25
	20:51		20:26	28 19:09 (13)	19:37		18:44	20 17:40 (12)	16:58	16:37
7	05:39		06:08	18:42 (13)	06:41		07:13	17:22 (12)	06:51	07:26
	20:51		20:25	28 19:10 (13)	19:35		18:43	18 17:40 (12)	16:57	16:37
8	05:40		06:09	18:41 (13)	06:42		07:14	17:23 (12)	06:52	07:27
	20:50		20:24	28 19:09 (13)	19:34		18:41	14 17:37 (12)	16:56	16:37
9	05:41		06:10	18:42 (13)	06:43		07:15	17:26 (12)	06:53	07:28
	20:50		20:22	26 19:08 (13)	19:32		18:39	8 17:34 (12)	16:54	16:37
10	05:42		06:11	18:43 (13)	06:44		07:17		06:54	07:29
	20:50		20:21	24 19:07 (13)	19:30		18:37		16:53	16:37
11	05:42		06:12	18:42 (13)	06:45		07:18		06:56	07:29
	20:49		20:20	24 19:06 (13)	19:28		18:36		16:52	16:37
12	05:43		06:13	18:43 (13)	06:46		07:19		06:57	07:30
	20:49		20:18	22 19:05 (13)	19:27		18:34		16:51	16:37
13	05:44		06:14	18:44 (13)	06:47		07:20		06:58	07:31
	20:48		20:17	20 19:04 (13)	19:25		18:32		16:50	16:37
14	05:45		06:15	18:45 (13)	06:48		07:21		06:59	07:32
	20:48		20:16	18 19:03 (13)	19:23		18:31		16:49	16:37
15	05:45		06:16	18:46 (13)	06:49		07:22		07:01	07:33
	20:47		20:14	14 19:00 (13)	19:21		18:29		16:48	16:37
16	05:46		06:17	18:51 (13)	06:50		07:24		07:02	07:33
	20:46		20:13	6 18:57 (13)	19:20		18:28		16:47	16:38
17	05:47		06:18		06:51		07:25		07:03	07:34
	20:46		20:11		19:18		18:26		16:47	16:38
18	05:48		06:19		06:52		07:26		07:04	07:35
	20:45		20:10		19:16		18:24		16:46	16:38
19	05:49		06:20		06:53		07:27		07:06	07:35
	20:44		20:08		19:14		18:23		16:45	16:39
20	05:50		06:21		06:55		07:28		07:07	07:36
	20:44		20:07		19:12		18:21		16:44	16:39
21	05:51		06:22	18:56 (13)	06:56		07:30		07:08	07:36
	20:43	4	20:05	19:00 (13)	19:11		18:20		16:43	16:40
22	05:52		06:24	18:52 (13)	06:57		07:31		07:09	07:37
	20:42	8	20:04	19:00 (13)	19:09		18:18		16:43	16:40
23	05:52		06:25	18:49 (13)	06:58		07:32		07:10	07:37
	20:41	14	20:02	19:03 (13)	19:07		18:17		16:42	16:41
24	05:53		06:26	18:48 (13)	06:59	17:33 (12)	07:33		07:12	07:38
	20:40	16	20:01	19:04 (13)	19:05	4 17:37 (12)	18:15		16:41	16:41
25	05:54		06:27	18:47 (13)	07:00	17:28 (12)	06:34		07:13	07:38
	20:39	18	19:57	19:05 (13)	19:04	12 17:40 (12)	17:14		16:41	16:42
26	05:55		06:28	18:46 (13)	07:01	17:25 (12)	06:36		07:14	07:39
	20:38	20	19:56	19:06 (13)	19:02	18 17:43 (12)	17:12		16:40	16:42
27	05:56		06:29	18:45 (13)	07:02	17:24 (12)	06:37		07:15	07:39
	20:37	22	19:54	19:07 (13)	19:00	20 17:44 (12)	17:11		16:40	16:43
28	05:57		06:30	18:44 (13)	07:03	17:23 (12)	06:38		07:16	07:39
	20:36	24	19:52	19:08 (13)	18:58	20 17:43 (12)	17:10		16:39	16:44
29	05:58		06:31	18:43 (13)	07:04	17:23 (12)	06:39		07:17	07:40
	20:35	26	19:51	19:09 (13)	18:56	22 17:45 (12)	17:08		16:39	16:45
30	05:59		06:32	18:44 (13)	07:05	17:22 (12)	06:41		07:19	07:40
	20:34	24	19:49	19:08 (13)	18:55	22 17:44 (12)	17:07		16:39	16:45
31	06:00		06:33	18:43 (13)			06:42			07:40
	20:33	26	19:47	19:09 (13)			17:05			16:46
Potential sun hours	-280		-145		375		343		294	283
Total, worst case		202		376		118		176		
Sun reduction		0.65		0.55		0.55		0.45		
Oper. time red.		0.86		0.86		0.86		0.86		
Wind dir. red.		0.60		0.60		0.59		0.59		
Total reduction		0.34		0.28		0.28		0.23		
Total, real		68		107		33		40		

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	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, North part
16 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
1000 meter max shadow distance applied along with default 3° inclination
Sunshine probabilities applied (pdf plots)
Directional run-hours applied from tab file (tower 1)
.

Printed/Page
03/05/06 23:47 / 26
Licensed user:
Wind Engineers, Inc.
7660 Whitegate Avenue
US-RIVERSIDE, CA 92506

Calculated:
03/02/06 05:47/2.4.0.67

SHADOW - Calendar

Calculation: North part **Shadow receptor:** 662 - 662

Assumptions for shadow calculations

Maximum distance for influence	1,000 m
Minimum sun height over horizon for influence	3 °
Day step for calculation	1 days
Time step for calculation	2 minutes

Sun shine probabilities (part of time from sun rise to sun set with sun shine)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.35	0.45	0.45	0.55	0.55	0.55	0.65	0.55	0.55	0.45	0.35	0.30

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
475	585	238	199	220	474	1,184	813	840	1,246	803	479	7,555

	January		February		March		April		May		June	
1	07:40		07:25	15:58 (11)	06:47		05:54	17:01 (12)	06:06		05:36	18:58 (13)
	16:47		17:23	22 16:20 (11)	17:59		18:35	12 17:13 (12)	20:08		20:40	28 19:26 (13)
2	07:40		07:24	15:59 (11)	06:45		05:52	17:05 (12)	06:05		05:35	18:57 (13)
	16:48		17:24	20 16:19 (11)	18:00		18:37	4 17:09 (12)	20:09		20:41	28 19:25 (13)
3	07:40		07:23	15:58 (11)	06:44		05:50		06:03		05:35	18:57 (13)
	16:49		17:26	22 16:20 (11)	18:02		18:38		20:11		20:41	30 19:27 (13)
4	07:40		07:22	15:59 (11)	06:42		05:49		06:02		05:34	18:57 (13)
	16:50		17:27	22 16:21 (11)	18:03		18:39		20:12		20:42	30 19:27 (13)
5	07:40		07:21	15:59 (11)	06:41		06:47		06:01		05:34	18:58 (13)
	16:51		17:28	20 16:19 (11)	18:04		19:40		20:13		20:43	28 19:26 (13)
6	07:40		07:20	16:00 (11)	06:39		06:45		05:59		05:34	18:58 (13)
	16:52		17:30	18 16:18 (11)	18:05		19:41		20:14		20:44	28 19:26 (13)
7	07:40		07:18	16:01 (11)	06:37		06:44		05:58		05:33	18:58 (13)
	16:53		17:31	18 16:19 (11)	18:06		19:42		20:15		20:44	30 19:28 (13)
8	07:40		07:17	16:02 (11)	06:36		06:42		05:57		05:33	18:58 (13)
	16:54		17:32	16 16:18 (11)	18:08		19:43		20:16		20:45	30 19:28 (13)
9	07:40		07:16	16:05 (11)	06:34		06:40		05:56		05:33	18:59 (13)
	16:55		17:34	12 16:17 (11)	18:09		19:45		20:17		20:46	28 19:27 (13)
10	07:40		07:15	16:07 (11)	06:32		06:39		05:55		05:32	18:59 (13)
	16:56		17:35	6 16:13 (11)	18:10		19:46		20:18		20:46	28 19:27 (13)
11	07:39		07:13		06:30		06:37		05:53		05:32	18:59 (13)
	16:57		17:36		18:11		19:47		20:19		20:47	28 19:27 (13)
12	07:39		07:12		06:29		06:35		05:52		05:32	18:59 (13)
	16:58		17:37		18:12		19:48		20:21		20:47	28 19:27 (13)
13	07:39		07:11		06:27		06:34		05:51		05:32	18:59 (13)
	16:59		17:39		18:14		19:49		20:22		20:48	30 19:29 (13)
14	07:38		07:09		06:25		06:32		05:50		05:32	18:59 (13)
	17:00		17:40		18:15		19:50		20:23		20:48	30 19:29 (13)
15	07:38		07:08		06:24		06:30		05:49		05:32	19:01 (13)
	17:02		17:41		18:16		19:51		20:24		20:49	28 19:29 (13)
16	07:37		07:07		06:22		06:29		05:48		05:32	19:01 (13)
	17:03		17:43		18:17		19:52		20:25		20:49	28 19:29 (13)
17	07:37		07:05		06:20		17:10 (12)	06:27	05:47		05:32	19:01 (13)
	17:04		17:44		18:18	4	17:14 (12)	19:54	20:26		20:50	28 19:29 (13)
18	07:36		07:04		06:18		17:04 (12)	06:25	05:46		19:07 (13)	05:32 19:01 (13)
	17:05		17:45		18:19	14	17:18 (12)	19:55	20:27	6	19:13 (13)	20:50 28 19:29 (13)
19	07:36		07:02		06:17		17:02 (12)	06:24	05:45		19:04 (13)	05:32 19:01 (13)
	17:06		17:47		18:21	16	17:18 (12)	19:56	20:28	12	19:16 (13)	20:50 28 19:29 (13)
20	07:35		07:01		06:15		17:00 (12)	06:22	05:44		19:02 (13)	05:32 19:01 (13)
	17:08		17:48		18:22	20	17:20 (12)	19:57	20:29	16	19:18 (13)	20:51 28 19:29 (13)
21	07:35		06:59		06:13		16:59 (12)	06:21	05:43		19:01 (13)	05:32 19:02 (13)
	17:09		17:49		18:23	22	17:21 (12)	19:58	20:30	18	19:19 (13)	20:51 28 19:30 (13)
22	07:34		06:58		06:11		16:57 (12)	06:19	05:42		19:00 (13)	05:33 19:02 (13)
	17:10		17:50		18:24	24	17:21 (12)	19:59	20:31	20	19:20 (13)	20:51 28 19:30 (13)
23	07:33		06:56		06:10		16:57 (12)	06:18	05:42		18:59 (13)	05:33 19:02 (13)
	17:11		17:52		18:25	24	17:21 (12)	20:00	20:32	22	19:21 (13)	20:51 28 19:30 (13)
24	07:32		16:02 (11)	06:55	06:08		16:57 (12)	06:16	05:41		18:58 (13)	05:33 19:02 (13)
	17:13	10	16:12 (11)	17:53	18:26	24	17:21 (12)	20:00	20:33	24	19:22 (13)	20:52 28 19:30 (13)
25	07:32		16:01 (11)	06:53	06:06		16:55 (12)	06:15	05:40		18:58 (13)	05:33 19:03 (13)
	17:14	12	16:13 (11)	17:54	18:27	26	17:21 (12)	20:02	20:34	24	19:22 (13)	20:52 28 19:31 (13)
26	07:31		16:00 (11)	06:52	06:04		16:56 (12)	06:13	05:39		18:57 (13)	05:34 19:03 (13)
	17:15	14	16:14 (11)	17:55	18:29	26	17:22 (12)	20:03	20:35	26	19:23 (13)	20:52 28 19:31 (13)
27	07:30		15:59 (11)	06:50	06:03		16:56 (12)	06:12	05:39		18:59 (13)	05:34 19:03 (13)
	17:16	18	16:17 (11)	17:57	18:30	24	17:20 (12)	20:04	20:36	26	19:25 (13)	20:52 28 19:31 (13)
28	07:29		15:58 (11)	06:49	06:01		16:56 (12)	06:10	05:38		18:58 (13)	05:35 19:02 (13)
	17:18	20	16:18 (11)	17:58	18:31	24	17:20 (12)	20:05	20:36	26	19:24 (13)	20:52 30 19:32 (13)
29	07:28		15:57 (11)		05:59		16:56 (12)	06:09	05:37		18:57 (13)	05:35 19:02 (13)
	17:19	20	16:17 (11)		18:32	22	17:18 (12)	20:06	20:37	28	19:25 (13)	20:52 30 19:32 (13)
30	07:27		15:58 (11)		05:57		16:59 (12)	06:07	05:37		18:57 (13)	05:35 19:03 (13)
	17:20	20	16:18 (11)		18:33	18	17:17 (12)	20:07	20:38	28	19:25 (13)	20:52 30 19:33 (13)
31	07:26		15:57 (11)		05:56		16:59 (12)		05:36		18:58 (13)	
	17:22	22	16:19 (11)		18:34	16	17:15 (12)		20:39	26	19:24 (13)	
Potential sun hours	293		295		370		209		-292		-263	
Total, worst case		136		176		304		16		302		858
Sun reduction		0.35		0.45		0.45		0.55		0.55		0.55
Oper. time red.		0.86		0.86		0.86		0.86		0.86		0.86
Wind dir. red.		0.64		0.64		0.60		0.60		0.61		0.61
Total reduction		0.20		0.25		0.23		0.29		0.29		0.29
Total, real		27		44		71		5		87		248

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	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, North part
16 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
1000 meter max shadow distance applied along with default 3° inclination
Sunshine probabilities applied (pdf plots)
Directional run-hours applied from tab file (tower 1)
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7660 Whitegate Avenue
US-RIVERSIDE, CA 92506

Calculated:
03/02/06 05:47/2.4.0.67

SHADOW - Calendar

Calculation: North part **Shadow receptor:** 662 - 662

Assumptions for shadow calculations

Maximum distance for influence	1,000	m
Minimum sun height over horizon for influence	3	°
Day step for calculation	1	days
Time step for calculation	2	minutes

Sun shine probabilities (part of time from sun rise to sun set with sun shine)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.35	0.45	0.45	0.55	0.55	0.55	0.65	0.55	0.55	0.45	0.35	0.30

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
475	585	238	199	220	474	1,184	813	840	1,246	803	479	7,555

	July			August			September			October			November			December
1	05:36		19:03 (13)	06:01			06:34			07:07			06:43		15:35 (11)	07:20
	20:52	28	19:31 (13)	20:32			19:46			18:53			17:04	8	15:43 (11)	16:38
2	05:36		19:04 (13)	06:02			06:35			07:08			06:44		15:34 (11)	07:21
	20:52	28	19:32 (13)	20:31			19:44			18:51			17:03	12	15:46 (11)	16:38
3	05:37		19:04 (13)	06:03			06:36			07:09			06:46		15:32 (11)	07:22
	20:52	28	19:32 (13)	20:30			19:42			18:49			17:02	16	15:48 (11)	16:38
4	05:38		19:03 (13)	06:04			06:37			07:10			06:47		15:31 (11)	07:23
	20:51	30	19:33 (13)	20:29			19:41			18:48			17:00	18	15:49 (11)	16:37
5	05:38		19:03 (13)	06:05			06:39			07:11			06:48		15:30 (11)	07:24
	20:51	30	19:33 (13)	20:28			19:39			18:46			16:59	18	15:48 (11)	16:37
6	05:39		19:04 (13)	06:07			06:40			07:12			06:49		15:30 (11)	07:25
	20:51	28	19:32 (13)	20:26			19:37			18:44			16:58	20	15:50 (11)	16:37
7	05:39		19:05 (13)	06:08			06:41			07:13			06:51		15:29 (11)	07:26
	20:51	28	19:33 (13)	20:25			19:35			18:43			16:57	22	15:51 (11)	16:37
8	05:40		19:05 (13)	06:09			06:42			07:14			06:52		15:28 (11)	07:27
	20:50	28	19:33 (13)	20:24			19:34			18:41			16:56	22	15:50 (11)	16:37
9	05:41		19:04 (13)	06:10			06:43			07:15			06:53		15:28 (11)	07:28
	20:50	30	19:34 (13)	20:22			19:32			18:39			16:54	22	15:50 (11)	16:37
10	05:42		19:05 (13)	06:11			06:44			07:17			06:54		15:29 (11)	07:29
	20:50	28	19:33 (13)	20:21			19:30			18:37			16:53	22	15:51 (11)	16:37
11	05:42		19:05 (13)	06:12			06:45		17:54 (12)	07:18			06:56		15:28 (11)	07:29
	20:49	28	19:33 (13)	20:20			19:28	12	18:06 (12)	18:36			16:52	22	15:50 (11)	16:37
12	05:43		19:06 (13)	06:13			06:46		17:51 (12)	07:19			06:57		15:30 (11)	07:30
	20:49	28	19:34 (13)	20:18			19:27	16	18:07 (12)	18:34			16:51	20	15:50 (11)	16:37
13	05:44		19:05 (13)	06:14			06:47		17:50 (12)	07:20			06:58		15:29 (11)	07:31
	20:48	28	19:33 (13)	20:17			19:25	18	18:08 (12)	18:32			16:50	20	15:49 (11)	16:37
14	05:45		19:06 (13)	06:15			06:48		17:47 (12)	07:21			06:59		15:30 (11)	07:32
	20:48	28	19:34 (13)	20:16			19:23	22	18:09 (12)	18:31			16:49	18	15:48 (11)	16:37
15	05:45		19:06 (13)	06:16			06:49		17:46 (12)	07:22			07:01		15:32 (11)	07:33
	20:47	26	19:32 (13)	20:14			19:21	24	18:10 (12)	18:29			16:48	18	15:50 (11)	16:37
16	05:46		19:07 (13)	06:17			06:50		17:45 (12)	07:24			07:02		15:33 (11)	07:33
	20:46	26	19:33 (13)	20:13			19:20	24	18:09 (12)	18:28			16:47	14	15:47 (11)	16:38
17	05:47		19:08 (13)	06:18			06:51		17:44 (12)	07:25			07:03		15:34 (11)	07:34
	20:46	24	19:32 (13)	20:11			19:18	26	18:10 (12)	18:26			16:47	12	15:46 (11)	16:38
18	05:48		19:07 (13)	06:19			06:52		17:43 (12)	07:26			07:04		15:36 (11)	07:35
	20:45	26	19:33 (13)	20:10			19:16	26	18:09 (12)	18:24			16:46	10	15:46 (11)	16:38
19	05:49		19:08 (13)	06:20			06:53		17:44 (12)	07:27			07:06			07:35
	20:44	24	19:32 (13)	20:08			19:14	24	18:08 (12)	18:23			16:45			16:39
20	05:50		19:09 (13)	06:21			06:55		17:43 (12)	07:28			07:07			07:36
	20:44	22	19:31 (13)	20:07			19:12	24	18:07 (12)	18:21			16:44			16:39
21	05:51		19:10 (13)	06:22			06:56		17:44 (12)	07:30			07:08			07:36
	20:43	20	19:30 (13)	20:05			19:11	24	18:08 (12)	18:20			16:43			16:40
22	05:52		19:10 (13)	06:24			06:57		17:43 (12)	07:31			07:09			07:37
	20:42	20	19:30 (13)	20:04			19:09	22	18:05 (12)	18:18			16:43			16:40
23	05:52		19:11 (13)	06:25			06:58		17:44 (12)	07:32			07:10			07:37
	20:41	18	19:29 (13)	20:02			19:07	20	18:04 (12)	18:17			16:42			16:41
24	05:53		19:12 (13)	06:26			06:59		17:45 (12)	07:33			07:12			07:38
	20:40	16	19:28 (13)	20:01			19:05	18	18:03 (12)	18:15			16:41			16:41
25	05:54		19:15 (13)	06:27			07:00		17:46 (12)	06:34			07:13			07:38
	20:39	10	19:25 (13)	19:57			19:04	14	18:00 (12)	17:14			16:41			16:42
26	05:55			06:28			07:01		17:49 (12)	06:36			07:14			07:39
	20:38			19:56			19:02	8	17:57 (12)	17:12			16:40			16:42
27	05:56			06:29			07:02			06:37			07:15			07:39
	20:37			19:54			19:00			17:11			16:40			16:43
28	05:57			06:30			07:03			06:38			07:16			07:39
	20:36			19:52			18:58			17:10			16:39			16:44
29	05:58			06:31			07:04			06:39			07:17			07:40
	20:35			19:51			18:56			17:08			16:39			16:45
30	05:59			06:32			07:05			06:41			07:19			07:40
	20:34			19:49			18:55			17:07			16:39			16:45
31	06:00			06:33						06:42						07:40
	20:33			19:47						17:05						16:46
Potential sun hours	-280			-145			375			343			294			283
Total, worst case		630						322						314		
Sun reduction		0.65						0.55						0.35		
Oper. time red.		0.86						0.86						0.86		
Wind dir. red.		0.61						0.60						0.64		
Total reduction		0.34						0.29						0.20		
Total, real		215						92						61		

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	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, North part
16 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
1000 meter max shadow distance applied along with default 3° inclination
Sunshine probabilities applied (pdf plots)
Directional run-hours applied from tab file (tower 1)
.

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US-RIVERSIDE, CA 92506

Calculated:
03/02/06 05:47/2.4.0.67

SHADOW - Calendar

Calculation: North part **Shadow receptor:** 663 - 663

Assumptions for shadow calculations

Maximum distance for influence	1,000	m
Minimum sun height over horizon for influence	3	°
Day step for calculation	1	days
Time step for calculation	2	minutes

Sun shine probabilities (part of time from sun rise to sun set with sun shine)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.35	0.45	0.45	0.55	0.55	0.55	0.65	0.55	0.55	0.45	0.35	0.30

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
475	585	238	199	220	474	1,184	813	840	1,246	803	479	7,555

	January		February		March		April		May		June	
1	07:40		07:25	16:08 (11)	06:47		05:54	17:03 (12)	06:06		05:36	18:58 (13)
	16:47		17:23	16 16:24 (11)	17:59		18:35	16 17:19 (12)	20:08		20:40	26 19:24 (13)
2	07:40		07:24	16:07 (11)	06:45		05:52	17:03 (12)	06:05		05:35	18:57 (13)
	16:48		17:24	18 16:25 (11)	18:00		18:37	14 17:17 (12)	20:09		20:41	28 19:25 (13)
3	07:40		07:23	16:08 (11)	06:44		05:50	17:06 (12)	06:03		05:35	18:57 (13)
	16:49		17:26	18 16:26 (11)	18:02		18:38	10 17:16 (12)	20:11		20:41	28 19:25 (13)
4	07:40		07:22	16:07 (11)	06:42		05:49		06:02		05:34	18:59 (13)
	16:50		17:27	20 16:27 (11)	18:03		18:39		20:12		20:42	26 19:25 (13)
5	07:40		07:21	16:05 (11)	06:41		06:47		06:01		05:34	18:58 (13)
	16:51		17:28	22 16:27 (11)	18:04		19:40		20:13		20:43	26 19:24 (13)
6	07:40		07:20	16:06 (11)	06:39		06:45		05:59		05:34	18:58 (13)
	16:52		17:30	20 16:26 (11)	18:05		19:41		20:14		20:44	28 19:26 (13)
7	07:40		07:18	16:07 (11)	06:37		06:44		05:58		05:33	19:00 (13)
	16:53		17:31	20 16:27 (11)	18:06		19:42		20:15		20:44	26 19:26 (13)
8	07:40		07:17	16:06 (11)	06:36		06:42		05:57		05:33	19:00 (13)
	16:54		17:32	22 16:28 (11)	18:08		19:43		20:16		20:45	26 19:26 (13)
9	07:40		07:16	16:07 (11)	06:34		06:40		05:56		05:33	18:59 (13)
	16:55		17:34	20 16:27 (11)	18:09		19:45		20:17		20:46	26 19:25 (13)
10	07:40		07:15	16:07 (11)	06:32		06:39		05:54		05:32	18:59 (13)
	16:56		17:35	20 16:27 (11)	18:10		19:46		20:18		20:46	26 19:25 (13)
11	07:39		07:13	16:08 (11)	06:30		06:37		05:53		05:32	19:01 (13)
	16:57		17:36	18 16:26 (11)	18:11		19:47		20:19		20:47	24 19:25 (13)
12	07:39		07:12	16:09 (11)	06:29		06:35		05:52		05:32	19:01 (13)
	16:58		17:37	16 16:25 (11)	18:12		19:48		20:21		20:47	24 19:25 (13)
13	07:39		07:11	16:11 (11)	06:27		06:34		05:51		05:32	19:01 (13)
	16:59		17:39	12 16:23 (11)	18:14		19:49		20:22		20:48	26 19:27 (13)
14	07:38		07:09	16:14 (11)	06:25		06:32		05:50		05:32	19:01 (13)
	17:00		17:40	8 16:22 (11)	18:15		19:50		20:23		20:48	26 19:27 (13)
15	07:38		07:08		06:24		06:30		05:49		05:32	19:01 (13)
	17:02		17:41		18:16		19:51		20:24		20:49	26 19:27 (13)
16	07:37		07:07		06:22		06:29		05:48	19:07 (13)	05:32	19:01 (13)
	17:03		17:43		18:17		19:52		20:25	6 19:13 (13)	20:49	26 19:27 (13)
17	07:37		07:05		06:20		06:27		05:47	19:04 (13)	05:32	19:03 (13)
	17:04		17:44		18:18		19:54		20:26	10 19:14 (13)	20:50	24 19:27 (13)
18	07:36		07:04		06:18		06:25		05:46	19:01 (13)	05:32	19:03 (13)
	17:05		17:45		18:19		19:55		20:27	16 19:17 (13)	20:50	24 19:27 (13)
19	07:36		07:02		06:17		06:24		05:45	19:00 (13)	05:32	19:03 (13)
	17:06		17:47		18:21		19:56		20:28	18 19:18 (13)	20:50	24 19:27 (13)
20	07:35		07:01		06:15	17:10 (12)	06:22		05:44	19:00 (13)	05:32	19:03 (13)
	17:08		17:48		18:22	8 17:18 (12)	19:57		20:29	20 19:20 (13)	20:51	24 19:27 (13)
21	07:35		06:59		06:13	17:07 (12)	06:21		05:43	18:59 (13)	05:32	19:04 (13)
	17:09		17:49		18:23	14 17:21 (12)	19:58		20:30	22 19:21 (13)	20:51	24 19:28 (13)
22	07:34		06:58		06:11	17:05 (12)	06:19		05:42	18:58 (13)	05:33	19:04 (13)
	17:10		17:50		18:24	18 17:23 (12)	19:59		20:31	22 19:20 (13)	20:51	24 19:28 (13)
23	07:33		06:56		06:10	17:03 (12)	06:18		05:42	18:59 (13)	05:33	19:04 (13)
	17:11		17:52		18:25	20 17:23 (12)	20:00		20:32	22 19:21 (13)	20:51	24 19:28 (13)
24	07:32		06:55		06:08	17:01 (12)	06:16		05:41	18:58 (13)	05:33	19:04 (13)
	17:13		17:53		18:26	22 17:23 (12)	20:00		20:33	24 19:22 (13)	20:52	24 19:28 (13)
25	07:32		06:53		06:06	17:01 (12)	06:15		05:40	18:58 (13)	05:33	19:05 (13)
	17:14		17:54		18:27	22 17:23 (12)	20:02		20:34	24 19:22 (13)	20:52	24 19:29 (13)
26	07:31		06:52		06:04	17:02 (12)	06:13		05:39	18:57 (13)	05:34	19:03 (13)
	17:15		17:55		18:29	22 17:24 (12)	20:03		20:35	26 19:23 (13)	20:52	26 19:29 (13)
27	07:30		06:50		06:03	17:00 (12)	06:12		05:39	18:57 (13)	05:34	19:03 (13)
	17:16		17:57		18:30	24 17:24 (12)	20:04		20:36	26 19:23 (13)	20:52	26 19:29 (13)
28	07:29		06:49		06:01	17:00 (12)	06:10		05:38	18:58 (13)	05:35	19:04 (13)
	17:18		17:58		18:31	24 17:24 (12)	20:05		20:36	26 19:24 (13)	20:52	26 19:30 (13)
29	07:28				05:59	17:00 (12)	06:09		05:37	18:57 (13)	05:35	19:04 (13)
	17:19				18:32	22 17:22 (12)	20:06		20:37	26 19:23 (13)	20:52	26 19:30 (13)
30	07:27	16:12 (11)			05:57	17:01 (12)	06:07		05:37	18:57 (13)	05:35	19:05 (13)
	17:20	6 16:18 (11)			18:33	22 17:23 (12)	20:07		20:38	28 19:25 (13)	20:52	24 19:29 (13)
31	07:26	16:09 (11)			05:56	17:01 (12)			05:36	18:58 (13)		
	17:22	12 16:21 (11)			18:34	20 17:21 (12)			20:39	26 19:24 (13)		
Potential sun hours	293		295		370		209		-292		-263	
Total, worst case		18		250		238		40		342		762
Sun reduction		0.35		0.45		0.45		0.55		0.55		0.55
Oper. time red.		0.86		0.86		0.86		0.86		0.86		0.86
Wind dir. red.		0.64		0.64		0.60		0.60		0.61		0.61
Total reduction		0.19		0.25		0.24		0.29		0.29		0.29
Total, real		3		62		56		12		98		219

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	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, North part
16 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
1000 meter max shadow distance applied along with default 3° inclination
Sunshine probabilities applied (pdf plots)
Directional run-hours applied from tab file (tower 1)
.

Licensed user:
Wind Engineers, Inc.
7660 Whitegate Avenue
US-RIVERSIDE, CA 92506

Calculated:
03/02/06 05:47/2.4.0.67

SHADOW - Calendar

Calculation: North part **Shadow receptor:** 663 - 663

Assumptions for shadow calculations

Maximum distance for influence	1,000	m
Minimum sun height over horizon for influence	3	°
Day step for calculation	1	days
Time step for calculation	2	minutes

Sun shine probabilities (part of time from sun rise to sun set with sun shine)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.35	0.45	0.45	0.55	0.55	0.55	0.65	0.55	0.55	0.45	0.35	0.30

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
475	585	238	199	220	474	1,184	813	840	1,246	803	479	7,555

	July			August			September			October			November			December
1	05:36		19:05 (13)	06:01			06:34			07:07			06:43		15:37 (11)	07:20
	20:52	24	19:29 (13)	20:32			19:46			18:53			17:04	20	15:57 (11)	16:38
2	05:36		19:04 (13)	06:02			06:35			07:08			06:44		15:36 (11)	07:21
	20:52	26	19:30 (13)	20:31			19:44			18:51			17:03	20	15:56 (11)	16:38
3	05:37		19:04 (13)	06:03			06:36			07:09			06:46		15:36 (11)	07:22
	20:52	26	19:30 (13)	20:30			19:42			18:49			17:02	22	15:58 (11)	16:38
4	05:38		19:05 (13)	06:04			06:37			07:10			06:47		15:37 (11)	07:23
	20:51	26	19:31 (13)	20:29			19:41			18:48			17:00	20	15:57 (11)	16:37
5	05:38		19:05 (13)	06:05			06:39			07:11			06:48		15:36 (11)	07:24
	20:51	26	19:31 (13)	20:28			19:39			18:46			16:59	20	15:56 (11)	16:37
6	05:39		19:04 (13)	06:07			06:40			07:12			06:49		15:36 (11)	07:25
	20:51	28	19:32 (13)	20:26			19:37			18:44			16:58	20	15:56 (11)	16:37
7	05:39		19:05 (13)	06:08			06:41			07:13			06:51		15:37 (11)	07:26
	20:51	26	19:31 (13)	20:25			19:35			18:43			16:57	20	15:57 (11)	16:37
8	05:40		19:05 (13)	06:09			06:42			07:14			06:52		15:38 (11)	07:27
	20:50	26	19:31 (13)	20:24			19:34			18:41			16:56	18	15:56 (11)	16:37
9	05:41		19:06 (13)	06:10			06:43		17:59 (12)	07:15			06:53		15:38 (11)	07:28
	20:50	26	19:32 (13)	20:22			19:32	8	18:07 (12)	18:39			16:54	18	15:56 (11)	16:37
10	05:42		19:05 (13)	06:11			06:44		17:57 (12)	07:17			06:54		15:39 (11)	07:29
	20:50	28	19:33 (13)	20:21			19:30	14	18:11 (12)	18:37			16:53	14	15:53 (11)	16:37
11	05:42		19:05 (13)	06:12			06:45		17:56 (12)	07:18			06:56		15:40 (11)	07:29
	20:49	26	19:31 (13)	20:20			19:28	16	18:12 (12)	18:36			16:52	12	15:52 (11)	16:37
12	05:43		19:06 (13)	06:13			06:46		17:53 (12)	07:19			06:57		15:44 (11)	07:30
	20:49	26	19:32 (13)	20:18			19:27	20	18:13 (12)	18:34			16:51	6	15:50 (11)	16:37
13	05:44		19:05 (13)	06:14			06:47		17:52 (12)	07:20			06:58			07:31
	20:48	28	19:33 (13)	20:17			19:25	22	18:14 (12)	18:32			16:50			16:37
14	05:45		19:06 (13)	06:15			06:48		17:51 (12)	07:21			06:59			07:32
	20:48	26	19:32 (13)	20:16			19:23	22	18:13 (12)	18:31			16:49			16:37
15	05:45		19:06 (13)	06:16			06:49		17:50 (12)	07:22			07:01			07:33
	20:47	26	19:32 (13)	20:14			19:21	24	18:14 (12)	18:29			16:48			16:37
16	05:46		19:07 (13)	06:17			06:50		17:49 (12)	07:24			07:02			07:33
	20:46	26	19:33 (13)	20:13			19:20	24	18:13 (12)	18:28			16:47			16:38
17	05:47		19:06 (13)	06:18			06:51		17:50 (12)	07:25			07:03			07:34
	20:46	26	19:32 (13)	20:11			19:18	22	18:12 (12)	18:26			16:47			16:38
18	05:48		19:07 (13)	06:19			06:52		17:49 (12)	07:26			07:04			07:35
	20:45	26	19:33 (13)	20:10			19:16	24	18:13 (12)	18:24			16:46			16:38
19	05:49		19:08 (13)	06:20			06:53		17:50 (12)	07:27			07:06			07:35
	20:44	24	19:32 (13)	20:08			19:14	22	18:12 (12)	18:23			16:45			16:39
20	05:50		19:09 (13)	06:21			06:55		17:49 (12)	07:28			07:07			07:36
	20:44	22	19:31 (13)	20:07			19:12	22	18:11 (12)	18:21			16:44			16:39
21	05:51		19:08 (13)	06:22			06:56		17:50 (12)	07:30			07:08			07:36
	20:43	24	19:32 (13)	20:05			19:11	18	18:08 (12)	18:20			16:43			16:40
22	05:52		19:08 (13)	06:24			06:57		17:51 (12)	07:31			07:09			07:37
	20:42	22	19:30 (13)	20:04			19:09	16	18:07 (12)	18:18			16:43			16:40
23	05:52		19:09 (13)	06:25			06:58		17:52 (12)	07:32			07:10			07:37
	20:41	20	19:29 (13)	20:02			19:07	12	18:04 (12)	18:17			16:42			16:41
24	05:53		19:10 (13)	06:26			06:59			07:33			07:12			07:38
	20:40	18	19:28 (13)	20:01			19:05			18:15			16:41			16:41
25	05:54		19:11 (13)	06:27			07:00			06:34			07:13			07:38
	20:39	16	19:27 (13)	19:57			19:03			17:14			16:41			16:42
26	05:55		19:12 (13)	06:28			07:01			06:36			07:14			07:39
	20:38	14	19:26 (13)	19:56			19:02			17:12			16:40			16:42
27	05:56		19:15 (13)	06:29			07:02			06:37			07:15			07:39
	20:37	10	19:25 (13)	19:54			19:00			17:11			16:40			16:43
28	05:57			06:30			07:03			06:38		15:42 (11)	07:16			07:39
	20:36			19:52			18:58			17:10	10	15:52 (11)	16:39			16:44
29	05:58			06:31			07:04			06:39		15:41 (11)	07:17			07:40
	20:35			19:51			18:56			17:08	12	15:53 (11)	16:39			16:45
30	05:59			06:32			07:05			06:41		15:38 (11)	07:19			07:40
	20:34			19:49			18:55			17:07	16	15:54 (11)	16:39			16:45
31	06:00			06:33						06:42		15:38 (11)				07:40
	20:33			19:47						17:05	18	15:56 (11)				16:46
Potential sun hours	-280			-145			375			343			294			283
Total, worst case		642						286			56			210		
Sun reduction		0.65						0.55			0.45			0.35		
Oper. time red.		0.86						0.86			0.86			0.86		
Wind dir. red.		0.61						0.60			0.64			0.64		
Total reduction		0.34						0.29			0.25			0.19		
Total, real		218						82			14			41		

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	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, North part
16 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
1000 meter max shadow distance applied along with default 3° inclination
Sunshine probabilities applied (pdf plots)
Directional run-hours applied from tab file (tower 1)
.

Printed/Page
03/05/06 23:47 / 30
Licensed user:
Wind Engineers, Inc.
7660 Whitegate Avenue
US-RIVERSIDE, CA 92506

Calculated:
03/02/06 05:47/2.4.0.67

SHADOW - Calendar

Calculation: North part **Shadow receptor:** 664 - 664

Assumptions for shadow calculations

Maximum distance for influence	1,000 m
Minimum sun height over horizon for influence	3 °
Day step for calculation	1 days
Time step for calculation	2 minutes

Sun shine probabilities (part of time from sun rise to sun set with sun shine)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.35	0.45	0.45	0.55	0.55	0.55	0.65	0.55	0.55	0.45	0.35	0.30

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
475	585	238	199	220	474	1,184	813	840	1,246	803	479	7,555

	January		February		March		April			May			June		
1	07:40		07:25		06:47		05:54		17:05 (12)	06:06			05:36		18:54 (13)
	16:47		17:23		17:59		18:35	8	17:13 (12)	20:08			20:40	24	19:18 (13)
2	07:40		07:24		06:45		05:52			06:05			05:35		18:55 (13)
	16:48		17:24		18:00		18:37			20:09			20:41	22	19:17 (13)
3	07:40		07:23		06:44		05:50			06:03			05:35		18:55 (13)
	16:49		17:26		18:02		18:38			20:11			20:41	24	19:19 (13)
4	07:40		07:22		06:42		05:49			06:02			05:34		18:57 (13)
	16:50		17:27		18:03		18:39			20:12			20:42	22	19:19 (13)
5	07:40		07:21		06:41		06:47			06:01			05:34		18:56 (13)
	16:51		17:28		18:04		19:40			20:13			20:43	22	19:18 (13)
6	07:40		07:20		06:39		06:45			05:59			05:33		18:58 (13)
	16:52		17:30		18:05		19:41			20:14			20:44	20	19:18 (13)
7	07:40		07:18		06:37		06:44			05:58			05:33		18:58 (13)
	16:53		17:31		18:06		19:42			20:15			20:44	20	19:18 (13)
8	07:40		07:17		06:36		06:42			05:57			05:33		18:58 (13)
	16:54		17:32		18:08		19:43			20:16			20:45	20	19:18 (13)
9	07:40		07:16		06:34		06:40			05:56			05:33		18:59 (13)
	16:55		17:34		18:09		19:45			20:17			20:46	18	19:17 (13)
10	07:40		07:15		06:32		06:39			05:54			05:32		18:59 (13)
	16:56		17:35		18:10		19:46			20:18			20:46	18	19:17 (13)
11	07:39		07:13		06:30		06:37			05:53		19:02 (13)	05:32		18:59 (13)
	16:57		17:36		18:11		19:47			20:19	6	19:08 (13)	20:47	18	19:17 (13)
12	07:39		07:12		06:29		06:35			05:52		18:59 (13)	05:32		19:01 (13)
	16:58		17:37		18:12		19:48			20:21	12	19:11 (13)	20:47	16	19:17 (13)
13	07:39		07:11		06:27		06:34			05:51		18:58 (13)	05:32		19:01 (13)
	16:59		17:39		18:14		19:49			20:22	14	19:12 (13)	20:48	16	19:17 (13)
14	07:38		07:09		06:25		06:32			05:50		18:57 (13)	05:32		19:01 (13)
	17:00		17:40		18:15		19:50			20:23	16	19:13 (13)	20:48	16	19:17 (13)
15	07:38		07:08		06:24		06:30			05:49		18:56 (13)	05:32		19:01 (13)
	17:02		17:41		18:16		19:51			20:24	18	19:14 (13)	20:49	16	19:17 (13)
16	07:37		07:07		06:22		06:29			05:48		18:55 (13)	05:32		19:03 (13)
	17:03		17:43		18:17		19:52			20:25	20	19:15 (13)	20:49	14	19:17 (13)
17	07:37		07:05		06:20		06:27			05:47		18:54 (13)	05:32		19:03 (13)
	17:04		17:44		18:18		19:54			20:26	22	19:16 (13)	20:50	14	19:17 (13)
18	07:36		07:04		06:18		17:12 (12)		06:25	05:46		18:53 (13)	05:32		19:03 (13)
	17:05		17:45		18:19	4	17:16 (12)		19:55	20:27	24	19:17 (13)	20:50	14	19:17 (13)
19	07:36		07:02		06:17		17:06 (12)		06:24	05:45		18:52 (13)	05:32		19:03 (13)
	17:06		17:46		18:21	12	17:18 (12)		19:56	20:28	24	19:16 (13)	20:50	14	19:17 (13)
20	07:35		07:01		06:15		17:04 (12)		06:22	05:44		18:54 (13)	05:32		19:03 (13)
	17:08		17:48		18:22	16	17:20 (12)		19:57	20:29	24	19:18 (13)	20:51	14	19:17 (13)
21	07:35		06:59		06:13		17:03 (12)		06:21	05:43		18:53 (13)	05:32		19:04 (13)
	17:09		17:49		18:23	18	17:21 (12)		19:58	20:30	26	19:19 (13)	20:51	14	19:18 (13)
22	07:34		06:58		06:11		17:01 (12)		06:19	05:42		18:52 (13)	05:33		19:04 (13)
	17:10		17:50		18:24	22	17:23 (12)		19:59	20:31	26	19:18 (13)	20:51	14	19:18 (13)
23	07:33		06:56		06:10		17:01 (12)		06:18	05:42		18:53 (13)	05:33		19:04 (13)
	17:11		17:52		18:25	22	17:23 (12)		20:00	20:32	26	19:19 (13)	20:51	14	19:18 (13)
24	07:32		06:55		06:08		16:59 (12)		06:16	05:41		18:52 (13)	05:33		19:04 (13)
	17:13		17:53		18:26	24	17:23 (12)		20:00	20:33	26	19:18 (13)	20:52	14	19:18 (13)
25	07:32		06:53		06:06		16:59 (12)		06:15	05:40		18:52 (13)	05:33		19:05 (13)
	17:14		17:54		18:27	22	17:21 (12)		20:02	20:34	26	19:18 (13)	20:52	14	19:19 (13)
26	07:31		06:52		06:04		17:00 (12)		06:13	05:39		18:53 (13)	05:34		19:05 (13)
	17:15		17:55		18:29	22	17:22 (12)		20:03	20:35	26	19:19 (13)	20:52	14	19:19 (13)
27	07:30		06:50		06:03		17:00 (12)		06:12	05:39		18:52 (13)	05:34		19:05 (13)
	17:16		17:57		18:30	22	17:22 (12)		20:04	20:36	26	19:18 (13)	20:52	14	19:19 (13)
28	07:29		06:49		06:01		17:00 (12)		06:10	05:38		18:54 (13)	05:35		19:04 (13)
	17:18		17:58		18:31	20	17:20 (12)		20:05	20:36	24	19:18 (13)	20:52	16	19:20 (13)
29	07:28				05:59		17:00 (12)		06:09	05:37		18:53 (13)	05:35		19:04 (13)
	17:19				18:32	20	17:20 (12)		20:06	20:37	26	19:19 (13)	20:52	16	19:20 (13)
30	07:27				05:57		17:01 (12)		06:07	05:37		18:55 (13)	05:35		19:05 (13)
	17:20				18:33	18	17:19 (12)		20:07	20:38	24	19:19 (13)	20:52	16	19:21 (13)
31	07:26				05:56		17:03 (12)			05:36		18:54 (13)			
	17:22				18:34	14	17:17 (12)			20:39	24	19:18 (13)			
Potential sun hours	293		295		370			209		-292			-263		
Total, worst case						256			8			460			508
Sun reduction						0.45			0.55			0.55			0.55
Oper. time red.						0.86			0.86			0.86			0.86
Wind dir. red.						0.60			0.60			0.60			0.60
Total reduction						0.23			0.29			0.28			0.28
Total, real						60			2			131			145

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	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, North part
16 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
1000 meter max shadow distance applied along with default 3° inclination
Sunshine probabilities applied (pdf plots)
Directional run-hours applied from tab file (tower 1)
.

Printed/Page
03/05/06 23:47 / 31
Licensed user:
Wind Engineers, Inc.
7660 Whitegate Avenue
US-RIVERSIDE, CA 92506

Calculated:
03/02/06 05:47/2.4.0.67

SHADOW - Calendar

Calculation: North part **Shadow receptor:** 664 - 664

Assumptions for shadow calculations

Maximum distance for influence	1,000	m
Minimum sun height over horizon for influence	3	°
Day step for calculation	1	days
Time step for calculation	2	minutes

Sun shine probabilities (part of time from sun rise to sun set with sun shine)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.35	0.45	0.45	0.55	0.55	0.55	0.65	0.55	0.55	0.45	0.35	0.30

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
475	585	238	199	220	474	1,184	813	840	1,246	803	479	7,555

	July			August			September			October	November	December
1	05:36		19:05 (13)	06:01		19:10 (13)	06:34			07:07	06:43	07:20
	20:52	16	19:21 (13)	20:32	10	19:20 (13)	19:46			18:53	17:04	16:38
2	05:36		19:04 (13)	06:02			06:35			07:08	06:44	07:21
	20:52	18	19:22 (13)	20:31			19:44			18:51	17:03	16:38
3	05:37		19:04 (13)	06:03			06:36			07:09	06:46	07:22
	20:52	18	19:22 (13)	20:30			19:42			18:49	17:02	16:38
4	05:38		19:05 (13)	06:04			06:37			07:10	06:47	07:23
	20:51	18	19:23 (13)	20:29			19:41			18:48	17:00	16:37
5	05:38		19:03 (13)	06:05			06:39			07:11	06:48	07:24
	20:51	20	19:23 (13)	20:28			19:39			18:46	16:59	16:37
6	05:39		19:04 (13)	06:07			06:40			07:12	06:49	07:25
	20:51	20	19:24 (13)	20:26			19:37			18:44	16:58	16:37
7	05:39		19:03 (13)	06:08			06:41			07:13	06:51	07:26
	20:51	22	19:25 (13)	20:25			19:35			18:43	16:57	16:37
8	05:40		19:03 (13)	06:09			06:42			07:14	06:52	07:27
	20:50	22	19:25 (13)	20:24			19:34			18:41	16:56	16:37
9	05:41		19:04 (13)	06:10			06:43			07:15	06:53	07:28
	20:50	22	19:26 (13)	20:22			19:32			18:39	16:54	16:37
10	05:42		19:03 (13)	06:11			06:44			07:17	06:54	07:29
	20:50	24	19:27 (13)	20:21			19:30			18:37	16:53	16:37
11	05:42		19:03 (13)	06:12			06:45		17:58 (12)	07:18	06:56	07:29
	20:49	22	19:25 (13)	20:20			19:28	8	18:06 (12)	18:36	16:52	16:37
12	05:43		19:02 (13)	06:13			06:46		17:55 (12)	07:19	06:57	07:30
	20:49	24	19:26 (13)	20:18			19:27	14	18:09 (12)	18:34	16:51	16:37
13	05:44		19:03 (13)	06:14			06:47		17:52 (12)	07:20	06:58	07:31
	20:48	24	19:27 (13)	20:17			19:25	18	18:10 (12)	18:32	16:50	16:37
14	05:45		19:02 (13)	06:15			06:48		17:51 (12)	07:21	06:59	07:32
	20:48	26	19:28 (13)	20:16			19:23	20	18:11 (12)	18:31	16:49	16:37
15	05:45		19:02 (13)	06:16			06:49		17:50 (12)	07:22	07:01	07:33
	20:47	26	19:28 (13)	20:14			19:21	20	18:10 (12)	18:29	16:48	16:37
16	05:46		19:03 (13)	06:17			06:50		17:49 (12)	07:24	07:02	07:33
	20:46	24	19:27 (13)	20:13			19:20	22	18:11 (12)	18:28	16:47	16:38
17	05:47		19:02 (13)	06:18			06:51		17:48 (12)	07:25	07:03	07:34
	20:46	26	19:28 (13)	20:11			19:18	22	18:10 (12)	18:26	16:47	16:38
18	05:48		19:03 (13)	06:19			06:52		17:47 (12)	07:26	07:04	07:35
	20:45	26	19:29 (13)	20:10			19:16	24	18:11 (12)	18:24	16:46	16:38
19	05:49		19:02 (13)	06:20			06:53		17:48 (12)	07:27	07:06	07:35
	20:44	26	19:28 (13)	20:08			19:14	22	18:10 (12)	18:23	16:45	16:39
20	05:50		19:03 (13)	06:21			06:55		17:47 (12)	07:28	07:07	07:36
	20:44	26	19:29 (13)	20:07			19:12	22	18:09 (12)	18:21	16:44	16:39
21	05:51		19:02 (13)	06:22			06:56		17:46 (12)	07:30	07:08	07:36
	20:43	26	19:28 (13)	20:05			19:11	22	18:08 (12)	18:20	16:43	16:40
22	05:52		19:02 (13)	06:24			06:57		17:47 (12)	07:31	07:09	07:37
	20:42	26	19:28 (13)	20:04			19:09	20	18:07 (12)	18:18	16:43	16:40
23	05:52		19:03 (13)	06:25			06:58		17:48 (12)	07:32	07:10	07:37
	20:41	24	19:27 (13)	20:02			19:07	16	18:04 (12)	18:17	16:42	16:41
24	05:53		19:02 (13)	06:26			06:59		17:49 (12)	07:33	07:12	07:38
	20:40	26	19:28 (13)	20:01			19:05	14	18:03 (12)	18:15	16:41	16:41
25	05:54		19:03 (13)	06:27			07:00		17:52 (12)	06:34	07:13	07:38
	20:39	24	19:27 (13)	19:57			19:03	8	18:00 (12)	17:14	16:41	16:42
26	05:55		19:04 (13)	06:28			07:01			06:36	07:14	07:39
	20:38	22	19:26 (13)	19:56			19:02			17:12	16:40	16:42
27	05:56		19:05 (13)	06:29			07:02			06:37	07:15	07:39
	20:37	22	19:27 (13)	19:54			19:00			17:11	16:40	16:43
28	05:57		19:06 (13)	06:30			07:03			06:38	07:16	07:39
	20:36	20	19:26 (13)	19:52			18:58			17:10	16:39	16:44
29	05:58		19:07 (13)	06:31			07:04			06:39	07:17	07:40
	20:35	18	19:25 (13)	19:51			18:56			17:08	16:39	16:45
30	05:59		19:08 (13)	06:32			07:05			06:41	07:19	07:40
	20:34	16	19:24 (13)	19:49			18:55			17:07	16:39	16:45
31	06:00		19:09 (13)	06:33						06:42		07:40
	20:33	14	19:23 (13)	19:47						17:05		16:46
Potential sun hours	-280			-145			375			343	294	283
Total, worst case		688			10			272				
Sun reduction		0.65			0.55			0.55				
Oper. time red.		0.86			0.86			0.86				
Wind dir. red.		0.60			0.60			0.60				
Total reduction		0.34			0.28			0.29				
Total, real		231			3			78				

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	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, North part
16 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
1000 meter max shadow distance applied along with default 3° inclination
Sunshine probabilities applied (pdf plots)
Directional run-hours applied from tab file (tower 1)
.

Printed/Page
03/05/06 23:47 / 32

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Wind Engineers, Inc.
7660 Whitegate Avenue
US-RIVERSIDE, CA 92506

Calculated:
03/02/06 05:47/2.4.0.67

SHADOW - Calendar

Calculation: North part **Shadow receptor:** 665 - 665

Assumptions for shadow calculations

Maximum distance for influence	1,000	m
Minimum sun height over horizon for influence	3	°
Day step for calculation	1	days
Time step for calculation	2	minutes

Sun shine probabilities (part of time from sun rise to sun set with sun shine)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.35	0.45	0.45	0.55	0.55	0.55	0.65	0.55	0.55	0.45	0.35	0.30

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
475	585	238	199	220	474	1,184	813	840	1,246	803	479	7,555

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:40	07:25	06:47	05:54	06:06	05:36	05:36	06:01	06:34	07:06	06:43	07:20
	16:47	17:23	17:59	18:35	20:08	20:40 6 19:06 (13)	20:52	20:32 22	19:46	18:53	17:04	16:38
2	07:40	07:24	06:45	05:52	06:05	05:35	05:36	06:02	06:35	07:08	06:44	07:21
	16:48	17:24	18:00	18:37	20:09	20:41	20:52	20:31 22	19:44	18:51	17:03	16:38
3	07:40	07:23	06:44	05:50	06:03	05:35	05:37	06:03	06:36	07:09	06:46	07:22
	16:49	17:26	18:02	18:38	20:11	20:41	20:52	20:30 20	19:42	18:49	17:02	16:38
4	07:40	07:22	06:42	05:49	06:02	05:34	05:38	06:04	06:37	07:10	06:47	07:23
	16:50	17:27	18:03	18:39	20:12	20:42	20:51	20:29 18	19:41	18:48	17:00	16:37
5	07:40	07:21	06:41	06:47	06:01	05:34	05:38	06:05	06:39	07:11	06:48	07:24
	16:51	17:28	18:04	19:40	20:13	20:43	20:51	20:28 16	19:39	18:46	16:59	16:37
6	07:40	07:20	06:39	06:45	05:59 18:56 (13)	05:33	05:39	06:07	06:40	07:12	06:49	07:25
	16:52	17:30	18:05	19:41	20:14 10 19:06 (13)	20:44	20:51	20:26 14	19:37	18:44	16:58	16:37
7	07:40	07:18	06:37	06:44	05:58 18:53 (13)	05:33	05:39	06:08	06:41	07:13	06:51	07:26
	16:53	17:31	18:06	19:42	20:15 14 19:07 (13)	20:44	20:51	20:25 8	19:35	18:43	16:57	16:37
8	07:40	07:17	06:36	06:42	05:57 18:51 (13)	05:33	05:40	06:09	06:42	07:14	06:52	07:27
	16:54	17:32	18:08	19:43	20:16 18 19:09 (13)	20:45	20:50	20:24	19:34	18:41	16:56	16:37
9	07:40	07:16	06:34	06:40	05:56 18:50 (13)	05:33	05:41	06:10	06:43	07:15	06:53	07:28
	16:55	17:34	18:09	19:45	20:17 20 19:10 (13)	20:46	20:50	20:22	19:32	18:39	16:54	16:37
10	07:40	07:15	06:32	06:39	05:54 18:49 (13)	05:32	05:42	06:11	06:44	07:17	06:54	07:29
	16:56	17:35	18:10	19:46	20:18 22 19:11 (13)	20:46	20:50	20:21	19:30	18:37	16:53	16:37
11	07:39	07:13	06:30	06:37	05:53 18:48 (13)	05:32	05:42 19:07 (13)	06:12	06:45	07:18	06:56	07:29
	16:57	17:36	18:11	19:47	20:19 22 19:10 (13)	20:47	20:49 4 19:11 (13)	20:20	19:28	18:36	16:52	16:37
12	07:39	07:12	06:29	06:35	05:52 18:49 (13)	05:32	05:43 19:06 (13)	06:13	06:46	07:19	06:57	07:30
	16:58	17:37	18:12	19:48	20:21 22 19:11 (13)	20:47	20:49 8 19:14 (13)	20:18	19:27	18:34	16:51	16:37
13	07:39	07:11	06:27	06:34	05:51 18:48 (13)	05:32	05:44 19:05 (13)	06:14	06:47	07:20	06:58	07:31
	16:59	17:39	18:14	19:49	20:22 24 19:12 (13)	20:48	20:48 10 19:15 (13)	20:17	19:25	18:32	16:50	16:37
14	07:38	07:09	06:25	06:32	05:50 18:47 (13)	05:32	05:45 19:04 (13)	06:15	06:48 17:55 (12)	07:21	06:59	07:32
	17:00	17:40	18:15	19:50	20:23 26 19:13 (13)	20:48	20:48 14 19:18 (13)	20:16	19:23 10 18:05 (12)	18:31	16:49	16:37
15	07:38	07:08	06:24	06:30	05:49 18:48 (13)	05:32	05:45 19:02 (13)	06:16	06:49 17:52 (12)	07:22	07:01	07:33
	17:02	17:41	18:16	19:51	20:24 24 19:12 (13)	20:49	20:47 16 19:18 (13)	20:14	19:21 14 18:06 (12)	18:29	16:48	16:37
16	07:37	07:07	06:22	06:29	05:48 18:47 (13)	05:32	05:46 19:01 (13)	06:17	06:50 17:49 (12)	07:24	07:02	07:33
	17:03	17:43	18:17	19:52	20:25 26 19:13 (13)	20:49	20:46 18 19:19 (13)	20:13	19:20 18 18:07 (12)	18:28	16:47	16:38
17	07:37	07:05	06:20 17:06 (12)	06:27	05:47 18:48 (13)	05:32	05:47 19:02 (13)	06:18	06:51 17:48 (12)	07:25	07:03	07:34
	17:04	17:44	18:18 12 17:18 (12)	19:54	20:26 24 19:12 (13)	20:50	20:46 18 19:20 (13)	20:11	19:18 20 18:08 (12)	18:26	16:47	16:38
18	07:36	07:04	06:18 17:04 (12)	06:25	05:46 18:47 (13)	05:32	05:48 19:01 (13)	06:19	06:52 17:47 (12)	07:26	07:04	07:35
	17:05	17:45	18:19 16 17:20 (12)	19:55	20:27 26 19:13 (13)	20:50	20:45 20 19:21 (13)	20:10	19:16 20 18:07 (12)	18:24	16:46	16:38
19	07:36	07:02	06:17 17:02 (12)	06:24	05:45 18:48 (13)	05:32	05:49 19:00 (13)	06:20	06:53 17:46 (12)	07:27	07:06	07:35
	17:06	17:46	18:21 18 17:20 (12)	19:56	20:28 24 19:12 (13)	20:50	20:44 20 19:20 (13)	20:08	19:14 22 18:08 (12)	18:23	16:45	16:39
20	07:35	07:01	06:15 17:00 (12)	06:22	05:44 18:48 (13)	05:32	05:50 19:01 (13)	06:21	06:55 17:45 (12)	07:28	07:07	07:36
	17:08	17:48	18:22 20 17:20 (12)	19:57	20:29 24 19:12 (13)	20:51	20:44 20 19:21 (13)	20:07	19:12 22 18:07 (12)	18:21	16:44	16:39
21	07:35	06:59	06:13 17:01 (12)	06:21	05:43 18:49 (13)	05:32	05:51 19:00 (13)	06:22	06:56 17:44 (12)	07:30	07:08	07:36
	17:09	17:49	18:23 20 17:21 (12)	19:58	20:30 24 19:13 (13)	20:51	20:43 22 19:22 (13)	20:05	19:11 22 18:06 (12)	18:20	16:43	16:40
22	07:34	06:58	06:11 16:59 (12)	06:19	05:42 18:50 (13)	05:33	05:52 18:58 (13)	06:24	06:57 17:45 (12)	07:31	07:09	07:37
	17:10	17:50	18:24 22 17:21 (12)	19:59	20:31 22 19:12 (13)	20:51	20:42 24 19:22 (13)	20:04	19:09 20 18:05 (12)	18:18	16:43	16:40
23	07:33	06:56	06:10 16:59 (12)	06:18	05:42 18:49 (13)	05:33	05:52 18:59 (13)	06:25	06:58 17:44 (12)	07:32	07:10	07:37
	17:11	17:52	18:25 22 17:21 (12)	20:00	20:32 22 19:11 (13)	20:51	20:41 24 19:23 (13)	20:02	19:07 20 18:04 (12)	18:17	16:42	16:41
24	07:32	06:55	06:08 16:59 (12)	06:16	05:41 18:50 (13)	05:33	05:53 18:58 (13)	06:26	06:59 17:45 (12)	07:33	07:12	07:38
	17:13	17:53	18:26 22 17:21 (12)	20:00	20:33 20 19:10 (13)	20:52	20:40 24 19:22 (13)	20:01	19:05 18 18:03 (12)	18:15	16:41	16:41
25	07:32	06:53	06:06 16:59 (12)	06:15	05:40 18:52 (13)	05:33	05:54 18:59 (13)	06:27	07:00 17:46 (12)	06:34	07:13	07:38
	17:14	17:54	18:27 20 17:19 (12)	20:02	20:34 20 19:12 (13)	20:52	20:39 24 19:23 (13)	19:57	19:03 16 18:02 (12)	17:14	16:41	16:42
26	07:31	06:52	06:04 17:00 (12)	06:13	05:39 18:51 (13)	05:34	05:55 18:58 (13)	06:28	07:01 17:47 (12)	06:36	07:14	07:39
	17:15	17:55	18:29 20 17:20 (12)	20:03	20:35 20 19:11 (13)	20:52	20:38 24 19:22 (13)	19:56	19:02 12 17:59 (12)	17:12	16:40	16:42
27	07:30	06:50	06:03 17:00 (12)	06:12	05:39 18:52 (13)	05:34	05:56 18:59 (13)	06:29	07:02 17:50 (12)	06:37	07:15	07:39
	17:16	17:57	18:30 18 17:18 (12)	20:04	20:36 18 19:10 (13)	20:52	20:37 24 19:23 (13)	19:54	19:00 6 17:56 (12)	17:11	16:40	16:43
28	07:29	06:49	06:01 17:00 (12)	06:10	05:38 18:54 (13)	05:35	05:57 18:58 (13)	06:30	07:03	06:38	07:16	07:39
	17:18	17:58	18:31 16 17:16 (12)	20:05	20:36 16 19:10 (13)	20:52	20:36 24 19:22 (13)	19:52	18:58	17:09	16:39	16:44
29	07:28		05:59 17:02 (12)	06:09	05:37 18:55 (13)	05:35	05:58 18:59 (13)	06:31	07:04	06:39	07:17	07:40
	17:19		18:32 12 17:14 (12)	20:06	20:37 14 19:09 (13)	20:52	20:35 24 19:23 (13)	19:51	18:56	17:08	16:39	16:44
30	07:27		05:57	06:07	05:37 18:55 (13)	05:35	05:59 18:58 (13)	06:32	07:05	06:41	07:19	07:40
	17:20		18:33	20:07	20:38 12 19:07 (13)	20:52	20:34 24 19:22 (13)	19:49	18:55	17:07	16:39	16:45
31	07:26		05:56		05:36 18:56 (13)		06:00 18:59 (13)	06:33		06:42		07:40
	17:22		18:34		20:39 10 19:06 (13)		20:33 24 19:23 (13)	19:47		17:05		16:46
Potential sun hours	293	295	370	209	-292	-263	-280	-145	375	343	294	283
Total, worst case			238		524	6	410	120	240			
Sun reduction			0.45		0.55	0.55	0.65	0.55	0.55			
Oper. time red.			0.86		0.86	0.86	0.86	0.86	0.86			
Wind dir. red.			0.60		0.59	0.59	0.59	0.59	0.60			
Total reduction			0.23		0.28	0.28	0.33	0.28	0.29			
Total, real			56		147	2	136	34	69			

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	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, North part
16 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
1000 meter max shadow distance applied along with default 3° inclination
Sunshine probabilities applied (pdf plots)
Directional run-hours applied from tab file (tower 1)
.

Licensed user:
Wind Engineers, Inc.
7660 Whitegate Avenue
US-RIVERSIDE, CA 92506

Calculated:
03/02/06 05:47/2.4.0.67

SHADOW - Calendar

Calculation: North part **Shadow receptor:** 666 - 666

Assumptions for shadow calculations

Maximum distance for influence	1,000	m
Minimum sun height over horizon for influence	3	°
Day step for calculation	1	days
Time step for calculation	2	minutes

Sun shine probabilities (part of time from sun rise to sun set with sun shine)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.35	0.45	0.45	0.55	0.55	0.55	0.65	0.55	0.55	0.45	0.35	0.30

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
475	585	238	199	220	474	1,184	813	840	1,246	803	479	7,555

	January		February		March		April		May		June	
1	07:40		07:25		16:12 (11)		06:47		05:54		17:15 (12)	06:06	05:36
	16:47		17:23	8	16:20 (11)		17:59		18:35	16	17:31 (12)	20:08	20:40
2	07:40		07:24		16:11 (11)		06:45		05:52		17:14 (12)	06:05	05:35
	16:48		17:24	12	16:23 (11)		18:00		18:37	20	17:34 (12)	20:09	20:41
3	07:40		07:23		16:08 (11)		06:44		05:50		17:12 (12)	06:03	05:35
	16:49		17:26	18	16:26 (11)		18:02		18:38	22	17:34 (12)	20:11	20:41
4	07:40		07:22		16:09 (11)		06:42		05:49		17:10 (12)	06:02	05:34
	16:50		17:27	18	16:27 (11)		18:03		18:39	26	17:36 (12)	20:12	20:42
5	07:40		07:21		16:08 (11)		06:41		06:47		18:10 (12)	06:01	05:34
	16:51		17:28	20	16:28 (11)		18:04		19:40	26	18:36 (12)	20:13	20:43
6	07:40		07:20		16:06 (11)		06:39		06:45		18:09 (12)	05:59	05:34
	16:52		17:30	22	16:28 (11)		18:05		19:41	28	18:37 (12)	20:14	20:44
7	07:40		07:18		16:05 (11)		06:37		06:44		18:09 (12)	05:58	05:33
	16:53		17:31	24	16:29 (11)		18:06		19:42	28	18:37 (12)	20:15	20:44
8	07:40		07:17		16:06 (11)		06:36		06:42		18:07 (12)	05:57	05:33
	16:54		17:32	24	16:30 (11)		18:08		19:43	28	18:35 (12)	20:16	20:45
9	07:40		07:16		16:07 (11)		06:34		06:40		18:08 (12)	05:56	05:33
	16:55		17:34	24	16:31 (11)		18:09		19:45	28	18:36 (12)	20:17	20:46
10	07:40		07:15		16:05 (11)		06:32		06:39		18:08 (12)	05:55	05:32
	16:56		17:35	24	16:29 (11)		18:10		19:46	28	18:36 (12)	20:18	20:46
11	07:39		07:13		16:06 (11)		06:30		06:37		18:08 (12)	05:53	05:32
	16:57		17:36	24	16:30 (11)		18:11		19:47	26	18:34 (12)	20:19	20:47
12	07:39		07:12		16:07 (11)		06:29		06:35		18:09 (12)	05:52	05:32
	16:58		17:37	24	16:31 (11)		18:12		19:48	26	18:35 (12)	20:21	20:47
13	07:39		07:11		16:07 (11)		06:27		06:34		18:09 (12)	05:51	05:32
	16:59		17:39	22	16:29 (11)		18:14		19:49	24	18:33 (12)	20:22	20:48
14	07:38		07:09		16:08 (11)		06:25		06:32		18:09 (12)	05:50	05:32
	17:00		17:40	22	16:30 (11)		18:15		19:50	24	18:33 (12)	20:23	20:48
15	07:38		07:08		16:08 (11)		06:24		06:30		18:10 (12)	05:49	05:32
	17:02		17:41	20	16:28 (11)		18:16		19:51	22	18:32 (12)	20:24	20:49
16	07:37		07:07		16:09 (11)		06:22		06:29		18:12 (12)	05:48	05:32
	17:03		17:43	18	16:27 (11)		18:17		19:52	18	18:30 (12)	20:25	20:49
17	07:37		07:05		16:12 (11)		06:20		06:27		18:13 (12)	05:47	05:32
	17:04		17:44	14	16:26 (11)		18:18		19:54	14	18:27 (12)	20:26	20:50
18	07:36		07:04		16:14 (11)		06:18		06:25		18:17 (12)	05:46	05:32
	17:05		17:45	8	16:22 (11)		18:19		19:55	6	18:23 (12)	20:27	20:50
19	07:36		07:02				06:17		06:24			05:45	05:32
	17:06		17:47				18:21		19:56			20:28	20:50
20	07:35		07:01				06:15		06:22			05:44	05:32
	17:08		17:48				18:22		19:57			20:29	20:51
21	07:35		06:59				06:13		06:21			05:43	05:32
	17:09		17:49				18:23		19:58			20:30	20:51
22	07:34		06:58				06:11		06:19			05:42	05:33
	17:10		17:50				18:24		19:59			20:31	20:51
23	07:33		06:56				06:10		06:18			05:42	05:33
	17:11		17:52				18:25		20:00			20:32	20:51
24	07:32		06:55				06:08		06:16			05:41	05:33
	17:13		17:53				18:26		20:00			20:33	20:52
25	07:32		06:53				06:06		06:15			05:40	05:33
	17:14		17:54				18:27		20:02			20:34	20:52
26	07:31		06:52				06:04		06:13			05:39	05:34
	17:15		17:55				18:29		20:03			20:35	20:52
27	07:30		06:50				06:03		06:12			05:39	05:34
	17:16		17:57				18:30		20:04			20:36	20:52
28	07:29		06:49				06:01		06:10			05:38	05:35
	17:18		17:58				18:31		20:05			20:36	20:52
29	07:28						05:59		06:09			05:37	05:35
	17:19						18:32		20:06			20:37	20:52
30	07:27						05:57		06:07			05:37	05:35
	17:20						18:33		20:07			20:38	20:52
31	07:26						05:56					05:36	
	17:22						18:34	10	17:29 (12)			20:39	
Potential sun hours	293		295		370				209			-292	-263
Total, worst case				346			10				410		
Sun reduction				0.45			0.45				0.55		
Oper. time red.				0.86			0.86				0.86		
Wind dir. red.				0.64			0.61				0.61		
Total reduction				0.25			0.24				0.29		
Total, real				86			2				119		

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	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, North part
16 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
1000 meter max shadow distance applied along with default 3° inclination
Sunshine probabilities applied (pdf plots)
Directional run-hours applied from tab file (tower 1)
.

Printed/Page
03/05/06 23:47 / 34
Licensed user:
Wind Engineers, Inc.
7660 Whitegate Avenue
US-RIVERSIDE, CA 92506

Calculated:
03/02/06 05:47/2.4.0.67

SHADOW - Calendar

Calculation: North part **Shadow receptor:** 666 - 666

Assumptions for shadow calculations

Maximum distance for influence	1,000	m
Minimum sun height over horizon for influence	3	°
Day step for calculation	1	days
Time step for calculation	2	minutes

Sun shine probabilities (part of time from sun rise to sun set with sun shine)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.35	0.45	0.45	0.55	0.55	0.55	0.65	0.55	0.55	0.45	0.35	0.30

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
475	585	238	199	220	474	1,184	813	840	1,246	803	479	7,555

	July		August		September		October		November		December
1	05:36		06:01		06:34		18:07 (12)		07:07		06:43		15:35 (11)		07:20
	20:52		20:32		19:46	26	18:33 (12)		18:53		17:04	24	15:59 (11)		16:38
2	05:36		06:02		06:35		18:06 (12)		07:08		06:44		15:34 (11)		07:21
	20:52		20:31		19:44	28	18:34 (12)		18:51		17:03	26	16:00 (11)		16:38
3	05:37		06:03		06:36		18:05 (12)		07:09		06:46		15:36 (11)		07:22
	20:52		20:30		19:42	28	18:33 (12)		18:49		17:02	24	16:00 (11)		16:38
4	05:38		06:04		06:37		18:04 (12)		07:10		06:47		15:35 (11)		07:23
	20:51		20:29		19:41	28	18:32 (12)		18:48		17:00	24	15:59 (11)		16:37
5	05:38		06:05		06:39		18:05 (12)		07:11		06:48		15:36 (11)		07:24
	20:51		20:28		19:39	28	18:33 (12)		18:46		16:59	22	15:58 (11)		16:37
6	05:39		06:07		06:40		18:04 (12)		07:12		06:49		15:38 (11)		07:25
	20:51		20:26		19:37	28	18:32 (12)		18:44		16:58	20	15:58 (11)		16:37
7	05:39		06:08		06:41		18:05 (12)		07:13		06:51		15:39 (11)		07:26
	20:51		20:25		19:35	26	18:31 (12)		18:43		16:57	18	15:57 (11)		16:37
8	05:40		06:09		06:42		18:06 (12)		07:14		06:52		15:38 (11)		07:27
	20:50		20:24		19:34	24	18:30 (12)		18:41		16:56	16	15:54 (11)		16:37
9	05:41		06:10		06:43		18:05 (12)		07:15		06:53		15:42 (11)		07:28
	20:50		20:22		19:32	24	18:29 (12)		18:39		16:54	12	15:54 (11)		16:37
10	05:42		06:11		06:44		18:07 (12)		07:17		06:54		15:43 (11)		07:29
	20:50		20:21		19:30	20	18:27 (12)		18:37		16:53	8	15:51 (11)		16:37
11	05:42		06:12		06:45		18:08 (12)		07:18		06:56				07:29
	20:49		20:20		19:28	18	18:26 (12)		18:36		16:52				16:37
12	05:43		06:13		06:46		18:11 (12)		07:19		06:57				07:30
	20:49		20:18		19:27	10	18:21 (12)		18:34		16:51				16:37
13	05:44		06:14		06:47				07:20		06:58				07:31
	20:48		20:17		19:25				18:32		16:50				16:37
14	05:45		06:15		06:48				07:21		06:59				07:32
	20:48		20:16		19:23				18:31		16:49				16:37
15	05:45		06:16		06:49				07:22		07:01				07:33
	20:47		20:14		19:21				18:29		16:48				16:37
16	05:46		06:17		06:50				07:24		07:02				07:33
	20:46		20:13		19:20				18:28		16:47				16:38
17	05:47		06:18		06:51				07:25		07:03				07:34
	20:46		20:11		19:18				18:26		16:47				16:38
18	05:48		06:19		06:52				07:26		07:04				07:35
	20:45		20:10		19:16				18:24		16:46				16:38
19	05:49		06:20		06:53				07:27		07:06				07:35
	20:44		20:08		19:14				18:23		16:45				16:39
20	05:50		06:21		06:55				07:28		07:07				07:36
	20:44		20:07		19:12				18:21		16:44				16:39
21	05:51		06:23		06:56				07:30		07:08				07:36
	20:43		20:05		19:11				18:20		16:43				16:40
22	05:52		06:24		06:57				07:31		07:09				07:37
	20:42		20:04		19:09				18:18		16:43				16:40
23	05:52		06:25		06:58				07:32		07:10				07:37
	20:41		20:02		19:07				18:17		16:42				16:41
24	05:53		06:26		06:59				07:33		16:42 (11)		07:12		07:38
	20:40		20:01		19:05				18:15	12	16:54 (11)		16:41		16:41
25	05:54		06:27		18:20 (12)		07:00		06:34		15:40 (11)		07:13		07:38
	20:39		19:57	6	18:26 (12)		19:04		17:14	16	15:56 (11)		16:41		16:42
26	05:55		06:28		18:15 (12)		07:01		06:36		15:39 (11)		07:14		07:39
	20:38		19:56	14	18:29 (12)		19:02		17:12	18	15:57 (11)		16:40		16:42
27	05:56		06:29		18:14 (12)		07:02		06:37		15:38 (11)		07:15		07:39
	20:37		19:54	18	18:32 (12)		19:00		17:11	20	15:58 (11)		16:40		16:43
28	05:57		06:30		18:11 (12)		07:03		06:38		15:38 (11)		07:16		07:39
	20:36		19:52	22	18:33 (12)		18:58		17:10	20	15:58 (11)		16:39		16:44
29	05:58		06:31		18:10 (12)		07:04		06:39		15:37 (11)		07:17		07:40
	20:35		19:51	22	18:32 (12)		18:56		17:08	22	15:59 (11)		16:39		16:45
30	05:59		06:32		18:09 (12)		07:05		06:41		15:36 (11)		07:19		07:40
	20:34		19:49	24	18:33 (12)		18:55		17:07	24	16:00 (11)		16:39		16:45
31	06:00		06:33		18:08 (12)				06:42		15:36 (11)				07:40
	20:33		19:47	26	18:34 (12)				17:05	24	16:00 (11)				16:46
Potential sun hours	-280		-145		375				343				294		283
Total, worst case				132			288			156			194		
Sun reduction				0.55			0.55			0.45			0.35		
Oper. time red.				0.86			0.86			0.86			0.86		
Wind dir. red.				0.61			0.61			0.64			0.64		
Total reduction				0.29			0.29			0.25			0.19		
Total, real				38			84			39			38		

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	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, North part
16 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
1000 meter max shadow distance applied along with default 3° inclination
Sunshine probabilities applied (pdf plots)
Directional run-hours applied from tab file (tower 1)
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Printed/Page
03/05/06 23:47 / 35
Licensed user:
Wind Engineers, Inc.
7660 Whitegate Avenue
US-RIVERSIDE, CA 92506

Calculated:
03/02/06 05:47/2.4.0.67

SHADOW - Calendar

Calculation: North part **Shadow receptor:** 667 - 667

Assumptions for shadow calculations

Maximum distance for influence	1,000	m
Minimum sun height over horizon for influence	3	°
Day step for calculation	1	days
Time step for calculation	2	minutes

Sun shine probabilities (part of time from sun rise to sun set with sun shine)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.35	0.45	0.45	0.55	0.55	0.55	0.65	0.55	0.55	0.45	0.35	0.30

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
475	585	238	199	220	474	1,184	813	840	1,246	803	479	7,555

	January		February			March	April			May	June
1	07:40		07:25		15:54 (11)	06:47	05:54			06:06	05:36
	16:47		17:23	26	16:20 (11)	17:59	18:35			20:08	20:40
2	07:40		07:24		15:53 (11)	06:45	05:52			06:05	05:35
	16:48		17:24	28	16:21 (11)	18:00	18:37			20:09	20:41
3	07:40		07:23		15:54 (11)	06:44	05:50			06:03	05:35
	16:49		17:26	28	16:22 (11)	18:02	18:38			20:11	20:41
4	07:40		07:22		15:55 (11)	06:42	05:49			06:02	05:34
	16:50		17:27	28	16:23 (11)	18:03	18:39			20:12	20:42
5	07:40		07:21		15:54 (11)	06:41	06:47		18:20 (12)	06:01	05:34
	16:51		17:28	28	16:22 (11)	18:04	19:40	14	18:34 (12)	20:13	20:43
6	07:40		07:20		15:54 (11)	06:39	06:45		18:17 (12)	05:59	05:34
	16:52		17:30	28	16:22 (11)	18:05	19:41	20	18:37 (12)	20:14	20:44
7	07:40		07:18		15:55 (11)	06:37	06:44		18:15 (12)	05:58	05:33
	16:53		17:31	28	16:23 (11)	18:06	19:42	22	18:37 (12)	20:15	20:44
8	07:40		07:17		15:54 (11)	06:36	06:42		18:13 (12)	05:57	05:33
	16:54		17:32	28	16:22 (11)	18:08	19:43	26	18:39 (12)	20:16	20:45
9	07:40		07:16		15:55 (11)	06:34	06:40		18:12 (12)	05:56	05:33
	16:55		17:34	28	16:23 (11)	18:09	19:45	28	18:40 (12)	20:17	20:46
10	07:40		07:15		15:55 (11)	06:32	06:39		18:10 (12)	05:55	05:32
	16:56		17:35	26	16:21 (11)	18:10	19:46	30	18:40 (12)	20:18	20:46
11	07:39		07:13		15:56 (11)	06:30	06:37		18:10 (12)	05:53	05:32
	16:57		17:36	24	16:20 (11)	18:11	19:47	30	18:40 (12)	20:19	20:47
12	07:39		07:12		15:59 (11)	06:29	06:35		18:09 (12)	05:52	05:32
	16:58		17:37	22	16:21 (11)	18:12	19:48	32	18:41 (12)	20:21	20:47
13	07:39		07:11		15:59 (11)	06:27	06:34		18:09 (12)	05:51	05:32
	16:59		17:39	20	16:19 (11)	18:14	19:49	32	18:41 (12)	20:22	20:48
14	07:38		07:10		16:02 (11)	06:25	06:32		18:07 (12)	05:50	05:32
	17:00		17:40	16	16:18 (11)	18:15	19:50	34	18:41 (12)	20:23	20:48
15	07:38		07:08		16:04 (11)	06:24	06:30		18:08 (12)	05:49	05:32
	17:02		17:41	10	16:14 (11)	18:16	19:51	34	18:42 (12)	20:24	20:49
16	07:37		07:07			06:22	06:29		18:08 (12)	05:48	05:32
	17:03		17:43			18:17	19:53	32	18:40 (12)	20:25	20:49
17	07:37		07:05			06:20	06:27		18:07 (12)	05:47	05:32
	17:04		17:44			18:18	19:54	34	18:41 (12)	20:26	20:50
18	07:36		07:04			06:18	06:25		18:07 (12)	05:46	05:32
	17:05		17:45			18:19	19:55	32	18:39 (12)	20:27	20:50
19	07:36		07:02			06:17	06:24		18:07 (12)	05:45	05:32
	17:06		17:47			18:21	19:56	32	18:39 (12)	20:28	20:50
20	07:35		07:01			06:15	06:22		18:08 (12)	05:44	05:32
	17:08		17:48			18:22	19:57	30	18:38 (12)	20:29	20:51
21	07:35		06:59			06:13	06:21		18:08 (12)	05:43	05:32
	17:09		17:49			18:23	19:58	30	18:38 (12)	20:30	20:51
22	07:34		06:58			06:11	06:19		18:09 (12)	05:42	05:33
	17:10		17:50			18:24	19:59	28	18:37 (12)	20:31	20:51
23	07:33		06:56			06:10	06:18		18:09 (12)	05:42	05:33
	17:11		17:52			18:25	20:00	26	18:35 (12)	20:32	20:51
24	07:32		06:55			06:08	06:16		18:12 (12)	05:41	05:33
	17:13		17:53			18:26	20:00	22	18:34 (12)	20:33	20:52
25	07:32		16:01 (11)	06:53		06:06	06:15		18:12 (12)	05:40	05:33
	17:14	10	16:11 (11)	17:54		18:27	20:02	20	18:32 (12)	20:34	20:52
26	07:31		15:58 (11)	06:52		06:04	06:13		18:15 (12)	05:39	05:34
	17:15	14	16:12 (11)	17:55		18:29	20:03	16	18:31 (12)	20:35	20:52
27	07:30		15:57 (11)	06:50		06:03	06:12		18:18 (12)	05:39	05:34
	17:16	18	16:15 (11)	17:57		18:30	20:04	10	18:28 (12)	20:36	20:52
28	07:29		15:56 (11)	06:49		06:01	06:10			05:38	05:35
	17:18	20	16:16 (11)	17:58		18:31	20:05			20:36	20:52
29	07:28		15:55 (11)			05:59	06:09			05:37	05:35
	17:19	22	16:17 (11)			18:32	20:06			20:37	20:52
30	07:27		15:54 (11)			05:57	06:07			05:37	05:35
	17:20	24	16:18 (11)			18:33	20:07			20:38	20:52
31	07:26		15:55 (11)			05:56				05:36	
	17:22	24	16:19 (11)			18:34				20:39	
Potential sun hours	293			295		370	209			-292	-263
Total, worst case		132			368			614			
Sun reduction		0.35			0.45			0.55			
Oper. time red.		0.86			0.86			0.86			
Wind dir. red.		0.64			0.64			0.61			
Total reduction		0.20			0.25			0.29			
Total, real		26			92			179			

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	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, North part
16 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
1000 meter max shadow distance applied along with default 3° inclination
Sunshine probabilities applied (pdf plots)
Directional run-hours applied from tab file (tower 1)
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03/05/06 23:47 / 36
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Wind Engineers, Inc.
7660 Whitegate Avenue
US-RIVERSIDE, CA 92506

Calculated:
03/02/06 05:47/2.4.0.67

SHADOW - Calendar

Calculation: North part **Shadow receptor:** 667 - 667

Assumptions for shadow calculations

Maximum distance for influence	1,000	m
Minimum sun height over horizon for influence	3	°
Day step for calculation	1	days
Time step for calculation	2	minutes

Sun shine probabilities (part of time from sun rise to sun set with sun shine)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.35	0.45	0.45	0.55	0.55	0.55	0.65	0.55	0.55	0.45	0.35	0.30

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
475	585	238	199	220	474	1,184	813	840	1,246	803	479	7,555

	July		August		September		October		November		December
1	05:36		06:01		06:34		18:09 (12)		07:07		06:43		15:25 (11)		07:20
	20:52		20:32		19:46	30	18:39 (12)		18:53		17:04	26	15:51 (11)		16:38
2	05:36		06:02		06:35		18:08 (12)		07:08		06:44		15:24 (11)		07:21
	20:52		20:31		19:44	30	18:38 (12)		18:51		17:03	28	15:52 (11)		16:38
3	05:37		06:03		06:36		18:09 (12)		07:09		06:46		15:24 (11)		07:22
	20:52		20:30		19:42	28	18:37 (12)		18:49		17:02	28	15:52 (11)		16:38
4	05:38		06:04		06:37		18:10 (12)		07:10		06:47		15:23 (11)		07:23
	20:51		20:29		19:41	26	18:36 (12)		18:48		17:00	30	15:53 (11)		16:37
5	05:38		06:05		06:39		18:11 (12)		07:11		06:48		15:24 (11)		07:24
	20:51		20:28		19:39	22	18:33 (12)		18:46		16:59	28	15:52 (11)		16:37
6	05:39		06:07		06:40		18:12 (12)		07:12		06:49		15:24 (11)		07:25
	20:51		20:26		19:37	20	18:32 (12)		18:44		16:58	28	15:52 (11)		16:37
7	05:39		06:08		06:41		18:15 (12)		07:13		06:51		15:23 (11)		07:26
	20:51		20:25		19:35	14	18:29 (12)		18:43		16:57	30	15:53 (11)		16:37
8	05:40		06:09		06:42		18:20 (12)		07:14		06:52		15:24 (11)		07:27
	20:50		20:24		19:34	4	18:24 (12)		18:41		16:56	28	15:52 (11)		16:37
9	05:41		06:10		06:43				07:15		06:53		15:24 (11)		07:28
	20:50		20:22		19:32				18:39		16:54	28	15:52 (11)		16:37
10	05:42		06:11		06:44				07:17		06:54		15:25 (11)		07:29
	20:50		20:21		19:30				18:37		16:53	26	15:51 (11)		16:37
11	05:42		06:12		06:45				07:18		06:56		15:26 (11)		07:29
	20:49		20:20		19:28				18:36		16:52	24	15:50 (11)		16:37
12	05:43		06:13		06:46				07:19		06:57		15:26 (11)		07:30
	20:49		20:18		19:27				18:34		16:51	24	15:50 (11)		16:37
13	05:44		06:14		06:47				07:20		06:58		15:27 (11)		07:31
	20:48		20:17		19:25				18:32		16:50	22	15:49 (11)		16:37
14	05:45		06:15		06:48				07:21		06:59		15:28 (11)		07:32
	20:48		20:16		19:23				18:31		16:49	20	15:48 (11)		16:37
15	05:45		06:16		06:49				07:22		07:01		15:30 (11)		07:33
	20:47		20:14		19:21				18:29		16:48	18	15:48 (11)		16:37
16	05:46		06:17		18:23 (12)		06:50		07:24		07:02		15:31 (11)		07:33
	20:46		20:13	12	18:35 (12)		19:20		18:28		16:47	14	15:45 (11)		16:38
17	05:47		06:18		18:20 (12)		06:51		07:25		07:03		15:34 (11)		07:34
	20:46		20:11	18	18:38 (12)		19:18		18:26		16:47	10	15:44 (11)		16:38
18	05:48		06:19		18:19 (12)		06:52		07:26		07:04				07:35
	20:45		20:10	20	18:39 (12)		19:16		18:24		16:46				16:38
19	05:49		06:20		18:16 (12)		06:53		07:27		07:06				07:35
	20:44		20:08	24	18:40 (12)		19:14		18:23		16:45				16:39
20	05:50		06:21		18:15 (12)		06:55		07:28		07:07				07:36
	20:44		20:07	26	18:41 (12)		19:12		18:21		16:44				16:39
21	05:51		06:23		18:14 (12)		06:56		07:30		07:08				07:36
	20:43		20:05	28	18:42 (12)		19:11		18:20		16:43				16:40
22	05:52		06:24		18:13 (12)		06:57		07:31		07:09				07:37
	20:42		20:04	30	18:43 (12)		19:09		18:18		16:43				16:40
23	05:52		06:25		18:12 (12)		06:58		07:32		07:10				07:37
	20:41		20:02	30	18:42 (12)		19:07		18:17		16:42				16:41
24	05:53		06:26		18:11 (12)		06:59		07:33		07:12				07:38
	20:40		20:01	32	18:43 (12)		19:05		18:15		16:42				16:41
25	05:54		06:27		18:10 (12)		07:00		06:34		07:13				07:38
	20:39		19:57	32	18:42 (12)		19:04		17:14		16:41				16:42
26	05:55		06:28		18:09 (12)		07:01		06:36		15:37 (11)		07:14		07:39
	20:38		19:56	34	18:43 (12)		19:02		17:12	4	15:41 (11)		16:40		16:42
27	05:56		06:29		18:08 (12)		07:02		06:37		15:32 (11)		07:15		07:39
	20:37		19:54	34	18:42 (12)		19:00		17:11	12	15:44 (11)		16:40		16:43
28	05:57		06:30		18:09 (12)		07:03		06:38		15:30 (11)		07:16		07:39
	20:36		19:52	34	18:43 (12)		18:58		17:10	18	15:48 (11)		16:39		16:44
29	05:58		06:31		18:08 (12)		07:04		06:39		15:29 (11)		07:17		07:40
	20:35		19:51	34	18:42 (12)		18:56		17:08	20	15:49 (11)		16:39		16:45
30	05:59		06:32		18:09 (12)		07:05		06:41		15:26 (11)		07:19		07:40
	20:34		19:49	32	18:41 (12)		18:55		17:07	24	15:50 (11)		16:39		16:45
31	06:00		06:33		18:08 (12)				06:42		15:26 (11)				07:40
	20:33		19:47	32	18:40 (12)				17:05	24	15:50 (11)				16:46
Potential sun hours	-280		-145		375				343				294		283
Total, worst case				452			174			102			412		
Sun reduction				0.55			0.55			0.45			0.35		
Oper. time red.				0.86			0.86			0.86			0.86		
Wind dir. red.				0.61			0.61			0.64			0.64		
Total reduction				0.29			0.29			0.25			0.20		
Total, real				131			51			26			80		

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	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, North part
16 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
1000 meter max shadow distance applied along with default 3° inclination
Sunshine probabilities applied (pdf plots)
Directional run-hours applied from tab file (tower 1)
.

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US-RIVERSIDE, CA 92506

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03/02/06 05:47/2.4.0.67

SHADOW - Calendar

Calculation: North part **Shadow receptor:** 668 - 668

Assumptions for shadow calculations

Maximum distance for influence	1,000	m
Minimum sun height over horizon for influence	3	°
Day step for calculation	1	days
Time step for calculation	2	minutes

Sun shine probabilities (part of time from sun rise to sun set with sun shine)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.35	0.45	0.45	0.55	0.55	0.55	0.65	0.55	0.55	0.45	0.35	0.30

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
475	585	238	199	220	474	1,184	813	840	1,246	803	479	7,555

	January		February		March		April		May		June	
1	07:40	07:25			06:47	16:27 (11)	05:54		06:06	18:34 (12)	05:36	
	16:47	17:23			17:59	26 16:53 (11)	18:35		20:08	28 19:02 (12)	20:40	
2	07:40	07:24			06:45	16:27 (11)	05:52		06:05	18:33 (12)	05:35	
	16:48	17:24			18:00	24 16:51 (11)	18:37		20:09	30 19:03 (12)	20:41	
3	07:40	07:23			06:44	16:28 (11)	05:50		06:03	18:34 (12)	05:35	
	16:49	17:26			18:02	24 16:52 (11)	18:38		20:11	28 19:02 (12)	20:41	
4	07:40	07:22			06:42	16:28 (11)	05:49		06:02	18:32 (12)	05:34	
	16:50	17:27			18:03	22 16:50 (11)	18:39		20:12	30 19:02 (12)	20:42	
5	07:40	07:21			06:41	16:30 (11)	06:47		06:01	18:33 (12)	05:34	
	16:51	17:28			18:04	18 16:48 (11)	19:40		20:13	28 19:01 (12)	20:43	
6	07:40	07:20			06:39	16:31 (11)	06:45		05:59	18:34 (12)	05:34	
	16:52	17:30			18:05	16 16:47 (11)	19:41		20:14	28 19:02 (12)	20:44	
7	07:40	07:18			06:37	16:33 (11)	06:44		05:58	18:33 (12)	05:33	
	16:53	17:31			18:06	12 16:45 (11)	19:42		20:15	28 19:01 (12)	20:44	
8	07:40	07:17			06:36		06:42		05:57	18:33 (12)	05:33	
	16:54	17:32			18:08		19:43		20:16	28 19:01 (12)	20:45	
9	07:40	07:16			06:34		06:40		05:56	18:34 (12)	05:33	
	16:55	17:34			18:09		19:45		20:17	26 19:00 (12)	20:46	
10	07:40	07:15			06:32		06:39		05:55	18:35 (12)	05:32	
	16:56	17:35			18:10		19:46		20:18	24 18:59 (12)	20:46	
11	07:39	07:13			06:30		06:37		05:53	18:36 (12)	05:32	
	16:57	17:36			18:11		19:47		20:19	22 18:58 (12)	20:47	
12	07:39	07:12			06:29		06:35		05:52	18:37 (12)	05:32	
	16:58	17:37			18:12		19:48		20:21	22 18:59 (12)	20:47	
13	07:39	07:11			06:27		06:34		05:51	18:38 (12)	05:32	
	16:59	17:39			18:14		19:49		20:22	20 18:58 (12)	20:48	
14	07:38	07:09			06:25		06:32		05:50	18:39 (12)	05:32	
	17:00	17:40			18:15		19:50		20:23	16 18:55 (12)	20:48	
15	07:38	07:08			06:24		06:30		05:49	18:40 (12)	05:32	
	17:02	17:41			18:16		19:51		20:24	14 18:54 (12)	20:49	
16	07:37	07:07			06:22		06:29		05:48	18:43 (12)	05:32	
	17:03	17:43			18:17		19:52		20:25	10 18:53 (12)	20:49	
17	07:37	07:05			06:20		06:27		05:47		05:32	
	17:04	17:44			18:18		19:54		20:26		20:50	
18	07:36	07:04			06:18		06:25		05:46		05:32	
	17:05	17:45			18:19		19:55		20:27		20:50	
19	07:36	07:02		16:37 (11)	06:17		06:24		05:45		05:32	
	17:06	17:47	8	16:45 (11)	18:21		19:56		20:28		20:50	
20	07:35	07:01		16:33 (11)	06:15		06:22		05:44		05:32	
	17:08	17:48	14	16:47 (11)	18:22		19:57		20:29		20:51	
21	07:35	06:59		16:32 (11)	06:13		06:21		05:43		05:32	
	17:09	17:49	18	16:50 (11)	18:23		19:58		20:30		20:51	
22	07:34	06:58		16:30 (11)	06:11		06:19		05:42		05:33	
	17:10	17:50	20	16:50 (11)	18:24		19:59		20:31		20:51	
23	07:33	06:56		16:28 (11)	06:10		06:18	18:43 (12)	05:42		05:33	
	17:11	17:52	22	16:50 (11)	18:25		20:00	12 18:55 (12)	20:32		20:51	
24	07:32	06:55		16:27 (11)	06:08		06:16	18:40 (12)	05:41		05:33	
	17:13	17:53	24	16:51 (11)	18:26		20:00	16 18:56 (12)	20:33		20:52	
25	07:32	06:53		16:27 (11)	06:06		06:15	18:38 (12)	05:40		05:33	
	17:14	17:54	24	16:51 (11)	18:27		20:02	20 18:58 (12)	20:34		20:52	
26	07:31	06:52		16:28 (11)	06:04		06:13	18:37 (12)	05:39		05:34	
	17:15	17:55	24	16:52 (11)	18:29		20:03	22 18:59 (12)	20:35		20:52	
27	07:30	06:50		16:26 (11)	06:03		06:12	18:36 (12)	05:39		05:34	
	17:16	17:57	26	16:52 (11)	18:30		20:04	24 19:00 (12)	20:36		20:52	
28	07:29	06:49		16:27 (11)	06:01		06:10	18:34 (12)	05:38		05:35	
	17:18	17:58	26	16:53 (11)	18:31		20:05	26 19:00 (12)	20:36		20:52	
29	07:28				05:59		06:09	18:35 (12)	05:37		05:35	
	17:19				18:32		20:06	26 19:01 (12)	20:37		20:52	
30	07:27				05:57		06:07	18:33 (12)	05:37		05:35	
	17:20				18:33		20:07	28 19:01 (12)	20:38		20:52	
31	07:26				05:56				05:36			
	17:22				18:34				20:39			
Potential sun hours	293	295			370		209		-292		-263	
Total, worst case			206			142		174		382		
Sun reduction			0.45			0.45		0.55		0.55		
Oper. time red.			0.86			0.86		0.86		0.86		
Wind dir. red.			0.62			0.62		0.60		0.60		
Total reduction			0.24			0.24		0.29		0.29		
Total, real			49			34		50		109		

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	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, North part
16 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
1000 meter max shadow distance applied along with default 3° inclination
Sunshine probabilities applied (pdf plots)
Directional run-hours applied from tab file (tower 1)
.

Licensed user:
Wind Engineers, Inc.
7660 Whitegate Avenue
US-RIVERSIDE, CA 92506

Calculated:
03/02/06 05:47/2.4.0.67

SHADOW - Calendar

Calculation: North part **Shadow receptor:** 668 - 668

Assumptions for shadow calculations

Maximum distance for influence	1,000	m
Minimum sun height over horizon for influence	3	°
Day step for calculation	1	days
Time step for calculation	2	minutes

Sun shine probabilities (part of time from sun rise to sun set with sun shine)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.35	0.45	0.45	0.55	0.55	0.55	0.65	0.55	0.55	0.45	0.35	0.30

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
475	585	238	199	220	474	1,184	813	840	1,246	803	479	7,555

	July		August		September	October		November	December
1	05:36		06:01	18:46 (12)	06:34	07:07		06:43	07:20
	20:52	24	20:32	19:10 (12)	19:46	18:53		17:04	16:38
2	05:36		06:02	18:45 (12)	06:35	07:08		06:44	07:21
	20:52	24	20:31	19:09 (12)	19:44	18:51		17:03	16:38
3	05:37		06:03	18:46 (12)	06:36	07:09		06:46	07:22
	20:52	24	20:30	19:10 (12)	19:42	18:49		17:02	16:38
4	05:38		06:04	18:45 (12)	06:37	07:10		06:47	07:23
	20:51	26	20:29	19:11 (12)	19:41	18:48		17:00	16:37
5	05:38		06:05	18:44 (12)	06:39	07:11		06:48	07:24
	20:51	28	20:28	19:12 (12)	19:39	18:46		16:59	16:37
6	05:39		06:07	18:43 (12)	06:40	07:12	17:12 (11)	06:49	07:25
	20:51	28	20:26	19:11 (12)	19:37	18:44	6 17:18 (11)	16:58	16:37
7	05:39		06:08	18:42 (12)	06:41	07:13	17:08 (11)	06:51	07:26
	20:51	30	20:25	19:12 (12)	19:35	18:43	14 17:22 (11)	16:57	16:37
8	05:40		06:09	18:43 (12)	06:42	07:14	17:05 (11)	06:52	07:27
	20:50	28	20:24	19:11 (12)	19:34	18:41	18 17:23 (11)	16:56	16:37
9	05:41		06:10	18:42 (12)	06:43	07:15	17:04 (11)	06:53	07:28
	20:50	30	20:22	19:12 (12)	19:32	18:39	20 17:24 (11)	16:54	16:37
10	05:42		06:11	18:43 (12)	06:44	07:17	17:03 (11)	06:54	07:29
	20:50	28	20:21	19:11 (12)	19:30	18:37	22 17:25 (11)	16:53	16:37
11	05:42		06:12	18:42 (12)	06:45	07:18	17:00 (11)	06:56	07:29
	20:49	28	20:20	19:10 (12)	19:28	18:36	24 17:24 (11)	16:52	16:37
12	05:43		06:13	18:43 (12)	06:46	07:19	16:59 (11)	06:57	07:30
	20:49	28	20:18	19:11 (12)	19:27	18:34	26 17:25 (11)	16:51	16:37
13	05:44		06:14	18:42 (12)	06:47	07:20	16:59 (11)	06:58	07:31
	20:48	28	20:17	19:10 (12)	19:25	18:32	26 17:25 (11)	16:50	16:37
14	05:45		06:15	18:43 (12)	06:48	07:21	17:00 (11)	06:59	07:32
	20:48	26	20:16	19:09 (12)	19:23	18:31	26 17:26 (11)	16:49	16:37
15	05:45		06:16	18:42 (12)	06:49	07:22	16:59 (11)	07:01	07:33
	20:47	26	20:14	19:08 (12)	19:21	18:29	26 17:25 (11)	16:48	16:37
16	05:46		06:17	18:43 (12)	06:50	07:24	16:58 (11)	07:02	07:33
	20:46	24	20:13	19:07 (12)	19:20	18:28	26 17:24 (11)	16:47	16:38
17	05:47		06:18	18:44 (12)	06:51	07:25	17:00 (11)	07:03	07:34
	20:46	22	20:11	19:06 (12)	19:18	18:26	24 17:24 (11)	16:47	16:38
18	05:48		06:19	18:45 (12)	06:52	07:26	16:59 (11)	07:04	07:35
	20:45	20	20:10	19:05 (12)	19:16	18:24	24 17:23 (11)	16:46	16:38
19	05:49		06:20	18:46 (12)	06:53	07:27	17:00 (11)	07:06	07:35
	20:44	16	20:08	19:02 (12)	19:14	18:23	22 17:22 (11)	16:45	16:39
20	05:50		06:21	18:49 (12)	06:55	07:28	17:01 (11)	07:07	07:36
	20:44	10	20:07	18:59 (12)	19:12	18:21	20 17:21 (11)	16:44	16:39
21	05:51		06:23		06:56	07:30	17:03 (11)	07:08	07:36
	20:43		20:05		19:11	18:20	16 17:19 (11)	16:43	16:40
22	05:52		06:24		06:57	07:31	17:04 (11)	07:09	07:37
	20:42		20:04		19:09	18:18	12 17:16 (11)	16:43	16:40
23	05:52		06:25		06:58	07:32	17:09 (11)	07:10	07:37
	20:41		20:02		19:07	18:17	4 17:13 (11)	16:42	16:41
24	05:53		06:26		06:59	07:33		07:12	07:38
	20:40		20:01		19:05	18:15		16:41	16:41
25	05:54		06:27		07:00	06:34		07:13	07:38
	20:39		19:57		19:04	17:14		16:41	16:42
26	05:55		06:28		07:01	06:36		07:14	07:39
	20:38		19:56		19:02	17:12		16:40	16:42
27	05:56		18:55 (12)	06:29	07:02	06:37		07:15	07:39
	20:37	6	19:01 (12)	19:54	19:00	17:11		16:40	16:43
28	05:57		18:52 (12)	06:30	07:03	06:38		07:16	07:39
	20:36	12	19:04 (12)	19:52	18:58	17:10		16:39	16:44
29	05:58		18:51 (12)	06:31	07:04	06:39		07:17	07:40
	20:35	14	19:05 (12)	19:51	18:56	17:08		16:39	16:45
30	05:59		18:50 (12)	06:32	07:05	06:41		07:19	07:40
	20:34	18	19:08 (12)	19:49	18:55	17:07		16:39	16:45
31	06:00		18:47 (12)	06:33		06:42			07:40
	20:33	22	19:09 (12)	19:47		17:05			16:46
Potential sun hours	-280			-145	375	343		294	283
Total, worst case		72		498			356		
Sun reduction		0.65		0.55			0.45		
Oper. time red.		0.86		0.86			0.86		
Wind dir. red.		0.60		0.60			0.62		
Total reduction		0.34		0.29			0.24		
Total, real		24		142			85		

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	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, North part
16 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
1000 meter max shadow distance applied along with default 3° inclination
Sunshine probabilities applied (pdf plots)
Directional run-hours applied from tab file (tower 1)
.

Licensed user:
Wind Engineers, Inc.
7660 Whitegate Avenue
US-RIVERSIDE, CA 92506

Calculated:
03/02/06 05:47/2.4.0.67

SHADOW - Calendar

Calculation: North part **Shadow receptor:** 669 - 669

Assumptions for shadow calculations

Maximum distance for influence	1,000	m
Minimum sun height over horizon for influence	3	°
Day step for calculation	1	days
Time step for calculation	2	minutes

Sun shine probabilities (part of time from sun rise to sun set with sun shine)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.35	0.45	0.45	0.55	0.55	0.55	0.65	0.55	0.55	0.45	0.35	0.30

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
475	585	238	199	220	474	1,184	813	840	1,246	803	479	7,555

	January		February		March		April		May		June	
1	07:40		07:25		06:47		16:33 (11)		05:54		06:06	
	16:47		17:23		17:59	24	16:57 (11)		18:35		19:02 (12)	
2	07:40		07:24		06:45		16:31 (11)		05:52		06:05	
	16:48		17:24		18:00	26	16:57 (11)		18:37		19:03 (12)	
3	07:40		07:23		06:44		16:32 (11)		05:50		06:03	
	16:49		17:26		18:02	26	16:58 (11)		18:38		19:06 (12)	
4	07:40		07:22		06:42		16:30 (11)		05:49		06:02	
	16:50		17:27		18:03	28	16:58 (11)		18:39		19:06 (12)	
5	07:40		07:21		06:41		16:30 (11)		06:47		06:01	
	16:51		17:28		18:04	26	16:56 (11)		19:40		19:07 (12)	
6	07:40		07:20		06:39		16:31 (11)		06:45		05:59	
	16:52		17:30		18:05	26	16:57 (11)		19:41		19:08 (12)	
7	07:40		07:18		06:37		16:31 (11)		06:44		05:58	
	16:53		17:31		18:06	26	16:57 (11)		19:42		19:09 (12)	
8	07:40		07:17		06:36		16:31 (11)		06:42		05:57	
	16:54		17:32		18:08	24	16:55 (11)		19:43		19:07 (12)	
9	07:40		07:16		06:34		16:31 (11)		06:40		05:56	
	16:55		17:34		18:09	24	16:55 (11)		19:45		19:08 (12)	
10	07:40		07:15		06:32		16:34 (11)		06:39		05:55	
	16:56		17:35		18:10	20	16:54 (11)		19:46		19:09 (12)	
11	07:39		07:13		06:30		16:34 (11)		06:37		05:53	
	16:57		17:36		18:11	18	16:52 (11)		19:47		19:08 (12)	
12	07:39		07:12		06:29		16:36 (11)		06:35		05:52	
	16:58		17:37		18:12	14	16:50 (11)		19:48		19:09 (12)	
13	07:39		07:11		06:27		16:41 (11)		06:34		05:51	
	16:59		17:39		18:14	4	16:45 (11)		19:49		19:08 (12)	
14	07:38		07:09		06:25				06:32		05:50	
	17:00		17:40		18:15				19:50		19:09 (12)	
15	07:38		07:08		06:24				06:30		05:49	
	17:02		17:41		18:16				19:51		19:08 (12)	
16	07:37		07:07		06:22				06:29		05:48	
	17:03		17:43		18:17				19:52		19:09 (12)	
17	07:37		07:05		06:20				06:27		05:47	
	17:04		17:44		18:18				19:54		19:08 (12)	
18	07:36		07:04		06:18				06:25		05:46	
	17:05		17:45		18:19				19:55		19:07 (12)	
19	07:36		07:02		06:17				06:24		05:45	
	17:06		17:47		18:21				19:56		19:08 (12)	
20	07:35		07:01		06:15				06:22		05:44	
	17:08		17:48		18:22				19:57		19:08 (12)	
21	07:35		06:59		06:13				06:21		05:43	
	17:09		17:49		18:23				19:58		19:07 (12)	
22	07:34		06:58		06:11				06:19		05:42	
	17:10		17:50		18:24				19:59		19:06 (12)	
23	07:33		06:56		06:10				06:18		05:42	
	17:11		17:52		18:25				20:00		19:05 (12)	
24	07:32		06:55		06:08				06:16		05:41	
	17:13		17:53		18:26				20:00		19:04 (12)	
25	07:32		06:53		06:06				06:15		05:40	
	17:14		17:54	12	18:27				20:02		19:04 (12)	
26	07:31		06:52		06:04				06:13		05:39	
	17:15		17:55	18	18:29				20:03		19:03 (12)	
27	07:30		06:50		06:03				06:12		05:39	
	17:16		17:57	20	18:30				20:04		19:03 (12)	
28	07:29		06:49		06:01				06:10		05:38	
	17:18		17:58	24	18:31				20:05		19:00 (12)	
29	07:28				05:59				06:09		05:37	
	17:19				18:32				20:06		18:53 (12)	
30	07:27				05:57				06:07		05:37	
	17:20				18:33				20:07		18:59 (12)	
31	07:26				05:56						05:36	
	17:22				18:34						20:39	
Potential sun hours	293		295		370		209		-292		-263	
Total, worst case			74		286		6		670			
Sun reduction			0.45		0.45		0.55		0.55			
Oper. time red.			0.86		0.86		0.86		0.86			
Wind dir. red.			0.61		0.61		0.60		0.60			
Total reduction			0.24		0.24		0.28		0.28			
Total, real			18		68		2		189			

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	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, North part
16 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
1000 meter max shadow distance applied along with default 3° inclination
Sunshine probabilities applied (pdf plots)
Directional run-hours applied from tab file (tower 1)
.

Licensed user:
Wind Engineers, Inc.
7660 Whitegate Avenue
US-RIVERSIDE, CA 92506

Calculated:
03/02/06 05:47/2.4.0.67

SHADOW - Calendar

Calculation: North part **Shadow receptor:** 669 - 669

Assumptions for shadow calculations

Maximum distance for influence	1,000	m
Minimum sun height over horizon for influence	3	°
Day step for calculation	1	days
Time step for calculation	2	minutes

Sun shine probabilities (part of time from sun rise to sun set with sun shine)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.35	0.45	0.45	0.55	0.55	0.55	0.65	0.55	0.55	0.45	0.35	0.30

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
475	585	238	199	220	474	1,184	813	840	1,246	803	479	7,555

	July		August		September	October		November	December
1	05:36		06:01	18:50 (12)	06:34	07:07	17:17 (11)	06:43	07:20
	20:52		20:32 30	19:20 (12)	19:46	18:53 10	17:27 (11)	17:04	16:38
2	05:36		06:02	18:51 (12)	06:35	07:08	17:14 (11)	06:44	07:21
	20:52		20:31 28	19:19 (12)	19:44	18:51 16	17:30 (11)	17:03	16:38
3	05:37		06:03	18:50 (12)	06:36	07:09	17:11 (11)	06:46	07:22
	20:52		20:30 28	19:18 (12)	19:42	18:49 20	17:31 (11)	17:02	16:38
4	05:38		06:04	18:51 (12)	06:37	07:10	17:10 (11)	06:47	07:23
	20:51		20:29 28	19:19 (12)	19:41	18:48 22	17:32 (11)	17:00	16:37
5	05:38		06:05	18:50 (12)	06:39	07:11	17:09 (11)	06:48	07:24
	20:51		20:28 28	19:18 (12)	19:39	18:46 22	17:31 (11)	16:59	16:37
6	05:39		06:07	18:51 (12)	06:40	07:12	17:06 (11)	06:49	07:25
	20:51		20:26 26	19:17 (12)	19:37	18:44 26	17:32 (11)	16:58	16:37
7	05:39		06:08	18:52 (12)	06:41	07:13	17:06 (11)	06:51	07:26
	20:51		20:25 24	19:16 (12)	19:35	18:43 26	17:32 (11)	16:57	16:37
8	05:40		06:09	18:51 (12)	06:42	07:14	17:07 (11)	06:52	07:27
	20:50		20:24 24	19:15 (12)	19:34	18:41 26	17:33 (11)	16:56	16:37
9	05:41		06:10	18:52 (12)	06:43	07:15	17:06 (11)	06:53	07:28
	20:50		20:22 22	19:14 (12)	19:32	18:39 26	17:32 (11)	16:54	16:37
10	05:42		06:11	18:53 (12)	06:44	07:17	17:05 (11)	06:54	07:29
	20:50		20:21 20	19:13 (12)	19:30	18:37 26	17:31 (11)	16:53	16:37
11	05:42		06:12	18:56 (12)	06:45	07:18	17:06 (11)	06:56	07:29
	20:49		20:20 16	19:12 (12)	19:28	18:36 24	17:30 (11)	16:52	16:37
12	05:43		06:13	18:57 (12)	06:46	07:19	17:05 (11)	06:57	07:30
	20:49		20:18 12	19:09 (12)	19:27	18:34 24	17:29 (11)	16:51	16:37
13	05:44		06:14	19:02 (12)	06:47	07:20	17:07 (11)	06:58	07:31
	20:48		20:17 4	19:06 (12)	19:25	18:32 22	17:29 (11)	16:50	16:37
14	05:45		06:15		06:48	07:21	17:06 (11)	06:59	07:32
	20:48		20:16		19:23	18:31 22	17:28 (11)	16:49	16:37
15	05:45	19:00 (12)	06:16		06:49	07:22	17:07 (11)	07:01	07:33
	20:47 8	19:08 (12)	20:14		19:21	18:29 20	17:27 (11)	16:48	16:37
16	05:46	18:59 (12)	06:17		06:50	07:24	17:08 (11)	07:02	07:33
	20:46 12	19:11 (12)	20:13		19:20	18:28 16	17:24 (11)	16:47	16:38
17	05:47	18:58 (12)	06:18		06:51	07:25	17:12 (11)	07:03	07:34
	20:46 14	19:12 (12)	20:11		19:18	18:26 10	17:22 (11)	16:47	16:38
18	05:48	18:57 (12)	06:19		06:52	07:26		07:04	07:35
	20:45 16	19:13 (12)	20:10		19:16	18:24		16:46	16:38
19	05:49	18:56 (12)	06:20		06:53	07:27		07:06	07:35
	20:44 18	19:14 (12)	20:08		19:14	18:23		16:45	16:39
20	05:50	18:55 (12)	06:21		06:55	07:28		07:07	07:36
	20:44 20	19:15 (12)	20:07		19:12	18:21		16:44	16:39
21	05:51	18:54 (12)	06:23		06:56	07:30		07:08	07:36
	20:43 22	19:16 (12)	20:05		19:11	18:20		16:43	16:40
22	05:52	18:52 (12)	06:24		06:57	07:31		07:09	07:37
	20:42 24	19:16 (12)	20:04		19:09	18:18		16:43	16:40
23	05:52	18:53 (12)	06:25		06:58	07:32		07:10	07:37
	20:41 24	19:17 (12)	20:02		19:07	18:17		16:42	16:41
24	05:53	18:52 (12)	06:26		06:59	07:33		07:12	07:38
	20:40 26	19:18 (12)	20:01		19:05	18:15		16:42	16:41
25	05:54	18:51 (12)	06:27		07:00	06:34		07:13	07:38
	20:39 28	19:19 (12)	19:57		19:04	17:14		16:41	16:42
26	05:55	18:52 (12)	06:28		07:01	06:36		07:14	07:39
	20:38 26	19:18 (12)	19:56		19:02	17:12		16:40	16:42
27	05:56	18:51 (12)	06:29		07:02	06:37		07:15	07:39
	20:37 28	19:19 (12)	19:54		19:00	17:11		16:40	16:43
28	05:57	18:50 (12)	06:30		07:03	06:38		07:16	07:39
	20:36 30	19:20 (12)	19:52		18:58	17:10		16:39	16:44
29	05:58	18:51 (12)	06:31		07:04	06:39		07:17	07:40
	20:35 28	19:19 (12)	19:51		18:56	17:08		16:39	16:45
30	05:59	18:50 (12)	06:32		07:05	06:41		07:19	07:40
	20:34 30	19:20 (12)	19:49		18:55	17:07		16:39	16:45
31	06:00	18:51 (12)	06:33			06:42			07:40
	20:33 28	19:19 (12)	19:47			17:05			16:46
Potential sun hours	-280		-145		375	343		294	283
Total, worst case	382		290			358			
Sun reduction	0.65		0.55			0.45			
Oper. time red.	0.86		0.86			0.86			
Wind dir. red.	0.60		0.60			0.61			
Total reduction	0.33		0.28			0.24			
Total, real	128		82			85			

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	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, North part
16 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
1000 meter max shadow distance applied along with default 3° inclination
Sunshine probabilities applied (pdf plots)
Directional run-hours applied from tab file (tower 1)
.

Printed/Page
03/05/06 23:47 / 41
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Wind Engineers, Inc.
7660 Whitegate Avenue
US-RIVERSIDE, CA 92506

Calculated:
03/02/06 05:47/2.4.0.67

SHADOW - Calendar

Calculation: North part **Shadow receptor:** 670 - 670

Assumptions for shadow calculations

Maximum distance for influence	1,000	m
Minimum sun height over horizon for influence	3	°
Day step for calculation	1	days
Time step for calculation	2	minutes

Sun shine probabilities (part of time from sun rise to sun set with sun shine)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.35	0.45	0.45	0.55	0.55	0.55	0.65	0.55	0.55	0.45	0.35	0.30

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
475	585	238	199	220	474	1,184	813	840	1,246	803	479	7,555

	January		February		March		April		May		June	
1	07:40		07:25		06:47		05:54		06:06		18:42 (12)	05:36
	16:47		17:23		17:59		18:35		20:08	24	19:06 (12)	20:40
2	07:40		07:24		06:45		05:52		06:05		18:43 (12)	05:35
	16:48		17:24		18:00		18:37		20:09	24	19:07 (12)	20:41
3	07:40		07:23		06:44		16:54 (11)	05:50	06:03		18:42 (12)	05:35
	16:49		17:26		18:02	10	17:04 (11)	18:38	20:11	24	19:06 (12)	20:41
4	07:40		07:22		06:42		16:50 (11)	05:49	06:02		18:42 (12)	05:34
	16:50		17:27		18:03	16	17:06 (11)	18:39	20:12	24	19:06 (12)	20:42
5	07:40		07:21		06:41		16:48 (11)	06:47	06:01		18:43 (12)	05:34
	16:51		17:28		18:04	18	17:06 (11)	19:40	20:13	22	19:05 (12)	20:43
6	07:40		07:20		06:39		16:49 (11)	06:45	05:59		18:42 (12)	05:34
	16:52		17:30		18:05	18	17:07 (11)	19:41	20:14	24	19:06 (12)	20:44
7	07:40		07:18		06:37		16:47 (11)	06:44	05:58		18:43 (12)	05:33
	16:53		17:31		18:06	20	17:07 (11)	19:42	20:15	22	19:05 (12)	20:44
8	07:40		07:17		06:36		16:47 (11)	06:42	05:57		18:43 (12)	05:33
	16:54		17:32		18:08	20	17:07 (11)	19:43	20:16	22	19:05 (12)	20:45
9	07:40		07:16		06:34		16:45 (11)	06:40	05:56		18:44 (12)	05:33
	16:55		17:34		18:09	22	17:07 (11)	19:45	20:17	20	19:04 (12)	20:46
10	07:40		07:15		06:32		16:46 (11)	06:39	05:55		18:45 (12)	05:32
	16:56		17:35		18:10	22	17:08 (11)	19:46	20:18	18	19:03 (12)	20:46
11	07:39		07:13		06:30		16:46 (11)	06:37	05:53		18:46 (12)	05:32
	16:57		17:36		18:11	22	17:08 (11)	19:47	20:19	16	19:02 (12)	20:47
12	07:39		07:12		06:29		16:46 (11)	06:35	05:52		18:47 (12)	05:32
	16:58		17:37		18:12	20	17:06 (11)	19:48	20:21	14	19:01 (12)	20:47
13	07:39		07:11		06:27		16:47 (11)	06:34	05:51		18:50 (12)	05:32
	16:59		17:39		18:14	20	17:07 (11)	19:49	20:22	8	18:58 (12)	20:48
14	07:38		07:09		06:25		16:47 (11)	06:32	05:50		18:53 (12)	05:32
	17:00		17:40		18:15	18	17:05 (11)	19:50	20:23	4	18:57 (12)	20:48
15	07:38		07:08		06:24		16:49 (11)	06:30	05:49			05:32
	17:02		17:41		18:16	14	17:03 (11)	19:51	20:24			20:49
16	07:37		07:07		06:22		16:51 (11)	06:29	05:48			05:32
	17:03		17:43		18:17	8	16:59 (11)	19:52	20:25			20:49
17	07:37		07:05		06:20			06:27	05:47			05:32
	17:04		17:44		18:18			19:54	20:26			20:50
18	07:36		07:04		06:18			06:25	05:46			05:32
	17:05		17:45		18:19			19:55	20:27			20:50
19	07:36		07:02		06:17			06:24	05:45			05:32
	17:06		17:47		18:21			19:56	20:28			20:50
20	07:35		07:01		06:15			06:22	05:44			05:32
	17:08		17:48		18:22			19:57	20:29			20:51
21	07:35		06:59		06:13			06:21	05:43			05:32
	17:09		17:49		18:23			19:58	20:30			20:51
22	07:34		06:58		06:11			06:19	05:42			05:33
	17:10		17:50		18:24			19:59	20:31			20:51
23	07:33		06:56		06:10			06:18	05:42			05:33
	17:11		17:52		18:25			20:00	20:32			20:51
24	07:32		06:55		06:08			06:16	18:54 (12)		05:41	05:33
	17:13		17:53		18:26			20:00	4	18:58 (12)	20:33	20:52
25	07:32		06:53		06:06			06:15	18:50 (12)		05:40	05:33
	17:14		17:54		18:27			20:02	10	19:00 (12)	20:34	20:52
26	07:31		06:52		06:04			06:13	18:47 (12)		05:39	05:34
	17:15		17:55		18:29			20:03	16	19:03 (12)	20:35	20:52
27	07:30		06:50		06:03			06:12	18:46 (12)		05:39	05:34
	17:16		17:57		18:30			20:04	18	19:04 (12)	20:36	20:52
28	07:29		06:49		06:01			06:10	18:44 (12)		05:38	05:35
	17:18		17:58		18:31			20:05	20	19:04 (12)	20:36	20:52
29	07:28				05:59			06:09	18:45 (12)		05:37	05:35
	17:19				18:32			20:06	20	19:05 (12)	20:37	20:52
30	07:27				05:57			06:07	18:43 (12)		05:37	05:35
	17:20				18:33			20:07	22	19:05 (12)	20:38	20:52
31	07:26				05:56						05:36	
	17:22				18:34						20:39	
Potential sun hours	293		295		370		209		-292			-263
Total, worst case						248		110		266		
Sun reduction						0.45		0.55		0.55		
Oper. time red.						0.86		0.86		0.86		
Wind dir. red.						0.59		0.60		0.60		
Total reduction						0.23		0.28		0.28		
Total, real						57		31		76		

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	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, North part
16 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
1000 meter max shadow distance applied along with default 3° inclination
Sunshine probabilities applied (pdf plots)
Directional run-hours applied from tab file (tower 1)
.

Licensed user:
Wind Engineers, Inc.
7660 Whitegate Avenue
US-RIVERSIDE, CA 92506

Calculated:
03/02/06 05:47/2.4.0.67

SHADOW - Calendar

Calculation: North part **Shadow receptor:** 670 - 670

Assumptions for shadow calculations

Maximum distance for influence	1,000	m
Minimum sun height over horizon for influence	3	°
Day step for calculation	1	days
Time step for calculation	2	minutes

Sun shine probabilities (part of time from sun rise to sun set with sun shine)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.35	0.45	0.45	0.55	0.55	0.55	0.65	0.55	0.55	0.45	0.35	0.30

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
475	585	238	199	220	474	1,184	813	840	1,246	803	479	7,555

	July		August			September			October			November	December
1	05:36		06:01		18:58 (12)	06:34			07:07		17:25 (11)	06:43	07:20
	20:52		20:32	14	19:12 (12)	19:46			18:53	20	17:45 (11)	17:04	16:38
2	05:36		06:02		18:57 (12)	06:35			07:08		17:24 (11)	06:44	07:21
	20:52		20:31	16	19:13 (12)	19:44			18:51	22	17:46 (11)	17:03	16:38
3	05:37		06:03		18:54 (12)	06:36			07:09		17:23 (11)	06:46	07:22
	20:52		20:30	20	19:14 (12)	19:42			18:49	22	17:45 (11)	17:02	16:38
4	05:38		06:04		18:55 (12)	06:37			07:10		17:24 (11)	06:47	07:23
	20:51		20:29	20	19:15 (12)	19:41			18:48	22	17:46 (11)	17:00	16:37
5	05:38		06:05		18:54 (12)	06:39			07:11		17:23 (11)	06:48	07:24
	20:51		20:28	20	19:14 (12)	19:39			18:46	22	17:45 (11)	16:59	16:37
6	05:39		06:07		18:53 (12)	06:40			07:12		17:22 (11)	06:49	07:25
	20:51		20:26	22	19:15 (12)	19:37			18:44	22	17:44 (11)	16:58	16:37
7	05:39		06:08		18:52 (12)	06:41			07:13		17:24 (11)	06:51	07:26
	20:51		20:25	24	19:16 (12)	19:35			18:43	20	17:44 (11)	16:57	16:37
8	05:40		06:09		18:51 (12)	06:42			07:14		17:23 (11)	06:52	07:27
	20:50		20:24	24	19:15 (12)	19:34			18:41	20	17:43 (11)	16:56	16:37
9	05:41		06:10		18:52 (12)	06:43			07:15		17:24 (11)	06:53	07:28
	20:50		20:22	24	19:16 (12)	19:32			18:39	16	17:40 (11)	16:54	16:37
10	05:42		06:11		18:51 (12)	06:44			07:17		17:25 (11)	06:54	07:29
	20:50		20:21	24	19:15 (12)	19:30			18:37	14	17:39 (11)	16:53	16:37
11	05:42		06:12		18:52 (12)	06:45			07:18		17:28 (11)	06:56	07:29
	20:49		20:20	22	19:14 (12)	19:28			18:36	8	17:36 (11)	16:52	16:37
12	05:43		06:13		18:51 (12)	06:46			07:19			06:57	07:30
	20:49		20:18	24	19:15 (12)	19:27			18:34			16:51	16:37
13	05:44		06:14		18:52 (12)	06:47			07:20			06:58	07:31
	20:48		20:17	22	19:14 (12)	19:25			18:32			16:50	16:37
14	05:45		06:15		18:51 (12)	06:48			07:21			06:59	07:32
	20:48		20:16	22	19:13 (12)	19:23			18:31			16:49	16:37
15	05:45		06:16		18:52 (12)	06:49			07:22			07:01	07:33
	20:47		20:14	20	19:12 (12)	19:21			18:29			16:48	16:37
16	05:46		06:17		18:53 (12)	06:50			07:24			07:02	07:33
	20:46		20:13	18	19:11 (12)	19:20			18:28			16:47	16:38
17	05:47		06:18		18:54 (12)	06:51			07:25			07:03	07:34
	20:46		20:11	14	19:08 (12)	19:18			18:26			16:47	16:38
18	05:48		06:19		18:57 (12)	06:52			07:26			07:04	07:35
	20:45		20:10	10	19:07 (12)	19:16			18:24			16:46	16:38
19	05:49		06:20			06:53			07:27			07:06	07:35
	20:44		20:08			19:14			18:23			16:45	16:39
20	05:50		06:21			06:55			07:28			07:07	07:36
	20:44		20:07			19:12			18:21			16:44	16:39
21	05:51		06:22			06:56			07:30			07:08	07:36
	20:43		20:05			19:11			18:20			16:43	16:40
22	05:52		06:24			06:57			07:31			07:09	07:37
	20:42		20:04			19:09			18:18			16:43	16:40
23	05:52		06:25			06:58			07:32			07:10	07:37
	20:41		20:02			19:07			18:17			16:42	16:41
24	05:53		06:26			06:59			07:33			07:12	07:38
	20:40		20:01			19:05			18:15			16:41	16:41
25	05:54		06:27			07:00			06:34			07:13	07:38
	20:39		19:57			19:03			17:14			16:41	16:42
26	05:55		06:28			07:01			06:36			07:14	07:39
	20:38		19:56			19:02			17:12			16:40	16:42
27	05:56		06:29			07:02		17:36 (11)	06:37			07:15	07:39
	20:37		19:54			19:00	4	17:40 (11)	17:11			16:40	16:43
28	05:57		06:30			07:03		17:31 (11)	06:38			07:16	07:39
	20:36		19:52			18:58	10	17:41 (11)	17:10			16:39	16:44
29	05:58		06:31			07:04		17:29 (11)	06:39			07:17	07:40
	20:35		19:51			18:56	16	17:45 (11)	17:08			16:39	16:45
30	05:59		19:02 (12)		06:32	07:05		17:28 (11)	06:41			07:19	07:40
	20:34	6	19:08 (12)		19:49	18:55	18	17:46 (11)	17:07			16:39	16:45
31	06:00		18:59 (12)		06:33				06:42				07:40
	20:33	12	19:11 (12)		19:47				17:05				16:46
Potential sun hours	-280				-145	375			343			294	283
Total, worst case		18			360		48			208			
Sun reduction		0.65			0.55		0.55			0.45			
Oper. time red.		0.86			0.86		0.86			0.86			
Wind dir. red.		0.60			0.60		0.59			0.59			
Total reduction		0.34			0.28		0.28			0.23			
Total, real		6			102		13			48			

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	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, North part
16 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
1000 meter max shadow distance applied along with default 3° inclination
Sunshine probabilities applied (pdf plots)
Directional run-hours applied from tab file (tower 1)
.

Printed/Page
03/05/06 23:47 / 43
Licensed user:
Wind Engineers, Inc.
7660 Whitegate Avenue
US-RIVERSIDE, CA 92506

Calculated:
03/02/06 05:47/2.4.0.67

SHADOW - Calendar

Calculation: North part **Shadow receptor:** 671 - 671

Assumptions for shadow calculations

Maximum distance for influence	1,000	m
Minimum sun height over horizon for influence	3	°
Day step for calculation	1	days
Time step for calculation	2	minutes

Sun shine probabilities (part of time from sun rise to sun set with sun shine)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.35	0.45	0.45	0.55	0.55	0.55	0.65	0.55	0.55	0.45	0.35	0.30

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
475	585	238	199	220	474	1,184	813	840	1,246	803	479	7,555

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:40 16:47	07:25 17:23	06:47 17:59	05:54 18:35	06:06 20:08	05:36 20:40 24 19:36 (12)	05:36 20:52 28 19:43 (12)	06:01 20:32	06:34 19:46	07:07 18:53 26 17:53 (11)	06:43 17:04	07:20 16:38
2	07:40 16:48	07:24 17:24	06:45 18:00	05:52 18:37	06:05 20:09	05:35 20:41 24 19:35 (12)	19:11 (12) 05:36 20:52 28 19:44 (12)	19:16 (12) 06:02 20:31	06:35 19:44	07:08 18:51 22 17:50 (11)	17:28 (11) 06:44 17:03	07:21 16:38
3	07:40 16:49	07:23 17:26	06:44 18:02	05:50 18:38	06:03 20:11	05:35 20:41 26 19:37 (12)	19:11 (12) 05:37 20:52 28 19:44 (12)	19:16 (12) 06:03 20:30	06:36 19:42	07:09 18:49 20 17:49 (11)	17:29 (11) 06:46 17:02	07:22 16:38
4	07:40 16:50	07:22 17:27	06:42 18:03	05:49 18:39	06:02 20:12	05:34 20:42 26 19:37 (12)	19:11 (12) 05:38 20:51 28 19:45 (12)	19:17 (12) 06:04 20:29	06:37 19:41	07:10 18:48 16 17:46 (11)	17:30 (11) 06:47 17:00	07:23 16:37
5	07:40 16:51	07:21 17:28	06:41 18:04	06:47 19:40	06:01 20:13	05:34 20:43 26 19:36 (12)	19:10 (12) 05:38 20:51 28 19:43 (12)	19:15 (12) 06:05 20:28	06:39 19:39	07:11 18:46 10 17:43 (11)	17:33 (11) 06:48 16:59	07:24 16:37
6	07:40 16:52	07:20 17:30	06:39 18:05	06:45 19:41	05:59 20:14	05:34 20:44 28 19:38 (12)	19:10 (12) 05:39 20:51 28 19:44 (12)	19:16 (12) 06:07 20:26	06:40 19:37	07:12 18:44	06:49 16:58	07:25 16:37
7	07:40 16:53	07:18 17:31	06:37 18:06	06:44 19:42	05:58 20:15	05:33 20:44 28 19:38 (12)	19:10 (12) 05:39 20:51 28 19:45 (12)	19:17 (12) 06:08 20:25	06:41 19:35	07:13 18:43	06:51 16:57	07:26 16:37
8	07:40 16:54	07:17 17:32	06:36 18:08 4 16:59 (11) 17:03 (11)	06:42 19:43	05:57 20:16	05:33 20:45 30 19:40 (12)	19:10 (12) 05:40 20:50 26 19:43 (12)	19:17 (12) 06:09 20:24	06:42 19:34	07:14 18:41	06:52 16:56	07:27 16:37
9	07:40 16:55	07:16 17:34	06:34 18:09 14 16:53 (11) 17:07 (11)	06:40 19:45	05:56 20:17	05:33 20:46 28 19:39 (12)	19:11 (12) 05:41 20:50 26 19:44 (12)	19:18 (12) 06:10 20:22	06:43 19:32	07:15 18:39	06:53 16:54	07:28 16:37
10	07:40 16:56	07:15 17:35	06:32 18:10 18 16:52 (11) 17:10 (11)	06:39 19:46	05:55 20:18	05:32 20:46 28 19:39 (12)	19:11 (12) 05:42 20:50 24 19:43 (12)	19:19 (12) 06:11 20:21	06:44 19:30	07:17 18:37	06:54 16:53	07:29 16:37
11	07:39 16:57	07:13 17:36	06:30 18:11 22 16:50 (11) 17:12 (11)	06:37 19:47	05:53 20:19	05:32 20:47 28 19:39 (12)	19:11 (12) 05:42 20:49 24 19:43 (12)	19:19 (12) 06:12 20:20	06:45 19:28	07:18 18:36	06:56 16:52	07:29 16:37
12	07:39 16:58	07:12 17:37	06:29 18:12 24 16:48 (11) 17:12 (11)	06:35 19:48	05:52 20:21	05:32 20:47 30 19:41 (12)	19:11 (12) 05:43 20:49 22 19:42 (12)	19:20 (12) 06:13 20:18	06:46 19:27	07:19 18:34	06:57 16:51	07:30 16:37
13	07:39 16:59	07:11 17:39	06:27 18:14 26 16:47 (11) 17:13 (11)	06:34 19:49	05:51 20:22	05:32 20:48 30 19:41 (12)	19:11 (12) 05:44 20:48 22 19:43 (12)	19:21 (12) 06:14 20:17	06:47 19:25	07:20 18:32	06:58 16:50	07:31 16:37
14	07:38 17:00	07:09 17:40	06:25 18:15 26 16:47 (11) 17:13 (11)	06:32 19:50	05:50 20:23	05:32 20:48 30 19:41 (12)	19:11 (12) 05:45 20:48 20 19:42 (12)	19:22 (12) 06:15 20:16	06:48 19:23	07:21 18:31	06:59 16:49	07:32 16:37
15	07:38 17:02	07:08 17:41	06:24 18:16 28 16:45 (11) 17:13 (11)	06:30 19:51	05:49 20:24	05:32 20:49 30 19:41 (12)	19:11 (12) 05:45 20:47 18 19:40 (12)	19:22 (12) 06:16 20:14	06:49 19:21	07:22 18:29	07:01 16:48	07:33 16:38
16	07:37 17:03	07:07 17:43	06:22 18:17 28 16:45 (11) 17:13 (11)	06:29 19:52	05:48 20:25	05:32 20:49 30 19:41 (12)	19:11 (12) 05:46 20:46 16 19:39 (12)	19:23 (12) 06:17 20:13	06:50 19:20	07:24 18:28	07:02 16:47	07:33 16:38
17	07:37 17:04	07:05 17:44	06:20 18:18 30 16:44 (11) 17:14 (11)	06:27 19:54	05:47 20:26	05:32 20:50 30 19:41 (12)	19:11 (12) 05:47 20:46 14 19:38 (12)	19:24 (12) 06:18 20:11	06:51 19:18 6 17:48 (11)	17:42 (11) 07:25 18:26	07:03 16:47	07:34 16:38
18	07:36 17:05	07:04 17:45	06:18 18:19 30 16:44 (11) 17:14 (11)	06:25 19:55	05:46 20:27	05:32 20:50 30 19:41 (12)	19:11 (12) 05:48 20:45 10 19:37 (12)	19:27 (12) 06:19 20:10	06:52 19:16 16 17:53 (11)	17:37 (11) 07:26 18:24	07:04 16:46	07:35 16:38
19	07:36 17:06	07:02 17:47	06:17 18:21 28 16:44 (11) 17:12 (11)	06:24 19:56	05:45 20:28	05:32 20:50 30 19:41 (12)	19:11 (12) 05:49 20:44 4 19:36 (12)	19:32 (12) 06:20 20:08	06:53 19:14 18 17:54 (11)	17:36 (11) 07:27 18:23	07:06 16:45	07:35 16:39
20	07:35 17:08	07:01 17:48	06:15 18:22 28 16:44 (11) 17:12 (11)	06:22 19:57	05:44 20:29	05:32 20:51 30 19:41 (12)	19:11 (12) 05:50 20:44	06:21 20:07	06:55 19:12 22 17:55 (11)	17:33 (11) 07:28 18:21	07:07 16:44	07:36 16:39
21	07:35 17:09	06:59 17:49	06:13 18:23 26 16:45 (11) 17:11 (11)	06:21 19:58	05:43 20:30	05:32 20:51 30 19:42 (12)	19:12 (12) 05:51 20:43	06:23 20:05	06:56 19:11 24 17:56 (11)	17:32 (11) 07:30 18:20	07:08 16:43	07:36 16:40
22	07:34 17:10	06:58 17:50	06:11 18:24 26 16:45 (11) 17:11 (11)	06:19 19:59	05:42 20:31	05:33 20:51 30 19:42 (12)	19:12 (12) 05:52 20:42	06:24 20:04	06:57 19:09 26 17:57 (11)	17:31 (11) 07:31 18:18	07:09 16:43	07:37 16:40
23	07:33 17:11	06:56 17:52	06:10 18:25 22 16:47 (11) 17:09 (11)	06:18 20:00	05:42 20:32	05:33 20:51 30 19:42 (12)	19:12 (12) 05:52 20:41	06:25 20:02	06:58 19:07 28 17:56 (11)	17:28 (11) 07:32 18:17	07:10 16:42	07:37 16:41
24	07:32 17:13	06:55 17:53	06:08 18:26 20 16:47 (11) 17:07 (11)	06:16 20:00	05:41 20:33	05:33 20:52 30 19:42 (12)	19:12 (12) 05:53 20:40	06:26 20:01	06:59 19:05 30 17:57 (11)	17:27 (11) 07:33 18:15	07:12 16:42	07:38 16:41
25	07:32 17:14	06:53 17:54	06:06 16:49 (11) 18:27 16 17:05 (11)	06:15 20:02	05:40 20:34 8 19:26 (12)	19:18 (12) 05:34 20:52 30 19:43 (12)	19:13 (12) 05:54 20:39	06:27 19:57	07:00 19:04 28 17:56 (11)	17:28 (11) 06:34 17:14	07:13 16:41	07:38 16:42
26	07:31 17:15	06:52 17:55	06:04 16:52 (11) 18:29 10 17:02 (11)	06:13 20:03	05:39 20:35 12 19:29 (12)	19:17 (12) 05:34 20:52 30 19:43 (12)	19:13 (12) 05:55 20:38	06:28 19:56	07:01 19:02 28 17:55 (11)	17:27 (11) 06:36 17:12	07:14 16:40	07:39 16:42
27	07:30 17:16	06:50 17:57	06:03 18:30	06:12 20:04	05:39 20:36 16 19:31 (12)	19:15 (12) 05:34 20:52 30 19:43 (12)	19:13 (12) 05:56 20:37	06:29 19:54	07:02 19:00 30 17:56 (11)	17:26 (11) 06:37 17:11	07:15 16:40	07:39 16:43
28	07:29 17:18	06:49 17:58	06:01 18:31	06:10 20:05	05:38 20:36 18 19:32 (12)	19:14 (12) 05:35 20:52 30 19:44 (12)	19:14 (12) 05:57 20:36	06:30 19:52	07:03 18:58 30 17:55 (11)	17:25 (11) 06:38 17:10	07:16 16:39	07:39 16:44
29	07:28 17:19		05:59 18:32	06:09 20:06	05:37 20:37 20 19:33 (12)	19:13 (12) 05:35 20:52 30 19:44 (12)	19:14 (12) 05:58 20:35	06:31 19:51	07:04 18:56 28 17:55 (11)	17:27 (11) 06:39 17:08	07:17 16:39	07:40 16:45
30	07:27 17:20		05:57 18:33	06:07 20:07	05:37 20:38 20 19:33 (12)	19:13 (12) 05:35 20:52 30 19:45 (12)	19:15 (12) 05:59 20:34	06:32 19:49	07:05 18:55 28 17:54 (11)	17:26 (11) 06:41 17:07	07:19 16:39	07:40 16:45
31	07:26 17:22		05:56 18:34		05:36 20:39 22 19:34 (12)	19:12 (12)	06:00 20:33	06:33 19:47		06:42 17:05		07:40 16:46
Potential sun hours	293	295	370	209	-292	-263	-280	-145	375	343	294	283
Total, worst case			426		116	866	422		342	94		
Sun reduction			0.45		0.55	0.55	0.65		0.55	0.45		
Oper. time red.			0.86		0.86	0.86	0.86		0.86	0.86		
Wind dir. red.			0.59		0.62	0.62	0.62		0.59	0.59		
Total reduction			0.23		0.29	0.29	0.34		0.28	0.23		
Total, real			98		34	252	145		96	22		

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

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

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, North part
16 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
1000 meter max shadow distance applied along with default 3° inclination
Sunshine probabilities applied (pdf plots)
Directional run-hours applied from tab file (tower 1)
.

Printed/Page
03/05/06 23:47 / 44
Licensed user:
Wind Engineers, Inc.
7660 Whitegate Avenue
US-RIVERSIDE, CA 92506
Calculated:
03/02/06 05:47/2.4.0.67

SHADOW - Calendar

Calculation: North part **Shadow receptor:** 672 - 672

Assumptions for shadow calculations

Maximum distance for influence	1,000	m
Minimum sun height over horizon for influence	3	°
Day step for calculation	1	days
Time step for calculation	2	minutes

Sun shine probabilities (part of time from sun rise to sun set with sun shine)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.35	0.45	0.45	0.55	0.55	0.55	0.65	0.55	0.55	0.45	0.35	0.30

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
475	585	238	199	220	474	1,184	813	840	1,246	803	479	7,555

	January		February		March		April		May		June
1	07:40		15:06 (8)	07:25		06:47		05:54		06:13 (11)	06:06	05:36
	16:47	36	15:42 (8)	17:23		17:59		18:35	26	06:39 (11)	20:08	20:40
2	07:40		15:06 (8)	07:24		06:45		05:52		06:12 (11)	06:05	05:35
	16:48	36	15:42 (8)	17:24		18:00		18:37	28	06:40 (11)	20:10	20:41
3	07:40		15:08 (8)	07:23		06:44		05:51		06:10 (11)	06:03	05:35
	16:49	34	15:42 (8)	17:26		18:02		18:38	30	06:40 (11)	20:11	20:41
4	07:40		15:07 (8)	07:22		06:42		05:49		06:08 (11)	06:02	05:34
	16:50	34	15:41 (8)	17:27		18:03		18:39	34	06:42 (11)	20:12	20:42
5	07:40		15:09 (8)	07:21		06:41		06:47		07:06 (11)	06:01	05:34
	16:51	32	15:41 (8)	17:28		18:04		19:40	36	07:42 (11)	20:13	20:43
6	07:40		15:09 (8)	07:20		06:39		06:45		07:05 (11)	05:59	05:34
	16:52	32	15:41 (8)	17:30		18:05		19:41	38	07:43 (11)	20:14	20:44
7	07:40		15:11 (8)	07:18		06:37		06:44		07:05 (11)	05:58	05:33
	16:53	30	15:41 (8)	17:31		18:06		19:42	36	07:41 (11)	20:15	20:44
8	07:40		15:11 (8)	07:17		06:36		06:42		07:03 (11)	05:57	05:33
	16:54	30	15:41 (8)	17:32		18:08		19:43	38	07:41 (11)	20:16	20:45
9	07:40		15:13 (8)	07:16		06:34		06:40		07:04 (11)	05:56	05:33
	16:55	30	15:43 (8)	17:34		18:09		19:45	38	07:42 (11)	20:17	20:46
10	07:40		15:14 (8)	07:15		06:32		06:39		07:02 (11)	05:55	05:33
	16:56	28	15:42 (8)	17:35		18:10		19:46	40	07:42 (11)	20:18	20:46
11	07:39		15:14 (8)	07:14		06:30		06:37		07:02 (11)	05:53	05:32
	16:57	28	15:42 (8)	17:36		18:11		19:47	38	07:40 (11)	20:20	20:47
12	07:39		15:15 (8)	07:12		06:29		06:35		07:03 (11)	05:52	05:32
	16:58	26	15:41 (8)	17:38		18:12		19:48	38	07:41 (11)	20:21	20:47
13	07:39		15:17 (8)	07:11		06:27		06:34		07:03 (11)	05:51	05:32
	16:59	24	15:41 (8)	17:39		18:14		19:49	36	07:39 (11)	20:22	20:48
14	07:38		15:19 (8)	07:10		06:25		06:32		07:03 (11)	05:50	05:32
	17:00	20	15:39 (8)	17:40		18:15		19:50	36	07:39 (11)	20:23	20:48
15	07:38		15:20 (8)	07:08		06:24		06:30		07:04 (11)	05:49	05:32
	17:02	18	15:38 (8)	17:41		18:16		19:51	34	07:38 (11)	20:24	20:49
16	07:37		15:23 (8)	07:07		06:22		06:29		07:04 (11)	05:48	05:32
	17:03	14	15:37 (8)	17:43		18:17		19:53	32	07:36 (11)	20:25	20:49
17	07:37		15:27 (8)	07:05		06:20		06:27		07:05 (11)	05:47	05:32
	17:04	8	15:35 (8)	17:44		18:18		19:54	32	07:37 (11)	20:26	20:50
18	07:36			07:04		06:18		06:25		07:05 (11)	05:46	05:32
	17:05			17:45		18:19		19:55	30	07:35 (11)	20:27	20:50
19	07:36			07:02		06:17		06:24		07:05 (11)	05:45	05:32
	17:06			17:47		18:21		19:56	28	07:33 (11)	20:28	20:50
20	07:35			07:01		06:15		06:22		07:08 (11)	05:44	05:32
	17:08			17:48		18:22		19:57	24	07:32 (11)	20:29	20:51
21	07:35			07:00		06:13		06:21		07:08 (11)	05:43	05:33
	17:09			17:49		18:23		19:58	20	07:28 (11)	20:30	20:51
22	07:34			06:58		06:11		06:19		07:11 (11)	05:42	05:33
	17:10			17:50		18:24		19:59	16	07:27 (11)	20:31	20:51
23	07:33			06:57		06:10		06:18		07:15 (11)	05:42	05:33
	17:11			17:52		18:25		20:00	6	07:21 (11)	20:32	20:51
24	07:32			06:55		06:08		06:16			05:41	05:33
	17:13			17:53		18:26		20:00			20:33	20:52
25	07:32			06:53		06:06		06:15			05:40	05:34
	17:14			17:54		18:28		20:02			20:34	20:52
26	07:31			06:52		06:04		06:13			05:39	05:34
	17:15			17:55		18:29		20:03			20:35	20:52
27	07:30			06:50		06:03		06:12			05:39	05:34
	17:17			17:57		18:30		20:04			20:36	20:52
28	07:29			06:49		06:01		06:10			05:38	05:35
	17:18			17:58		18:31		20:05			20:37	20:52
29	07:28					05:59	06:19 (11)	06:09			05:37	05:35
	17:19					18:32	14 06:33 (11)	20:06			20:37	20:52
30	07:27					05:57	06:17 (11)	06:07			05:37	05:36
	17:20					18:33	20 06:37 (11)	20:07			20:38	20:52
31	07:26					05:56	06:15 (11)				05:36	
	17:22					18:34	22 06:37 (11)				20:39	
Potential sun hours	293			295		370		209			-292	-263
Total, worst case		460				56			714			
Sun reduction		0.35				0.45			0.55			
Oper. time red.		0.86				0.86			0.86			
Wind dir. red.		0.65				0.61			0.61			
Total reduction		0.20				0.24			0.29			
Total, real		91				13			208			

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	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, North part
16 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
1000 meter max shadow distance applied along with default 3° inclination
Sunshine probabilities applied (pdf plots)
Directional run-hours applied from tab file (tower 1)
.

Licensed user:
Wind Engineers, Inc.
7660 Whitegate Avenue
US-RIVERSIDE, CA 92506

Calculated:
03/02/06 05:47/2.4.0.67

SHADOW - Calendar

Calculation: North part **Shadow receptor:** 672 - 672

Assumptions for shadow calculations

Maximum distance for influence	1,000	m
Minimum sun height over horizon for influence	3	°
Day step for calculation	1	days
Time step for calculation	2	minutes

Sun shine probabilities (part of time from sun rise to sun set with sun shine)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.35	0.45	0.45	0.55	0.55	0.55	0.65	0.55	0.55	0.45	0.35	0.30

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
475	585	238	199	220	474	1,184	813	840	1,246	803	479	7,555

	July		August		September		October		November		December	
1	05:36		06:01		06:34	07:01 (11)	07:07		06:43		07:20	14:56 (8)
	20:52		20:32		19:46	38 07:39 (11)	18:53		17:04		16:38	28 15:24 (8)
2	05:37		06:02		06:35	07:00 (11)	07:08		06:44		07:21	14:57 (8)
	20:52		20:31		19:44	40 07:40 (11)	18:51		17:03		16:38	28 15:25 (8)
3	05:37		06:03		06:36	07:01 (11)	07:09		06:46		07:22	14:56 (8)
	20:52		20:30		19:42	38 07:39 (11)	18:49		17:02		16:38	30 15:26 (8)
4	05:38		06:05		06:38	07:00 (11)	07:10		06:47		07:23	14:55 (8)
	20:51		20:29		19:41	38 07:38 (11)	18:48		17:00		16:37	32 15:27 (8)
5	05:38		06:06		06:39	07:01 (11)	07:11		06:48		07:24	14:56 (8)
	20:51		20:28		19:39	36 07:37 (11)	18:46		16:59		16:37	30 15:26 (8)
6	05:39		06:07		06:40	07:00 (11)	07:12		06:49		07:25	14:55 (8)
	20:51		20:26		19:37	38 07:38 (11)	18:44		16:58		16:37	32 15:27 (8)
7	05:40		06:08		06:41	07:02 (11)	07:13		06:51		07:26	14:56 (8)
	20:51		20:25		19:35	36 07:38 (11)	18:43		16:57		16:37	32 15:28 (8)
8	05:40		06:09		06:42	07:03 (11)	07:14		06:52		07:27	14:55 (8)
	20:50		20:24		19:34	34 07:37 (11)	18:41		16:56		16:37	34 15:29 (8)
9	05:41		06:10		06:43	07:04 (11)	07:16		06:53		07:28	14:56 (8)
	20:50		20:23		19:32	32 07:36 (11)	18:39		16:55		16:37	34 15:30 (8)
10	05:42		06:11		06:44	07:05 (11)	07:17		06:54		07:29	14:55 (8)
	20:50		20:21		19:30	28 07:33 (11)	18:38		16:53		16:37	36 15:31 (8)
11	05:42		06:12		06:45	07:06 (11)	07:18		06:56		07:29	14:56 (8)
	20:49		20:20		19:28	26 07:32 (11)	18:36		16:52		16:37	36 15:32 (8)
12	05:43		06:13		06:46	07:07 (11)	07:19		06:57		07:30	14:57 (8)
	20:49		20:18		19:27	24 07:31 (11)	18:34		16:51		16:37	36 15:33 (8)
13	05:44		06:14		06:47	07:08 (11)	07:20		06:58		07:31	14:56 (8)
	20:48		20:17		19:25	20 07:28 (11)	18:33		16:50		16:37	38 15:34 (8)
14	05:45		06:15		06:48	07:09 (11)	07:21		06:59		07:32	14:56 (8)
	20:48		20:16		19:23	16 07:25 (11)	18:31		16:49		16:37	36 15:32 (8)
15	05:45		06:16		06:49	07:14 (11)	07:22		07:01		07:33	14:57 (8)
	20:47		20:14		19:21	4 07:18 (11)	18:29		16:48		16:38	36 15:33 (8)
16	05:46		06:17		06:50		07:24		07:02		07:33	14:58 (8)
	20:46		20:13		19:20		18:28		16:48		16:38	36 15:34 (8)
17	05:47		06:18		06:51		07:25		07:03		07:34	14:58 (8)
	20:46		20:11		19:18		18:26		16:47		16:38	36 15:34 (8)
18	05:48		06:19		06:52		07:26		07:04		07:35	14:59 (8)
	20:45		20:10		19:16		18:24		16:46		16:38	36 15:35 (8)
19	05:49		06:20		06:54		07:27		07:06		07:35	15:00 (8)
	20:44		20:08		19:14		18:23		16:45		16:39	36 15:36 (8)
20	05:50		06:21	07:19 (11)	06:55		07:28		07:07		07:36	14:58 (8)
	20:44		20:07	8 07:27 (11)	19:12		18:21		16:44		16:39	38 15:36 (8)
21	05:51		06:23	07:16 (11)	06:56		07:30		07:08		07:37	14:59 (8)
	20:43		20:05	16 07:32 (11)	19:11		18:20		16:44		16:40	38 15:37 (8)
22	05:52		06:24	07:13 (11)	06:57		07:31		07:09		07:37	14:59 (8)
	20:42		20:04	20 07:33 (11)	19:09		18:18		16:43		16:40	38 15:37 (8)
23	05:53		06:25	07:10 (11)	06:58		07:32		07:11		07:38	15:00 (8)
	20:41		20:02	26 07:36 (11)	19:07		18:17		16:42		16:41	38 15:38 (8)
24	05:53		06:26	07:09 (11)	06:59		07:33		07:12		07:38	15:00 (8)
	20:40		20:01	28 07:37 (11)	19:05		18:15		16:42		16:41	38 15:38 (8)
25	05:54		06:27	07:08 (11)	07:00		06:34		07:13	15:05 (8)	07:38	15:02 (8)
	20:39		19:57	30 07:38 (11)	19:04		17:14		16:41	8 15:13 (8)	16:42	36 15:38 (8)
26	05:55		06:28	07:07 (11)	07:01		06:36		07:14	15:02 (8)	07:39	15:03 (8)
	20:38		19:56	32 07:39 (11)	19:02		17:12		16:40	14 15:16 (8)	16:42	36 15:39 (8)
27	05:56		06:29	07:06 (11)	07:02		06:37		07:15	14:59 (8)	07:39	15:03 (8)
	20:38		19:54	32 07:38 (11)	19:00		17:11		16:40	18 15:17 (8)	16:43	36 15:39 (8)
28	05:57		06:30	07:05 (11)	07:03		06:38		07:16	14:58 (8)	07:39	15:03 (8)
	20:37		19:52	34 07:39 (11)	18:58		17:10		16:39	20 15:18 (8)	16:44	36 15:39 (8)
29	05:58		06:31	07:04 (11)	07:04		06:39		07:17	14:58 (8)	07:40	15:03 (8)
	20:36		19:51	36 07:40 (11)	18:56		17:08		16:39	24 15:22 (8)	16:45	36 15:39 (8)
30	05:59		06:32	07:03 (11)	07:05		06:41		07:19	14:57 (8)	07:40	15:04 (8)
	20:34		19:49	36 07:39 (11)	18:55		17:07		16:39	26 15:23 (8)	16:45	38 15:42 (8)
31	06:00		06:33	07:02 (11)			06:42				07:40	15:06 (8)
	20:33		19:47	38 07:40 (11)			17:05				16:46	36 15:42 (8)
Potential sun hours	-280		-145		375		343		294		283	
Total, worst case				336		448				110		1086
Sun reduction				0.55		0.55				0.35		0.30
Oper. time red.				0.86		0.86				0.86		0.86
Wind dir. red.				0.61		0.61				0.65		0.65
Total reduction				0.29		0.29				0.20		0.17
Total, real				98		131				22		184

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	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, North part
16 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
1000 meter max shadow distance applied along with default 3° inclination
Sunshine probabilities applied (pdf plots)
Directional run-hours applied from tab file (tower 1)
.

Printed/Page
03/05/06 23:47 / 46
Licensed user:
Wind Engineers, Inc.
7660 Whitegate Avenue
US-RIVERSIDE, CA 92506

Calculated:
03/02/06 05:47/2.4.0.67

SHADOW - Calendar

Calculation: North part **Shadow receptor:** 673 - 673

Assumptions for shadow calculations

Maximum distance for influence	1,000	m
Minimum sun height over horizon for influence	3	°
Day step for calculation	1	days
Time step for calculation	2	minutes

Sun shine probabilities (part of time from sun rise to sun set with sun shine)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.35	0.45	0.45	0.55	0.55	0.55	0.65	0.55	0.55	0.45	0.35	0.30

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
475	585	238	199	220	474	1,184	813	840	1,246	803	479	7,555

	January		February		March	April	May		June	
1	07:40		07:25		16:22 (8)	06:47	05:54	06:06	05:36	06:00 (11)
	16:47		17:23	34	16:56 (8)	17:59	18:35	20:08	20:40	46 06:46 (11)
2	07:40		07:24		16:21 (8)	06:45	05:52	06:05	05:35	06:00 (11)
	16:48		17:24	36	16:57 (8)	18:00	18:37	20:10	20:41	46 06:46 (11)
3	07:40		07:23		16:22 (8)	06:44	05:51	06:03	05:35	05:59 (11)
	16:49		17:26	36	16:58 (8)	18:02	18:38	20:11	20:41	48 06:47 (11)
4	07:40		07:22		16:21 (8)	06:42	05:49	06:02	06:22 (11)	05:34 06:01 (11)
	16:50		17:27	38	16:59 (8)	18:03	18:39	20:12	6 06:28 (11)	20:42 46 06:47 (11)
5	07:40		07:21		16:22 (8)	06:41	06:47	06:01	06:21 (11)	05:34 06:00 (11)
	16:51		17:28	38	17:00 (8)	18:04	19:40	20:13	10 06:31 (11)	20:43 46 06:46 (11)
6	07:40		07:20		16:20 (8)	06:39	06:45	05:59	06:20 (11)	05:34 06:00 (11)
	16:52		17:30	40	17:00 (8)	18:05	19:41	20:14	14 06:34 (11)	20:44 46 06:46 (11)
7	07:40		07:18		16:21 (8)	06:37	06:44	05:58	06:19 (11)	05:33 06:00 (11)
	16:53		17:31	38	16:59 (8)	18:06	19:42	20:15	18 06:37 (11)	20:44 46 06:46 (11)
8	07:40		07:17		16:22 (8)	06:36	06:42	05:57	06:18 (11)	05:33 06:02 (11)
	16:54		17:32	38	17:00 (8)	18:08	19:43	20:16	20 06:38 (11)	20:45 44 06:46 (11)
9	07:40		07:16		16:21 (8)	06:34	06:40	05:56	06:16 (11)	05:33 06:01 (11)
	16:55		17:34	40	17:01 (8)	18:09	19:45	20:17	22 06:38 (11)	20:46 46 06:47 (11)
10	07:40		07:15		16:21 (8)	06:32	06:39	05:55	06:15 (11)	05:33 06:01 (11)
	16:56		17:35	38	16:59 (8)	18:10	19:46	20:18	24 06:39 (11)	20:46 46 06:47 (11)
11	07:39		07:14		16:22 (8)	06:30	06:37	05:53	06:14 (11)	05:32 06:01 (11)
	16:57		17:36	38	17:00 (8)	18:11	19:47	20:19	26 06:40 (11)	20:47 46 06:47 (11)
12	07:39		07:12		16:23 (8)	06:29	06:35	05:52	06:13 (11)	05:32 06:03 (11)
	16:58		17:38	36	16:59 (8)	18:12	19:48	20:21	28 06:41 (11)	20:47 44 06:47 (11)
13	07:39		07:11		16:23 (8)	06:27	06:34	05:51	06:12 (11)	05:32 06:03 (11)
	16:59		17:39	36	16:59 (8)	18:14	19:49	20:22	30 06:42 (11)	20:48 44 06:47 (11)
14	07:38		07:10		16:24 (8)	06:25	06:32	05:50	06:11 (11)	05:32 06:03 (11)
	17:00		17:40	34	16:58 (8)	18:15	19:50	20:23	32 06:43 (11)	20:48 44 06:47 (11)
15	07:38		07:08		16:24 (8)	06:24	06:30	05:49	06:10 (11)	05:32 06:03 (11)
	17:02		17:41	34	16:58 (8)	18:16	19:51	20:24	32 06:42 (11)	20:49 44 06:47 (11)
16	07:37		07:07		16:25 (8)	06:22	06:29	05:48	06:09 (11)	05:32 06:03 (11)
	17:03		17:43	32	16:57 (8)	18:17	19:53	20:25	34 06:43 (11)	20:49 44 06:47 (11)
17	07:37		07:05		16:26 (8)	06:20	06:27	05:47	06:08 (11)	05:32 06:03 (11)
	17:04		17:44	30	16:56 (8)	18:18	19:54	20:26	36 06:44 (11)	20:50 44 06:47 (11)
18	07:36		07:04		16:28 (8)	06:18	06:25	05:46	06:07 (11)	05:32 06:03 (11)
	17:05		17:45	26	16:54 (8)	18:19	19:55	20:27	36 06:43 (11)	20:50 44 06:47 (11)
19	07:36		07:02		16:29 (8)	06:17	06:24	05:45	06:06 (11)	05:32 06:03 (11)
	17:06		17:47	24	16:53 (8)	18:21	19:56	20:28	38 06:44 (11)	20:50 44 06:47 (11)
20	07:35		07:01		16:31 (8)	06:15	06:22	05:44	06:06 (11)	05:32 06:04 (11)
	17:08		17:48	20	16:51 (8)	18:22	19:57	20:29	40 06:46 (11)	20:51 44 06:48 (11)
21	07:35		07:00		16:34 (8)	06:13	06:21	05:43	06:05 (11)	05:33 06:04 (11)
	17:09		17:49	16	16:50 (8)	18:23	19:58	20:30	40 06:45 (11)	20:51 44 06:48 (11)
22	07:34		06:58		16:38 (8)	06:11	06:19	05:42	06:04 (11)	05:33 06:04 (11)
	17:10		17:50	6	16:44 (8)	18:24	19:59	20:31	42 06:46 (11)	20:51 44 06:48 (11)
23	07:33		16:35 (8)	06:57		06:10	06:18	05:42	06:03 (11)	05:33 06:04 (11)
	17:11	6	16:41 (8)	17:52		18:25	20:00	20:32	42 06:45 (11)	20:51 44 06:48 (11)
24	07:32		16:30 (8)	06:55		06:08	06:16	05:41	06:03 (11)	05:33 06:04 (11)
	17:13	14	16:44 (8)	17:53		18:26	20:00	20:33	42 06:45 (11)	20:52 44 06:48 (11)
25	07:32		16:29 (8)	06:53		06:06	06:15	05:40	06:02 (11)	05:34 06:05 (11)
	17:14	18	16:47 (8)	17:54		18:27	20:02	20:34	44 06:46 (11)	20:52 44 06:49 (11)
26	07:31		16:28 (8)	06:52		06:04	06:13	05:39	06:01 (11)	05:34 06:05 (11)
	17:15	22	16:50 (8)	17:55		18:29	20:03	20:35	44 06:45 (11)	20:52 44 06:49 (11)
27	07:30		16:25 (8)	06:50		06:03	06:12	05:39	06:01 (11)	05:34 06:06 (11)
	17:17	26	16:51 (8)	17:57		18:30	20:04	20:36	46 06:47 (11)	20:52 44 06:50 (11)
28	07:29		16:24 (8)	06:49		06:01	06:10	05:38	06:00 (11)	05:35 06:06 (11)
	17:18	28	16:52 (8)	17:58		18:31	20:05	20:37	46 06:46 (11)	20:52 44 06:50 (11)
29	07:28		16:23 (8)			05:59	06:09	05:37	05:59 (11)	05:35 06:06 (11)
	17:19	30	16:53 (8)			18:32	20:06	20:37	46 06:45 (11)	20:52 44 06:50 (11)
30	07:27		16:24 (8)			05:57	06:07	05:37	05:59 (11)	05:36 06:07 (11)
	17:20	30	16:54 (8)			18:33	20:07	20:38	48 06:47 (11)	20:52 44 06:51 (11)
31	07:26		16:23 (8)			05:56		05:36	05:58 (11)	
	17:22	32	16:55 (8)			18:34		20:39	48 06:46 (11)	
Potential sun hours	293		295			370	209	-292		-263
Total, worst case		206		708				934		1342
Sun reduction		0.35		0.45				0.55		0.55
Oper. time red.		0.86		0.86				0.86		0.86
Wind dir. red.		0.63		0.63				0.61		0.61
Total reduction		0.19		0.25				0.29		0.29
Total, real		39		174				273		392

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	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, North part
16 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
1000 meter max shadow distance applied along with default 3° inclination
Sunshine probabilities applied (pdf plots)
Directional run-hours applied from tab file (tower 1)
.

Printed/Page
03/05/06 23:47 / 47
Licensed user:
Wind Engineers, Inc.
7660 Whitegate Avenue
US-RIVERSIDE, CA 92506

Calculated:
03/02/06 05:47/2.4.0.67

SHADOW - Calendar

Calculation: North part **Shadow receptor:** 673 - 673

Assumptions for shadow calculations

Maximum distance for influence	1,000	m
Minimum sun height over horizon for influence	3	°
Day step for calculation	1	days
Time step for calculation	2	minutes

Sun shine probabilities (part of time from sun rise to sun set with sun shine)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.35	0.45	0.45	0.55	0.55	0.55	0.65	0.55	0.55	0.45	0.35	0.30

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
475	585	238	199	220	474	1,184	813	840	1,246	803	479	7,555

	July		August		September	October		November		December
1	05:36	06:05 (11)	06:01	06:24 (11)	06:34	07:07		06:43	15:51 (8)	07:20
	20:52 46	06:51 (11)	20:32 28	06:52 (11)	19:46	18:53		17:04 38	16:29 (8)	16:38
2	05:37	06:06 (11)	06:02	06:25 (11)	06:35	07:08		06:44	15:50 (8)	07:21
	20:52 46	06:52 (11)	20:31 26	06:51 (11)	19:44	18:51		17:03 40	16:30 (8)	16:38
3	05:37	06:06 (11)	06:03	06:26 (11)	06:36	07:09		06:46	15:52 (8)	07:22
	20:52 46	06:52 (11)	20:30 24	06:50 (11)	19:42	18:49		17:02 38	16:30 (8)	16:38
4	05:38	06:07 (11)	06:05	06:27 (11)	06:38	07:10		06:47	15:51 (8)	07:23
	20:51 46	06:53 (11)	20:29 22	06:49 (11)	19:41	18:48		17:00 38	16:29 (8)	16:37
5	05:38	06:08 (11)	06:06	06:28 (11)	06:39	07:11		06:48	15:50 (8)	07:24
	20:51 44	06:52 (11)	20:28 18	06:46 (11)	19:39	18:46		16:59 38	16:28 (8)	16:37
6	05:39	06:06 (11)	06:07	06:29 (11)	06:40	07:12		06:49	15:52 (8)	07:25
	20:51 46	06:52 (11)	20:26 16	06:45 (11)	19:37	18:44		16:58 38	16:30 (8)	16:37
7	05:40	06:07 (11)	06:08	06:30 (11)	06:41	07:13		06:51	15:51 (8)	07:26
	20:51 46	06:53 (11)	20:25 14	06:44 (11)	19:35	18:43		16:57 38	16:29 (8)	16:37
8	05:40	06:07 (11)	06:09	06:31 (11)	06:42	07:14		06:52	15:52 (8)	07:27
	20:50 46	06:53 (11)	20:24 10	06:41 (11)	19:34	18:41		16:56 36	16:28 (8)	16:37
9	05:41	06:06 (11)	06:10	06:32 (11)	06:43	07:16		06:53	15:52 (8)	07:28
	20:50 48	06:54 (11)	20:23 4	06:36 (11)	19:32	18:39		16:55 36	16:28 (8)	16:37
10	05:42	06:07 (11)	06:11		06:44	07:17		06:54	15:53 (8)	07:29
	20:50 46	06:53 (11)	20:21		19:30	18:38		16:53 34	16:27 (8)	16:37
11	05:42	06:08 (11)	06:12		06:45	07:18		06:56	15:54 (8)	07:29
	20:49 46	06:54 (11)	20:20		19:28	18:36		16:52 32	16:26 (8)	16:37
12	05:43	06:06 (11)	06:13		06:46	07:19		06:57	15:56 (8)	07:30
	20:49 48	06:54 (11)	20:18		19:27	18:34		16:51 30	16:26 (8)	16:37
13	05:44	06:07 (11)	06:14		06:47	07:20		06:58	15:55 (8)	07:31
	20:48 48	06:55 (11)	20:17		19:25	18:33		16:50 30	16:25 (8)	16:37
14	05:45	06:08 (11)	06:15		06:48	07:21		06:59	15:57 (8)	07:32
	20:48 46	06:54 (11)	20:16		19:23	18:31		16:49 28	16:25 (8)	16:37
15	05:45	06:09 (11)	06:16		06:49	07:22		07:01	15:58 (8)	07:33
	20:47 46	06:55 (11)	20:14		19:21	18:29		16:48 26	16:24 (8)	16:38
16	05:46	06:09 (11)	06:17		06:50	07:24		07:02	16:01 (8)	07:33
	20:46 46	06:55 (11)	20:13		19:20	18:28		16:48 22	16:23 (8)	16:38
17	05:47	06:10 (11)	06:18		06:51	07:25		07:03	16:03 (8)	07:34
	20:46 44	06:54 (11)	20:11		19:18	18:26		16:47 18	16:21 (8)	16:38
18	05:48	06:11 (11)	06:19		06:52	07:26		07:04	16:04 (8)	07:35
	20:45 44	06:55 (11)	20:10		19:16	18:24		16:46 14	16:18 (8)	16:38
19	05:49	06:12 (11)	06:20		06:54	07:27		07:06	16:09 (8)	07:35
	20:44 44	06:56 (11)	20:08		19:14	18:23		16:45 6	16:15 (8)	16:39
20	05:50	06:13 (11)	06:21		06:55	07:28	17:07 (8)	07:07		07:36
	20:44 42	06:55 (11)	20:07		19:12	18:21 10	17:17 (8)	16:44		16:39
21	05:51	06:14 (11)	06:23		06:56	07:30	17:03 (8)	07:08		07:37
	20:43 42	06:56 (11)	20:05		19:11	18:20 18	17:21 (8)	16:44		16:40
22	05:52	06:14 (11)	06:24		06:57	07:31	17:00 (8)	07:09		07:37
	20:42 40	06:54 (11)	20:04		19:09	18:18 22	17:22 (8)	16:43		16:40
23	05:53	06:15 (11)	06:25		06:58	07:32	16:59 (8)	07:11		07:38
	20:41 40	06:55 (11)	20:02		19:07	18:17 24	17:23 (8)	16:42		16:41
24	05:53	06:16 (11)	06:26		06:59	07:33	16:56 (8)	07:12		07:38
	20:40 38	06:54 (11)	20:01		19:05	18:15 28	17:24 (8)	16:42		16:41
25	05:54	06:17 (11)	06:27		07:00	06:34	15:56 (8)	07:13		07:38
	20:39 38	06:55 (11)	19:57		19:04	17:14 30	16:26 (8)	16:41		16:42
26	05:55	06:18 (11)	06:28		07:01	06:36	15:55 (8)	07:14		07:39
	20:38 36	06:54 (11)	19:56		19:02	17:12 32	16:27 (8)	16:40		16:42
27	05:56	06:19 (11)	06:29		07:02	06:37	15:54 (8)	07:15		07:39
	20:38 34	06:53 (11)	19:54		19:00	17:11 34	16:28 (8)	16:40		16:43
28	05:57	06:20 (11)	06:30		07:03	06:38	15:52 (8)	07:16		07:39
	20:37 34	06:54 (11)	19:52		18:58	17:10 36	16:28 (8)	16:39		16:44
29	05:58	06:21 (11)	06:31		07:04	06:39	15:51 (8)	07:17		07:40
	20:36 32	06:53 (11)	19:51		18:56	17:08 38	16:29 (8)	16:39		16:45
30	05:59	06:22 (11)	06:32		07:05	06:41	15:52 (8)	07:19		07:40
	20:34 30	06:52 (11)	19:49		18:55	17:07 36	16:28 (8)	16:39		16:45
31	06:00	06:23 (11)	06:33			06:42	15:52 (8)			07:40
	20:33 28	06:51 (11)	19:47			17:05 38	16:30 (8)			16:46
Potential sun hours	-280		-145		375	343		294		283
Total, worst case	1306		162			346		580		
Sun reduction	0.65		0.55			0.45		0.35		
Oper. time red.	0.86		0.86			0.86		0.86		
Wind dir. red.	0.61		0.61			0.63		0.63		
Total reduction	0.35		0.29			0.25		0.19		
Total, real	451		47			85		111		

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	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, North part
16 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
1000 meter max shadow distance applied along with default 3° inclination
Sunshine probabilities applied (pdf plots)
Directional run-hours applied from tab file (tower 1)
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Printed/Page
03/05/06 23:47 / 48
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Wind Engineers, Inc.
7660 Whitegate Avenue
US-RIVERSIDE, CA 92506

Calculated:
03/02/06 05:47/2.4.0.67

SHADOW - Calendar

Calculation: North part **Shadow receptor:** 674 - 674

Assumptions for shadow calculations

Maximum distance for influence	1,000 m
Minimum sun height over horizon for influence	3 °
Day step for calculation	1 days
Time step for calculation	2 minutes

Sun shine probabilities (part of time from sun rise to sun set with sun shine)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.35	0.45	0.45	0.55	0.55	0.55	0.65	0.55	0.55	0.45	0.35	0.30

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
475	585	238	199	220	474	1,184	813	840	1,246	803	479	7,555

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:40	07:25	06:47	16:45 (10)	05:54	06:06	05:36	05:36	06:01	06:34	07:07	17:21 (10)	06:43	07:20
	16:47	17:23	17:59 20	17:05 (10)	18:35	20:08	20:40	20:52	20:32	19:46	18:53 24	17:45 (10)	17:04	16:38
2	07:40	07:24	06:45	16:43 (10)	05:52	06:05	05:35	05:37	06:02	06:35	07:08	17:20 (10)	06:44	07:21
	16:48	17:24	18:00 24	17:07 (10)	18:37	20:09	20:41	20:52	20:31	19:44	18:51 26	17:46 (10)	17:03	16:38
3	07:40	07:23	06:44	16:44 (10)	05:50	06:03	05:35	05:37	06:03	06:36	07:09	17:19 (10)	06:46	07:22
	16:49	17:26	18:02 24	17:08 (10)	18:38	20:11	20:41	20:52	20:30	19:42	18:49 26	17:45 (10)	17:02	16:38
4	07:40	07:22	06:42	16:42 (10)	05:49	06:02	05:34	05:38	06:04	06:38	07:10	17:18 (10)	06:47	07:23
	16:50	17:27	18:03 26	17:08 (10)	18:39	20:12	20:42	20:51	20:29	19:41	18:48 28	17:46 (10)	17:00	16:37
5	07:40	07:21	06:41	16:40 (10)	06:47	06:01	05:34	05:38	06:06	06:39	07:11	17:17 (10)	06:48	07:24
	16:51	17:28	18:04 28	17:08 (10)	19:40	20:13	20:43	20:51	20:28	19:39	18:46 28	17:45 (10)	16:59	16:37
6	07:40	07:20	06:39	16:41 (10)	06:45	05:59	05:34	05:39	06:07	06:40	07:12	17:16 (10)	06:49	07:25
	16:52	17:30	18:05 28	17:09 (10)	19:41	20:14	20:44	20:51	20:26	19:37	18:44 28	17:44 (10)	16:58	16:37
7	07:40	07:18	06:37	16:41 (10)	06:44	05:58	05:33	05:40	06:08	06:41	07:13	17:16 (10)	06:51	07:26
	16:53	17:31	18:06 28	17:09 (10)	19:42	20:15	20:44	20:51	20:25	19:35	18:43 30	17:46 (10)	16:57	16:37
8	07:40	07:17	06:36	16:39 (10)	06:42	05:57	05:33	05:40	06:09	06:42	07:14	17:17 (10)	06:52	07:27
	16:54	17:32	18:08 30	17:09 (10)	19:43	20:16	20:45	20:50	20:24	19:34	18:41 28	17:45 (10)	16:56	16:37
9	07:40	07:16	06:34	16:39 (10)	06:40	05:56	05:33	05:41	06:10	06:43	07:16	17:16 (10)	06:53	07:28
	16:55	17:34	18:09 28	17:07 (10)	19:45	20:17	20:46	20:50	20:22	19:32	18:39 28	17:44 (10)	16:54	16:37
10	07:40	07:15	06:32	16:40 (10)	06:39	05:55	05:33	05:42	06:11	06:44	07:17	17:17 (10)	06:54	07:29
	16:56	17:35	18:10 28	17:08 (10)	19:46	20:18	20:46	20:50	20:21	19:30	18:37 26	17:43 (10)	16:53	16:37
11	07:39	07:13	06:30	16:40 (10)	06:37	05:53	05:32	05:42	06:12	06:45	07:18	17:18 (10)	06:56	07:29
	16:57	17:36	18:11 28	17:08 (10)	19:47	20:19	20:47	20:49	20:20	19:28	18:36 22	17:40 (10)	16:52	16:37
12	07:39	07:12	06:29	16:40 (10)	06:35	05:52	05:32	05:43	06:13	06:46	07:19	17:17 (10)	06:57	07:30
	16:58	17:37	18:12 26	17:06 (10)	19:48	20:21	20:47	20:49	20:18	19:27	18:34 22	17:39 (10)	16:51	16:37
13	07:39	07:11	06:27	16:43 (10)	06:34	05:51	05:32	05:44	06:14	06:47	07:20	17:21 (10)	06:58	07:31
	16:59	17:39	18:14 22	17:05 (10)	19:49	20:22	20:48	20:48	20:17	19:25	18:33 16	17:37 (10)	16:50	16:37
14	07:38	07:10	06:25	16:43 (10)	06:32	05:50	05:32	05:45	06:15	06:48	07:21	17:22 (10)	06:59	07:32
	17:00	17:40	18:15 20	17:03 (10)	19:50	20:23	20:48	20:48	20:16	19:23	18:31 14	17:36 (10)	16:49	16:37
15	07:38	07:08	06:24	16:45 (10)	06:30	05:49	05:32	05:45	06:16	06:49	07:22	17:27 (10)	07:01	07:33
	17:02	17:41	18:16 16	17:01 (10)	19:51	20:24	20:49	20:47	20:14	19:21	18:29 4	17:31 (10)	16:48	16:38
16	07:37	07:07	06:22	16:47 (10)	06:29	05:48	05:32	05:46	06:17	06:50	07:24		07:02	07:33
	17:03	17:43	18:17 12	16:59 (10)	19:53	20:25	20:49	20:46	20:13	19:20	18:28		16:48	16:38
17	07:37	07:05	06:20		06:27	05:47	05:32	05:47	06:18	06:51	07:25		07:03	07:34
	17:04	17:44	18:18		19:54	20:26	20:50	20:46	20:11	19:18	18:26		16:47	16:38
18	07:36	07:04	06:18		06:25	05:46	05:32	05:48	06:19	06:52	07:26		07:04	07:35
	17:05	17:45	18:19		19:55	20:27	20:50	20:45	20:10	19:16	18:24		16:46	16:38
19	07:36	07:02	06:17		06:24	05:45	05:32	05:49	06:20	06:53	07:27		07:06	07:35
	17:06	17:47	18:21		19:56	20:28	20:50	20:44	20:08	19:14	18:23		16:45	16:39
20	07:35	07:01	06:15		06:22	05:44	05:32	05:50	06:21	06:55	07:28		07:07	07:36
	17:08	17:48	18:22		19:57	20:29	20:51	20:44	20:07	19:12	18:21		16:44	16:39
21	07:35	07:00	06:13		06:21	05:43	05:33	05:51	06:23	06:56	07:30		07:08	07:36
	17:09	17:49	18:23		19:58	20:30	20:51	20:43	20:05	19:11	18:20		16:44	16:40
22	07:34	06:58	06:11		06:19	05:42	05:33	05:52	06:24	06:57	07:31		07:09	07:37
	17:10	17:50	18:24		19:59	20:31	20:51	20:42	20:04	19:09	18:18		16:43	16:40
23	07:33	06:56	06:10		06:18	05:42	05:33	05:53	06:25	06:58	07:32		07:10	07:37
	17:11	17:52	18:25		20:00	20:32	20:51	20:41	20:02	19:07	18:17		16:42	16:41
24	07:32	06:55	06:08		06:16	05:41	05:33	05:53	06:26	06:59	07:33		07:12	07:38
	17:13	17:53	18:26		20:00	20:33	20:52	20:40	20:01	19:05	18:15		16:42	16:41
25	07:32	06:53	06:06		06:15	05:40	05:34	05:54	06:27	07:00	06:34		07:13	07:38
	17:14	17:54	18:27		20:02	20:34	20:52	20:39	19:57	19:04	17:14		16:41	16:42
26	07:31	06:52	06:04		06:13	05:39	05:34	05:55	06:28	07:01	06:36		07:14	07:39
	17:15	17:55	18:29		20:03	20:35	20:52	20:38	19:56	19:02	17:12		16:40	16:42
27	07:30	06:50	16:52 (10)	06:03	06:12	05:39	05:34	05:56	06:29	07:02	17:30 (10)	06:37	07:15	07:39
	17:16	17:57 8	17:00 (10)	18:30	20:04	20:36	20:52	20:37	19:54	19:00 8	17:38 (10)	17:11	16:40	16:43
28	07:29	06:49	16:49 (10)	06:01	06:10	05:38	05:35	05:57	06:30	07:03	17:25 (10)	06:38	07:16	07:39
	17:18	17:58 14	17:03 (10)	18:31	20:05	20:36	20:52	20:36	19:52	18:58 16	17:41 (10)	17:10	16:39	16:44
29	07:28			05:59	06:09	05:37	05:35	05:58	06:31	07:04	17:25 (10)	06:39	07:17	07:40
	17:19			18:32	20:06	20:37	20:52	20:35	19:51	18:56 18	17:43 (10)	17:08	16:39	16:45
30	07:27			05:57	06:07	05:37	05:36	05:59	06:32	07:05	17:22 (10)	06:41	07:19	07:40
	17:20			18:33	20:07	20:38	20:52	20:34	19:49	18:55 22	17:44 (10)	17:07	16:39	16:45
31	07:26			05:56		05:36		06:00	06:33			06:42		07:40
	17:22			18:34		20:39		20:33	19:47			17:05		16:46
Potential sun hours	293	295	370		209	-292	-263	-280	-145	375		343	294	283
Total, worst case		22		388						64		350		
Sun reduction		0.45		0.45						0.55		0.45		
Oper. time red.		0.86		0.86						0.86		0.86		
Wind dir. red.		0.60		0.60						0.60		0.60		
Total reduction		0.23		0.23						0.28		0.23		
Total, real		5		90						18		81		

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	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, North part
16 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
1000 meter max shadow distance applied along with default 3° inclination
Sunshine probabilities applied (pdf plots)
Directional run-hours applied from tab file (tower 1)
.

Licensed user:
Wind Engineers, Inc.
7660 Whitegate Avenue
US-RIVERSIDE, CA 92506

Calculated:
03/02/06 05:47/2.4.0.67

SHADOW - Calendar

Calculation: North part **Shadow receptor:** 675 - 675

Assumptions for shadow calculations

Maximum distance for influence	1,000	m
Minimum sun height over horizon for influence	3	°
Day step for calculation	1	days
Time step for calculation	2	minutes

Sun shine probabilities (part of time from sun rise to sun set with sun shine)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.35	0.45	0.45	0.55	0.55	0.55	0.65	0.55	0.55	0.45	0.35	0.30

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
475	585	238	199	220	474	1,184	813	840	1,246	803	479	7,555

	January		February	March	April	May	June	July	August	September	October	November		December	
1	07:40	08:16 (10)	07:25	06:47	05:54	06:06	05:36	05:36	06:01	06:34	07:07	06:43		07:20	08:02 (10)
	16:47	56 09:48 (8)	17:23	17:59	18:36	20:08	20:40	20:52	20:32	19:46	18:53	17:04		16:38	42 09:26 (8)
2	07:40	08:16 (10)	07:24	06:46	05:52	06:05	05:35	05:37	06:02	06:35	07:08	06:44		07:21	08:03 (10)
	16:48	56 09:48 (8)	17:24	18:00	18:37	20:10	20:41	20:52	20:31	19:44	18:51	17:03		16:38	44 09:27 (8)
3	07:40	08:16 (10)	07:23	06:44	05:51	06:03	05:35	05:37	06:04	06:37	07:09	06:46		07:22	08:02 (10)
	16:49	56 09:48 (8)	17:26	18:02	18:38	20:11	20:42	20:52	20:30	19:42	18:50	17:02		16:38	48 09:30 (8)
4	07:40	08:18 (10)	07:22	06:42	05:49	06:02	05:34	05:38	06:05	06:38	07:10	06:47		07:23	08:03 (10)
	16:50	54 09:48 (8)	17:27	18:03	18:39	20:12	20:42	20:51	20:29	19:41	18:48	17:00		16:37	48 09:31 (8)
5	07:40	08:17 (10)	07:21	06:41	06:47	06:01	05:34	05:38	06:06	06:39	07:11	06:48		07:24	08:02 (10)
	16:51	54 09:47 (8)	17:28	18:04	19:40	20:13	20:43	20:51	20:28	19:39	18:46	16:59		16:37	52 09:32 (8)
6	07:40	08:17 (10)	07:20	06:39	06:45	05:59	05:34	05:39	06:07	06:40	07:12	06:49		07:25	08:03 (10)
	16:52	52 09:47 (8)	17:30	18:05	19:41	20:14	20:44	20:51	20:26	19:37	18:44	16:58		16:37	52 09:33 (8)
7	07:40	08:17 (10)	07:19	06:37	06:44	05:58	05:33	05:40	06:08	06:41	07:13	06:51		07:26	08:04 (10)
	16:53	52 09:47 (8)	17:31	18:06	19:42	20:15	20:44	20:51	20:25	19:35	18:43	16:57		16:37	54 09:34 (8)
8	07:40	08:19 (10)	07:17	06:36	06:42	05:57	05:33	05:40	06:09	06:42	07:14	06:52		07:27	08:05 (10)
	16:54	50 09:47 (8)	17:32	18:08	19:43	20:16	20:45	20:50	20:24	19:34	18:41	16:56		16:37	54 09:35 (8)
9	07:40	08:19 (10)	07:16	06:34	06:40	05:56	05:33	05:41	06:10	06:43	07:16	06:53		07:28	08:04 (10)
	16:55	48 09:47 (8)	17:34	18:09	19:45	20:17	20:46	20:50	20:23	19:32	18:39	16:55		16:37	56 09:36 (8)
10	07:40	08:20 (10)	07:15	06:32	06:39	05:55	05:33	05:42	06:11	06:44	07:17	06:54		07:29	08:05 (10)
	16:56	44 09:44 (8)	17:35	18:10	19:46	20:18	20:46	20:50	20:21	19:30	18:38	16:53		16:37	56 09:37 (8)
11	07:39	08:20 (10)	07:14	06:31	06:37	05:53	05:32	05:42	06:12	06:45	07:18	06:56		07:30	08:06 (10)
	16:57	42 09:44 (8)	17:36	18:11	19:47	20:20	20:47	20:49	20:20	19:28	18:36	16:52		16:37	56 09:38 (8)
12	07:39	08:19 (10)	07:12	06:29	06:35	05:52	05:32	05:43	06:13	06:46	07:19	06:57		07:30	08:07 (10)
	16:58	36 09:41 (8)	17:38	18:12	19:48	20:21	20:47	20:49	20:19	19:27	18:34	16:51		16:37	58 09:39 (8)
13	07:39	08:21 (10)	07:11	06:27	06:34	05:51	05:32	05:44	06:14	06:47	07:20	06:58		07:31	08:08 (10)
	16:59	30 09:39 (8)	17:39	18:14	19:49	20:22	20:48	20:48	20:17	19:25	18:33	16:50		16:37	56 09:40 (8)
14	07:38	08:21 (10)	07:10	06:25	06:32	05:50	05:32	05:45	06:15	06:48	07:21	06:59		07:32	08:08 (10)
	17:00	24 08:45 (10)	17:40	18:15	19:50	20:23	20:48	20:48	20:16	19:23	18:31	16:49		16:37	56 09:40 (8)
15	07:38	08:22 (10)	07:08	06:24	06:30	05:49	05:32	05:45	06:16	06:49	07:22	07:01		07:33	08:09 (10)
	17:02	22 08:44 (10)	17:41	18:16	19:51	20:24	20:49	20:47	20:14	19:21	18:29	16:48		16:38	58 09:41 (8)
16	07:37	08:24 (10)	07:07	06:22	06:29	05:48	05:32	05:46	06:17	06:50	07:24	07:02		07:33	08:10 (10)
	17:03	20 08:44 (10)	17:43	18:17	19:53	20:25	20:49	20:46	20:13	19:20	18:28	16:48		16:38	58 09:42 (8)
17	07:37	08:23 (10)	07:05	06:20	06:27	05:47	05:32	05:47	06:18	06:51	07:25	07:03		07:34	08:08 (10)
	17:04	22 08:45 (10)	17:44	18:18	19:54	20:26	20:50	20:46	20:11	19:18	18:26	16:47		16:38	60 09:42 (8)
18	07:36	08:24 (10)	07:04	06:18	06:26	05:46	05:32	05:48	06:19	06:52	07:26	07:04		07:35	08:09 (10)
	17:05	20 08:44 (10)	17:45	18:19	19:55	20:27	20:50	20:45	20:10	19:16	18:25	16:46		16:38	60 09:43 (8)
19	07:36	08:26 (10)	07:03	06:17	06:24	05:45	05:32	05:49	06:20	06:54	07:27	07:06		07:35	08:10 (10)
	17:06	18 08:44 (10)	17:47	18:21	19:56	20:28	20:50	20:44	20:08	19:14	18:23	16:45		16:39	60 09:44 (8)
20	07:35	08:27 (10)	07:01	06:15	06:22	05:44	05:32	05:50	06:22	06:55	07:28	07:07	08:05 (10)	07:36	08:10 (10)
	17:08	16 08:43 (10)	17:48	18:22	19:57	20:29	20:51	20:44	20:07	19:12	18:21	16:44	10 08:15 (10)	16:39	58 09:44 (8)
21	07:35	08:28 (10)	07:00	06:13	06:21	05:43	05:33	05:51	06:23	06:56	07:30	07:08	08:04 (10)	07:37	08:11 (10)
	17:09	14 08:42 (10)	17:49	18:23	19:58	20:30	20:51	20:43	20:05	19:11	18:20	16:44	14 08:18 (10)	16:40	58 09:45 (8)
22	07:34	08:29 (10)	06:58	06:11	06:19	05:42	05:33	05:52	06:24	06:57	07:31	07:09	08:03 (10)	07:37	08:11 (10)
	17:10	10 08:39 (10)	17:50	18:24	19:59	20:31	20:51	20:42	20:04	19:09	18:18	16:43	16 08:19 (10)	16:40	58 09:45 (8)
23	07:33		06:57	06:10	06:18	05:42	05:33	05:53	06:25	06:58	07:32	07:11	08:02 (10)	07:38	08:12 (10)
	17:11		17:52	18:25	20:01	20:32	20:51	20:41	20:02	19:07	18:17	16:42	18 08:20 (10)	16:41	58 09:46 (8)
24	07:32		06:55	06:08	06:16	05:41	05:33	05:54	06:26	06:59	07:33	07:12	08:02 (10)	07:38	08:12 (10)
	17:13		17:53	18:26	20:01	20:33	20:52	20:40	20:01	19:05	18:15	16:42	20 08:22 (10)	16:41	60 09:46 (8)
25	07:32		06:53	06:06	06:15	05:40	05:34	05:54	06:27	07:00	06:34	07:13	08:01 (10)	07:38	08:12 (10)
	17:14		17:54	18:28	20:02	20:34	20:52	20:39	19:57	19:04	17:14	16:41	22 08:23 (10)	16:42	60 09:46 (8)
26	07:31		06:52	06:04	06:13	05:39	05:34	05:55	06:28	07:01	06:36	07:14	08:02 (10)	07:39	08:13 (10)
	17:15		17:55	18:29	20:03	20:35	20:52	20:39	19:56	19:02	17:12	16:40	20 08:22 (10)	16:43	60 09:47 (8)
27	07:30		06:50	06:03	06:12	05:39	05:34	05:56	06:29	07:02	06:37	07:15	08:01 (10)	07:39	08:15 (10)
	17:17		17:57	18:30	20:04	20:36	20:52	20:38	19:54	19:00	17:11	16:40	22 08:23 (10)	16:43	58 09:47 (8)
28	07:29		06:49	06:01	06:10	05:38	05:35	05:57	06:30	07:03	06:38	07:16	08:00 (10)	07:39	08:15 (10)
	17:18		17:58	18:31	20:05	20:37	20:52	20:37	19:53	18:58	17:10	16:39	24 08:24 (10)	16:44	58 09:47 (8)
29	07:28			05:59	06:09	05:37	05:35	05:58	06:31	07:04	06:39	07:18	08:02 (10)	07:40	08:15 (10)
	17:19			18:32	20:06	20:37	20:52	20:36	19:51	18:57	17:08	16:39	30 09:20 (8)	16:45	56 09:47 (8)
30	07:27			05:57	06:08	05:37	05:36	05:59	06:32	07:05	06:41	07:19	08:01 (10)	07:40	08:16 (10)
	17:20			18:33	20:07	20:38	20:52	20:34	19:49	18:55	17:07	16:39	36 09:23 (8)	16:45	56 09:48 (8)
31	07:26			05:56		05:36		06:00	06:33		06:42			07:40	08:16 (10)
	17:22			18:34		20:39		20:33	19:47		17:06			16:46	58 09:48 (8)
Potential sun hours	293		295	370	209	-292	-263	-280	-145	375	343	294		283	
Total, worst case		796											232		1726
Sun reduction		0.35											0.35		0.30
Oper. time red.		0.86											0.86		0.86
Wind dir. red.		0.63											0.63		0.64
Total reduction		0.19											0.19		0.16
Total, real		152											44		285

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	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, North part
16 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
1000 meter max shadow distance applied along with default 3° inclination
Sunshine probabilities applied (pdf plots)
Directional run-hours applied from tab file (tower 1)
.

Licensed user:
Wind Engineers, Inc.
7660 Whitegate Avenue
US-RIVERSIDE, CA 92506

Calculated:
03/02/06 05:47/2.4.0.67

SHADOW - Calendar

Calculation: North part **Shadow receptor:** 676 - 676

Assumptions for shadow calculations

Maximum distance for influence	1,000	m
Minimum sun height over horizon for influence	3	°
Day step for calculation	1	days
Time step for calculation	2	minutes

Sun shine probabilities (part of time from sun rise to sun set with sun shine)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.35	0.45	0.45	0.55	0.55	0.55	0.65	0.55	0.55	0.45	0.35	0.30

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
475	585	238	199	220	474	1,184	813	840	1,246	803	479	7,555

	January		February		March	April	May	June	July	August	September	October		November		December
1	07:40		07:25		08:12 (8)	06:47	05:54	06:06	05:36	05:36	06:01	06:34	07:07		06:43	07:41 (8)	07:20
	16:47		17:23	34	08:46 (8)	17:59	18:36	20:08	20:40	20:52	20:32	19:46	18:53		17:04	36 08:17 (8)	16:38
2	07:40		07:24		08:11 (8)	06:46	05:52	06:05	05:35	05:37	06:02	06:35	07:08		06:44	07:40 (8)	07:21
	16:48		17:24	34	08:45 (8)	18:00	18:37	20:10	20:41	20:52	20:31	19:44	18:51		17:03	36 08:16 (8)	16:38
3	07:40		07:23		08:10 (8)	06:44	05:51	06:03	05:35	05:37	06:04	06:37	07:09		06:46	07:40 (8)	07:22
	16:49		17:26	36	08:46 (8)	18:02	18:38	20:11	20:42	20:52	20:30	19:42	18:50		17:02	38 08:18 (8)	16:38
4	07:40		07:22		08:11 (8)	06:42	05:49	06:02	05:34	05:38	06:05	06:38	07:10		06:47	07:41 (8)	07:23
	16:50		17:27	36	08:47 (8)	18:03	18:39	20:12	20:42	20:51	20:29	19:41	18:48		17:00	36 08:17 (8)	16:38
5	07:40		07:21		08:10 (8)	06:41	06:47	06:01	05:34	05:38	06:06	06:39	07:11		06:48	07:40 (8)	07:24
	16:51		17:28	38	08:48 (8)	18:04	19:40	20:13	20:43	20:51	20:28	19:39	18:46		16:59	36 08:16 (8)	16:37
6	07:40		07:20		08:10 (8)	06:39	06:45	06:00	05:34	05:39	06:07	06:40	07:12		06:49	07:40 (8)	07:25
	16:52		17:30	36	08:46 (8)	18:05	19:41	20:14	20:44	20:51	20:26	19:37	18:44		16:58	38 08:18 (8)	16:37
7	07:40		07:19		08:11 (8)	06:37	06:44	05:58	05:33	05:40	06:08	06:41	07:13		06:51	07:41 (8)	07:26
	16:53		17:31	36	08:47 (8)	18:06	19:42	20:15	20:44	20:51	20:25	19:36	18:43		16:57	36 08:17 (8)	16:37
8	07:40		07:17		08:10 (8)	06:36	06:42	05:57	05:33	05:40	06:09	06:42	07:14		06:52	07:40 (8)	07:27
	16:54		17:32	38	08:48 (8)	18:08	19:44	20:16	20:45	20:50	20:24	19:34	18:41		16:56	36 08:16 (8)	16:37
9	07:40		07:16		08:11 (8)	06:34	06:40	05:56	05:33	05:41	06:10	06:43	07:16		06:53	07:42 (8)	07:28
	16:55		17:34	36	08:47 (8)	18:09	19:45	20:17	20:46	20:50	20:23	19:32	18:39		16:55	34 08:16 (8)	16:37
10	07:40		07:15		08:11 (8)	06:32	06:39	05:55	05:33	05:42	06:11	06:44	07:17		06:54	07:43 (8)	07:29
	16:56		17:35	36	08:47 (8)	18:10	19:46	20:18	20:46	20:50	20:21	19:30	18:38		16:53	32 08:15 (8)	16:37
11	07:39		07:14		08:12 (8)	06:31	06:37	05:53	05:32	05:42	06:12	06:45	07:18		06:56	07:43 (8)	07:30
	16:57		17:36	34	08:46 (8)	18:11	19:47	20:20	20:47	20:49	20:20	19:28	18:36		16:52	34 08:17 (8)	16:37
12	07:39		07:12		08:13 (8)	06:29	06:35	05:52	05:32	05:43	06:13	06:46	07:19		06:57	07:44 (8)	07:30
	16:58		17:38	34	08:47 (8)	18:12	19:48	20:21	20:47	20:49	20:19	19:27	18:34		16:51	32 08:16 (8)	16:37
13	07:39		07:11		08:13 (8)	06:27	06:34	05:51	05:32	05:44	06:14	06:47	07:20		06:58	07:45 (8)	07:31
	16:59		17:39	32	08:45 (8)	18:14	19:49	20:22	20:48	20:48	20:17	19:25	18:33		16:50	30 08:15 (8)	16:37
14	07:38		07:10		08:14 (8)	06:25	06:32	05:50	05:32	05:45	06:15	06:48	07:21		06:59	07:47 (8)	07:32
	17:01		17:40	30	08:44 (8)	18:15	19:50	20:23	20:48	20:48	20:16	19:23	18:31		16:49	28 08:15 (8)	16:37
15	07:38		07:08		08:14 (8)	06:24	06:30	05:49	05:32	05:46	06:16	06:49	07:22		07:01	07:48 (8)	07:33
	17:02		17:41	28	08:42 (8)	18:16	19:51	20:24	20:49	20:47	20:14	19:21	18:29		16:48	26 08:14 (8)	16:38
16	07:37		07:07		08:15 (8)	06:22	06:29	05:48	05:32	05:46	06:17	06:50	07:24		07:02	07:49 (8)	07:33
	17:03		17:43	26	08:41 (8)	18:17	19:53	20:25	20:49	20:46	20:13	19:20	18:28		16:48	22 08:11 (8)	16:38
17	07:37		07:05		08:18 (8)	06:20	06:27	05:47	05:32	05:47	06:18	06:51	07:25		07:03	07:51 (8)	07:34
	17:04		17:44	22	08:40 (8)	18:18	19:54	20:26	20:50	20:46	20:11	19:18	18:26		16:47	20 08:11 (8)	16:38
18	07:36		07:04		08:18 (8)	06:18	06:26	05:46	05:32	05:48	06:19	06:52	07:26		07:04	07:52 (8)	07:35
	17:05		17:45	20	08:38 (8)	18:19	19:55	20:27	20:50	20:45	20:10	19:16	18:25		16:46	18 08:10 (8)	16:38
19	07:36		07:03		08:21 (8)	06:17	06:24	05:45	05:32	05:49	06:20	06:54	07:27		07:06	07:55 (8)	07:35
	17:06		17:47	14	08:35 (8)	18:21	19:56	20:28	20:50	20:44	20:08	19:14	18:23		16:45	12 08:07 (8)	16:39
20	07:35		07:01			06:15	06:22	05:44	05:32	05:50	06:22	06:55	07:28		07:07	07:59 (8)	07:36
	17:08		17:48			18:22	19:57	20:29	20:51	20:44	20:07	19:12	18:21		16:44	6 08:05 (8)	16:39
21	07:35		07:00			06:13	06:21	05:43	05:33	05:51	06:23	06:56	07:30		07:08		07:37
	17:09		17:49			18:23	19:58	20:30	20:51	20:43	20:05	19:11	18:20		16:44		16:40
22	07:34		08:24 (8)	06:58		06:11	06:19	05:42	05:33	05:52	06:24	06:57	07:31	08:54 (8)	07:09		07:37
	17:10	6	08:30 (8)	17:50		18:24	19:59	20:31	20:51	20:42	20:04	19:09	18:18	8 09:02 (8)	16:43		16:40
23	07:33		08:21 (8)	06:57		06:10	06:18	05:42	05:33	05:53	06:25	06:58	07:32	08:51 (8)	07:11		07:38
	17:11	12	08:33 (8)	17:52		18:25	20:01	20:32	20:51	20:41	20:02	19:07	18:17	16 09:07 (8)	16:42		16:41
24	07:32		08:18 (8)	06:55		06:08	06:16	05:41	05:33	05:54	06:26	06:59	07:33	08:48 (8)	07:12		07:38
	17:13	18	08:36 (8)	17:53		18:26	20:01	20:33	20:52	20:40	20:01	19:05	18:15	20 09:08 (8)	16:42		16:41
25	07:32		08:17 (8)	06:53		06:06	06:15	05:40	05:34	05:54	06:27	07:00	06:34	07:46 (8)	07:13		07:38
	17:14	20	08:37 (8)	17:54		18:28	20:02	20:34	20:52	20:39	19:57	19:04	17:14	24 08:10 (8)	16:41		16:42
26	07:31		08:16 (8)	06:52		06:04	06:13	05:39	05:34	05:55	06:28	07:01	06:36	07:45 (8)	07:14		07:39
	17:15	22	08:38 (8)	17:55		18:29	20:03	20:35	20:52	20:39	19:56	19:02	17:12	26 08:11 (8)	16:40		16:43
27	07:30		08:15 (8)	06:50		06:03	06:12	05:39	05:34	05:56	06:29	07:02	06:37	07:44 (8)	07:15		07:39
	17:17	26	08:41 (8)	17:57		18:30	20:04	20:36	20:52	20:38	19:54	19:00	17:11	28 08:12 (8)	16:40		16:43
28	07:29		08:14 (8)	06:49		06:01	06:10	05:38	05:35	05:57	06:30	07:03	06:38	07:44 (8)	07:16		07:39
	17:18	28	08:42 (8)	17:58		18:31	20:05	20:37	20:52	20:37	19:53	18:58	17:10	30 08:14 (8)	16:40		16:44
29	07:28		08:13 (8)			05:59	06:09	05:37	05:35	05:58	06:31	07:04	06:39	07:41 (8)	07:18		07:40
	17:19	30	08:43 (8)			18:32	20:06	20:37	20:52	20:36	19:51	18:57	17:08	34 08:15 (8)	16:39		16:45
30	07:27		08:12 (8)			05:57	06:08	05:37	05:36	05:59	06:32	07:06	06:41	07:42 (8)	07:19		07:40
	17:20	32	08:44 (8)			18:33	20:07	20:38	20:52	20:35	19:49	18:55	17:07	34 08:16 (8)	16:39		16:45
31	07:26		08:11 (8)			05:56		05:36		06:00	06:33		06:42	07:42 (8)			07:40
	17:22	34	08:45 (8)			18:34		20:39		20:33	19:48		17:06	34 08:16 (8)			16:46
Potential sun hours	293		295		370	209	-292	-263	-280	-145	375	343		294			283
Total, worst case		228		600									254		586		
Sun reduction		0.35		0.45									0.45		0.35		
Oper. time red.		0.86		0.86									0.86		0.86		
Wind dir. red.		0.63		0.63									0.63		0.63		
Total reduction		0.19		0.24									0.24		0.19		
Total, real		43		147									62		112		

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	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, North part
16 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
1000 meter max shadow distance applied along with default 3° inclination
Sunshine probabilities applied (pdf plots)
Directional run-hours applied from tab file (tower 1)
.

Licensed user:
Wind Engineers, Inc.
7660 Whitegate Avenue
US-RIVERSIDE, CA 92506

Calculated:
03/02/06 05:47/2.4.0.67

SHADOW - Calendar

Calculation: North part **Shadow receptor:** 677 - 677

Assumptions for shadow calculations

Maximum distance for influence	1,000	m
Minimum sun height over horizon for influence	3	°
Day step for calculation	1	days
Time step for calculation	2	minutes

Sun shine probabilities (part of time from sun rise to sun set with sun shine)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.35	0.45	0.45	0.55	0.55	0.55	0.65	0.55	0.55	0.45	0.35	0.30

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
475	585	238	199	220	474	1,184	813	840	1,246	803	479	7,555

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:40 - 16:47	07:25 - 17:23	06:47 - 17:59 (14) 07:59 (8) - 08:13 (8)	05:54 - 18:36	06:06 - 20:08	05:36 - 20:40	05:36 - 20:52	06:01 - 20:32	06:34 - 19:46	07:07 - 18:53	06:43 - 17:04 (22) 07:27 (8) - 07:49 (8)	07:20 - 16:38
2	07:40 - 16:48	07:24 - 17:24	06:46 - 18:00 (6) 08:03 (8) - 08:09 (8)	05:52 - 18:37	06:05 - 20:10	05:35 - 20:41	05:37 - 20:52	06:02 - 20:31	06:35 - 19:44	07:08 - 18:51	06:44 - 17:03 (18) 07:28 (8) - 07:46 (8)	07:21 - 16:38
3	07:40 - 16:49	07:23 - 17:26	06:44 - 18:02	05:51 - 18:38	06:03 - 20:11	05:35 - 20:42	05:37 - 20:52	06:04 - 20:30	06:37 - 19:42	07:09 - 18:50	06:46 - 17:02 (14) 07:32 (8) - 07:46 (8)	07:22 - 16:38
4	07:40 - 16:50	07:22 - 17:27	06:42 - 18:03	05:49 - 18:39	06:02 - 20:12	05:34 - 20:42	05:38 - 20:51	06:05 - 20:29	06:38 - 19:41	07:10 - 18:48	06:47 - 17:00 (4) 07:37 (8) - 07:41 (8)	07:23 - 16:38
5	07:40 - 16:51	07:21 - 17:28	06:41 - 18:04	06:47 - 19:40	06:01 - 20:13	05:34 - 20:43	05:38 - 20:51	06:06 - 20:28	06:39 - 19:39	07:11 - 18:46	06:48 - 16:59	07:24 - 16:37
6	07:40 - 16:52	07:20 - 17:30	06:39 - 18:05	06:45 - 19:41	06:00 - 20:14	05:34 - 20:44	05:39 - 20:51	06:07 - 20:26	06:40 - 19:37	07:12 - 18:44	06:49 - 16:58	07:25 - 16:37
7	07:40 - 16:53	07:19 - 17:31 (6) 08:11 (8) - 08:06	08:05 (8) - 06:37 - 18:06	06:44 - 19:42	05:58 - 20:15	05:33 - 20:44	05:40 - 20:51	06:08 - 20:25	06:41 - 19:36	07:13 - 18:43	06:51 - 16:57	07:26 - 16:37
8	07:40 - 16:54	07:17 - 17:32 (14) 08:16 (8) - 08:02 (8)	06:36 - 18:08	06:42 - 19:44	05:57 - 20:16	05:33 - 20:45	05:40 - 20:50	06:09 - 20:24	06:42 - 19:34	07:14 - 18:41	06:52 - 16:56	07:27 - 16:37
9	07:40 - 16:55	07:16 - 17:34 (20) 08:19 (8) - 07:59 (8)	06:34 - 18:09	06:40 - 19:45	05:56 - 20:17	05:33 - 20:46	05:41 - 20:50	06:10 - 20:23	06:43 - 19:32	07:16 - 18:39	06:53 - 16:55	07:28 - 16:37
10	07:40 - 16:56	07:15 - 17:35 (22) 08:19 (8) - 07:57 (8)	06:32 - 18:10	06:39 - 19:46	05:55 - 20:18	05:33 - 20:46	05:42 - 20:50	06:11 - 20:21	06:44 - 19:30	07:17 - 18:38	06:54 - 16:53	07:29 - 16:37
11	07:39 - 16:57	07:14 - 17:36 (26) 08:22 (8) - 07:56 (8)	06:31 - 18:11	06:37 - 19:47	05:53 - 20:20	05:32 - 20:47	05:42 - 20:49	06:12 - 20:20	06:45 - 19:28	07:18 - 18:36	06:56 - 16:52	07:30 - 16:37
12	07:39 - 16:58	07:12 - 17:38 (28) 08:23 (8) - 07:55 (8)	06:29 - 18:12	06:35 - 19:48	05:52 - 20:21	05:32 - 20:47	05:43 - 20:49	06:13 - 20:19	06:46 - 19:27	07:19 - 18:34 (10) 08:36 (8) - 08:46 (8)	06:57 - 16:51	07:30 - 16:37
13	07:39 - 16:59	07:11 - 17:39 (30) 08:23 (8) - 07:53 (8)	06:27 - 18:14	06:34 - 19:49	05:51 - 20:22	05:32 - 20:48	05:44 - 20:48	06:14 - 20:17	06:47 - 19:25	07:20 - 18:33 (18) 08:31 (8) - 08:49 (8)	06:58 - 16:50	07:31 - 16:37
14	07:38 - 17:01	07:10 - 17:40 (30) 08:24 (8) - 07:54 (8)	06:25 - 18:15	06:32 - 19:50	05:50 - 20:23	05:32 - 20:48	05:45 - 20:48	06:15 - 20:16	06:48 - 19:23	07:21 - 18:31 (22) 08:28 (8) - 08:50 (8)	06:59 - 16:49	07:32 - 16:37
15	07:38 - 17:02	07:08 - 17:41 (32) 08:24 (8) - 07:52 (8)	06:24 - 18:16	06:30 - 19:51	05:49 - 20:24	05:32 - 20:49	05:46 - 20:47	06:16 - 20:14	06:49 - 19:21	07:23 - 18:29 (24) 08:27 (8) - 08:51 (8)	07:01 - 16:48	07:33 - 16:38
16	07:37 - 17:03	07:07 - 17:43 (32) 08:25 (8) - 07:53 (8)	06:22 - 18:17	06:29 - 19:53	05:48 - 20:25	05:32 - 20:49	05:46 - 20:46	06:17 - 20:13	06:50 - 19:20	07:24 - 18:28 (26) 08:26 (8) - 08:52 (8)	07:02 - 16:48	07:33 - 16:38
17	07:37 - 17:04	07:05 - 17:44 (34) 08:26 (8) - 07:52 (8)	06:20 - 18:18	06:27 - 19:54	05:47 - 20:26	05:32 - 20:50	05:47 - 20:46	06:18 - 20:11	06:51 - 19:18	07:25 - 18:26 (30) 08:24 (8) - 08:54 (8)	07:03 - 16:47	07:34 - 16:38
18	07:36 - 17:05	07:04 - 17:45 (34) 08:26 (8) - 07:52 (8)	06:18 - 18:19	06:26 - 19:55	05:46 - 20:27	05:32 - 20:50	05:48 - 20:45	06:19 - 20:10	06:52 - 19:16	07:26 - 18:25 (32) 08:23 (8) - 08:55 (8)	07:04 - 16:46	07:35 - 16:38
19	07:36 - 17:06	07:03 - 17:47 (34) 08:25 (8) - 07:51 (8)	06:17 - 18:21	06:24 - 19:56	05:45 - 20:28	05:32 - 20:50	05:49 - 20:44	06:20 - 20:08	06:54 - 19:14	07:27 - 18:23 (32) 08:22 (8) - 08:54 (8)	07:06 - 16:45	07:35 - 16:39
20	07:35 - 17:08	07:01 - 17:48 (34) 08:25 (8) - 07:51 (8)	06:15 - 18:22	06:22 - 19:57	05:44 - 20:29	05:32 - 20:51	05:50 - 20:44	06:22 - 20:07	06:55 - 19:13	07:28 - 18:21 (32) 08:23 (8) - 08:55 (8)	07:07 - 16:44	07:36 - 16:39
21	07:35 - 17:09	07:00 - 17:49 (32) 08:24 (8) - 07:52 (8)	06:13 - 18:23	06:21 - 19:58	05:43 - 20:30	05:33 - 20:51	05:51 - 20:43	06:23 - 20:05	06:56 - 19:11	07:30 - 18:20 (32) 08:23 (8) - 08:55 (8)	07:08 - 16:44	07:37 - 16:40
22	07:34 - 17:10	06:58 - 17:50 (32) 08:24 (8) - 07:52 (8)	06:11 - 18:24	06:19 - 19:59	05:42 - 20:31	05:33 - 20:51	05:52 - 20:42	06:24 - 20:04	06:57 - 19:09	07:31 - 18:18 (34) 08:22 (8) - 08:56 (8)	07:09 - 16:43	07:37 - 16:40
23	07:33 - 17:11	06:57 - 17:52 (30) 08:23 (8) - 07:53 (8)	06:10 - 18:25	06:18 - 20:01	05:42 - 20:32	05:33 - 20:51	05:53 - 20:41	06:25 - 20:02	06:58 - 19:07	07:32 - 18:17 (34) 08:21 (8) - 08:55 (8)	07:11 - 16:42	07:38 - 16:41
24	07:32 - 17:13	06:55 - 17:53 (30) 08:23 (8) - 07:53 (8)	06:08 - 18:26	06:16 - 20:01	05:41 - 20:33	05:33 - 20:52	05:54 - 20:40	06:26 - 20:01	06:59 - 19:05	07:33 - 18:15 (32) 08:22 (8) - 08:54 (8)	07:12 - 16:42	07:38 - 16:41
25	07:32 - 17:14	06:53 - 17:54 (28) 08:21 (8) - 07:53 (8)	06:06 - 18:28	06:15 - 20:02	05:40 - 20:34	05:34 - 20:52	05:54 - 20:39	06:27 - 19:57	07:00 - 19:04	06:34 - 17:14 (34) 07:22 (8) - 07:56 (8)	07:13 - 16:41	07:38 - 16:42
26	07:31 - 17:15	06:52 - 17:55 (26) 08:20 (8) - 07:54 (8)	06:04 - 18:29	06:13 - 20:03	05:39 - 20:35	05:34 - 20:52	05:55 - 20:39	06:28 - 19:56	07:01 - 19:02	06:36 - 17:12 (34) 07:21 (8) - 07:55 (8)	07:14 - 16:40	07:39 - 16:43
27	07:30 - 17:17	06:50 - 17:57 (22) 08:18 (8) - 07:56 (8)	06:03 - 18:30	06:12 - 20:04	05:39 - 20:36	05:34 - 20:52	05:56 - 20:38	06:29 - 19:54	07:02 - 19:00	06:37 - 17:11 (32) 07:22 (8) - 07:54 (8)	07:15 - 16:40	07:39 - 16:43
28	07:29 - 17:18	06:49 - 17:58 (20) 08:17 (8) - 07:57 (8)	06:01 - 18:31	06:10 - 20:05	05:38 - 20:37	05:35 - 20:52	05:57 - 20:37	06:30 - 19:53	07:03 - 18:58	06:38 - 17:10 (30) 07:24 (8) - 07:54 (8)	07:16 - 16:40	07:39 - 16:44
29	07:28 - 17:19		05:59 - 18:32	06:09 - 20:06	05:37 - 20:37	05:35 - 20:52	05:58 - 20:36	06:31 - 19:51	07:04 - 18:57	06:39 - 17:08 (30) 07:23 (8) - 07:53 (8)	07:18 - 16:39	07:40 - 16:45
30	07:27 - 17:20		05:57 - 18:33	06:08 - 20:07	05:37 - 20:38	05:36 - 20:52	05:59 - 20:35	06:32 - 19:49	07:06 - 18:55	06:41 - 17:07 (28) 07:24 (8) - 07:52 (8)	07:19 - 16:39	07:40 - 16:45
31	07:26 - 17:22		05:56 - 18:34		05:36 - 20:39		06:00 - 20:33	06:33 - 19:48		06:42 - 17:06 (24) 07:26 (8) - 07:50 (8)		07:40 - 16:46
Potential sun hours	293	295	370	209	-292	-263	-280	-145	375	343	294	283
Total, worst case		596	20							570	58	
Sun reduction		0.45	0.45							0.45	0.35	
Oper. time red.		0.86	0.86							0.86	0.86	
Wind dir. red.		0.63	0.63							0.63	0.63	
Total reduction		0.24	0.24							0.24	0.19	
Total, real		145	5							138	11	

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	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, North part
16 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
1000 meter max shadow distance applied along with default 3° inclination
Sunshine probabilities applied (pdf plots)
Directional run-hours applied from tab file (tower 1)
.

Printed/Page
03/05/06 23:47 / 52
Licensed user:
Wind Engineers, Inc.
7660 Whitegate Avenue
US-RIVERSIDE, CA 92506

Calculated:
03/02/06 05:47/2.4.0.67

SHADOW - Calendar

Calculation: North part **Shadow receptor:** 678 - 678

Assumptions for shadow calculations

Maximum distance for influence	1,000 m
Minimum sun height over horizon for influence	3 °
Day step for calculation	1 days
Time step for calculation	2 minutes

Sun shine probabilities (part of time from sun rise to sun set with sun shine)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.35	0.45	0.45	0.55	0.55	0.55	0.65	0.55	0.55	0.45	0.35	0.30

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
475	585	238	199	220	474	1,184	813	840	1,246	803	479	7,555

	January			February		March			April	May	June	July	August	September			October			November	December		
1	07:40		08:18 (9)	07:25		06:47			05:54	06:06	05:36	05:36	06:01	06:34			07:07		07:35 (8)	06:43	07:20		
	16:47	18	08:36 (9)	17:23		17:59			18:36	20:08	20:40	20:52	20:32	19:46			18:53	30	08:05 (8)	17:04	16:38		
2	07:40		08:18 (9)	07:24		06:46			05:52	06:05	05:35	05:37	06:02	06:35			07:08		07:36 (8)	06:44	07:21		
	16:48	18	08:36 (9)	17:24		18:00			18:37	20:10	20:41	20:52	20:31	19:44			18:51	26	08:02 (8)	17:03	16:38		
3	07:40		08:20 (9)	07:23		06:44			05:51	06:03	05:35	05:37	06:04	06:37			07:09		07:37 (8)	06:46	07:22		08:10 (9)
	16:49	16	08:36 (9)	17:26		18:02			18:38	20:11	20:42	20:52	20:30	19:42			18:50	24	08:01 (8)	17:02	16:38	8	08:18 (9)
4	07:40		08:20 (9)	07:22		06:42			05:49	06:02	05:34	05:38	06:05	06:38			07:10		07:40 (8)	06:47	07:23		08:09 (9)
	16:50	16	08:36 (9)	17:27		18:03			18:39	20:12	20:42	20:51	20:29	19:41			18:48	18	07:58 (8)	17:00	16:38	10	08:19 (9)
5	07:40		08:21 (9)	07:21		06:41			06:47	06:01	05:34	05:38	06:06	06:39			07:11		07:41 (8)	06:48	07:24		08:08 (9)
	16:51	14	08:35 (9)	17:28		18:04			19:40	20:13	20:43	20:51	20:28	19:39			18:46	14	07:55 (8)	16:59	16:37	12	08:20 (9)
6	07:40		08:21 (9)	07:20		06:39			06:45	06:00	05:34	05:39	06:07	06:40			07:12			06:49	07:25		08:07 (9)
	16:52	14	08:35 (9)	17:30		18:05			19:41	20:14	20:44	20:51	20:26	19:37			18:44			16:58	16:37	14	08:21 (9)
7	07:40		08:23 (9)	07:19		06:37			06:44	05:58	05:33	05:40	06:08	06:41			07:13			06:51	07:26		08:08 (9)
	16:53	12	08:35 (9)	17:31		18:06			19:42	20:15	20:44	20:51	20:25	19:36			18:43			16:57	16:37	14	08:22 (9)
8	07:40		08:25 (9)	07:17		06:36		07:07 (8)	06:42	05:57	05:33	05:40	06:09	06:42			07:14			06:52	07:27		08:07 (9)
	16:54	10	08:35 (9)	17:32		18:08	8	07:15 (8)	19:44	20:16	20:45	20:50	20:24	19:34			18:41			16:56	16:37	16	08:23 (9)
9	07:40		08:27 (9)	07:16		06:34		07:04 (8)	06:40	05:56	05:33	05:41	06:10	06:43			07:16			06:53	07:28		08:08 (9)
	16:55	8	08:35 (9)	17:34		18:09	16	07:20 (8)	19:45	20:17	20:46	20:50	20:23	19:32			18:39			16:55	16:37	16	08:24 (9)
10	07:40			07:15		06:32		07:00 (8)	06:39	05:55	05:33	05:42	06:11	06:44			07:17			06:54	07:29		08:07 (9)
	16:56			17:35		18:10	22	07:22 (8)	19:46	20:18	20:46	20:50	20:21	19:30			18:38			16:53	16:37	18	08:25 (9)
11	07:39			07:14		06:31		06:58 (8)	06:37	05:53	05:32	05:42	06:12	06:45			07:18			06:56	07:30		08:08 (9)
	16:57			17:36		18:11	26	07:24 (8)	19:47	20:20	20:47	20:49	20:20	19:28			18:36			16:52	16:37	18	08:26 (9)
12	07:39			07:12		06:29		06:56 (8)	06:35	05:52	05:32	05:43	06:13	06:46			07:19			06:57	07:30		08:09 (9)
	16:58			17:38		18:12	28	07:24 (8)	19:48	20:21	20:47	20:49	20:19	19:27			18:34			16:51	16:37	18	08:27 (9)
13	07:39			07:11		06:27		06:55 (8)	06:34	05:51	05:32	05:44	06:14	06:47			07:20			06:58	07:31		08:08 (9)
	16:59			17:39		18:14	30	07:25 (8)	19:49	20:22	20:48	20:48	20:17	19:25			18:33			16:50	16:37	20	08:28 (9)
14	07:38			07:10		06:25		06:55 (8)	06:32	05:50	05:32	05:45	06:15	06:48		07:49 (8)	07:21			06:59	07:32		08:08 (9)
	17:01			17:40		18:15	32	07:27 (8)	19:50	20:23	20:48	20:48	20:16	19:23	14	08:03 (8)	18:31			16:49	16:37	20	08:28 (9)
15	07:38			07:08		06:24		06:53 (8)	06:30	05:49	05:32	05:46	06:16	06:49		07:46 (8)	07:23			07:01	07:33		08:09 (9)
	17:02			17:41		18:16	34	07:27 (8)	19:51	20:24	20:49	20:47	20:14	19:21	18	08:04 (8)	18:29			16:48	16:38	20	08:29 (9)
16	07:37			07:07		06:22		06:51 (8)	06:29	05:48	05:32	05:46	06:17	06:50		07:43 (8)	07:24			07:02	07:33		08:10 (9)
	17:03			17:43		18:17	36	07:27 (8)	19:53	20:25	20:49	20:46	20:13	19:20	24	08:07 (8)	18:28			16:48	16:38	20	08:30 (9)
17	07:37			07:05		06:20		06:52 (8)	06:27	05:47	05:32	05:47	06:18	06:51		07:42 (8)	07:25			07:03	07:34		08:10 (9)
	17:04			17:44		18:18	34	07:26 (8)	19:54	20:26	20:50	20:46	20:11	19:18	26	08:08 (8)	18:26			16:47	16:38	20	08:30 (9)
18	07:36			07:04		06:18		06:52 (8)	06:26	05:46	05:32	05:48	06:19	06:52		07:39 (8)	07:26			07:04	07:35		08:11 (9)
	17:05			17:45		18:19	34	07:26 (8)	19:55	20:27	20:50	20:45	20:10	19:16	30	08:09 (8)	18:25			16:46	16:38	20	08:31 (9)
19	07:36			07:03		06:17		06:50 (8)	06:24	05:45	05:32	05:49	06:20	06:54		07:38 (8)	07:27			07:06	07:35		08:10 (9)
	17:06			17:47		18:21	36	07:26 (8)	19:56	20:28	20:50	20:44	20:08	19:14	32	08:10 (8)	18:23			16:45	16:39	22	08:32 (9)
20	07:35			07:01		06:15		06:50 (8)	06:22	05:44	05:32	05:50	06:22	06:55		07:37 (8)	07:28			07:07	07:36		08:10 (9)
	17:08			17:48		18:22	36	07:26 (8)	19:57	20:29	20:51	20:44	20:07	19:13	32	08:09 (8)	18:21			16:44	16:39	22	08:32 (9)
21	07:35			07:00		06:13		06:51 (8)	06:21	05:43	05:33	05:51	06:23	06:56		07:36 (8)	07:30			07:08	07:37		08:11 (9)
	17:09			17:49		18:23	34	07:25 (8)	19:58	20:30	20:51	20:43	20:05	19:11	34	08:10 (8)	18:20			16:44	16:40	22	08:33 (9)
22	07:34			06:58		06:11		06:51 (8)	06:19	05:42	05:33	05:52	06:24	06:57		07:35 (8)	07:31			07:09	07:37		08:11 (9)
	17:10			17:50		18:24	34	07:25 (8)	19:59	20:31	20:51	20:42	20:04	19:09	34	08:09 (8)	18:18			16:43	16:40	22	08:33 (9)
23	07:33			06:57		06:10		06:51 (8)	06:18	05:42	05:33	05:53	06:25	06:58		07:34 (8)	07:32			07:11	07:38		08:12 (9)
	17:11			17:52		18:25	32	07:23 (8)	20:01	20:32	20:51	20:41	20:02	19:07	36	08:10 (8)	18:17			16:42	16:41	22	08:34 (9)
24	07:32			06:55		06:08		06:51 (8)	06:16	05:41	05:33	05:54	06:26	06:59		07:35 (8)	07:33			07:12	07:38		08:12 (9)
	17:13			17:53		18:26	30	07:21 (8)	20:01	20:33	20:52	20:40	20:01	19:05	34	08:09 (8)	18:15			16:42	16:41	22	08:34 (9)
25	07:32			06:53		06:06		06:52 (8)	06:15	05:40	05:34	05:54	06:27	07:00		07:34 (8)	06:34			07:13	07:38		08:12 (9)
	17:14			17:54		18:28	30	07:22 (8)	20:02	20:34	20:52	20:39	19:57	19:04	34	08:08 (8)	17:14			16:41	16:42	22	08:34 (9)
26	07:31			06:52		06:04		06:52 (8)	06:13	05:39	05:34	05:55	06:28	07:01		07:33 (8)	06:36			07:14	07:39		08:15 (9)
	17:15			17:55		18:29	28	07:20 (8)	20:03	20:35	20:52	20:39	19:56	19:02	36	08:09 (8)	17:12			16:40	16:43	20	08:35 (9)
27	07:30			06:50		06:03		06:54 (8)	06:12	05:39	05:34	05:56	06:29	07:02		07:34 (8)	06:37			07:15	07:39		08:15 (9)
	17:17			17:57		18:30	24	07:18 (8)	20:04	20:36	20:52	20:38	19:54	19:00	34	08:08 (8)	17:11			16:40	16:43	20	08:35 (9)
28	07:29			06:49		06:01		06:54 (8)	06:10	05:38	05:35	05:57	06:30	07:03		07:34 (8)	06:38			07:16	07:39		08:15 (9)
	17:18			17:58		18:31	22	07:16 (8)	20:05	20:37	20:52	20:37	19:53	18:58	34	08:08 (8)	17:10			16:40	16:44	20	08:35 (9)
29	07:28					05:59		06:57 (8)	06:09	05:37	05:35	05:58	06:31	07:04		07:35 (8)	06:39			07:18	07:40		08:15 (9)
	17:19					18:32	16	07:13 (8)	20:06	20:37	20:52	20:36	19:51	18:57	32	08:07 (8)	17:08			16:39	16:45	20	08:35 (9)
30	07:27					05:57		07:01 (8)	06:08	05:37	05:36	05:59	06:32	07:06		07:34 (8)	06:41			07:19	07:40		08:16 (9)
	17:20					18:33	6	07:07 (8)	20:07	20:38	20:52	20:35	19:49	18:55	32	08:06 (8)	17:07			16:39	16:45	20	08:36 (9)
31	07:26					05:56				05:36		06:00	06:33				06:42				07:40		08:18 (9)
	17:22					18:34				20:39		20:33	19:48				17:06				16:46	18	08:36 (9)
Potential sun hours	293			295		370			209	-292	-263	-280	-145	375			343			294	283		
Total, worst case		126					628								516			112				536	
Sun reduction		0.35					0.45								0.55			0.45				0.30	
Oper. time red.		0.86					0.86								0.86			0.86				0.86	
Wind dir. red.		0.63					0.60								0.60			0.60				0.63	
Total reduction		0.19					0.23								0.29			0.23				0.16	
Total, real		24					147								148			26				87	

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	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, North part
16 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
1000 meter max shadow distance applied along with default 3° inclination
Sunshine probabilities applied (pdf plots)
Directional run-hours applied from tab file (tower 1)
.

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03/05/06 23:47 / 53
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7660 Whitegate Avenue
US-RIVERSIDE, CA 92506

Calculated:
03/02/06 05:47/2.4.0.67

SHADOW - Calendar

Calculation: North part **Shadow receptor:** 679 - 679

Assumptions for shadow calculations

Maximum distance for influence	1,000 m
Minimum sun height over horizon for influence	3 °
Day step for calculation	1 days
Time step for calculation	2 minutes

Sun shine probabilities (part of time from sun rise to sun set with sun shine)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.35	0.45	0.45	0.55	0.55	0.55	0.65	0.55	0.55	0.45	0.35	0.30

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
475	585	238	199	220	474	1,184	813	840	1,246	803	479	7,555

	January		February		March	April	May	June	July	August	September	October	November		December	
1	07:40	15:37 (15)	07:25	15:54 (15)	06:47	05:54	06:06	05:36	05:36	06:01	06:34	07:07	06:43		07:20	15:22 (15)
	16:47	30 16:07 (15)	17:23	20 16:14 (15)	17:59	18:35	20:08	20:40	20:52	20:32	19:46	18:53	17:04		16:38	34 15:56 (15)
2	07:40	15:37 (15)	07:24	15:57 (15)	06:45	05:52	06:05	05:35	05:37	06:02	06:35	07:08	06:44		07:21	15:21 (15)
	16:48	30 16:07 (15)	17:24	14 16:11 (15)	18:00	18:37	20:09	20:41	20:52	20:31	19:44	18:51	17:03		16:38	36 15:57 (15)
3	07:40	15:37 (15)	07:23	16:00 (15)	06:44	05:50	06:03	05:35	05:37	06:03	06:36	07:09	06:46		07:22	15:22 (15)
	16:49	32 16:09 (15)	17:26	8 16:08 (15)	18:02	18:38	20:11	20:41	20:52	20:30	19:42	18:49	17:02		16:38	34 15:56 (15)
4	07:40	15:37 (15)	07:22		06:42	05:49	06:02	05:34	05:38	06:04	06:37	07:10	06:47		07:23	15:23 (15)
	16:50	32 16:09 (15)	17:27		18:03	18:39	20:12	20:42	20:51	20:29	19:41	18:48	17:00		16:37	34 15:57 (15)
5	07:40	15:37 (15)	07:21		06:41	06:47	06:01	05:34	05:38	06:06	06:39	07:11	06:48		07:24	15:24 (15)
	16:51	34 16:11 (15)	17:28		18:04	19:40	20:13	20:43	20:51	20:28	19:39	18:46	16:59		16:37	32 15:56 (15)
6	07:40	15:37 (15)	07:20		06:39	06:45	05:59	05:34	05:39	06:07	06:40	07:12	06:49		07:25	15:23 (15)
	16:52	34 16:11 (15)	17:30		18:05	19:41	20:14	20:44	20:51	20:26	19:37	18:44	16:58		16:37	34 15:57 (15)
7	07:40	15:39 (15)	07:18		06:37	06:44	05:58	05:33	05:39	06:08	06:41	07:13	06:51		07:26	15:24 (15)
	16:53	32 16:11 (15)	17:31		18:06	19:42	20:15	20:44	20:51	20:25	19:35	18:43	16:57		16:37	34 15:58 (15)
8	07:40	15:39 (15)	07:17		06:36	06:42	05:57	05:33	05:40	06:09	06:42	07:14	06:52	15:30 (15)	07:27	15:25 (15)
	16:54	34 16:13 (15)	17:32		18:08	19:43	20:16	20:45	20:50	20:24	19:34	18:41	16:56	8 15:38 (15)	16:37	32 15:57 (15)
9	07:40	15:38 (15)	07:16		06:34	06:40	05:56	05:33	05:41	06:10	06:43	07:15	06:53	15:26 (15)	07:28	15:26 (15)
	16:55	34 16:12 (15)	17:34		18:09	19:45	20:17	20:46	20:50	20:22	19:32	18:39	16:54	16 15:42 (15)	16:37	32 15:58 (15)
10	07:40	15:38 (15)	07:15		06:32	06:39	05:55	05:33	05:42	06:11	06:44	07:17	06:54	15:25 (15)	07:29	15:27 (15)
	16:56	36 16:14 (15)	17:35		18:10	19:46	20:18	20:46	20:49	20:21	19:30	18:37	16:53	20 15:45 (15)	16:37	30 15:57 (15)
11	07:39	15:40 (15)	07:13		06:30	06:37	05:53	05:32	05:42	06:12	06:45	07:18	06:56	15:22 (15)	07:29	15:28 (15)
	16:57	34 16:14 (15)	17:36		18:11	19:47	20:19	20:47	20:49	20:20	19:28	18:36	16:52	24 15:46 (15)	16:37	30 15:58 (15)
12	07:39	15:39 (15)	07:12		06:29	06:35	05:52	05:32	05:43	06:13	06:46	07:19	06:57	15:22 (15)	07:30	15:29 (15)
	16:58	36 16:15 (15)	17:37		18:12	19:48	20:21	20:47	20:49	20:18	19:27	18:34	16:51	26 15:48 (15)	16:37	30 15:59 (15)
13	07:39	15:39 (15)	07:11		06:27	06:34	05:51	05:32	05:44	06:14	06:47	07:20	06:58	15:21 (15)	07:31	15:29 (15)
	16:59	36 16:15 (15)	17:39		18:14	19:49	20:22	20:48	20:48	20:17	19:25	18:32	16:50	28 15:49 (15)	16:37	28 15:57 (15)
14	07:38	15:40 (15)	07:09		06:25	06:32	05:50	05:32	05:45	06:15	06:48	07:21	06:59	15:20 (15)	07:32	15:30 (15)
	17:00	36 16:16 (15)	17:40		18:15	19:50	20:23	20:48	20:48	20:16	19:23	18:31	16:49	28 15:48 (15)	16:37	28 15:58 (15)
15	07:38	15:40 (15)	07:08		06:24	06:30	05:49	05:32	05:45	06:16	06:49	07:22	07:01	15:20 (15)	07:33	15:31 (15)
	17:02	36 16:16 (15)	17:41		18:16	19:51	20:24	20:49	20:47	20:14	19:21	18:29	16:48	30 15:50 (15)	16:38	28 15:59 (15)
16	07:37	15:39 (15)	07:07		06:22	06:29	05:48	05:32	05:46	06:17	06:50	07:24	07:02	15:19 (15)	07:33	15:30 (15)
	17:03	38 16:17 (15)	17:43		18:17	19:52	20:25	20:49	20:46	20:13	19:20	18:28	16:48	32 15:51 (15)	16:38	30 16:00 (15)
17	07:37	15:41 (15)	07:05		06:20	06:27	05:47	05:32	05:47	06:18	06:51	07:25	07:03	15:18 (15)	07:34	15:30 (15)
	17:04	36 16:17 (15)	17:44		18:18	19:54	20:26	20:50	20:46	20:11	19:18	18:26	16:47	34 15:52 (15)	16:38	30 16:00 (15)
18	07:36	15:40 (15)	07:04		06:18	06:25	05:46	05:32	05:48	06:19	06:52	07:26	07:04	15:18 (15)	07:35	15:31 (15)
	17:05	38 16:18 (15)	17:45		18:19	19:55	20:27	20:50	20:45	20:10	19:16	18:24	16:46	34 15:52 (15)	16:38	28 15:59 (15)
19	07:36	15:42 (15)	07:02		06:17	06:24	05:45	05:32	05:49	06:20	06:53	07:27	07:06	15:19 (15)	07:35	15:32 (15)
	17:06	36 16:18 (15)	17:47		18:21	19:56	20:28	20:50	20:44	20:08	19:14	18:23	16:45	34 15:53 (15)	16:39	28 16:00 (15)
20	07:35	15:43 (15)	07:01		06:15	06:22	05:44	05:32	05:50	06:21	06:55	07:28	07:07	15:18 (15)	07:36	15:32 (15)
	17:08	36 16:19 (15)	17:48		18:22	19:57	20:29	20:51	20:44	20:07	19:12	18:21	16:44	34 15:52 (15)	16:39	28 16:00 (15)
21	07:34	15:42 (15)	06:59		06:13	06:21	05:43	05:33	05:51	06:23	06:56	07:30	07:08	15:18 (15)	07:36	15:33 (15)
	17:09	36 16:18 (15)	17:49		18:23	19:58	20:30	20:51	20:43	20:05	19:11	18:20	16:44	36 15:54 (15)	16:40	28 16:01 (15)
22	07:34	15:43 (15)	06:58		06:11	06:19	05:42	05:33	05:52	06:24	06:57	07:31	07:09	15:19 (15)	07:37	15:33 (15)
	17:10	34 16:17 (15)	17:50		18:24	19:59	20:31	20:51	20:42	20:04	19:09	18:18	16:43	36 15:55 (15)	16:40	28 16:01 (15)
23	07:33	15:45 (15)	06:56		06:10	06:18	05:42	05:33	05:52	06:25	06:58	07:32	07:10	15:18 (15)	07:37	15:34 (15)
	17:11	34 16:19 (15)	17:52		18:25	20:00	20:32	20:51	20:41	20:02	19:07	18:17	16:42	36 15:54 (15)	16:41	28 16:02 (15)
24	07:32	15:44 (15)	06:55		06:08	06:16	05:41	05:33	05:53	06:26	06:59	07:33	07:12	15:18 (15)	07:38	15:34 (15)
	17:13	34 16:18 (15)	17:53		18:26	20:00	20:33	20:52	20:40	20:01	19:05	18:15	16:42	38 15:56 (15)	16:41	28 16:02 (15)
25	07:32	15:45 (15)	06:53		06:06	06:15	05:40	05:34	05:54	06:27	07:00	06:34	07:13	15:19 (15)	07:38	15:34 (15)
	17:14	34 16:19 (15)	17:54		18:27	20:02	20:34	20:52	20:39	19:57	19:04	17:14	16:41	36 15:55 (15)	16:42	28 16:02 (15)
26	07:31	15:46 (15)	06:52		06:04	06:13	05:39	05:34	05:55	06:28	07:01	06:36	07:14	15:20 (15)	07:39	15:35 (15)
	17:15	32 16:18 (15)	17:55		18:29	20:03	20:35	20:52	20:38	19:56	19:02	17:12	16:40	36 15:56 (15)	16:42	30 16:05 (15)
27	07:30	15:47 (15)	06:50		06:03	06:12	05:39	05:34	05:56	06:29	07:02	06:37	07:15	15:19 (15)	07:39	15:35 (15)
	17:16	30 16:17 (15)	17:57		18:30	20:04	20:36	20:52	20:37	19:54	19:00	17:11	16:40	36 15:55 (15)	16:43	30 16:05 (15)
28	07:29	15:48 (15)	06:49		06:01	06:10	05:38	05:35	05:57	06:30	07:03	06:38	07:16	15:20 (15)	07:39	15:37 (15)
	17:18	28 16:16 (15)	17:58		18:31	20:05	20:36	20:52	20:36	19:52	18:58	17:10	16:39	36 15:56 (15)	16:44	28 16:05 (15)
29	07:28	15:49 (15)			05:59	06:09	05:37	05:35	05:58	06:31	07:04	06:39	07:17	15:20 (15)	07:40	15:37 (15)
	17:19	28 16:17 (15)			18:32	20:06	20:37	20:52	20:35	19:51	18:56	17:08	16:39	36 15:56 (15)	16:45	28 16:05 (15)
30	07:27	15:50 (15)			05:57	06:07	05:37	05:36	05:59	06:32	07:05	06:41	07:19	15:21 (15)	07:40	15:37 (15)
	17:20	26 16:16 (15)			18:33	20:07	20:38	20:52	20:34	19:49	18:55	17:07	16:39	36 15:57 (15)	16:45	28 16:05 (15)
31	07:26	15:51 (15)			05:56		05:36		06:00	06:33		06:42			07:40	15:38 (15)
	17:22	24 16:15 (15)			18:34		20:39		20:33	19:47		17:05			16:46	30 16:08 (15)
Potential sun hours	293		295		370	209	-292	-263	-280	-145	375	343	294		283	
Total, worst case		1030		42										710		934
Sun reduction		0.35		0.45										0.35		0.30
Oper. time red.		0.86		0.86										0.86		0.86
Wind dir. red.		0.65		0.65										0.65		0.65
Total reduction		0.20		0.25										0.20		0.17
Total, real		201		11										139		157

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	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, North part
16 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
1000 meter max shadow distance applied along with default 3° inclination
Sunshine probabilities applied (pdf plots)
Directional run-hours applied from tab file (tower 1)
.

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Calculated:
03/02/06 05:47/2.4.0.67

SHADOW - Calendar

Calculation: North part **Shadow receptor:** 680 - 680

Assumptions for shadow calculations

Maximum distance for influence	1,000 m
Minimum sun height over horizon for influence	3 °
Day step for calculation	1 days
Time step for calculation	2 minutes

Sun shine probabilities (part of time from sun rise to sun set with sun shine)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.35	0.45	0.45	0.55	0.55	0.55	0.65	0.55	0.55	0.45	0.35	0.30

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
475	585	238	199	220	474	1,184	813	840	1,246	803	479	7,555

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:40	07:25	06:47	05:54	06:06	05:36	05:36	06:02	07:14 (6)	06:34	07:07	06:43	07:20
	16:47	17:23	17:59	18:36	20:08	20:40	20:52	20:32	16 07:30 (6)	19:46	18:53	17:04	16:38
2	07:40	07:24	06:46	05:52	06:05	05:35	05:37	06:03	07:15 (6)	06:36	07:08	06:44	07:21
	16:48	17:24	18:00	18:37	20:10	20:41	20:52	20:31	14 07:29 (6)	19:44	18:51	17:03	16:38
3	07:40	07:23	06:44	05:51	06:03	05:35	05:37	06:04	07:16 (6)	06:37	07:09	06:46	07:22
	16:49	17:26	18:02	18:38	20:11	20:42	20:52	20:30	12 07:28 (6)	19:42	18:50	17:02	16:38
4	07:41	07:22	06:42	05:49	06:02	05:34	05:38	06:05	07:17 (6)	06:38	07:10	06:47	07:23
	16:50	17:27	18:03	18:39	20:12	20:42	20:51	20:29	10 07:27 (6)	19:41	18:48	17:00	16:38
5	07:40	07:21	06:41	06:47	06:01	05:34	05:38	06:06		06:39	07:11	06:48	07:24
	16:51	17:28	18:04	19:40	20:13	20:43	20:51	20:28		19:39	18:46	16:59	16:37
6	07:40	07:20	06:39	06:45	06:00	05:34	05:39	06:07		06:40	07:12	06:49	07:25
	16:52	17:30	18:05	19:41	20:14	20:44	20:51	20:26		19:37	18:44	16:58	16:37
7	07:40	07:19	06:37	06:44	05:58	05:33	05:40	06:08		06:41	07:13	06:51	07:26
	16:53	17:31	18:07	19:42	20:15	20:44	20:51	20:25		19:36	18:43	16:57	16:37
8	07:40	07:17	06:36	06:42	05:57	07:10 (6)	05:33	05:40	06:09		06:42	07:14	06:52	07:27
	16:54	17:32	18:08	19:44	20:16	6 07:16 (6)	20:45	20:50	20:24		19:34	18:41	16:56	16:37
9	07:40	07:16	06:34	06:40	05:56	07:07 (6)	05:33	05:41	06:10		06:43	07:16	06:53	07:28
	16:55	17:34	18:09	19:45	20:17	10 07:17 (6)	20:46	20:50	20:23		19:32	18:39	16:55	16:37
10	07:40	07:15	06:32	06:39	05:55	07:05 (6)	05:33	05:42	06:11		06:44	07:17	06:55	07:29
	16:56	17:35	18:10	19:46	20:18	14 07:19 (6)	20:46	20:50	20:21		19:30	18:38	16:54	16:37
11	07:39	07:14	06:31	06:37	05:54	07:04 (6)	05:33	05:42	06:12		06:45	07:18	06:56	07:30
	16:57	17:36	18:11	19:47	20:20	16 07:20 (6)	20:47	20:49	20:20		19:29	18:36	16:52	16:37
12	07:39	07:12	06:29	06:35	05:52	07:03 (6)	05:32	05:43	07:18 (6)	06:13	06:46	07:19	06:57	07:30
	16:58	17:38	18:13	19:48	20:21	18 07:21 (6)	20:47	20:49	4 07:22 (6)	20:19	19:27	18:34	16:51	16:37
13	07:39	07:11	06:27	06:34	05:51	07:02 (6)	05:32	05:44	07:17 (6)	06:14	06:47	07:20	06:58	07:31
	16:59	17:39	18:14	19:49	20:22	18 07:20 (6)	20:48	20:48	8 07:25 (6)	20:17	19:25	18:33	16:50	16:37
14	07:38	07:10	06:25	06:32	05:50	07:01 (6)	05:32	05:45	07:16 (6)	06:15	06:48	07:21	07:00	07:32
	17:01	17:40	18:15	19:50	20:23	20 07:21 (6)	20:48	20:48	10 07:26 (6)	20:16	19:23	18:31	16:50	16:37
15	07:38	07:08	06:24	06:30	05:49	07:02 (6)	05:32	05:46	07:15 (6)	06:16	06:49	07:23	07:01	07:33
	17:02	17:42	18:16	19:51	20:24	20 07:22 (6)	20:49	20:47	12 07:27 (6)	20:14	19:21	18:29	16:49	16:38
16	07:38	07:07	06:22	06:29	05:48	07:01 (6)	05:32	05:46	07:13 (6)	06:17	06:50	07:24	07:02	07:33
	17:03	17:43	18:17	19:53	20:25	20 07:21 (6)	20:49	20:46	14 07:27 (6)	20:13	19:20	18:28	16:48	16:38
17	07:37	07:05	06:20	06:27	05:47	07:00 (6)	05:32	05:47	07:12 (6)	06:18	06:51	07:25	07:03	07:34
	17:04	17:44	18:18	19:54	20:26	22 07:22 (6)	20:50	20:46	16 07:28 (6)	20:11	19:18	18:26	16:47	16:38
18	07:36	07:04	06:19	06:26	05:46	07:01 (6)	05:32	05:48	07:13 (6)	06:19	06:53	07:26	07:05	07:35
	17:05	17:45	18:20	19:55	20:27	20 07:21 (6)	20:50	20:45	16 07:29 (6)	20:10	19:16	18:25	16:46	16:39
19	07:36	07:03	06:17	06:24	05:45	07:01 (6)	05:32	05:49	07:12 (6)	06:21	06:54	07:27	07:06	07:35
	17:07	17:47	18:21	19:56	20:28	22 07:23 (6)	20:51	20:44	18 07:30 (6)	20:08	19:14	18:23	16:45	16:39
20	07:35	07:01	06:15	06:22	05:44	07:02 (6)	05:33	05:50	07:13 (6)	06:22	06:55	07:28	07:07	07:36
	17:08	17:48	18:22	19:57	20:29	20 07:22 (6)	20:51	20:44	18 07:31 (6)	20:07	19:13	18:21	16:44	16:39
21	07:35	07:00	06:13	06:21	05:43	07:01 (6)	05:33	05:51	07:12 (6)	06:23	06:56	07:30	07:08	07:37
	17:09	17:49	18:23	19:58	20:30	20 07:21 (6)	20:51	20:43	20 07:32 (6)	20:05	19:11	18:20	16:44	16:40
22	07:34	06:58	06:12	06:19	05:43	07:02 (6)	05:33	05:52	07:11 (6)	06:24	06:57	07:31	07:09	07:37
	17:10	17:50	18:24	19:59	20:31	20 07:22 (6)	20:51	20:42	22 07:33 (6)	20:04	19:09	18:18	16:43	16:40
23	07:33	06:57	06:10	06:18	05:42	07:01 (6)	05:33	05:53	07:12 (6)	06:25	06:58	07:32	07:11	07:38
	17:12	17:52	18:25	20:01	20:32	20 07:21 (6)	20:52	20:41	20 07:32 (6)	20:02	19:07	18:17	16:42	16:41
24	07:32	06:55	06:08	06:16	05:41	07:03 (6)	05:33	05:54	07:10 (6)	06:26	06:59	07:33	07:12	07:38
	17:13	17:53	18:26	20:01	20:33	18 07:21 (6)	20:52	20:40	22 07:32 (6)	20:01	19:05	18:15	16:42	16:41
25	07:32	06:54	06:06	06:15	05:40	07:04 (6)	05:34	05:55	07:11 (6)	06:27	07:00	06:35	07:13	07:38
	17:14	17:54	18:28	20:02	20:34	16 07:20 (6)	20:52	20:39	22 07:33 (6)	19:57	19:04	17:14	16:41	16:42
26	07:31	06:52	06:05	06:13	05:39	07:03 (6)	05:34	05:56	07:12 (6)	06:28	07:01	06:36	07:14	07:39
	17:15	17:56	18:29	20:03	20:35	16 07:19 (6)	20:52	20:39	20 07:32 (6)	19:56	19:02	17:13	16:41	16:43
27	07:30	06:50	06:03	06:12	05:39	07:05 (6)	05:34	05:57	07:11 (6)	06:29	07:02	06:37	07:15	07:39
	17:17	17:57	18:30	20:04	20:36	14 07:19 (6)	20:52	20:38	22 07:33 (6)	19:54	19:00	17:11	16:40	16:43
28	07:29	06:49	06:01	06:10	05:38	07:06 (6)	05:35	05:58	07:12 (6)	06:30	07:03	06:38	07:16	07:39
	17:18	17:58	18:31	20:05	20:37	12 07:18 (6)	20:52	20:37	20 07:32 (6)	19:53	18:58	17:10	16:40	16:44
29	07:28		05:59	06:09	05:37	07:06 (6)	05:35	05:58	07:11 (6)	06:31	07:04	06:39	07:18	07:40
	17:19		18:32	20:06	20:37	12 07:18 (6)	20:52	20:36	22 07:33 (6)	19:51	18:57	17:08	16:39	16:45
30	07:27		05:58	06:08	05:37	07:07 (6)	05:36	06:00	07:12 (6)	06:32	07:06	06:41	07:19	07:40
	17:21		18:33	20:07	20:38	10 07:17 (6)	20:52	20:35	20 07:32 (6)	19:49	18:55	17:07	16:39	16:45
31	07:26		05:56		05:36	07:09 (6)		06:01	07:13 (6)	06:33		06:42		07:40
	17:22		18:34		20:39	6 07:15 (6)		20:33	18 07:31 (6)	19:48		17:06		16:46
Potential sun hours	293	295	370	209	-292	-263	-280	-145	375	343	294	283
Total, worst case					390		344	52				
Sun reduction					0.55		0.65	0.55				
Oper. time red.					0.86		0.86	0.86				
Wind dir. red.					0.60		0.60	0.60				
Total reduction					0.28		0.33	0.28				
Total, real					110		115	15				

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	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, North part
16 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
1000 meter max shadow distance applied along with default 3° inclination
Sunshine probabilities applied (pdf plots)
Directional run-hours applied from tab file (tower 1)
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03/05/06 23:47 / 55

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US-RIVERSIDE, CA 92506

Calculated:
03/02/06 05:47/2.4.0.67

SHADOW - Calendar

Calculation: North part **Shadow receptor:** 681 - 681

Assumptions for shadow calculations

Maximum distance for influence	1,000 m
Minimum sun height over horizon for influence	3 °
Day step for calculation	1 days
Time step for calculation	2 minutes

Sun shine probabilities (part of time from sun rise to sun set with sun shine)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.35	0.45	0.45	0.55	0.55	0.55	0.65	0.55	0.55	0.45	0.35	0.30

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
475	585	238	199	220	474	1,184	813	840	1,246	803	479	7,555

	January	February	March	April	May	June		July		August	September	October	November	December
1	07:40	07:25	06:47	05:54	06:06	05:36		05:36		07:09 (6)	06:02	06:34	07:07	06:43	07:20
	16:47	17:23	17:59	18:36	20:08	20:40		20:52	20	07:29 (6)	20:32	19:46	18:53	17:04	16:38
2	07:40	07:24	06:46	05:52	06:05	05:35		05:37		07:10 (6)	06:03	06:36	07:08	06:44	07:21
	16:48	17:24	18:00	18:37	20:10	20:41		20:52	20	07:30 (6)	20:31	19:44	18:51	17:03	16:38
3	07:40	07:23	06:44	05:51	06:03	05:35	07:09 (6)	05:37		07:10 (6)	06:04	06:37	07:09	06:46	07:22
	16:49	17:26	18:02	18:38	20:11	20:42	8	07:17 (6)	20:52	18	07:28 (6)	20:30	19:42	18:50	17:02	16:38
4	07:40	07:22	06:42	05:49	06:02	05:34		07:09 (6)	05:38		07:11 (6)	06:05	06:38	07:10	06:47	07:23
	16:50	17:27	18:03	18:39	20:12	20:42	10	07:19 (6)	20:51	18	07:29 (6)	20:29	19:41	18:48	17:00	16:38
5	07:40	07:21	06:41	06:47	06:01	05:34		07:09 (6)	05:38		07:12 (6)	06:06	06:39	07:11	06:48	07:24
	16:51	17:28	18:04	19:40	20:13	20:43	12	07:21 (6)	20:51	16	07:28 (6)	20:28	19:39	18:46	16:59	16:37
6	07:40	07:20	06:39	06:45	06:00	05:34		07:06 (6)	05:39		07:12 (6)	06:07	06:40	07:12	06:49	07:25
	16:52	17:30	18:05	19:41	20:14	20:44	16	07:22 (6)	20:51	16	07:28 (6)	20:26	19:37	18:44	16:58	16:37
7	07:40	07:19	06:37	06:44	05:58	05:33		07:06 (6)	05:40		07:15 (6)	06:08	06:41	07:13	06:51	07:26
	16:53	17:31	18:07	19:42	20:15	20:44	16	07:22 (6)	20:51	12	07:27 (6)	20:25	19:36	18:43	16:57	16:37
8	07:40	07:17	06:36	06:42	05:57	05:33		07:06 (6)	05:40		07:16 (6)	06:09	06:42	07:14	06:52	07:27
	16:54	17:32	18:08	19:44	20:16	20:45	18	07:24 (6)	20:50	12	07:28 (6)	20:24	19:34	18:41	16:56	16:37
9	07:40	07:16	06:34	06:40	05:56	05:33		07:06 (6)	05:41		07:16 (6)	06:10	06:43	07:16	06:53	07:28
	16:55	17:34	18:09	19:45	20:17	20:46	18	07:24 (6)	20:50	10	07:26 (6)	20:23	19:32	18:39	16:55	16:37
10	07:40	07:15	06:32	06:39	05:55	05:33		07:05 (6)	05:42		07:19 (6)	06:11	06:44	07:17	06:54	07:29
	16:56	17:35	18:10	19:46	20:18	20:46	20	07:25 (6)	20:50	6	07:25 (6)	20:21	19:30	18:38	16:54	16:37
11	07:39	07:14	06:31	06:37	05:54	05:32		07:05 (6)	05:42			06:12	06:45	07:18	06:56	07:30
	16:57	17:36	18:11	19:47	20:20	20:47	20	07:25 (6)	20:49			20:20	19:29	18:36	16:52	16:37
12	07:39	07:12	06:29	06:35	05:52	05:32		07:05 (6)	05:43			06:13	06:46	07:19	06:57	07:30
	16:58	17:38	18:13	19:48	20:21	20:47	20	07:25 (6)	20:49			20:19	19:27	18:34	16:51	16:37
13	07:39	07:11	06:27	06:34	05:51	05:32		07:05 (6)	05:44			06:14	06:47	07:20	06:58	07:31
	16:59	17:39	18:14	19:49	20:22	20:48	20	07:25 (6)	20:48			20:17	19:25	18:33	16:50	16:37
14	07:38	07:10	06:25	06:32	05:50	05:32		07:05 (6)	05:45			06:15	06:48	07:21	07:00	07:32
	17:01	17:40	18:15	19:50	20:23	20:48	22	07:27 (6)	20:48			20:16	19:23	18:31	16:49	16:37
15	07:38	07:08	06:24	06:30	05:49	05:32		07:05 (6)	05:46			06:16	06:49	07:23	07:01	07:33
	17:02	17:42	18:16	19:51	20:24	20:49	22	07:27 (6)	20:47			20:14	19:21	18:29	16:49	16:38
16	07:38	07:07	06:22	06:29	05:48	05:32		07:05 (6)	05:46			06:17	06:50	07:24	07:02	07:33
	17:03	17:43	18:17	19:53	20:25	20:49	22	07:27 (6)	20:46			20:13	19:20	18:28	16:48	16:38
17	07:37	07:05	06:20	06:27	05:47	05:32		07:05 (6)	05:47			06:18	06:51	07:25	07:03	07:34
	17:04	17:44	18:18	19:54	20:26	20:50	22	07:27 (6)	20:46			20:11	19:18	18:26	16:47	16:38
18	07:36	07:04	06:19	06:26	05:46	05:32		07:05 (6)	05:48			06:19	06:53	07:26	07:04	07:35
	17:05	17:45	18:20	19:55	20:27	20:50	22	07:27 (6)	20:45			20:10	19:16	18:25	16:46	16:39
19	07:36	07:03	06:17	06:24	05:45	05:32		07:05 (6)	05:49			06:21	06:54	07:27	07:06	07:35
	17:07	17:47	18:21	19:56	20:28	20:50	22	07:27 (6)	20:44			20:08	19:14	18:23	16:45	16:39
20	07:35	07:01	06:15	06:22	05:44	05:33		07:06 (6)	05:50			06:22	06:55	07:28	07:07	07:36
	17:08	17:48	18:22	19:57	20:29	20:51	22	07:28 (6)	20:44			20:07	19:13	18:21	16:44	16:39
21	07:35	07:00	06:13	06:21	05:43	05:33		07:06 (6)	05:51			06:23	06:56	07:30	07:08	07:37
	17:09	17:49	18:23	19:58	20:30	20:51	22	07:28 (6)	20:43			20:05	19:11	18:20	16:44	16:40
22	07:34	06:58	06:12	06:19	05:43	05:33		07:06 (6)	05:52			06:24	06:57	07:31	07:09	07:37
	17:10	17:50	18:24	19:59	20:31	20:51	22	07:28 (6)	20:42			20:04	19:09	18:18	16:43	16:40
23	07:33	06:57	06:10	06:18	05:42	05:33		07:06 (6)	05:53			06:25	06:58	07:32	07:11	07:38
	17:12	17:52	18:25	20:01	20:32	20:52	22	07:28 (6)	20:41			20:02	19:07	18:17	16:42	16:41
24	07:32	06:55	06:08	06:16	05:41	05:33		07:07 (6)	05:54			06:26	06:59	07:33	07:12	07:38
	17:13	17:53	18:26	20:01	20:33	20:52	22	07:29 (6)	20:40			20:01	19:05	18:15	16:42	16:41
25	07:32	06:54	06:06	06:15	05:40	05:34		07:07 (6)	05:55			06:27	07:00	06:34	07:13	07:38
	17:14	17:54	18:28	20:02	20:34	20:52	22	07:29 (6)	20:39			19:57	19:04	17:14	16:41	16:42
26	07:31	06:52	06:05	06:13	05:39	05:34		07:07 (6)	05:56			06:28	07:01	06:36	07:14	07:39
	17:15	17:56	18:29	20:03	20:35	20:52	22	07:29 (6)	20:39			19:56	19:02	17:13	16:41	16:43
27	07:30	06:50	06:03	06:12	05:39	05:34		07:08 (6)	05:57			06:29	07:02	06:37	07:15	07:39
	17:17	17:57	18:30	20:04	20:36	20:52	22	07:30 (6)	20:38			19:54	19:00	17:11	16:40	16:43
28	07:29	06:49	06:01	06:10	05:38	05:35		07:08 (6)	05:57			06:30	07:03	06:38	07:16	07:39
	17:18	17:58	18:31	20:05	20:37	20:52	22	07:30 (6)	20:37			19:53	18:58	17:10	16:40	16:44
29	07:28		05:59	06:09	05:37	05:35		07:08 (6)	05:58			06:31	07:04	06:39	07:18	07:40
	17:19		18:32	20:06	20:37	20:52	20	07:28 (6)	20:36			19:51	18:57	17:08	16:39	16:45
30	07:27		05:58	06:08	05:37	05:36		07:09 (6)	05:59			06:32	07:06	06:41	07:19	07:40
	17:21		18:33	20:07	20:38	20:52	20	07:29 (6)	20:35			19:49	18:55	17:07	16:39	16:45
31	07:26		05:56		05:36				06:01			06:33		06:42		07:40
	17:22		18:34		20:39				20:33			19:48		17:06		16:46
Potential sun hours	293	295	370	209	-292	-263			-280			-145	375	343	294	283
Total, worst case							548		148							
Sun reduction							0.55		0.65							
Oper. time red.							0.86		0.86							
Wind dir. red.							0.60		0.60							
Total reduction							0.28		0.33							
Total, real							155		49							

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	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, North part
16 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
1000 meter max shadow distance applied along with default 3° inclination
Sunshine probabilities applied (pdf plots)
Directional run-hours applied from tab file (tower 1)
.

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03/05/06 23:47 / 56
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7660 Whitegate Avenue
US-RIVERSIDE, CA 92506

Calculated:
03/02/06 05:47/2.4.0.67

SHADOW - Calendar

Calculation: North part **Shadow receptor:** 682 - 682

Assumptions for shadow calculations

Maximum distance for influence	1,000	m
Minimum sun height over horizon for influence	3	°
Day step for calculation	1	days
Time step for calculation	2	minutes

Sun shine probabilities (part of time from sun rise to sun set with sun shine)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.35	0.45	0.45	0.55	0.55	0.55	0.65	0.55	0.55	0.45	0.35	0.30

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
475	585	238	199	220	474	1,184	813	840	1,246	803	479	7,555

	January	February	March	April	May	June		July	August	September	October	November	December
1	07:40	07:25	06:47	05:54	06:06	05:36		05:36	06:02	06:34	07:07	06:43	07:20
	16:47	17:23	17:59	18:36	20:08	20:40		20:52	20:32	19:46	18:53	17:04	16:38
2	07:40	07:24	06:46	05:52	06:05	05:35		05:37	06:03	06:36	07:08	06:44	07:21
	16:48	17:24	18:00	18:37	20:10	20:41		20:52	20:31	19:44	18:51	17:03	16:38
3	07:40	07:23	06:44	05:51	06:03	05:35		05:37	06:04	06:37	07:09	06:46	07:22
	16:49	17:26	18:02	18:38	20:11	20:42		20:52	20:30	19:42	18:50	17:02	16:38
4	07:40	07:22	06:42	05:49	06:02	05:34		05:38	06:05	06:38	07:10	06:47	07:23
	16:50	17:27	18:03	18:39	20:12	20:42		20:51	20:29	19:41	18:48	17:00	16:38
5	07:40	07:21	06:41	06:47	06:01	05:34		05:38	06:06	06:39	07:11	06:48	07:24
	16:51	17:28	18:04	19:40	20:13	20:43		20:51	20:28	19:39	18:46	16:59	16:37
6	07:40	07:20	06:39	06:45	06:00	05:34		05:39	06:07	06:40	07:12	06:49	07:25
	16:52	17:30	18:05	19:41	20:14	20:44		20:51	20:26	19:37	18:44	16:58	16:37
7	07:40	07:19	06:37	06:44	05:58	05:33		05:40	06:08	06:41	07:13	06:51	07:26
	16:53	17:31	18:07	19:42	20:15	20:44		20:51	20:25	19:36	18:43	16:57	16:37
8	07:40	07:17	06:36	06:42	05:57	05:33		05:40	06:09	06:42	07:14	06:52	07:27
	16:54	17:32	18:08	19:44	20:16	20:45		20:50	20:24	19:34	18:41	16:56	16:37
9	07:40	07:16	06:34	06:40	05:56	05:33		05:41	06:10	06:43	07:16	06:53	07:28
	16:55	17:34	18:09	19:45	20:17	20:46		20:50	20:23	19:32	18:39	16:55	16:37
10	07:40	07:15	06:32	06:39	05:55	05:33		05:42	06:11	06:44	07:17	06:54	07:29
	16:56	17:35	18:10	19:46	20:18	20:46		20:50	20:21	19:30	18:38	16:54	16:37
11	07:39	07:14	06:31	06:37	05:54	05:32		05:42	06:12	06:45	07:18	06:56	07:30
	16:57	17:36	18:11	19:47	20:20	20:47		20:49	20:20	19:29	18:36	16:52	16:37
12	07:39	07:12	06:29	06:35	05:52	05:32	07:13 (6)	05:43	06:13	06:46	07:19	06:57	07:30
	16:58	17:38	18:12	19:48	20:21	20:47	4 07:17 (6)	20:49	20:19	19:27	18:34	16:51	16:37
13	07:39	07:11	06:27	06:34	05:51	05:32	07:13 (6)	05:44	06:14	06:47	07:20	06:58	07:31
	16:59	17:39	18:14	19:49	20:22	20:48	6 07:19 (6)	20:48	20:17	19:25	18:33	16:50	16:37
14	07:38	07:10	06:25	06:32	05:50	05:32	07:11 (6)	05:45	06:15	06:48	07:21	07:00	07:32
	17:01	17:40	18:15	19:50	20:23	20:48	10 07:21 (6)	20:48	20:16	19:23	18:31	16:49	16:37
15	07:38	07:08	06:24	06:30	05:49	05:32	07:11 (6)	05:46	06:16	06:49	07:23	07:01	07:33
	17:02	17:42	18:16	19:51	20:24	20:49	10 07:21 (6)	20:47	20:14	19:21	18:29	16:49	16:38
16	07:38	07:07	06:22	06:29	05:48	05:32	07:11 (6)	05:46	06:17	06:50	07:24	07:02	07:33
	17:03	17:43	18:17	19:53	20:25	20:49	10 07:21 (6)	20:46	20:13	19:20	18:28	16:48	16:38
17	07:37	07:05	06:20	06:27	05:47	05:32	07:11 (6)	05:47	06:18	06:51	07:25	07:03	07:34
	17:04	17:44	18:18	19:54	20:26	20:50	12 07:23 (6)	20:46	20:11	19:18	18:26	16:47	16:38
18	07:36	07:04	06:19	06:26	05:46	05:32	07:11 (6)	05:48	06:19	06:53	07:26	07:04	07:35
	17:05	17:45	18:20	19:55	20:27	20:50	12 07:23 (6)	20:45	20:10	19:16	18:25	16:46	16:39
19	07:36	07:03	06:17	06:24	05:45	05:32	07:11 (6)	05:49	06:21	06:54	07:27	07:06	07:35
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20	07:35	07:01	06:15	06:22	05:44	05:32	07:12 (6)	05:50	06:22	06:55	07:28	07:07	07:36
	17:08	17:48	18:22	19:57	20:29	20:51	12 07:24 (6)	20:44	20:07	19:13	18:21	16:44	16:39
21	07:35	07:00	06:13	06:21	05:43	05:33	07:12 (6)	05:51	06:23	06:56	07:30	07:08	07:37
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22	07:34	06:58	06:12	06:19	05:43	05:33	07:12 (6)	05:52	06:24	06:57	07:31	07:09	07:37
	17:10	17:50	18:24	19:59	20:31	20:51	12 07:24 (6)	20:42	20:04	19:09	18:18	16:43	16:40
23	07:33	06:57	06:10	06:18	05:42	05:33	07:12 (6)	05:53	06:25	06:58	07:32	07:11	07:38
	17:12	17:52	18:25	20:01	20:32	20:52	12 07:24 (6)	20:41	20:02	19:07	18:17	16:42	16:41
24	07:32	06:55	06:08	06:16	05:41	05:33	07:13 (6)	05:54	06:26	06:59	07:33	07:12	07:38
	17:13	17:53	18:26	20:01	20:33	20:52	12 07:25 (6)	20:40	20:01	19:05	18:15	16:42	16:41
25	07:32	06:54	06:06	06:15	05:40	05:34	07:13 (6)	05:55	06:27	07:00	06:34	07:13	07:38
	17:14	17:54	18:28	20:02	20:34	20:52	12 07:25 (6)	20:39	19:57	19:04	17:14	16:41	16:42
26	07:31	06:52	06:05	06:13	05:39	05:34	07:13 (6)	05:56	06:28	07:01	06:36	07:14	07:39
	17:15	17:56	18:29	20:03	20:35	20:52	10 07:23 (6)	20:39	19:56	19:02	17:13	16:41	16:43
27	07:30	06:50	06:03	06:12	05:39	05:34	07:14 (6)	05:56	06:29	07:02	06:37	07:15	07:39
	17:17	17:57	18:30	20:04	20:36	20:52	10 07:24 (6)	20:38	19:54	19:00	17:11	16:40	16:43
28	07:29	06:49	06:01	06:10	05:38	05:35	07:14 (6)	05:57	06:30	07:03	06:38	07:16	07:39
	17:18	17:58	18:31	20:05	20:37	20:52	10 07:24 (6)	20:37	19:53	18:58	17:10	16:40	16:44
29	07:28		05:59	06:09	05:37	05:35	07:16 (6)	05:58	06:31	07:04	06:39	07:18	07:40
	17:19		18:32	20:06	20:37	20:52	6 07:22 (6)	20:36	19:51	18:57	17:08	16:39	16:45
30	07:27		05:58	06:08	05:37	05:36	07:17 (6)	05:59	06:32	07:06	06:41	07:19	07:40
	17:21		18:33	20:07	20:38	20:52	6 07:23 (6)	20:35	19:49	18:55	17:07	16:39	16:45
31	07:26		05:56		05:36			06:01	06:33		06:42		07:40
	17:22		18:34		20:39			20:33	19:48		17:06		16:46
Potential sun hours	293	295	370	209	-292	-263		-280	-145	375	343	294	283
Total, worst case						190							
Sun reduction						0.55							
Oper. time red.						0.86							
Wind dir. red.						0.60							
Total reduction						0.28							
Total, real						54							

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	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, North part
16 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
1000 meter max shadow distance applied along with default 3° inclination
Sunshine probabilities applied (pdf plots)
Directional run-hours applied from tab file (tower 1)
.

Printed/Page
03/05/06 23:47 / 57
Licensed user:
Wind Engineers, Inc.
7660 Whitegate Avenue
US-RIVERSIDE, CA 92506

Calculated:
03/02/06 05:47/2.4.0.67

SHADOW - Calendar

Calculation: North part **Shadow receptor:** 685 - 685

Assumptions for shadow calculations

Maximum distance for influence	1,000 m
Minimum sun height over horizon for influence	3 °
Day step for calculation	1 days
Time step for calculation	2 minutes

Sun shine probabilities (part of time from sun rise to sun set with sun shine)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.35	0.45	0.45	0.55	0.55	0.55	0.65	0.55	0.55	0.45	0.35	0.30

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
475	585	238	199	220	474	1,184	813	840	1,246	803	479	7,555

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:40	07:25	06:47	05:54	06:06	05:36	05:36	06:01 (15)	06:01	06:34	07:03 (14)	07:07	06:43	07:20
	16:47	17:23	17:59	18:35	20:08	20:40 18	06:16 (15)	20:52 24	06:25 (15)	20:32	19:46 32	07:35 (14)	18:53	17:04	16:38
2	07:40	07:24	06:45	05:52	06:05	05:35	05:58 (15)	05:37	06:02 (15)	06:02	06:35	07:02 (14)	07:08	06:44	07:21
	16:48	17:24	18:00	18:37	20:10	20:41 20	06:18 (15)	20:52 24	06:26 (15)	20:31	19:44 32	07:34 (14)	18:51	17:03	16:38
3	07:40	07:23	06:44	05:51	06:16 (14) 06:03	05:35	05:57 (15)	05:37	06:02 (15)	06:04	06:37	07:03 (14)	07:09	06:46	07:22
	16:49	17:26	18:02	18:38 12	06:28 (14) 20:11	20:41 20	06:17 (15)	20:52 22	06:24 (15)	20:30	19:42 30	07:33 (14)	18:50	17:02	16:38
4	07:40	07:22	06:42	05:49	06:14 (14) 06:02	05:34	05:59 (15)	05:38	06:03 (15)	06:05	06:38	07:02 (14)	07:10	06:47	07:23
	16:50	17:27	18:03	18:39 16	06:30 (14) 20:12	20:42 20	06:19 (15)	20:51 22	06:25 (15)	20:29	19:41 30	07:32 (14)	18:48	17:00	16:38
5	07:40	07:21	06:41	06:47	07:10 (14) 06:01	05:34	05:58 (15)	05:38	06:04 (15)	06:06	06:39	07:03 (14)	07:11	06:48	07:24
	16:51	17:28	18:04	19:40 22	07:32 (14) 20:13	20:43 20	06:18 (15)	20:51 22	06:26 (15)	20:28	19:39 28	07:31 (14)	18:46	16:59	16:37
6	07:40	07:20	06:39	06:45	07:09 (14) 06:00	05:34	05:58 (15)	05:39	06:04 (15)	06:07	06:40	07:04 (14)	07:12	06:49	07:25
	16:52	17:30	18:05	19:41 26	07:35 (14) 20:14	20:44 20	06:18 (15)	20:51 22	06:26 (15)	20:26	19:37 26	07:30 (14)	18:44	16:58	16:37
7	07:40	07:18	06:37	06:44	07:07 (14) 05:58	05:33	05:58 (15)	05:40	06:05 (15)	06:08	06:41	07:06 (14)	07:13	06:51	07:26
	16:53	17:31	18:06	19:42 28	07:35 (14) 20:15	20:44 22	06:20 (15)	20:51 20	06:25 (15)	20:25	19:35 22	07:28 (14)	18:43	16:57	16:37
8	07:40	07:17	06:36	06:42	07:05 (14) 05:57	05:33	05:58 (15)	05:40	06:05 (15)	06:09	06:42	07:09 (14)	07:14	06:52	07:27
	16:54	17:32	18:08	19:43 30	07:35 (14) 20:16	20:45 22	06:20 (15)	20:50 20	06:25 (15)	20:24	19:34 18	07:27 (14)	18:41	16:56	16:37
9	07:40	07:16	06:34	06:40	07:06 (14) 05:56	05:33	05:58 (15)	05:41	06:04 (15)	06:10	06:43	07:10 (14)	07:16	06:53	07:28
	16:55	17:34	18:09	19:45 30	07:36 (14) 20:17	20:46 22	06:20 (15)	20:50 20	06:24 (15)	20:23	19:32 12	07:22 (14)	18:39	16:55	16:37
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11	07:39	07:14	06:30	06:37	07:04 (14) 05:53	05:32	05:57 (15)	05:42	06:06 (15)	06:12	06:45		07:18	06:56	07:29
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	16:58	17:38	18:12	19:48 34	07:37 (14) 20:21	20:47 24	06:21 (15)	20:49 18	06:24 (15)	20:18	19:27		18:34	16:51	16:37
13	07:39	07:11	06:27	06:34	07:03 (14) 05:51	05:32	05:57 (15)	05:44	06:07 (15)	06:14	06:47		07:20	06:58	07:31
	16:59	17:39	18:14	19:49 32	07:35 (14) 20:22	20:48 24	06:21 (15)	20:48 16	06:23 (15)	20:17	19:25		18:33	16:50	16:37
14	07:38	07:10	06:25	06:32	07:01 (14) 05:50	05:32	05:57 (15)	05:45	06:10 (15)	06:15	06:48		07:21	06:59	07:32
	17:01	17:40	18:15	19:50 34	07:35 (14) 20:23	20:48 24	06:21 (15)	20:48 12	06:22 (15)	20:16	19:23		18:31	16:49	16:37
15	07:38	07:08	06:24	06:30	07:02 (14) 05:49	05:32	05:59 (15)	05:46	06:11 (15)	06:16	06:49		07:22	07:01	07:33
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16	07:37	07:07	06:22	06:29	07:02 (14) 05:48	05:32	05:59 (15)	05:46	06:11 (15)	06:17	06:50		07:24	07:02	07:33
	17:03	17:43	18:17	19:53 32	07:34 (14) 20:25	20:49 24	06:23 (15)	20:46 8	06:19 (15)	20:13	19:20		18:28	16:48	16:38
17	07:37	07:05	06:20	06:27	07:03 (14) 05:47	05:32	05:59 (15)	05:47	06:14 (15)	06:18	06:51		07:25	07:03	07:34
	17:04	17:44	18:18	19:54 32	07:35 (14) 20:26	20:50 24	06:23 (15)	20:46 4	06:18 (15)	20:11	19:18		18:26	16:47	16:38
18	07:36	07:04	06:18	06:26	07:03 (14) 05:46	05:32	05:59 (15)	05:48	06:19	07:17 (14)	06:52		07:26	07:04	07:35
	17:05	17:45	18:19	19:55 30	07:33 (14) 20:27	20:50 24	06:23 (15)	20:45	20:10 10	07:27 (14)	19:16		18:25	16:46	16:38
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23	07:33	06:57	06:10	06:18	07:07 (14) 05:42	05:33	06:00 (15)	05:53	06:25	07:08 (14)	06:58		07:32	07:10	07:37
	17:11	17:52	18:25	20:00 18	07:25 (14) 20:32	20:51 24	06:24 (15)	20:41	20:02 28	07:36 (14)	19:07		18:17	16:42	16:41
24	07:32	06:55	06:08	06:16	07:08 (14) 05:41	05:33	06:01 (15)	05:54	06:26	07:07 (14)	06:59		07:33	07:12	07:38
	17:13	17:53	18:26	20:00 16	07:24 (14) 20:33	20:52 24	06:25 (15)	20:40	20:01 28	07:35 (14)	19:05		18:15	16:42	16:41
25	07:32	06:53	06:06	06:15	07:13 (14) 05:40	05:34	06:01 (15)	05:54	06:27	07:06 (14)	07:00		06:34	07:13	07:38
	17:14	17:54	18:28	20:02 8	07:21 (14) 20:34	20:52 24	06:25 (15)	20:39	19:57 30	07:36 (14)	19:04		17:14	16:41	16:42
26	07:31	06:52	06:04	06:13	05:39	05:34	06:01 (15)	05:55	06:28	07:05 (14)	07:01		06:36	07:14	07:39
	17:15	17:55	18:29	20:03	20:35	20:52 24	06:25 (15)	20:38	19:56 32	07:37 (14)	19:02		17:12	16:40	16:43
27	07:30	06:50	06:03	06:12	05:39 06:03 (15)	05:34	06:02 (15)	05:56	06:29	07:04 (14)	07:02		06:37	07:15	07:39
	17:17	17:57	18:30	20:04	20:36 8 06:11 (15)	20:52 22	06:24 (15)	20:37	19:54 32	07:36 (14)	19:00		17:11	16:40	16:43
28	07:29	06:49	06:01	06:10	05:38 06:02 (15)	05:35	06:00 (15)	05:57	06:30	07:03 (14)	07:03		06:38	07:16	07:39
	17:18	17:58	18:31	20:05	20:36 10 06:12 (15)	20:52 24	06:24 (15)	20:37	19:52 34	07:37 (14)	18:58		17:10	16:40	16:44
29	07:28		05:59	06:09	05:37 06:01 (15)	05:35	06:00 (15)	05:58	06:31	07:02 (14)	07:04		06:39	07:17	07:40
	17:19		18:32	20:06	20:37 12 06:13 (15)	20:52 24	06:24 (15)	20:35	19:51 34	07:36 (14)	18:57		17:08	16:39	16:45
30	07:27		05:57	06:08	05:37 05:59 (15)	05:36	06:01 (15)	05:59	06:32	07:03 (14)	07:05		06:41	07:19	07:40
	17:20		18:33	20:07	20:38 16 06:15 (15)	20:52 24	06:25 (15)	20:34	19:49 32	07:35 (14)	18:55		17:07	16:39	16:45
31	07:26		05:56		05:36 05:58 (15)			06:00	06:33	07:02 (14)			06:42		07:40
	17:22		18:34		20:39 18 06:16 (15)			20:33	19:47 34	07:36 (14)			17:06		16:46
Potential sun hours	293	295	370	209	-292	-263	-280	-145	375		343	294	283		
Total, worst case				604	64	684	304	382	230						
Sun reduction				0.55	0.55	0.55	0.65	0.55	0.55						
Oper. time red.				0.86	0.86	0.86	0.86	0.86	0.86						
Wind dir. red.				0.61	0.63	0.63	0.63	0.61	0.61						
Total reduction				0.29	0.30	0.30	0.35	0.29	0.29						
Total, real				174	19	204	107	110	66						

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	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, North part
16 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
1000 meter max shadow distance applied along with default 3° inclination
Sunshine probabilities applied (pdf plots)
Directional run-hours applied from tab file (tower 1)
.

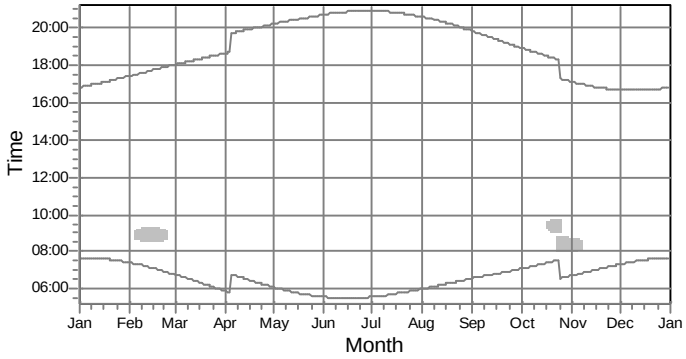
Printed/Page
03/05/06 23:47 / 58
Licensed user:
Wind Engineers, Inc.
7660 Whitegate Avenue
US-RIVERSIDE, CA 92506

Calculated:
03/02/06 05:47/2.4.0.67

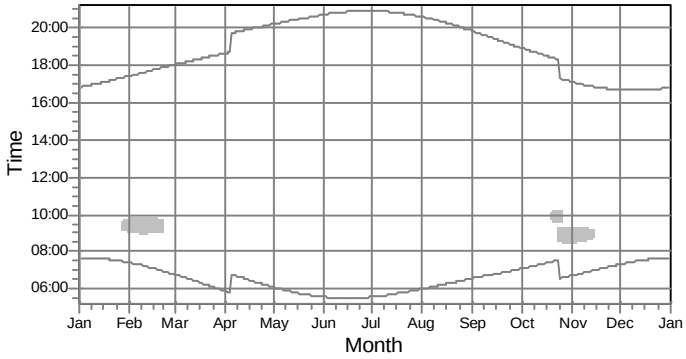
SHADOW - Calendar, graphical

Calculation: North part

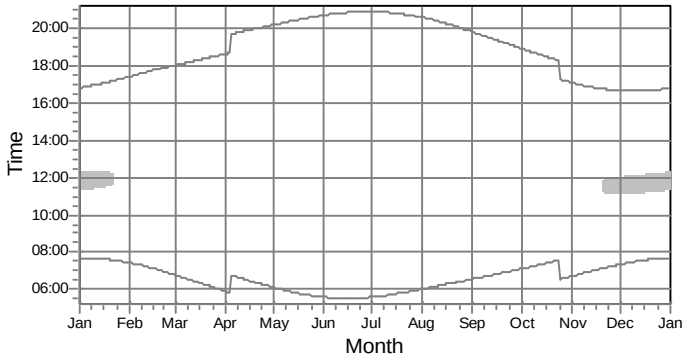
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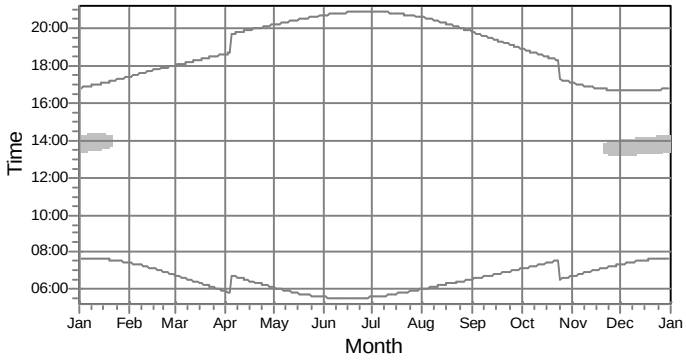
644: 644



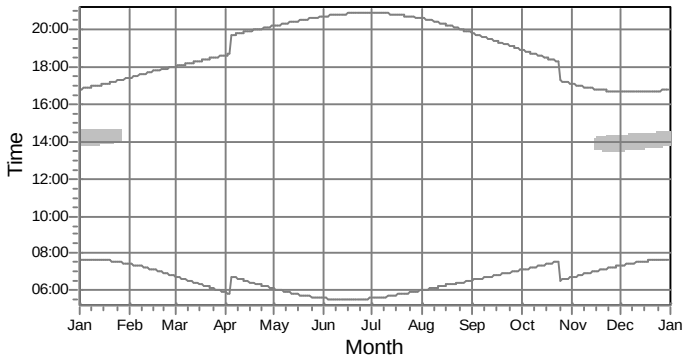
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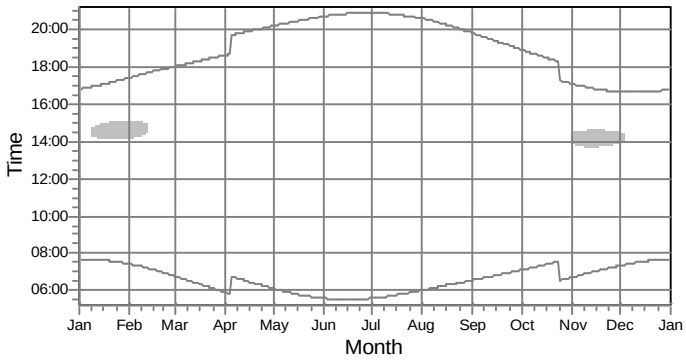
646: 646



647: 647



648: 648



WTGs

01

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, North part
16 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
1000 meter max shadow distance applied along with default 3° inclination
Sunshine probabilities applied (pdf plots)
Directional run-hours applied from tab file (tower 1)
.

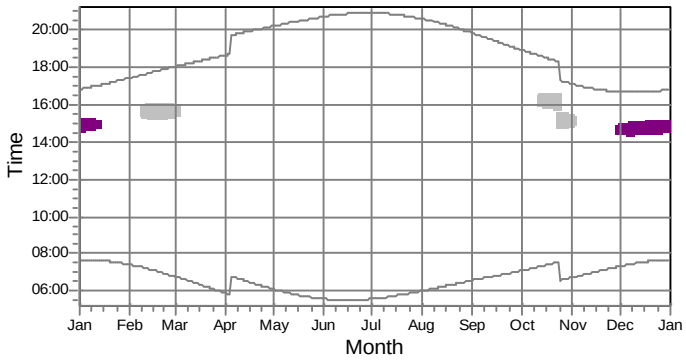
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7660 Whitegate Avenue
US-RIVERSIDE, CA 92506

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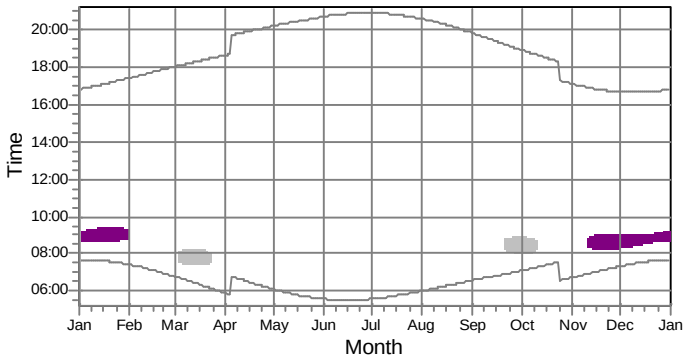
SHADOW - Calendar, graphical

Calculation: North part

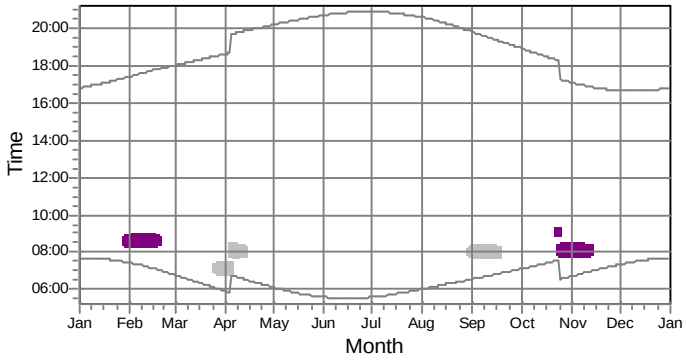
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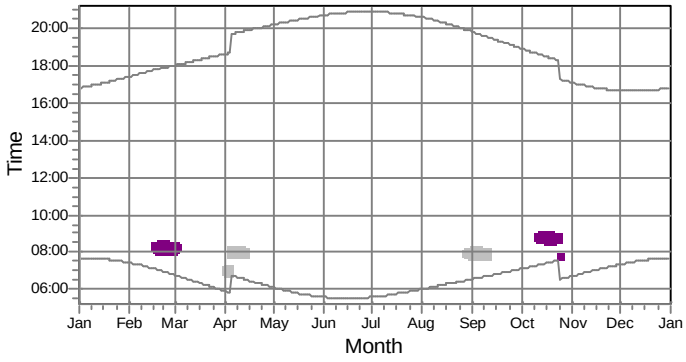
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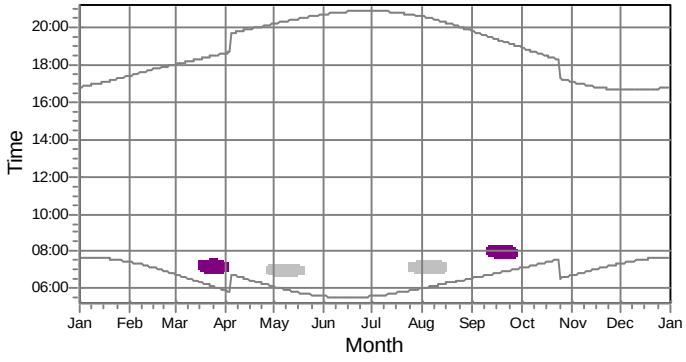
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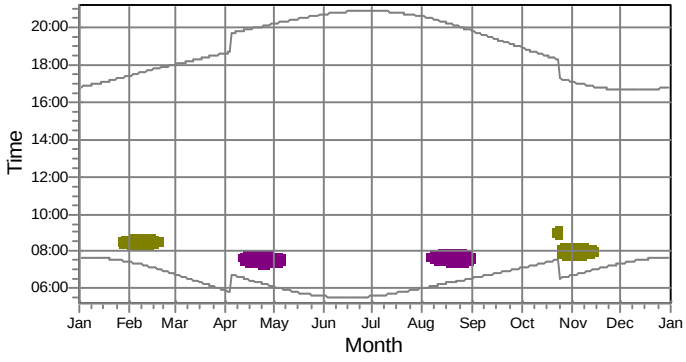
652: 652



653: 653



654: 654



WTGs

03 02 01

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, North part
16 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
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Sunshine probabilities applied (pdf plots)
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.

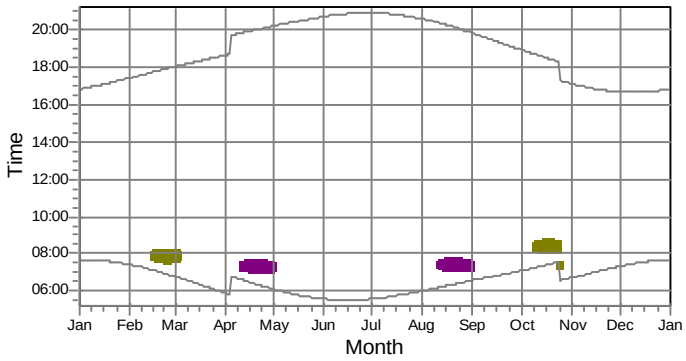
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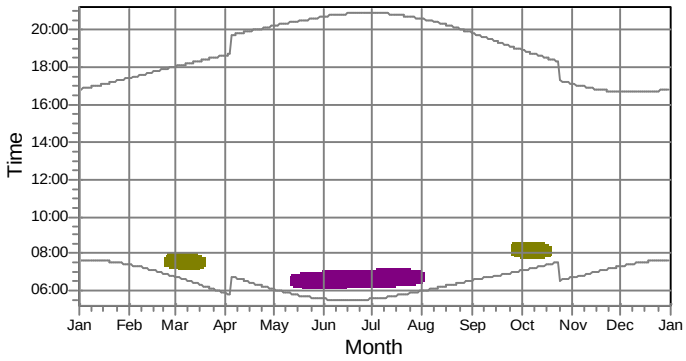
SHADOW - Calendar, graphical

Calculation: North part

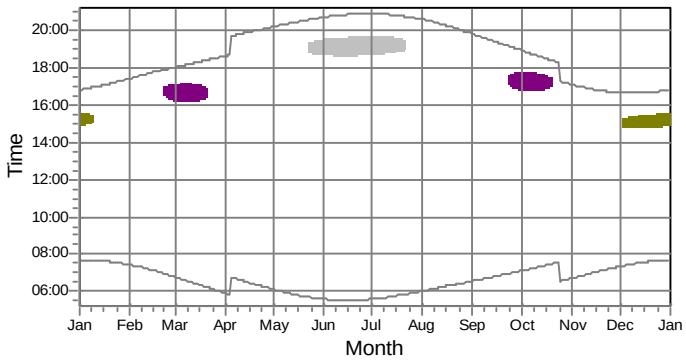
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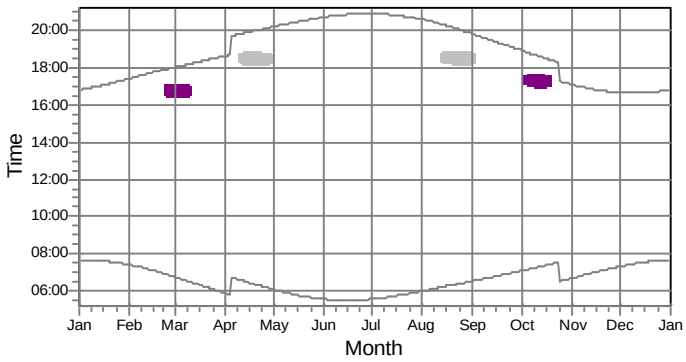
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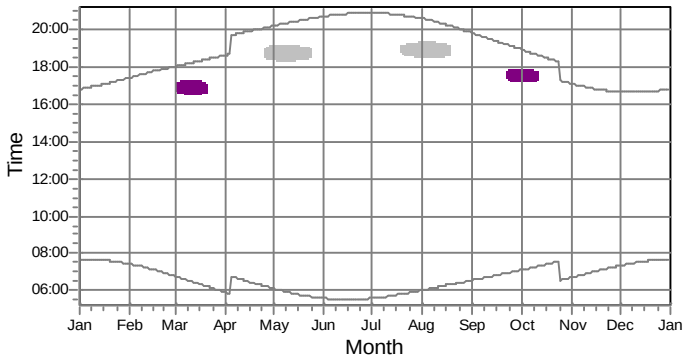
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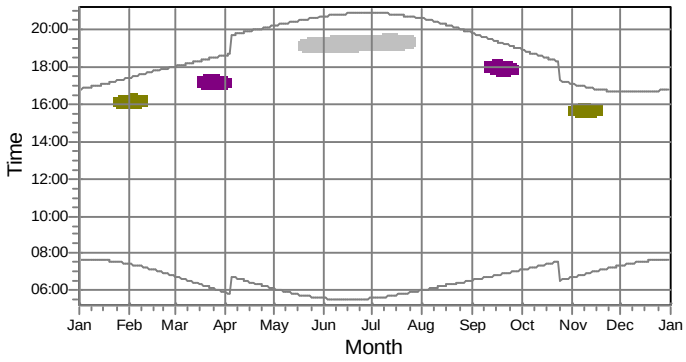
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661: 661



662: 662



WTGs

03 02 01

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, North part
16 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
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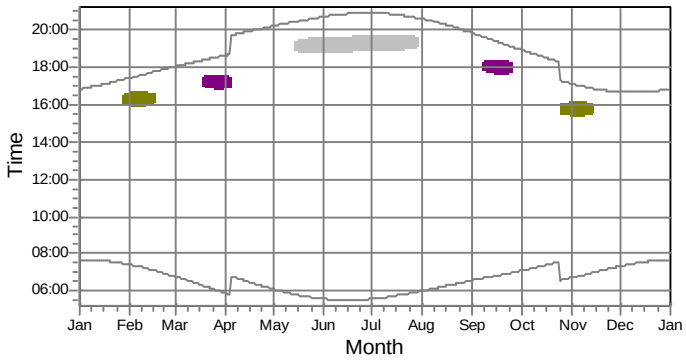
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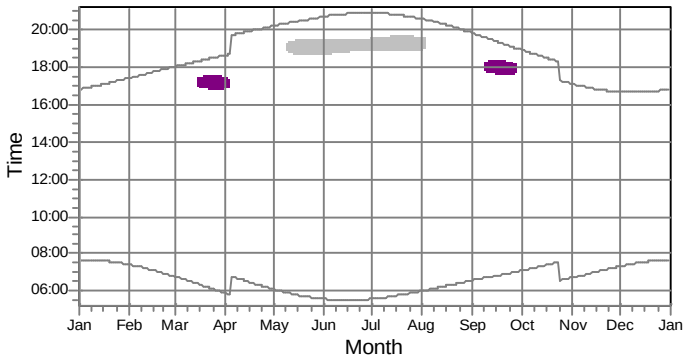
SHADOW - Calendar, graphical

Calculation: North part

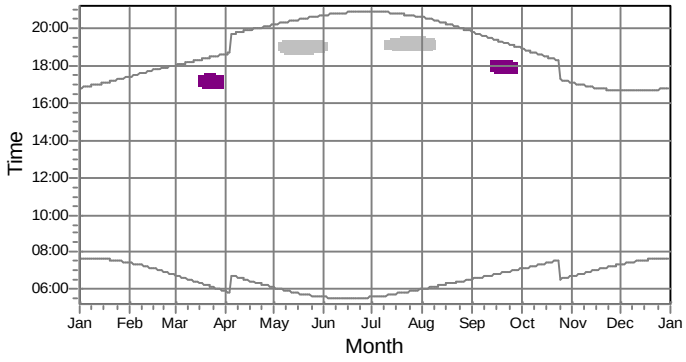
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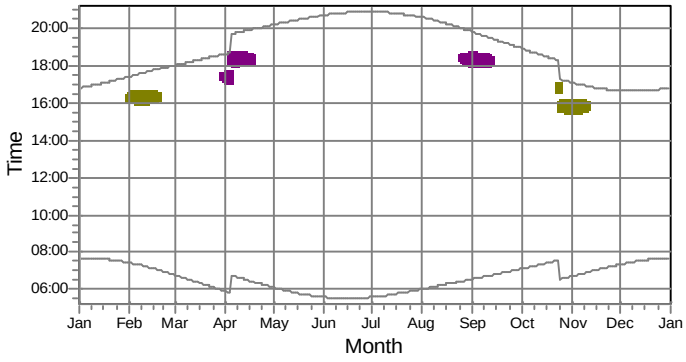
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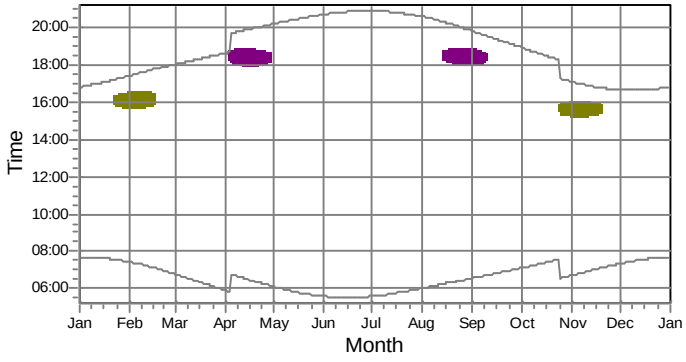
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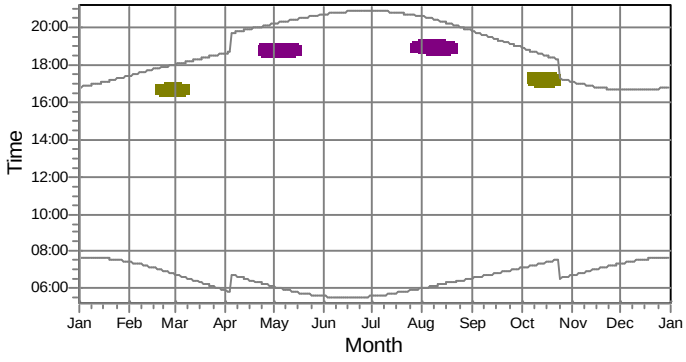
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667: 667



668: 668



WTGs

03 02 01

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, North part
16 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
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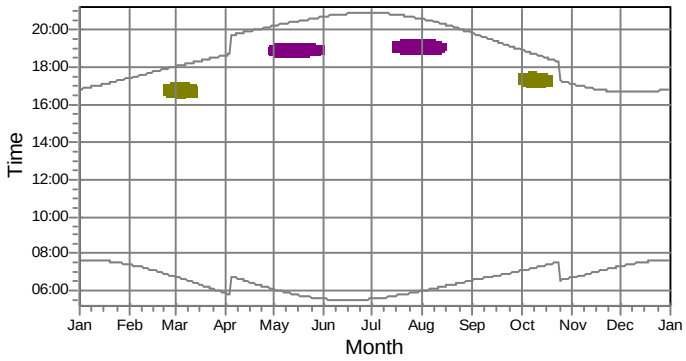
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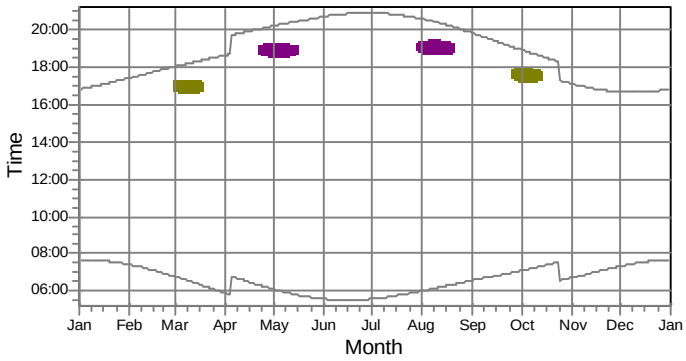
SHADOW - Calendar, graphical

Calculation: North part

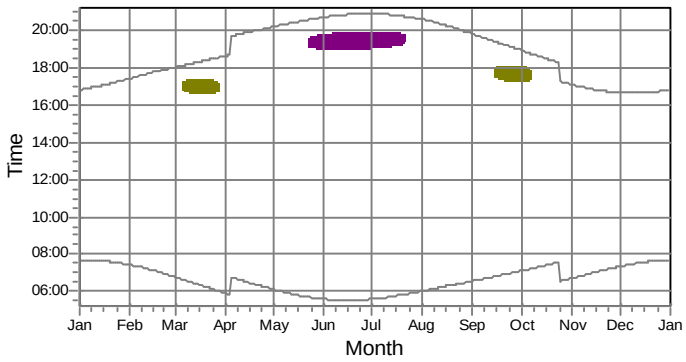
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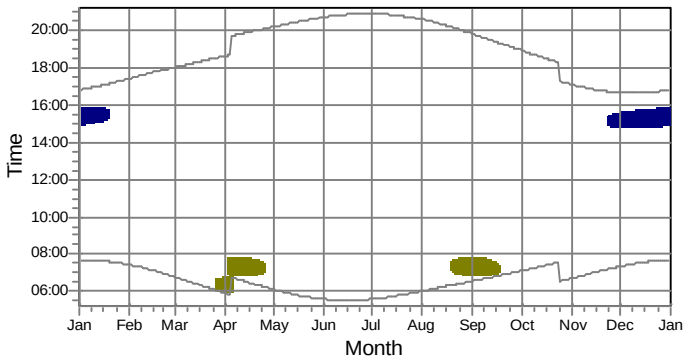
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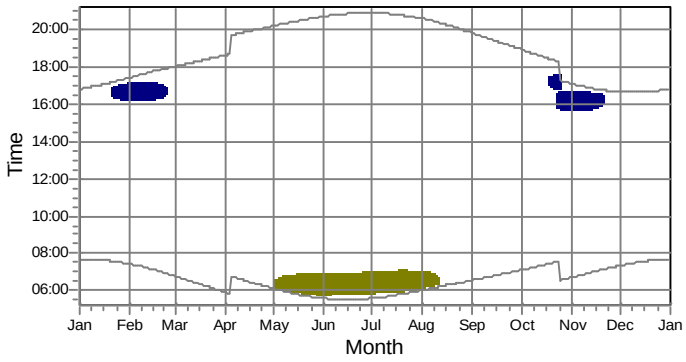
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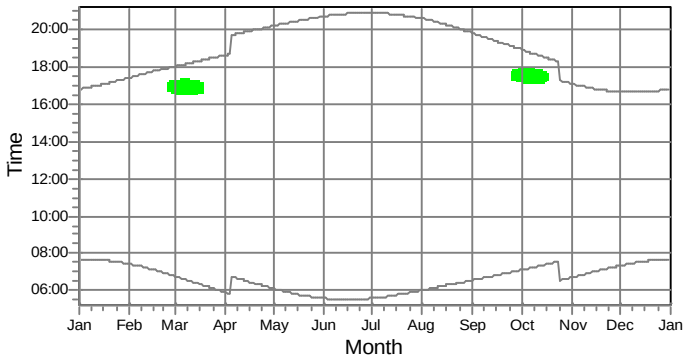
672: 672



673: 673



674: 674



WTGs

04 07 03 02

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, North part
16 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
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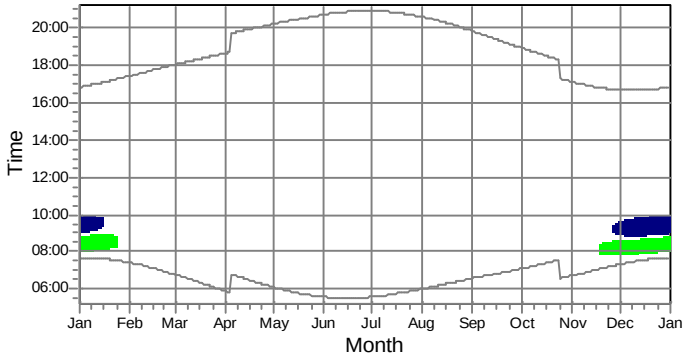
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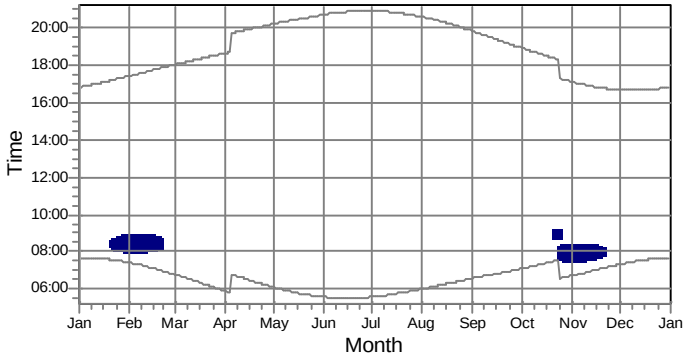
SHADOW - Calendar, graphical

Calculation: North part

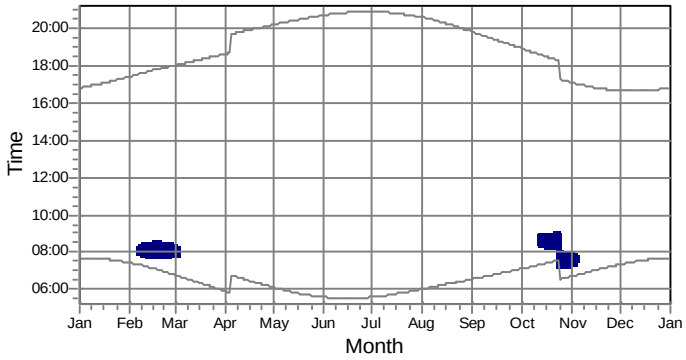
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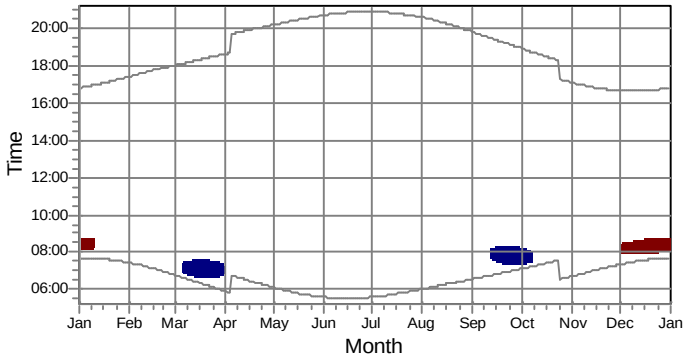
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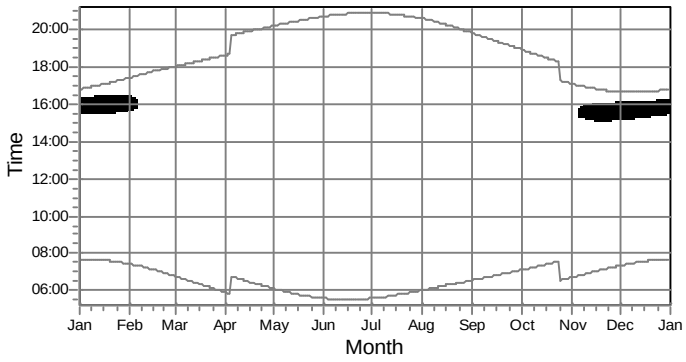
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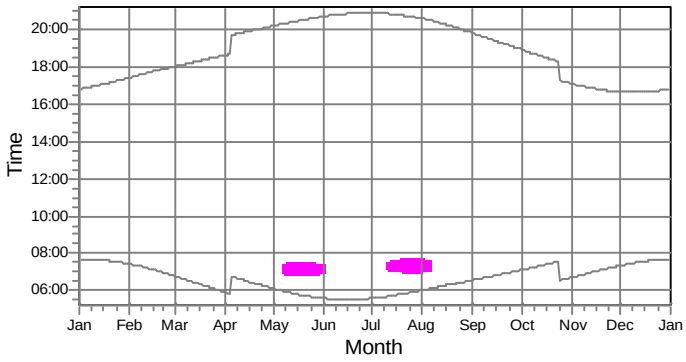
678: 678



679: 679



680: 680



WTGs

06 04 08 07 09

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, North part
16 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
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.

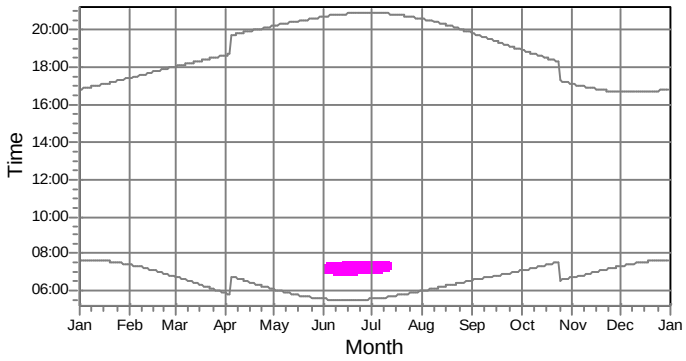
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US-RIVERSIDE, CA 92506

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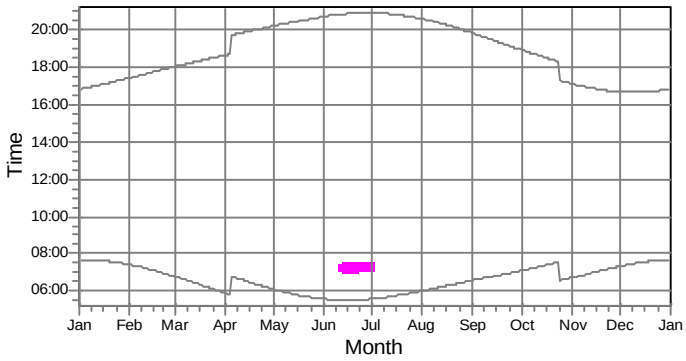
SHADOW - Calendar, graphical

Calculation: North part

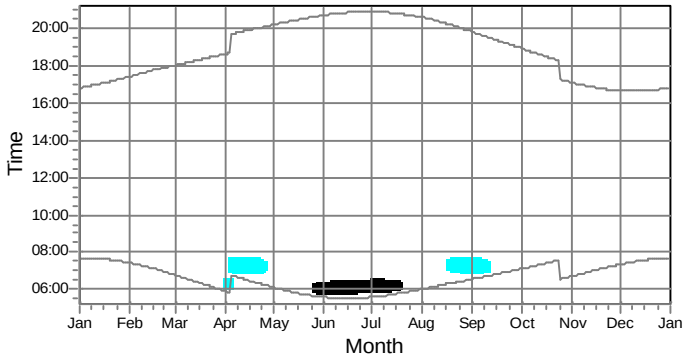
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682: 682



685: 685



WTGs

06 10 09

Project:
060226 Cohocton

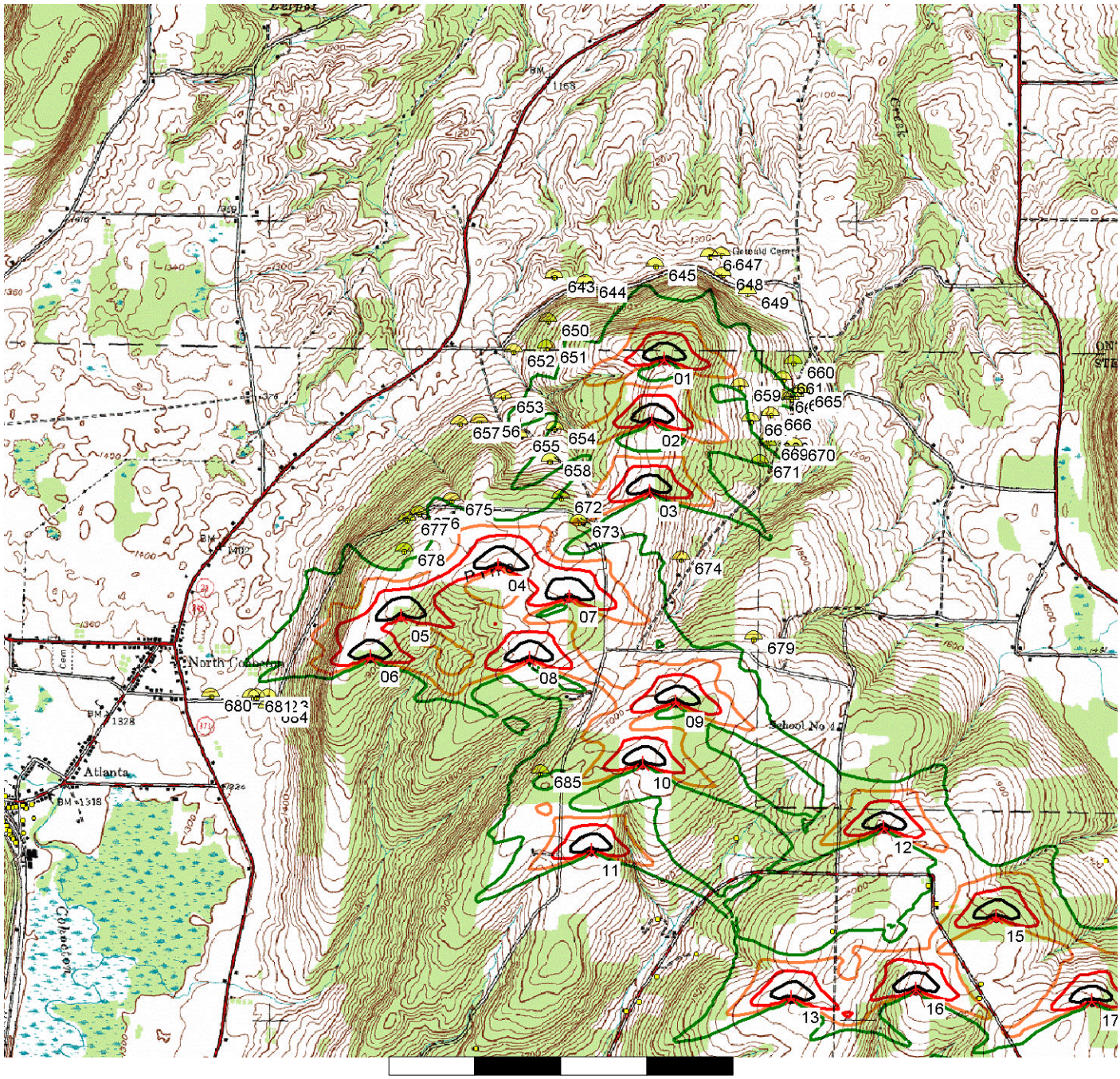
Description:
Cohocton Project
Shadow-Flicker, North part
16 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
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Sunshine probabilities applied (pdf plots)
Directional run-hours applied from tab file (tower 1)
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SHADOW - 060226 Cohocton USGS z13 w, 50k, 30x30

Calculation: North part **File:** 060226 Cohocton USGS z13 w, 50k, 30x30.bmi



Map: 060226 Cohocton USGS z13 w, 50k, 30x30 , Print scale 1:35,000, Map center UTM NAD27 Zone: 18 East: 300,000 North: 4,715,500

New WTG Shadow receptor

Isolines showing shadow in Shadow hours|per year. Real value calculation.

10 25 50 100

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, Southern part
11 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
1000 meter max shadow distance applied along with default 3° inclination
Sunshine probabilities applied (pdf plots)
Directional run-hours applied from tab file (tower 1)
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7660 Whitegate Avenue
US-RIVERSIDE, CA 92506

Calculated:
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SHADOW - Main Result

Calculation: Southern part

Assumptions for shadow calculations

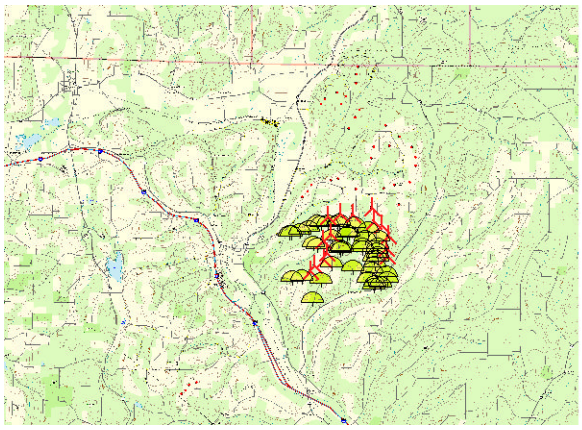
Maximum distance for influence	1,000	m
Minimum sun height over horizon for influence	3	°
Day step for calculation	1	days
Time step for calculation	2	minutes

Sun shine probabilities (part of time from sun rise to sun set with sun shine)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.35	0.45	0.45	0.55	0.55	0.55	0.65	0.55	0.55	0.45	0.35	0.30

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
475	585	238	199	220	474	1,184	813	840	1,246	803	479	7,555



Scale 1:350,000

New WTG Shadow receptor

WTGs

	UTM NAD27 Zone: 18					WTG type						
	East	North	Z [m]	Row data/Description	Valid	Manufact.	Type	Power [kW]	Diam. [m]	Height [m]	RPM [RPM]
29	298,935	4,709,555	580	29	Yes	GAMESA	G87/2000	2,000	87.0	78.0	16.7
30	299,525	4,709,635	599	30	Yes	GAMESA	G87/2000	2,000	87.0	78.0	16.7
31	300,072	4,709,586	600	31	Yes	GAMESA	G87/2000	2,000	87.0	78.0	16.7
32	300,993	4,709,880	600	32	Yes	GAMESA	G87/2000	2,000	87.0	78.0	16.7
34	301,050	4,709,272	580	34	Yes	GAMESA	G87/2000	2,000	87.0	78.0	16.7
35	301,430	4,709,068	587	35	Yes	GAMESA	G87/2000	2,000	87.0	78.0	16.7
36	301,723	4,708,552	575	36	Yes	GAMESA	G87/2000	2,000	87.0	78.0	16.7
37	301,626	4,708,006	580	37	Yes	GAMESA	G87/2000	2,000	87.0	78.0	16.7
38	301,635	4,707,653	560	38	Yes	GAMESA	G87/2000	2,000	87.0	78.0	16.7
39	299,029	4,708,734	600	39	Yes	GAMESA	G87/2000	2,000	87.0	78.0	16.7
40	298,655	4,708,456	600	40	Yes	GAMESA	G87/2000	2,000	87.0	78.0	16.7
41	298,812	4,707,854	600	41	Yes	GAMESA	G87/2000	2,000	87.0	78.0	16.7
42	298,678	4,707,540	600	42	Yes	GAMESA	G87/2000	2,000	87.0	78.0	16.7
43	298,260	4,707,296	580	43	Yes	GAMESA	G87/2000	2,000	87.0	78.0	16.7
44	298,046	4,707,041	580	44	Yes	GAMESA	G87/2000	2,000	87.0	78.0	16.7

Shadow receptor-Input

		UTM NAD27 Zone: 18							
No.	Name	East	North	Z [m]	Width [m]	Height [m]	Height a.g.l. [m]	Degrees from south cw [°]	Slope of window [°]
763	763	297,125	4,708,661	470	1.0	1.0	1.0	0.0	0.0
764	764	297,197	4,708,668	471	1.0	1.0	1.0	0.0	0.0
768	768	297,626	4,708,751	480	1.0	1.0	1.0	0.0	0.0
769	769	298,011	4,708,835	500	1.0	1.0	1.0	0.0	0.0
770	770	298,435	4,709,105	537	1.0	1.0	1.0	0.0	0.0
771	771	298,621	4,709,075	540	1.0	1.0	1.0	0.0	0.0
772	772	298,924	4,709,105	560	1.0	1.0	1.0	0.0	0.0
773	773	299,353	4,709,059	586	1.0	1.0	1.0	0.0	0.0
774	774	299,450	4,709,113	582	1.0	1.0	1.0	0.0	0.0
775	775	299,086	4,708,437	600	1.0	1.0	1.0	0.0	0.0
776	776	299,774	4,708,551	541	1.0	1.0	1.0	0.0	0.0
777	777	299,860	4,708,558	552	1.0	1.0	1.0	0.0	0.0
778	778	298,405	4,708,042	571	1.0	1.0	1.0	0.0	0.0
779	779	299,398	4,707,946	528	1.0	1.0	1.0	0.0	0.0
780	780	299,461	4,707,825	512	1.0	1.0	1.0	0.0	0.0

Continued on next page...

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, Southern part
11 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
1000 meter max shadow distance applied along with default 3° inclination
Sunshine probabilities applied (pdf plots)
Directional run-hours applied from tab file (tower 1)
.

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Calculated:
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SHADOW - Main Result

Calculation: Southern part

...continued from previous page

UTM NAD27 Zone: 18

No.	Name	East	North	Z	Width	Height	Height a.g.l.	Degrees from south cw	Slope of window
				[m]	[m]	[m]	[m]	[°]	[°]
781	781	299,540	4,707,885	520	1.0	1.0	1.0	0.0	0.0
783	783	297,208	4,706,560	534	1.0	1.0	1.0	0.0	0.0
784	784	297,658	4,706,585	580	1.0	1.0	1.0	0.0	0.0
785	785	298,515	4,706,422	480	1.0	1.0	1.0	0.0	0.0
786	786	298,122	4,705,565	440	1.0	1.0	1.0	0.0	0.0
793	793	300,980	4,706,089	420	1.0	1.0	1.0	0.0	0.0
794	794	301,003	4,706,217	433	1.0	1.0	1.0	0.0	0.0
795	795	301,294	4,706,175	420	1.0	1.0	1.0	0.0	0.0
796	796	301,583	4,706,400	420	1.0	1.0	1.0	0.0	0.0
797	797	301,553	4,706,687	443	1.0	1.0	1.0	0.0	0.0
798	798	300,703	4,706,445	457	1.0	1.0	1.0	0.0	0.0
799	799	300,020	4,706,975	460	1.0	1.0	1.0	0.0	0.0
800	800	299,034	4,707,170	564	1.0	1.0	1.0	0.0	0.0
801	801	301,053	4,707,140	499	1.0	1.0	1.0	0.0	0.0
802	802	300,916	4,706,853	481	1.0	1.0	1.0	0.0	0.0
803	803	301,027	4,707,408	500	1.0	1.0	1.0	0.0	0.0
804	804	301,180	4,707,404	525	1.0	1.0	1.0	0.0	0.0
805	805	301,199	4,707,556	526	1.0	1.0	1.0	0.0	0.0
806	806	301,156	4,707,734	529	1.0	1.0	1.0	0.0	0.0
807	807	301,201	4,707,947	553	1.0	1.0	1.0	0.0	0.0
808	808	300,504	4,707,867	560	1.0	1.0	1.0	0.0	0.0
809	809	300,484	4,707,982	543	1.0	1.0	1.0	0.0	0.0
810	810	300,642	4,708,326	558	1.0	1.0	1.0	0.0	0.0
811	811	301,240	4,708,318	560	1.0	1.0	1.0	0.0	0.0
837	837	298,222	4,708,157	580	1.0	1.0	1.0	0.0	0.0
838	838	300,786	4,708,751	558	1.0	1.0	1.0	0.0	0.0
839	839	300,170	4,708,950	589	1.0	1.0	1.0	0.0	0.0

Calculation Results

		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]
763	763	0:00	0	0:00	0:00
764	764	0:00	0	0:00	0:00
768	768	0:00	0	0:00	0:00
769	769	12:40	37	0:28	3:05
770	770	15:54	42	0:30	3:42
771	771	30:22	62	0:38	6:28
772	772	10:08	28	0:28	1:40
773	773	57:10	76	1:00	10:20
774	774	40:12	72	0:38	7:19
775	775	37:20	63	0:46	10:38
776	776	15:36	45	0:28	4:25
777	777	11:08	36	0:24	3:09
778	778	32:46	58	0:44	7:55
779	779	30:02	80	0:34	7:30
780	780	26:26	74	0:30	7:08
781	781	20:44	65	0:28	5:28
783	783	0:00	0	0:00	0:00
784	784	0:00	0	0:00	0:00
785	785	0:00	0	0:00	0:00
786	786	0:00	0	0:00	0:00
793	793	0:00	0	0:00	0:00
794	794	0:00	0	0:00	0:00
795	795	0:00	0	0:00	0:00
796	796	0:00	0	0:00	0:00
797	797	0:00	0	0:00	0:00

Continued on next page...

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, Southern part
11 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
1000 meter max shadow distance applied along with default 3° inclination
Sunshine probabilities applied (pdf plots)
Directional run-hours applied from tab file (tower 1)
.

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Calculated:
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SHADOW - Main Result

Calculation: Southern part

...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]
798	798	0:00	0	0:00	0:00
799	799	0:00	0	0:00	0:00
800	800	18:58	62	0:26	5:10
801	801	0:00	0	0:00	0:00
802	802	0:00	0	0:00	0:00
803	803	18:34	48	0:28	5:41
804	804	0:00	0	0:00	0:00
805	805	68:42	108	0:46	20:28
806	806	27:02	52	0:40	7:14
807	807	85:18	153	0:48	22:18
808	808	0:00	0	0:00	0:00
809	809	0:00	0	0:00	0:00
810	810	0:00	0	0:00	0:00
811	811	60:04	127	0:42	13:36
837	837	17:30	44	0:32	4:07
838	838	15:54	59	0:22	4:23
839	839	10:50	45	0:22	3:21

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, Southern part
11 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
1000 meter max shadow distance applied along with default 3° inclination
Sunshine probabilities applied (pdf plots)
Directional run-hours applied from tab file (tower 1)
.

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Calculated:
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SHADOW - Calendar

Calculation: Southern part **Shadow receptor:** 769 - 769

Assumptions for shadow calculations

Maximum distance for influence	1,000 m
Minimum sun height over horizon for influence	3 °
Day step for calculation	1 days
Time step for calculation	2 minutes

Sun shine probabilities (part of time from sun rise to sun set with sun shine)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.35	0.45	0.45	0.55	0.55	0.55	0.65	0.55	0.55	0.45	0.35	0.30

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
475	585	238	199	220	474	1,184	813	840	1,246	803	479	7,555

	January	February		March	April	May	June	July	August	September	October		November	December
1	07:40	07:25		06:47	05:54	06:06	05:36	05:36	06:02	06:35	07:07		06:43	07:20
	16:48	17:23		17:59	18:36	20:08	20:40	20:52	20:32	19:46	18:53		17:04	16:39
2	07:40	07:24		06:46	05:52	06:05	05:35	05:37	06:03	06:36	07:08		06:44	07:21
	16:48	17:25		18:00	18:37	20:09	20:41	20:52	20:31	19:44	18:51		17:03	16:38
3	07:40	07:23		06:44	05:51	06:04	05:35	05:37	06:04	06:37	07:09		06:46	07:22
	16:49	17:26		18:02	18:38	20:11	20:41	20:51	20:30	19:42	18:50		17:02	16:38
4	07:40	07:22		06:42	05:49	06:02	05:35	05:38	06:05	06:38	07:10		06:47	07:23
	16:50	17:27		18:03	18:39	20:12	20:42	20:51	20:29	19:41	18:48		17:01	16:38
5	07:40	07:21		06:41	06:47	06:01	05:34	05:39	06:06	06:39	07:11		06:48	07:24
	16:51	17:29		18:04	19:40	20:13	20:43	20:51	20:28	19:39	18:46		16:59	16:38
6	07:40	07:20		06:39	06:46	06:00	05:34	05:39	06:07	06:40	07:12		06:49	07:25
	16:52	17:30		18:05	19:41	20:14	20:44	20:51	20:26	19:37	18:44		16:58	16:37
7	07:40	07:18		06:37	06:44	05:58	05:34	05:40	06:08	06:41	07:13		06:51	07:26
	16:53	17:31		18:07	19:42	20:15	20:44	20:51	20:25	19:35	18:43		16:57	16:37
8	07:40	07:17		06:36	06:42	05:57	05:33	05:40	06:09	06:42	07:14		06:52	07:27
	16:54	17:32		18:08	19:43	20:16	20:45	20:50	20:24	19:34	18:41		16:56	16:37
9	07:40	07:16		06:34	06:40	05:56	05:33	05:41	06:10	06:43	07:16		06:53	07:28
	16:55	17:34		18:09	19:45	20:17	20:46	20:50	20:22	19:32	18:39		16:55	16:37
10	07:40	07:15		06:32	06:39	05:55	05:33	05:42	06:11	06:44	07:17		06:54	07:28
	16:56	17:35		18:10	19:46	20:18	20:46	20:49	20:21	19:30	18:38		16:54	16:37
11	07:39	07:13		08:18 (3)	06:31	06:37	05:54	05:33	05:43	06:12	06:45	07:18		06:56	07:29
	16:57	17:36	10	08:28 (3)	18:11	19:47	20:19	20:47	20:49	20:20	19:28	18:36		16:53	16:37
12	07:39	07:12		08:17 (3)	06:29	06:35	05:53	05:33	05:43	06:13	06:46	07:19		06:57	07:30
	16:58	17:38	14	08:31 (3)	18:13	19:48	20:21	20:47	20:49	20:18	19:27	18:34		16:52	16:37
13	07:39	07:11		08:13 (3)	06:27	06:34	05:51	05:32	05:44	06:14	06:47	07:20		08:53 (3)	06:58	07:31
	17:00	17:39	18	08:31 (3)	18:14	19:49	20:22	20:48	20:48	20:17	19:25	18:33	4	08:57 (3)	16:51	16:37
14	07:38	07:10		08:12 (3)	06:25	06:32	05:50	05:32	05:45	06:15	06:48	07:21		08:48 (3)	06:59	07:32
	17:01	17:40	22	08:34 (3)	18:15	19:50	20:23	20:48	20:47	20:16	19:23	18:31	12	09:00 (3)	16:50	16:38
15	07:38	07:08		08:12 (3)	06:24	06:30	05:49	05:32	05:46	06:16	06:49	07:22		08:45 (3)	07:01	07:33
	17:02	17:42	22	08:34 (3)	18:16	19:51	20:24	20:49	20:47	20:14	19:21	18:29	16	09:01 (3)	16:49	16:38
16	07:37	07:07		08:11 (3)	06:22	06:29	05:48	05:32	05:47	06:17	06:50	07:24		08:42 (3)	07:02	07:33
	17:03	17:43	24	08:35 (3)	18:17	19:53	20:25	20:49	20:46	20:13	19:20	18:28	20	09:02 (3)	16:48	16:38
17	07:37	07:05		08:10 (3)	06:20	06:27	05:47	05:32	05:47	06:18	06:51	07:25		08:42 (3)	07:03	07:34
	17:04	17:44	26	08:36 (3)	18:18	19:54	20:26	20:50	20:46	20:11	19:18	18:26	22	09:04 (3)	16:47	16:38
18	07:36	07:04		08:10 (3)	06:18	06:26	05:46	05:32	05:48	06:20	06:53	07:26		08:41 (3)	07:04	07:35
	17:05	17:45	26	08:36 (3)	18:20	19:55	20:27	20:50	20:45	20:10	19:16	18:25	24	09:05 (3)	16:46	16:39
19	07:36	07:02		08:09 (3)	06:17	06:24	05:45	05:33	05:49	06:21	06:54	07:27		08:40 (3)	07:06	07:35
	17:07	17:47	26	08:35 (3)	18:21	19:56	20:28	20:50	20:44	20:08	19:14	18:23	26	09:06 (3)	16:45	16:39
20	07:35	07:01		08:09 (3)	06:15	06:23	05:44	05:33	05:50	06:22	06:55	07:28		08:39 (3)	07:07	07:36
	17:08	17:48	26	08:35 (3)	18:22	19:57	20:29	20:51	20:44	20:07	19:13	18:22	26	09:05 (3)	16:45	16:40
21	07:34	07:00		08:10 (3)	06:13	06:21	05:44	05:33	05:51	06:23	06:56	07:30		08:39 (3)	07:08	07:36
	17:09	17:49	26	08:36 (3)	18:23	19:58	20:30	20:51	20:43	20:05	19:11	18:20	28	09:07 (3)	16:44	16:40
22	07:34	06:58		08:10 (3)	06:12	06:19	05:43	05:33	05:52	06:24	06:57	07:31		08:40 (3)	07:09	07:37
	17:10	17:51	24	08:34 (3)	18:24	19:59	20:31	20:51	20:42	20:04	19:09	18:18	26	09:06 (3)	16:43	16:40
23	07:33	06:57		08:09 (3)	06:10	06:18	05:42	05:33	05:53	06:25	06:58	07:32		08:39 (3)	07:10	07:37
	17:12	17:52	26	08:35 (3)	18:25	20:00	20:32	20:51	20:41	20:02	19:07	18:17	26	09:05 (3)	16:42	16:41
24	07:32	06:55		08:09 (3)	06:08	06:16	05:41	05:34	05:54	06:26	06:59	07:33		08:40 (3)	07:12	07:38
	17:13	17:53	24	08:33 (3)	18:26	20:00	20:33	20:51	20:40	20:01	19:05	18:15	24	09:04 (3)	16:42	16:42
25	07:32	06:53		08:11 (3)	06:06	06:15	05:40	05:34	05:55	06:27	07:00	06:34		07:40 (3)	07:13	07:38
	17:14	17:54	20	08:31 (3)	18:28	20:02	20:34	20:52	20:39	19:57	19:04	17:14	26	08:06 (3)	16:41	16:42
26	07:31	06:52		08:12 (3)	06:05	06:13	05:40	05:34	05:56	06:28	07:01	06:36		07:41 (3)	07:14	07:39
	17:15	17:56	18	08:30 (3)	18:29	20:03	20:35	20:52	20:38	19:56	19:02	17:13	24	08:05 (3)	16:41	16:43
27	07:30	06:50		08:14 (3)	06:03	06:12	05:39	05:35	05:57	06:29	07:02	06:37		07:40 (3)	07:15	07:39
	17:17	17:57	14	08:28 (3)	18:30	20:04	20:36	20:52	20:37	19:54	19:00	17:11	24	08:04 (3)	16:40	16:43
28	07:29	06:49		08:17 (3)	06:01	06:11	05:38	05:35	05:58	06:30	07:03	06:38		07:42 (3)	07:16	07:39
	17:18	17:58	10	08:27 (3)	18:31	20:05	20:36	20:52	20:36	19:52	18:58	17:10	20	08:02 (3)	16:40	16:44
29	07:28				05:59	06:09	05:38	05:35	05:59	06:31	07:04	06:39		07:43 (3)	07:17	07:40
	17:19				18:32	20:06	20:37	20:52	20:35	19:51	18:57	17:08	18	08:01 (3)	16:39	16:45
30	07:27				05:58	06:08	05:37	05:36	06:00	06:32	07:06	06:41		07:46 (3)	07:19	07:40
	17:21				18:33	20:07	20:38	20:52	20:34	19:49	18:55	17:07	12	07:58 (3)	16:39	16:46
31	07:26				05:56		05:36		06:01	06:33		06:42		07:50 (3)		07:40
	17:22				18:34		20:39		20:33	19:47		17:06	6	07:56 (3)		16:46
Potential sun hours	293	295			370	209	-292	-263	-280	-145	375	343			294	283
Total, worst case			376										384			
Sun reduction			0.45										0.45			
Oper. time red.			0.86										0.86			
Wind dir. red.			0.63										0.63			
Total reduction			0.24										0.24			
Total, real			92										94			

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	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, Southern part
11 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
1000 meter max shadow distance applied along with default 3° inclination
Sunshine probabilities applied (pdf plots)
Directional run-hours applied from tab file (tower 1)
.

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Calculated:
03/04/06 13:30/2.4.0.67

SHADOW - Calendar

Calculation: Southern part **Shadow receptor:** 770 - 770

Assumptions for shadow calculations

Maximum distance for influence	1,000 m
Minimum sun height over horizon for influence	3 °
Day step for calculation	1 days
Time step for calculation	2 minutes

Sun shine probabilities (part of time from sun rise to sun set with sun shine)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.35	0.45	0.45	0.55	0.55	0.55	0.65	0.55	0.55	0.45	0.35	0.30

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
475	585	238	199	220	474	1,184	813	840	1,246	803	479	7,555

	January	February		March	April	May	June	July	August	September	October		November		December
1	07:40	07:25		06:47	05:54	06:06	05:36	05:36	06:02	06:34	07:07		06:43	07:37 (4)	07:20
	16:47	17:23		17:59	18:36	20:08	20:40	20:52	20:32	19:46	18:53		17:04	28 08:05 (4)	16:39
2	07:40	07:24	08:17 (4)	06:46	05:52	06:05	05:35	05:37	06:03	06:36	07:08		06:44	07:38 (4)	07:21
	16:48	17:25	8 08:25 (4)	18:00	18:37	20:09	20:41	20:52	20:31	19:44	18:51		17:03	26 08:04 (4)	16:38
3	07:40	07:23	08:14 (4)	06:44	05:51	06:04	05:35	05:37	06:04	06:37	07:09		06:46	07:38 (4)	07:22
	16:49	17:26	14 08:28 (4)	18:02	18:38	20:11	20:41	20:51	20:30	19:42	18:50		17:02	26 08:04 (4)	16:38
4	07:40	07:22	08:13 (4)	06:42	05:49	06:02	05:35	05:38	06:05	06:38	07:10		06:47	07:39 (4)	07:23
	16:50	17:27	18 08:31 (4)	18:03	18:39	20:12	20:42	20:51	20:29	19:41	18:48		17:01	24 08:03 (4)	16:38
5	07:40	07:21	08:11 (4)	06:41	06:47	06:01	05:34	05:39	06:06	06:39	07:11		06:48	07:40 (4)	07:24
	16:51	17:29	20 08:31 (4)	18:04	19:40	20:13	20:43	20:51	20:28	19:39	18:46		16:59	22 08:02 (4)	16:38
6	07:40	07:20	08:10 (4)	06:39	06:45	06:00	05:34	05:39	06:07	06:40	07:12		06:49	07:42 (4)	07:25
	16:52	17:30	22 08:32 (4)	18:05	19:41	20:14	20:44	20:51	20:26	19:37	18:44		16:58	20 08:02 (4)	16:37
7	07:40	07:18	08:09 (4)	06:37	06:44	05:58	05:34	05:40	06:08	06:41	07:13		06:51	07:43 (4)	07:26
	16:53	17:31	24 08:33 (4)	18:07	19:42	20:15	20:44	20:51	20:25	19:35	18:43		16:57	18 08:01 (4)	16:37
8	07:40	07:17	08:08 (4)	06:36	06:42	05:57	05:33	05:40	06:09	06:42	07:14		06:52	07:44 (4)	07:27
	16:54	17:32	26 08:34 (4)	18:08	19:43	20:16	20:45	20:50	20:24	19:34	18:41		16:56	14 07:58 (4)	16:37
9	07:40	07:16	08:09 (4)	06:34	06:40	05:56	05:33	05:41	06:10	06:43	07:16		06:53	07:48 (4)	07:28
	16:55	17:34	26 08:35 (4)	18:09	19:45	20:17	20:46	20:50	20:22	19:32	18:39		16:55	8 07:56 (4)	16:37
10	07:40	07:15	08:07 (4)	06:32	06:39	05:55	05:33	05:42	06:11	06:44	07:17		06:54		07:28
	16:56	17:35	28 08:35 (4)	18:10	19:46	20:18	20:46	20:49	20:21	19:30	18:38		16:54		16:37
11	07:39	07:13	08:08 (4)	06:31	06:37	05:54	05:33	05:43	06:12	06:45	07:18		06:56		07:29
	16:57	17:36	28 08:36 (4)	18:11	19:47	20:19	20:47	20:49	20:20	19:28	18:36		16:53		16:37
12	07:39	07:12	08:07 (4)	06:29	06:35	05:52	05:32	05:43	06:13	06:46	07:19		06:57		07:30
	16:58	17:38	30 08:37 (4)	18:12	19:48	20:20	20:47	20:49	20:18	19:27	18:34		16:52		16:37
13	07:39	07:11	08:07 (4)	06:27	06:34	05:51	05:32	05:44	06:14	06:47	07:20		06:58		07:31
	17:00	17:39	28 08:35 (4)	18:14	19:49	20:22	20:48	20:48	20:17	19:25	18:33		16:51		16:37
14	07:38	07:10	08:08 (4)	06:25	06:32	05:50	05:32	05:45	06:15	06:48	07:21		06:59		07:32
	17:01	17:40	28 08:36 (4)	18:15	19:50	20:23	20:48	20:47	20:16	19:23	18:31		16:50		16:38
15	07:38	07:08	08:08 (4)	06:24	06:30	05:49	05:32	05:46	06:16	06:49	07:22		07:01		07:33
	17:02	17:42	26 08:34 (4)	18:16	19:51	20:24	20:49	20:47	20:14	19:21	18:29		16:49		16:38
16	07:37	07:07	08:07 (4)	06:22	06:29	05:48	05:32	05:47	06:17	06:50	07:24		07:02		07:33
	17:03	17:43	28 08:35 (4)	18:17	19:53	20:25	20:49	20:46	20:13	19:20	18:28		16:48		16:38
17	07:37	07:05	08:08 (4)	06:20	06:27	05:47	05:32	05:47	06:18	06:51	07:25		07:03		07:34
	17:04	17:44	26 08:34 (4)	18:18	19:54	20:26	20:50	20:46	20:11	19:18	18:26		16:47		16:38
18	07:36	07:04	08:08 (4)	06:18	06:26	05:46	05:32	05:48	06:20	06:53	07:26		07:04		07:35
	17:05	17:45	26 08:34 (4)	18:20	19:55	20:27	20:50	20:45	20:10	19:16	18:25		16:46		16:39
19	07:36	07:02	08:11 (4)	06:17	06:24	05:45	05:33	05:49	06:21	06:54	07:27		07:06		07:35
	17:07	17:47	22 08:33 (4)	18:21	19:56	20:28	20:50	20:44	20:08	19:14	18:23		16:45		16:39
20	07:35	07:01	08:11 (4)	06:15	06:22	05:44	05:33	05:50	06:22	06:55	07:28	08:45 (4)	07:07		07:36
	17:08	17:48	20 08:31 (4)	18:22	19:57	20:29	20:51	20:44	20:07	19:13	18:22	12 08:57 (4)	16:44		16:39
21	07:34	07:00	08:14 (4)	06:13	06:21	05:44	05:33	05:51	06:23	06:56	07:30	08:43 (4)	07:08		07:36
	17:09	17:49	14 08:28 (4)	18:23	19:58	20:30	20:51	20:43	20:05	19:11	18:20	18 09:01 (4)	16:44		16:40
22	07:34	06:58	08:16 (4)	06:12	06:19	05:43	05:33	05:52	06:24	06:57	07:31	08:42 (4)	07:09		07:37
	17:10	17:51	10 08:26 (4)	18:24	19:59	20:31	20:51	20:42	20:04	19:09	18:18	20 09:02 (4)	16:43		16:40
23	07:33	06:57		06:10	06:18	05:42	05:33	05:53	06:25	06:58	07:32	08:39 (4)	07:10		07:37
	17:12	17:52		18:25	20:00	20:32	20:51	20:41	20:02	19:07	18:17	24 09:03 (4)	16:42		16:41
24	07:32	06:55		06:08	06:16	05:41	05:34	05:54	06:26	06:59	07:33	08:38 (4)	07:12		07:38
	17:13	17:53		18:26	20:00	20:33	20:51	20:40	20:01	19:05	18:15	26 09:04 (4)	16:42		16:42
25	07:32	06:53		06:06	06:15	05:40	05:34	05:55	06:27	07:00	06:34	07:38 (4)	07:13		07:38
	17:14	17:54		18:28	20:02	20:34	20:52	20:39	19:57	19:04	17:14	26 08:04 (4)	16:41		16:42
26	07:31	06:52		06:05	06:13	05:40	05:34	05:56	06:28	07:01	06:36	07:37 (4)	07:14		07:39
	17:15	17:56		18:29	20:03	20:35	20:52	20:38	19:56	19:02	17:13	28 08:05 (4)	16:41		16:43
27	07:30	06:50		06:03	06:12	05:39	05:35	05:57	06:29	07:02	06:37	07:36 (4)	07:15		07:39
	17:17	17:57		18:30	20:04	20:35	20:52	20:37	19:54	19:00	17:11	28 08:04 (4)	16:40		16:43
28	07:29	06:49		06:01	06:10	05:38	05:35	05:58	06:30	07:03	06:38	07:38 (4)	07:16		07:39
	17:18	17:58		18:31	20:05	20:36	20:52	20:36	19:52	18:58	17:10	28 08:06 (4)	16:40		16:44
29	07:28			05:59	06:09	05:38	05:35	05:59	06:31	07:04	06:39	07:37 (4)	07:17		07:40
	17:19			18:32	20:06	20:37	20:52	20:35	19:51	18:57	17:08	28 08:05 (4)	16:39		16:45
30	07:27			05:58	06:08	05:37	05:36	06:00	06:32	07:06	06:41	07:36 (4)	07:18		07:40
	17:21			18:33	20:07	20:38	20:52	20:34	19:49	18:55	17:07	30 08:06 (4)	16:39		16:46
31	07:26			05:56		05:36		06:01	06:33		06:42	07:38 (4)			07:40
	17:22			18:34		20:39		20:33	19:47		17:06	28 08:06 (4)			16:46
Potential sun hours	293	295		370	209	-292	-263	-280	-145	375	343		294		283
Total, worst case			472									296		186	
Sun reduction			0.45									0.45		0.35	
Oper. time red.			0.86									0.86		0.86	
Wind dir. red.			0.63									0.63		0.63	
Total reduction			0.24									0.24		0.19	
Total, real			115									72		35	

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	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, Southern part
11 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
1000 meter max shadow distance applied along with default 3° inclination
Sunshine probabilities applied (pdf plots)
Directional run-hours applied from tab file (tower 1)
.

Licensed user:
Wind Engineers, Inc.
7660 Whitegate Avenue
US-RIVERSIDE, CA 92506

Calculated:
03/04/06 13:30/2.4.0.67

SHADOW - Calendar

Calculation: Southern part **Shadow receptor:** 771 - 771

Assumptions for shadow calculations

Maximum distance for influence	1,000	m
Minimum sun height over horizon for influence	3	°
Day step for calculation	1	days
Time step for calculation	2	minutes

Sun shine probabilities (part of time from sun rise to sun set with sun shine)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.35	0.45	0.45	0.55	0.55	0.55	0.65	0.55	0.55	0.45	0.35	0.30

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
475	585	238	199	220	474	1,184	813	840	1,246	803	479	7,555

	January		February		March	April	May	June	July	August	September	October		November		December
1	07:40		07:25		08:36 (4)	06:47	05:54	06:06	05:36	05:36	06:02	06:34	07:07		06:43	08:05 (4)	07:20
	16:47		17:23	36	09:12 (4)	17:59	18:36	20:08	20:40	20:52	20:32	19:46	18:53		17:04	36 08:41 (4)	16:39
2	07:40		07:24		08:35 (4)	06:45	05:52	06:05	05:35	05:37	06:03	06:36	07:08		06:44	08:06 (4)	07:21
	16:48		17:25	38	09:13 (4)	18:00	18:37	20:09	20:41	20:52	20:31	19:44	18:51		17:03	36 08:42 (4)	16:38
3	07:40		07:23		08:36 (4)	06:44	05:51	06:04	05:35	05:37	06:04	06:37	07:09		06:46	08:06 (4)	07:22
	16:49		17:26	36	09:12 (4)	18:02	18:38	20:11	20:41	20:51	20:30	19:42	18:50		17:02	36 08:42 (4)	16:38
4	07:40		07:22		08:35 (4)	06:42	05:49	06:02	05:35	05:38	06:05	06:38	07:10		06:47	08:05 (4)	07:23
	16:50		17:27	38	09:13 (4)	18:03	18:39	20:12	20:42	20:51	20:29	19:41	18:48		17:01	38 08:43 (4)	16:38
5	07:40		07:21		08:35 (4)	06:41	06:47	06:01	05:34	05:39	06:06	06:39	07:11		06:48	08:04 (4)	07:24
	16:51		17:29	38	09:13 (4)	18:04	19:40	20:13	20:43	20:51	20:28	19:39	18:46		16:59	38 08:42 (4)	16:38
6	07:40		07:20		08:34 (4)	06:39	06:45	06:00	05:34	05:39	06:07	06:40	07:12		06:49	08:06 (4)	07:25
	16:52		17:30	38	09:12 (4)	18:05	19:41	20:14	20:44	20:51	20:26	19:37	18:44		16:58	38 08:44 (4)	16:37
7	07:40		07:18		08:35 (4)	06:37	06:44	05:58	05:34	05:40	06:08	06:41	07:13		06:51	08:05 (4)	07:26
	16:53		17:31	38	09:13 (4)	18:07	19:42	20:15	20:44	20:50	20:25	19:35	18:43		16:57	38 08:43 (4)	16:37
8	07:40		07:17		08:36 (4)	06:36	06:42	05:57	05:33	05:40	06:09	06:42	07:14		06:52	08:06 (4)	07:27
	16:54		17:32	36	09:12 (4)	18:08	19:43	20:16	20:45	20:50	20:24	19:34	18:41		16:56	36 08:42 (4)	16:37
9	07:40		07:16		08:37 (4)	06:34	06:40	05:56	05:33	05:41	06:10	06:43	07:16		06:53	08:06 (4)	07:28
	16:55		17:34	36	09:13 (4)	18:09	19:45	20:17	20:46	20:50	20:22	19:32	18:39		16:55	38 08:44 (4)	16:37
10	07:40		07:15		08:37 (4)	06:32	06:39	05:55	05:33	05:42	06:11	06:44	07:17		06:54	08:07 (4)	07:28
	16:56		17:35	34	09:11 (4)	18:10	19:46	20:18	20:46	20:49	20:21	19:30	18:38		16:54	36 08:43 (4)	16:37
11	07:39		07:13		08:38 (4)	06:31	06:37	05:54	05:33	05:43	06:12	06:45	07:18		06:56	08:06 (4)	07:29
	16:57		17:36	34	09:12 (4)	18:11	19:47	20:19	20:47	20:49	20:20	19:28	18:36		16:53	36 08:42 (4)	16:37
12	07:39		07:12		08:39 (4)	06:29	06:35	05:52	05:32	05:43	06:13	06:46	07:19		06:57	08:08 (4)	07:30
	16:58		17:38	32	09:11 (4)	18:12	19:48	20:20	20:47	20:49	20:18	19:27	18:34		16:52	34 08:42 (4)	16:37
13	07:39		07:11		08:39 (4)	06:27	06:34	05:51	05:32	05:44	06:14	06:47	07:20		06:58	08:09 (4)	07:31
	17:00		17:39	30	09:09 (4)	18:14	19:49	20:22	20:48	20:48	20:17	19:25	18:33		16:51	32 08:41 (4)	16:37
14	07:38		07:10		08:40 (4)	06:25	06:32	05:50	05:32	05:45	06:15	06:48	07:21		06:59	08:08 (4)	07:32
	17:01		17:40	28	09:08 (4)	18:15	19:50	20:23	20:48	20:47	20:16	19:23	18:31		16:50	34 08:42 (4)	16:38
15	07:38		07:08		08:40 (4)	06:24	06:30	05:49	05:32	05:46	06:16	06:49	07:22		07:01	08:10 (4)	07:33
	17:02		17:42	26	09:06 (4)	18:16	19:51	20:24	20:49	20:47	20:14	19:21	18:29		16:49	32 08:42 (4)	16:38
16	07:37		07:07		08:43 (4)	06:22	06:29	05:48	05:32	05:47	06:17	06:50	07:24		07:02	08:11 (4)	07:33
	17:03		17:43	22	09:05 (4)	18:17	19:53	20:25	20:49	20:46	20:13	19:20	18:28		16:48	30 08:41 (4)	16:38
17	07:37		07:05		08:44 (4)	06:20	06:27	05:47	05:32	05:47	06:18	06:51	07:25		07:03	08:12 (4)	07:34
	17:04		17:44	20	09:04 (4)	18:18	19:54	20:26	20:50	20:46	20:11	19:18	18:26		16:47	28 08:40 (4)	16:38
18	07:36		07:04		08:48 (4)	06:18	06:26	05:46	05:32	05:48	06:20	06:53	07:26		07:04	08:14 (4)	07:35
	17:05		17:45	12	09:00 (4)	18:19	19:55	20:27	20:50	20:45	20:10	19:16	18:25		16:46	26 08:40 (4)	16:39
19	07:36	08:47 (4)	07:02			06:17	06:24	05:45	05:33	05:49	06:21	06:54	07:27		07:06	08:15 (4)	07:35
	17:07	6 08:53 (4)	17:47			18:21	19:56	20:28	20:50	20:44	20:08	19:14	18:23		16:45	24 08:39 (4)	16:39
20	07:35	08:45 (4)	07:01			06:15	06:22	05:44	05:33	05:50	06:22	06:55	07:28		07:07	08:16 (4)	07:36
	17:08	12 08:57 (4)	17:48			18:22	19:57	20:29	20:51	20:44	20:07	19:13	18:21		16:44	20 08:36 (4)	16:39
21	07:34	08:42 (4)	07:00			06:13	06:21	05:44	05:33	05:51	06:23	06:56	07:30		07:08	08:18 (4)	07:36
	17:09	18 09:00 (4)	17:49			18:23	19:58	20:30	20:51	20:43	20:05	19:11	18:20		16:44	18 08:36 (4)	16:40
22	07:34	08:41 (4)	06:58			06:11	06:19	05:43	05:33	05:52	06:24	06:57	07:31		07:09	08:21 (4)	07:37
	17:10	20 09:01 (4)	17:51			18:24	19:59	20:31	20:51	20:42	20:04	19:09	18:18		16:43	12 08:33 (4)	16:40
23	07:33	08:41 (4)	06:57			06:10	06:18	05:42	05:33	05:53	06:25	06:58	07:32		07:10	08:24 (4)	07:37
	17:12	24 09:05 (4)	17:52			18:25	20:00	20:32	20:51	20:41	20:02	19:07	18:17		16:42	6 08:30 (4)	16:41
24	07:32	08:40 (4)	06:55			06:08	06:16	05:41	05:34	05:54	06:26	06:59	07:33	09:16 (4)	07:12		07:38
	17:13	26 09:06 (4)	17:53			18:26	20:00	20:33	20:51	20:40	20:01	19:05	18:15	14 09:30 (4)	16:42		16:42
25	07:32	08:39 (4)	06:53			06:06	06:15	05:40	05:34	05:55	06:27	07:00	06:34	08:14 (4)	07:13		07:38
	17:14	28 09:07 (4)	17:54			18:28	20:02	20:34	20:52	20:39	19:57	19:04	17:14	20 08:34 (4)	16:41		16:42
26	07:31	08:38 (4)	06:52			06:05	06:13	05:40	05:34	05:56	06:28	07:01	06:36	08:11 (4)	07:14		07:39
	17:15	30 09:08 (4)	17:56			18:29	20:03	20:35	20:52	20:38	19:56	19:02	17:13	24 08:35 (4)	16:41		16:43
27	07:30	08:37 (4)	06:50			06:03	06:12	05:39	05:35	05:57	06:29	07:02	06:37	08:10 (4)	07:15		07:39
	17:17	32 09:09 (4)	17:57			18:30	20:04	20:35	20:52	20:37	19:54	19:00	17:11	26 08:36 (4)	16:40		16:43
28	07:29	08:36 (4)	06:49			06:01	06:10	05:38	05:35	05:58	06:30	07:03	06:38	08:10 (4)	07:16		07:39
	17:18	34 09:10 (4)	17:58			18:31	20:05	20:36	20:52	20:36	19:52	18:58	17:10	28 08:38 (4)	16:40		16:44
29	07:28	08:37 (4)				05:59	06:09	05:38	05:35	05:59	06:31	07:04	06:39	08:07 (4)	07:17		07:40
	17:19	34 09:11 (4)				18:32	20:06	20:37	20:52	20:35	19:51	18:57	17:08	32 08:39 (4)	16:39		16:45
30	07:27	08:36 (4)				05:58	06:08	05:37	05:36	06:00	06:32	07:06	06:41	08:06 (4)	07:18		07:40
	17:21	34 09:10 (4)				18:33	20:07	20:38	20:52	20:34	19:49	18:55	17:07	34 08:40 (4)	16:39		16:46
31	07:26	08:35 (4)				05:56		05:36		06:01	06:33		06:42	08:06 (4)			07:40
	17:22	36 09:11 (4)				18:34		20:39		20:33	19:47		17:06	36 08:42 (4)			16:46
Potential sun hours	293		295		370	209	-292	-263	-280	-145	375	343			294		283
Total, worst case		334		572									214			702	
Sun reduction		0.35		0.45									0.45			0.35	
Oper. time red.		0.86		0.86									0.86			0.86	
Wind dir. red.		0.63		0.63									0.63			0.63	
Total reduction		0.19		0.24									0.24			0.19	
Total, real		63		140									52			133	

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	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, Southern part
11 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
1000 meter max shadow distance applied along with default 3° inclination
Sunshine probabilities applied (pdf plots)
Directional run-hours applied from tab file (tower 1)
.

Licensed user:
Wind Engineers, Inc.
7660 Whitegate Avenue
US-RIVERSIDE, CA 92506

Calculated:
03/04/06 13:30/2.4.0.67

SHADOW - Calendar

Calculation: Southern part **Shadow receptor:** 772 - 772

Assumptions for shadow calculations

Maximum distance for influence	1,000	m
Minimum sun height over horizon for influence	3	°
Day step for calculation	1	days
Time step for calculation	2	minutes

Sun shine probabilities (part of time from sun rise to sun set with sun shine)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.35	0.45	0.45	0.55	0.55	0.55	0.65	0.55	0.55	0.45	0.35	0.30

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
475	585	238	199	220	474	1,184	813	840	1,246	803	479	7,555

	January		February	March	April	May	June	July	August	September	October	November	December		
1	07:40		07:25	06:47	05:54	06:06	05:36	05:36	06:02	06:34	07:07	06:43	07:20		
	16:47	18	17:23	17:59	18:35	20:08	20:40	20:52	20:32	19:46	18:53	17:04	16:38		
2	07:40		07:24	06:45	05:52	06:05	05:35	05:37	06:03	06:36	07:08	06:44	07:21		
	16:48	16	17:25	18:00	18:37	20:09	20:41	20:52	20:31	19:44	18:51	17:03	16:38		
3	07:40		07:23	06:44	05:51	06:04	05:35	05:37	06:04	06:37	07:09	06:46	07:22		
	16:49	12	17:26	18:02	18:38	20:11	20:41	20:51	20:30	19:42	18:50	17:02	16:38		
4	07:40		07:22	06:42	05:49	06:02	05:35	05:38	06:05	06:38	07:10	06:47	07:23		
	16:50	6	17:27	18:03	18:39	20:12	20:42	20:51	20:29	19:41	18:48	17:01	16:38		
5	07:40		07:21	06:41	06:47	06:01	05:34	05:39	06:06	06:39	07:11	06:48	07:24		
	16:51		17:28	18:04	19:40	20:13	20:43	20:51	20:28	19:39	18:46	16:59	16:37		
6	07:40		07:20	06:39	06:45	06:00	05:34	05:39	06:07	06:40	07:12	06:49	07:25		
	16:52		17:30	18:05	19:41	20:14	20:44	20:51	20:26	19:37	18:44	16:58	16:37		
7	07:40		07:18	06:37	06:44	05:58	05:34	05:40	06:08	06:41	07:13	06:51	07:26		
	16:53		17:31	18:07	19:42	20:15	20:44	20:50	20:25	19:35	18:43	16:57	16:37		
8	07:40		07:17	06:36	06:42	05:57	05:33	05:40	06:09	06:42	07:14	06:52	07:27		10:41 (4)
	16:54		17:32	18:08	19:43	20:16	20:45	20:50	20:24	19:34	18:41	16:56	16:37	4	10:45 (4)
9	07:40		07:16	06:34	06:40	05:56	05:33	05:41	06:10	06:43	07:16	06:53	07:28		10:38 (4)
	16:55		17:34	18:09	19:45	20:17	20:46	20:50	20:22	19:32	18:39	16:55	16:37	12	10:50 (4)
10	07:40		07:15	06:32	06:39	05:55	05:33	05:42	06:11	06:44	07:17	06:54	07:28		10:37 (4)
	16:56		17:35	18:10	19:46	20:18	20:46	20:49	20:21	19:30	18:38	16:54	16:37	16	10:53 (4)
11	07:39		07:13	06:31	06:37	05:54	05:33	05:43	06:12	06:45	07:18	06:56	07:29		10:36 (4)
	16:57		17:36	18:11	19:47	20:19	20:47	20:49	20:20	19:28	18:36	16:53	16:37	18	10:54 (4)
12	07:39		07:12	06:29	06:35	05:52	05:32	05:43	06:13	06:46	07:19	06:57	07:30		10:35 (4)
	16:58		17:38	18:12	19:48	20:20	20:47	20:48	20:18	19:27	18:34	16:52	16:37	20	10:55 (4)
13	07:39		07:11	06:27	06:34	05:51	05:32	05:44	06:14	06:47	07:20	06:58	07:31		10:35 (4)
	17:00		17:39	18:14	19:49	20:22	20:48	20:48	20:17	19:25	18:33	16:51	16:37	22	10:57 (4)
14	07:38		07:09	06:25	06:32	05:50	05:32	05:45	06:15	06:48	07:21	06:59	07:32		10:34 (4)
	17:01		17:40	18:15	19:50	20:23	20:48	20:47	20:16	19:23	18:31	16:50	16:38	24	10:58 (4)
15	07:38		07:08	06:24	06:30	05:49	05:32	05:46	06:16	06:49	07:22	07:01	07:33		10:35 (4)
	17:02		17:42	18:16	19:51	20:24	20:49	20:47	20:14	19:21	18:29	16:49	16:38	24	10:59 (4)
16	07:37		07:07	06:22	06:29	05:48	05:32	05:47	06:17	06:50	07:24	07:02	07:33		10:34 (4)
	17:03		17:43	18:17	19:53	20:25	20:49	20:46	20:13	19:20	18:28	16:48	16:38	26	11:00 (4)
17	07:37		07:05	06:20	06:27	05:47	05:32	05:47	06:18	06:51	07:25	07:03	07:34		10:34 (4)
	17:04		17:44	18:18	19:54	20:26	20:50	20:46	20:11	19:18	18:26	16:47	16:38	26	11:00 (4)
18	07:36		07:04	06:18	06:26	05:46	05:32	05:48	06:20	06:53	07:26	07:04	07:35		10:35 (4)
	17:05		17:45	18:19	19:55	20:27	20:50	20:45	20:10	19:16	18:25	16:46	16:39	26	11:01 (4)
19	07:36		07:02	06:17	06:24	05:45	05:32	05:49	06:21	06:54	07:27	07:06	07:35		10:35 (4)
	17:07		17:47	18:21	19:56	20:28	20:50	20:44	20:08	19:14	18:23	16:45	16:39	28	11:03 (4)
20	07:35		07:01	06:15	06:22	05:44	05:33	05:50	06:22	06:55	07:28	07:07	07:36		10:36 (4)
	17:08		17:48	18:22	19:57	20:29	20:51	20:43	20:07	19:12	18:21	16:44	16:39	28	11:04 (4)
21	07:34		07:00	06:13	06:21	05:43	05:33	05:51	06:23	06:56	07:30	07:08	07:36		10:37 (4)
	17:09		17:49	18:23	19:58	20:30	20:51	20:43	20:05	19:11	18:20	16:44	16:40	28	11:05 (4)
22	07:34		06:58	06:11	06:19	05:43	05:33	05:52	06:24	06:57	07:31	07:09	07:37		10:37 (4)
	17:10		17:51	18:24	19:59	20:31	20:51	20:42	20:04	19:09	18:18	16:43	16:40	28	11:05 (4)
23	07:33		06:56	06:10	06:18	05:42	05:33	05:53	06:25	06:58	07:32	07:10	07:37		10:37 (4)
	17:12		17:52	18:25	20:00	20:32	20:51	20:41	20:02	19:07	18:17	16:42	16:41	28	11:05 (4)
24	07:32		06:55	06:08	06:16	05:41	05:34	05:54	06:26	06:59	07:33	07:12	07:38		10:38 (4)
	17:13		17:53	18:26	20:00	20:33	20:51	20:40	20:01	19:05	18:15	16:42	16:41	28	11:06 (4)
25	07:31		06:53	06:06	06:15	05:40	05:34	05:55	06:27	07:00	06:34	07:13	07:38		10:38 (4)
	17:14		17:54	18:28	20:02	20:34	20:52	20:39	19:57	19:04	17:14	16:41	16:42	26	11:04 (4)
26	07:31		06:52	06:04	06:13	05:40	05:34	05:56	06:28	07:01	06:36	07:14	07:39		10:38 (4)
	17:15		17:56	18:29	20:03	20:35	20:52	20:38	19:56	19:02	17:13	16:41	16:43	26	11:04 (4)
27	07:30		06:50	06:03	06:12	05:39	05:35	05:57	06:29	07:02	06:37	07:15	07:39		10:39 (4)
	17:17		17:57	18:30	20:04	20:35	20:52	20:37	19:54	19:00	17:11	16:40	16:43	26	11:05 (4)
28	07:29		06:49	06:01	06:10	05:38	05:35	05:58	06:30	07:03	06:38	07:16	07:39		10:41 (4)
	17:18		17:58	18:31	20:05	20:36	20:52	20:36	19:52	18:58	17:10	16:40	16:44	24	11:05 (4)
29	07:28			05:59	06:09	05:38	05:35	05:59	06:31	07:04	06:39	07:17	07:40		10:41 (4)
	17:19			18:32	20:06	20:37	20:52	20:35	19:51	18:57	17:08	16:39	16:45	24	11:05 (4)
30	07:27			05:58	06:08	05:37	05:36	06:00	06:32	07:05	06:41	07:18	07:40		10:43 (4)
	17:21			18:33	20:07	20:38	20:52	20:34	19:49	18:55	17:07	16:39	16:46	22	11:05 (4)
31	07:26			05:56		05:36		06:01	06:33		06:42		07:40		10:43 (4)
	17:22			18:34		20:39		20:33	19:47		17:06		16:46	22	11:05 (4)
Potential sun hours	293		295	370	209	-292	-263	-280	-145	375	343	294	283		
Total, worst case		52												556	
Sun reduction		0.35												0.30	
Oper. time red.		0.86												0.86	
Wind dir. red.		0.63												0.63	
Total reduction		0.19												0.16	
Total, real		10												91	

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	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, Southern part
11 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
1000 meter max shadow distance applied along with default 3° inclination
Sunshine probabilities applied (pdf plots)
Directional run-hours applied from tab file (tower 1)
.

Licensed user:
Wind Engineers, Inc.
7660 Whitegate Avenue
US-RIVERSIDE, CA 92506

Calculated:
03/04/06 13:30/2.4.0.67

SHADOW - Calendar

Calculation: Southern part **Shadow receptor:** 773 - 773

Assumptions for shadow calculations

Maximum distance for influence	1,000	m
Minimum sun height over horizon for influence	3	°
Day step for calculation	1	days
Time step for calculation	2	minutes

Sun shine probabilities (part of time from sun rise to sun set with sun shine)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.35	0.45	0.45	0.55	0.55	0.55	0.65	0.55	0.55	0.45	0.35	0.30

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
475	585	238	199	220	474	1,184	813	840	1,246	803	479	7,555

	January		February	March	April	May	June	July	August	September	October	November		December	
1	07:40	14:57 (4)	07:25	06:47	05:54	06:06	05:36	05:36	06:02	06:34	07:07	06:43		07:20	14:44 (4)
	16:47	58 15:55 (3)	17:23	17:59	18:35	20:08	20:40	20:52	20:32	19:46	18:53	17:04		16:38	46 15:30 (4)
2	07:40	14:57 (4)	07:24	06:45	05:52	06:05	05:35	05:37	06:03	06:35	07:08	06:44		07:21	14:45 (4)
	16:48	56 15:55 (3)	17:25	18:00	18:37	20:09	20:41	20:52	20:31	19:44	18:51	17:03		16:38	46 15:31 (4)
3	07:40	14:57 (4)	07:23	06:44	05:51	06:04	05:35	05:37	06:04	06:37	07:09	06:46		07:22	14:46 (4)
	16:49	56 15:55 (3)	17:26	18:02	18:38	20:11	20:41	20:51	20:30	19:42	18:50	17:02		16:38	44 15:30 (4)
4	07:40	14:59 (4)	07:22	06:42	05:49	06:02	05:35	05:38	06:05	06:38	07:10	06:47		07:23	14:45 (4)
	16:50	50 15:53 (3)	17:27	18:03	18:39	20:12	20:42	20:51	20:29	19:41	18:48	17:00		16:38	46 15:31 (4)
5	07:40	14:59 (4)	07:21	06:41	06:47	06:01	05:34	05:38	06:06	06:39	07:11	06:48		07:24	14:46 (4)
	16:51	46 15:45 (4)	17:28	18:04	19:40	20:13	20:43	20:51	20:27	19:39	18:46	16:59		16:37	46 15:32 (4)
6	07:40	14:59 (4)	07:20	06:39	06:45	06:00	05:34	05:39	06:07	06:40	07:12	06:49		07:25	14:45 (4)
	16:52	46 15:45 (4)	17:30	18:05	19:41	20:14	20:44	20:51	20:26	19:37	18:44	16:58		16:37	46 15:31 (4)
7	07:40	15:01 (4)	07:18	06:37	06:44	05:58	05:33	05:40	06:08	06:41	07:13	06:51		07:26	14:46 (4)
	16:53	46 15:47 (4)	17:31	18:06	19:42	20:15	20:44	20:50	20:25	19:35	18:43	16:57		16:37	46 15:32 (4)
8	07:40	15:01 (4)	07:17	06:36	06:42	05:57	05:33	05:40	06:09	06:42	07:14	06:52		07:27	14:47 (4)
	16:54	46 15:47 (4)	17:32	18:08	19:43	20:16	20:45	20:50	20:24	19:34	18:41	16:56		16:37	50 15:41 (3)
9	07:40	15:02 (4)	07:16	06:34	06:40	05:56	05:33	05:41	06:10	06:43	07:16	06:53		07:28	14:46 (4)
	16:55	44 15:46 (4)	17:34	18:09	19:45	20:17	20:45	20:50	20:22	19:32	18:39	16:55		16:37	56 15:44 (3)
10	07:39	15:02 (4)	07:15	06:32	06:39	05:55	05:33	05:42	06:11	06:44	07:17	06:54		07:28	14:47 (4)
	16:56	44 15:46 (4)	17:35	18:10	19:46	20:18	20:46	20:49	20:21	19:30	18:38	16:54		16:37	56 15:45 (3)
11	07:39	15:02 (4)	07:13	06:30	06:37	05:54	05:33	05:43	06:12	06:45	07:18	06:56		07:29	14:48 (4)
	16:57	46 15:48 (4)	17:36	18:11	19:47	20:19	20:47	20:49	20:20	19:28	18:36	16:53		16:37	56 15:46 (3)
12	07:39	15:03 (4)	07:12	06:29	06:35	05:52	05:32	05:43	06:13	06:46	07:19	06:57		07:30	14:49 (4)
	16:58	44 15:47 (4)	17:38	18:12	19:48	20:20	20:47	20:48	20:18	19:27	18:34	16:51		16:37	58 15:47 (3)
13	07:39	15:05 (4)	07:11	06:27	06:34	05:51	05:32	05:44	06:14	06:47	07:20	06:58		07:31	14:47 (4)
	17:00	42 15:47 (4)	17:39	18:14	19:49	20:22	20:48	20:48	20:17	19:25	18:33	16:51		16:37	60 15:47 (3)
14	07:38	15:04 (4)	07:09	06:25	06:32	05:50	05:32	05:45	06:15	06:48	07:21	06:59	14:56 (4)	07:32	14:48 (4)
	17:01	44 15:48 (4)	17:40	18:15	19:50	20:23	20:48	20:47	20:16	19:23	18:31	16:50	14 15:10 (4)	16:38	60 15:48 (3)
15	07:38	15:06 (4)	07:08	06:24	06:30	05:49	05:32	05:46	06:16	06:49	07:22	07:01	14:54 (4)	07:32	14:49 (4)
	17:02	42 15:48 (4)	17:42	18:16	19:51	20:24	20:49	20:47	20:14	19:21	18:29	16:49	20 15:14 (4)	16:38	60 15:49 (3)
16	07:37	15:05 (4)	07:07	06:22	06:29	05:48	05:32	05:46	06:17	06:50	07:24	07:02	14:51 (4)	07:33	14:50 (4)
	17:03	42 15:47 (4)	17:43	18:17	19:52	20:25	20:49	20:46	20:13	19:20	18:28	16:48	24 15:15 (4)	16:38	60 15:50 (3)
17	07:37	15:07 (4)	07:05	06:20	06:27	05:47	05:32	05:47	06:18	06:51	07:25	07:03	14:50 (4)	07:34	14:50 (4)
	17:04	40 15:47 (4)	17:44	18:18	19:54	20:26	20:50	20:46	20:11	19:18	18:26	16:47	26 15:16 (4)	16:38	60 15:50 (3)
18	07:36	15:08 (4)	07:04	06:18	06:26	05:46	05:32	05:48	06:19	06:52	07:26	07:04	14:50 (4)	07:35	14:51 (4)
	17:05	40 15:48 (4)	17:45	18:19	19:55	20:27	20:50	20:45	20:10	19:16	18:25	16:46	28 15:18 (4)	16:39	60 15:51 (3)
19	07:36	15:09 (4)	07:02	06:17	06:24	05:45	05:32	05:49	06:21	06:54	07:27	07:06	14:49 (4)	07:35	14:51 (4)
	17:07	38 15:47 (4)	17:47	18:21	19:56	20:28	20:50	20:44	20:08	19:14	18:23	16:45	30 15:19 (4)	16:39	60 15:51 (3)
20	07:35	15:11 (4)	07:01	06:15	06:22	05:44	05:33	05:50	06:22	06:55	07:28	07:07	14:46 (4)	07:36	14:52 (4)
	17:08	36 15:47 (4)	17:48	18:22	19:57	20:29	20:51	20:43	20:07	19:12	18:21	16:44	34 15:20 (4)	16:39	60 15:52 (3)
21	07:34	15:10 (4)	06:59	06:13	06:21	05:43	05:33	05:51	06:23	06:56	07:30	07:08	14:48 (4)	07:36	14:52 (4)
	17:09	36 15:46 (4)	17:49	18:23	19:58	20:30	20:51	20:43	20:05	19:11	18:20	16:44	34 15:22 (4)	16:40	60 15:52 (3)
22	07:34	15:11 (4)	06:58	06:11	06:19	05:43	05:33	05:52	06:24	06:57	07:31	07:09	14:47 (4)	07:37	14:53 (4)
	17:10	34 15:45 (4)	17:50	18:24	19:59	20:31	20:51	20:42	20:04	19:09	18:18	16:43	36 15:23 (4)	16:40	60 15:53 (3)
23	07:33	15:15 (4)	06:56	06:10	06:18	05:42	05:33	05:53	06:25	06:58	07:32	07:10	14:46 (4)	07:37	14:53 (4)
	17:12	30 15:45 (4)	17:52	18:25	20:00	20:32	20:51	20:41	20:02	19:07	18:17	16:42	38 15:24 (4)	16:41	60 15:53 (3)
24	07:32	15:16 (4)	06:55	06:08	06:16	05:41	05:33	05:54	06:26	06:59	07:33	07:12	14:45 (4)	07:38	14:54 (4)
	17:13	28 15:44 (4)	17:53	18:26	20:00	20:33	20:51	20:40	20:01	19:05	18:15	16:42	40 15:25 (4)	16:41	60 15:54 (3)
25	07:31	15:17 (4)	06:53	06:06	06:15	05:40	05:34	05:55	06:27	07:00	06:34	07:13	14:45 (4)	07:38	14:54 (4)
	17:14	26 15:43 (4)	17:54	18:28	20:02	20:34	20:52	20:39	19:57	19:04	17:14	16:41	40 15:25 (4)	16:42	60 15:54 (3)
26	07:31	15:18 (4)	06:52	06:04	06:13	05:40	05:34	05:56	06:28	07:01	06:36	07:14	14:44 (4)	07:39	14:54 (4)
	17:15	24 15:42 (4)	17:55	18:29	20:03	20:35	20:52	20:38	19:56	19:02	17:13	16:41	42 15:26 (4)	16:43	60 15:54 (3)
27	07:30	15:21 (4)	06:50	06:03	06:12	05:39	05:35	05:57	06:29	07:02	06:37	07:15	14:45 (4)	07:39	14:55 (4)
	17:17	20 15:41 (4)	17:57	18:30	20:04	20:35	20:52	20:37	19:54	19:00	17:11	16:40	42 15:27 (4)	16:43	60 15:55 (3)
28	07:29	15:24 (4)	06:49	06:01	06:10	05:38	05:35	05:58	06:30	07:03	06:38	07:16	14:44 (4)	07:39	14:55 (4)
	17:18	14 15:38 (4)	17:58	18:31	20:05	20:36	20:52	20:36	19:52	18:58	17:10	16:40	44 15:28 (4)	16:44	60 15:55 (3)
29	07:28			05:59	06:09	05:38	05:35	05:59	06:31	07:04	06:39	07:17	14:45 (4)	07:39	14:55 (4)
	17:19			18:32	20:06	20:37	20:52	20:35	19:51	18:57	17:08	16:39	42 15:27 (4)	16:45	60 15:55 (3)
30	07:27			05:57	06:08	05:37	05:36	06:00	06:32	07:05	06:41	07:18	14:45 (4)	07:40	14:55 (4)
	17:21			18:33	20:07	20:38	20:52	20:34	19:49	18:55	17:07	16:39	44 15:29 (4)	16:46	60 15:55 (3)
31	07:26			05:56		05:36		06:01	06:33		06:42			07:40	14:57 (4)
	17:22			18:34		20:39		20:33	19:47		17:06			16:46	58 15:55 (3)
Potential sun hours	293		295	370	209	-292	-263	-280	-145	375	343	294		283	
Total, worst case		1118											578		1734
Sun reduction		0.35											0.35		0.30
Oper. time red.		0.86											0.86		0.86
Wind dir. red.		0.65											0.65		0.65
Total reduction		0.20											0.20		0.17
Total, real		218											113		290

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	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, Southern part
11 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
1000 meter max shadow distance applied along with default 3° inclination
Sunshine probabilities applied (pdf plots)
Directional run-hours applied from tab file (tower 1)
.

Printed/Page
03/05/06 22:12 / 9

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Wind Engineers, Inc.
7660 Whitegate Avenue
US-RIVERSIDE, CA 92506

Calculated:
03/04/06 13:30/2.4.0.67

SHADOW - Calendar

Calculation: Southern part **Shadow receptor:** 774 - 774

Assumptions for shadow calculations

Maximum distance for influence	1,000 m
Minimum sun height over horizon for influence	3 °
Day step for calculation	1 days
Time step for calculation	2 minutes

Sun shine probabilities (part of time from sun rise to sun set with sun shine)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.35	0.45	0.45	0.55	0.55	0.55	0.65	0.55	0.55	0.45	0.35	0.30

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
475	585	238	199	220	474	1,184	813	840	1,246	803	479	7,555

	January		February	March	April	May	June	July	August	September	October	November		December	
1	07:40	15:17 (4)	07:25	06:47	05:54	06:06	05:36	05:36	06:02	06:34	07:07	06:43		07:20	15:04 (4)
	16:47	38 15:55 (4)	17:23	17:59	18:35	20:08	20:40	20:52	20:32	19:46	18:53	17:04		16:38	36 15:40 (4)
2	07:40	15:17 (4)	07:24	06:45	05:52	06:05	05:35	05:37	06:03	06:35	07:08	06:44		07:21	15:05 (4)
	16:48	38 15:55 (4)	17:25	18:00	18:37	20:09	20:41	20:52	20:31	19:44	18:51	17:03		16:38	36 15:41 (4)
3	07:40	15:17 (4)	07:23	06:44	05:51	06:04	05:35	05:37	06:04	06:37	07:09	06:45		07:22	15:04 (4)
	16:49	38 15:55 (4)	17:26	18:02	18:38	20:11	20:41	20:51	20:30	19:42	18:50	17:02		16:38	38 15:42 (4)
4	07:40	15:17 (4)	07:22	06:42	05:49	06:02	05:35	05:38	06:05	06:38	07:10	06:47		07:23	15:05 (4)
	16:50	38 15:55 (4)	17:27	18:03	18:39	20:12	20:42	20:51	20:29	19:41	18:48	17:00		16:38	36 15:41 (4)
5	07:40	15:19 (4)	07:21	06:41	06:47	06:01	05:34	05:38	06:06	06:39	07:11	06:48		07:24	15:04 (4)
	16:51	38 15:57 (4)	17:28	18:04	19:40	20:13	20:43	20:51	20:27	19:39	18:46	16:59		16:37	38 15:42 (4)
6	07:40	15:19 (4)	07:20	06:39	06:45	06:00	05:34	05:39	06:07	06:40	07:12	06:49		07:25	15:05 (4)
	16:52	38 15:57 (4)	17:30	18:05	19:41	20:14	20:44	20:51	20:26	19:37	18:44	16:58		16:37	38 15:43 (4)
7	07:40	15:19 (4)	07:18	06:37	06:44	05:58	05:33	05:40	06:08	06:41	07:13	06:51		07:26	15:06 (4)
	16:53	38 15:57 (4)	17:31	18:06	19:42	20:15	20:44	20:50	20:25	19:35	18:43	16:57		16:37	38 15:44 (4)
8	07:40	15:21 (4)	07:17	06:36	06:42	05:57	05:33	05:40	06:09	06:42	07:14	06:52		07:27	15:05 (4)
	16:54	36 15:57 (4)	17:32	18:08	19:43	20:16	20:45	20:50	20:24	19:34	18:41	16:56		16:37	38 15:43 (4)
9	07:40	15:20 (4)	07:16	06:34	06:40	05:56	05:33	05:41	06:10	06:43	07:16	06:53		07:28	15:06 (4)
	16:55	38 15:58 (4)	17:34	18:09	19:45	20:17	20:45	20:50	20:22	19:32	18:39	16:55		16:37	38 15:44 (4)
10	07:39	15:20 (4)	07:15	06:32	06:39	05:55	05:33	05:42	06:11	06:44	07:17	06:54		07:28	15:07 (4)
	16:56	38 15:58 (4)	17:35	18:10	19:46	20:18	20:46	20:49	20:21	19:30	18:38	16:54		16:37	38 15:45 (4)
11	07:39	15:22 (4)	07:13	06:30	06:37	05:54	05:33	05:43	06:12	06:45	07:18	06:56		07:29	15:08 (4)
	16:57	36 15:58 (4)	17:36	18:11	19:47	20:19	20:47	20:49	20:20	19:28	18:36	16:53		16:37	38 15:46 (4)
12	07:39	15:21 (4)	07:12	06:29	06:35	05:52	05:32	05:43	06:13	06:46	07:19	06:57		07:30	15:07 (4)
	16:58	38 15:59 (4)	17:38	18:12	19:48	20:20	20:47	20:48	20:18	19:27	18:34	16:51		16:37	38 15:45 (4)
13	07:39	15:23 (4)	07:11	06:27	06:34	05:51	05:32	05:44	06:14	06:47	07:20	06:58		07:31	15:07 (4)
	17:00	36 15:59 (4)	17:39	18:14	19:49	20:22	20:48	20:48	20:17	19:25	18:33	16:50		16:37	38 15:45 (4)
14	07:38	15:24 (4)	07:09	06:25	06:32	05:50	05:32	05:45	06:15	06:48	07:21	06:59		07:32	15:08 (4)
	17:01	34 15:58 (4)	17:40	18:15	19:50	20:23	20:48	20:47	20:16	19:23	18:31	16:50		16:38	38 15:46 (4)
15	07:38	15:24 (4)	07:08	06:24	06:30	05:49	05:32	05:46	06:16	06:49	07:22	07:01		07:32	15:09 (4)
	17:02	34 15:58 (4)	17:42	18:16	19:51	20:24	20:49	20:47	20:14	19:21	18:29	16:49		16:38	38 15:47 (4)
16	07:37	15:25 (4)	07:07	06:22	06:29	05:48	05:32	05:46	06:17	06:50	07:24	07:02	15:13 (4)	07:33	15:10 (4)
	17:03	34 15:59 (4)	17:43	18:17	19:52	20:25	20:49	20:46	20:13	19:20	18:28	16:48	10 15:23 (4)	16:38	38 15:48 (4)
17	07:37	15:27 (4)	07:05	06:20	06:27	05:47	05:32	05:47	06:18	06:51	07:25	07:03	15:10 (4)	07:34	15:10 (4)
	17:04	32 15:59 (4)	17:44	18:18	19:54	20:26	20:50	20:46	20:11	19:18	18:26	16:47	16 15:26 (4)	16:38	38 15:48 (4)
18	07:36	15:26 (4)	07:04	06:18	06:26	05:46	05:32	05:48	06:19	06:52	07:26	07:04	15:10 (4)	07:35	15:11 (4)
	17:05	32 15:58 (4)	17:45	18:19	19:55	20:27	20:50	20:45	20:10	19:16	18:25	16:46	18 15:28 (4)	16:39	38 15:49 (4)
19	07:36	15:27 (4)	07:02	06:17	06:24	05:45	05:32	05:49	06:21	06:54	07:27	07:06	15:07 (4)	07:35	15:11 (4)
	17:07	30 15:57 (4)	17:47	18:21	19:56	20:28	20:50	20:44	20:08	19:14	18:23	16:45	22 15:29 (4)	16:39	36 15:47 (4)
20	07:35	15:29 (4)	07:01	06:15	06:22	05:44	05:33	05:50	06:22	06:55	07:28	07:07	15:06 (4)	07:36	15:10 (4)
	17:08	28 15:57 (4)	17:48	18:22	19:57	20:29	20:51	20:43	20:07	19:12	18:21	16:44	26 15:32 (4)	16:39	38 15:48 (4)
21	07:34	15:30 (4)	06:59	06:13	06:21	05:43	05:33	05:51	06:23	06:56	07:30	07:08	15:06 (4)	07:36	15:10 (4)
	17:09	26 15:56 (4)	17:49	18:23	19:58	20:30	20:51	20:43	20:05	19:11	18:20	16:44	26 15:32 (4)	16:40	38 15:48 (4)
22	07:34	15:31 (4)	06:58	06:11	06:19	05:43	05:33	05:52	06:24	06:57	07:31	07:09	15:05 (4)	07:37	15:11 (4)
	17:10	26 15:57 (4)	17:50	18:24	19:59	20:31	20:51	20:42	20:04	19:09	18:18	16:43	28 15:33 (4)	16:40	38 15:49 (4)
23	07:33	15:33 (4)	06:56	06:10	06:18	05:42	05:33	05:53	06:25	06:58	07:32	07:10	15:04 (4)	07:37	15:11 (4)
	17:12	22 15:55 (4)	17:52	18:25	20:00	20:32	20:51	20:41	20:02	19:07	18:17	16:42	30 15:34 (4)	16:41	38 15:49 (4)
24	07:32	15:36 (4)	06:55	06:08	06:16	05:41	05:33	05:54	06:26	06:59	07:33	07:12	15:03 (4)	07:38	15:12 (4)
	17:13	18 15:54 (4)	17:53	18:26	20:00	20:33	20:51	20:40	20:01	19:05	18:15	16:42	32 15:35 (4)	16:41	38 15:50 (4)
25	07:31	15:37 (4)	06:53	06:06	06:15	05:40	05:34	05:55	06:27	07:00	06:34	07:13	15:05 (4)	07:38	15:14 (4)
	17:14	16 15:53 (4)	17:54	18:27	20:02	20:34	20:52	20:39	19:57	19:04	17:14	16:41	32 15:37 (4)	16:42	36 15:50 (4)
26	07:31	15:42 (4)	06:52	06:04	06:13	05:40	05:34	05:56	06:28	07:01	06:36	07:14	15:04 (4)	07:39	15:14 (4)
	17:15	8 15:50 (4)	17:55	18:29	20:03	20:35	20:52	20:38	19:56	19:02	17:13	16:41	34 15:38 (4)	16:43	38 15:52 (4)
27	07:30		06:50	06:03	06:12	05:39	05:34	05:57	06:29	07:02	06:37	07:15	15:03 (4)	07:39	15:15 (4)
	17:17		17:57	18:30	20:04	20:35	20:52	20:37	19:54	19:00	17:11	16:40	34 15:37 (4)	16:43	38 15:53 (4)
28	07:29		06:49	06:01	06:10	05:38	05:35	05:58	06:30	07:03	06:38	07:16	15:04 (4)	07:39	15:15 (4)
	17:18		17:58	18:31	20:05	20:36	20:52	20:36	19:52	18:58	17:10	16:40	34 15:38 (4)	16:44	38 15:53 (4)
29	07:28			05:59	06:09	05:38	05:35	05:59	06:31	07:04	06:39	07:17	15:03 (4)	07:39	15:15 (4)
	17:19			18:32	20:06	20:37	20:52	20:35	19:51	18:57	17:08	16:39	36 15:39 (4)	16:45	38 15:53 (4)
30	07:27			05:57	06:08	05:37	05:36	06:00	06:32	07:05	06:41	07:18	15:03 (4)	07:40	15:15 (4)
	17:21			18:33	20:07	20:38	20:52	20:34	19:49	18:55	17:07	16:39	38 15:41 (4)	16:46	38 15:53 (4)
31	07:26			05:56		05:36		06:01	06:33		06:42			07:40	15:15 (4)
	17:22			18:34		20:39		20:33	19:47		17:06			16:46	38 15:53 (4)
Potential sun hours	293		295	370	209	-292	-263	-280	-145	375	343	294		283	
Total, worst case		828											416		1168
Sun reduction		0.35											0.35		0.30
Oper. time red.		0.86											0.86		0.86
Wind dir. red.		0.65											0.65		0.65
Total reduction		0.20											0.20		0.17
Total, real		162											81		196

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	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, Southern part
11 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
1000 meter max shadow distance applied along with default 3° inclination
Sunshine probabilities applied (pdf plots)
Directional run-hours applied from tab file (tower 1)
.

Licensed user:
Wind Engineers, Inc.
7660 Whitegate Avenue
US-RIVERSIDE, CA 92506

Calculated:
03/04/06 13:30/2.4.0.67

SHADOW - Calendar

Calculation: Southern part **Shadow receptor:** 775 - 775

Assumptions for shadow calculations

Maximum distance for influence	1,000	m
Minimum sun height over horizon for influence	3	°
Day step for calculation	1	days
Time step for calculation	2	minutes

Sun shine probabilities (part of time from sun rise to sun set with sun shine)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.35	0.45	0.45	0.55	0.55	0.55	0.65	0.55	0.55	0.45	0.35	0.30

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
475	585	238	199	220	474	1,184	813	840	1,246	803	479	7,555

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:40	07:25	06:47	05:54	17:25 (3) 06:06	05:36	05:36	06:02	06:34	18:19 (3) 07:07	06:43	07:20
	16:47	17:23	17:59	18:35 40	18:05 (3) 20:08	20:40	20:52	20:32	19:46 46	19:05 (3) 18:53	17:04	16:39
2	07:40	07:24	06:45	05:52	17:26 (3) 06:05	05:35	05:37	06:03	06:36	18:18 (3) 07:08	06:44	07:21
	16:48	17:25	18:00	18:37 40	18:06 (3) 20:09	20:41	20:52	20:31	19:44 46	19:04 (3) 18:51	17:03	16:38
3	07:40	07:23	06:44	05:51	17:24 (3) 06:04	05:35	05:37	06:04	06:37	18:20 (3) 07:09	06:46	07:22
	16:49	17:26	18:02	18:38 42	18:06 (3) 20:11	20:41	20:51	20:30	19:42 46	19:06 (3) 18:50	17:02	16:38
4	07:40	07:22	06:42	05:49	17:24 (3) 06:02	05:35	05:38	06:05	06:38	18:19 (3) 07:10	06:47	07:23
	16:50	17:27	18:03	18:39 42	18:06 (3) 20:12	20:42	20:51	20:29	19:41 46	19:05 (3) 18:48	17:01	16:38
5	07:40	07:21	06:41	06:47	18:22 (3) 06:01	05:34	05:39	06:06	06:39	18:18 (3) 07:11	06:48	07:24
	16:51	17:28	18:04	19:40 44	19:06 (3) 20:13	20:43	20:51	20:27	19:39 46	19:04 (3) 18:46	16:59	16:38
6	07:40	07:20	06:39	06:45	18:23 (3) 06:00	05:34	05:39	06:07	06:40	18:19 (3) 07:12	06:49	07:25
	16:52	17:30	18:05	19:41 44	19:07 (3) 20:14	20:44	20:51	20:26	19:37 44	19:03 (3) 18:44	16:58	16:37
7	07:40	07:18	06:37	06:44	18:21 (3) 05:58	05:34	05:40	06:08	06:41	18:18 (3) 07:13	06:51	07:26
	16:53	17:31	18:07	19:42 46	19:07 (3) 20:15	20:44	20:50	20:25	19:35 44	19:02 (3) 18:43	16:57	16:37
8	07:40	07:17	06:36	06:42	18:21 (3) 05:57	05:33	05:40	06:09	06:42	18:19 (3) 07:14	06:52	07:27
	16:54	17:32	18:08	19:43 46	19:07 (3) 20:16	20:45	20:50	20:24	19:34 42	19:01 (3) 18:41	16:56	16:37
9	07:40	07:16	06:34	06:40	18:22 (3) 05:56	05:33	05:41	06:10	06:43	18:18 (3) 07:16	06:53	07:28
	16:55	17:34	18:09	19:45 46	19:08 (3) 20:17	20:45	20:50	20:22	19:32 44	19:02 (3) 18:39	16:55	16:37
10	07:39	07:15	06:32	06:39	18:20 (3) 05:55	05:33	05:42	06:11	06:44	18:19 (3) 07:17	06:54	07:28
	16:56	17:35	18:10	19:46 46	19:06 (3) 20:18	20:46	20:49	20:21	19:30 40	18:59 (3) 18:38	16:54	16:37
11	07:39	07:13	06:30	06:37	18:20 (3) 05:54	05:33	05:43	06:12	06:45	18:20 (3) 07:18	06:56	07:29
	16:57	17:36	18:11	19:47 46	19:06 (3) 20:19	20:47	20:49	20:20	19:28 38	18:58 (3) 18:36	16:53	16:37
12	07:39	07:12	06:29	06:35	18:21 (3) 05:52	05:32	05:43	06:13	06:46	18:19 (3) 07:19	06:57	07:30
	16:58	17:38	18:12	19:48 44	19:05 (3) 20:20	20:47	20:48	20:18	19:27 38	18:57 (3) 18:34	16:52	16:37
13	07:39	07:11	06:27	06:34	18:21 (3) 05:51	05:32	05:44	06:14	06:47	18:20 (3) 07:20	06:58	07:31
	17:00	17:39	18:14	19:49 44	19:05 (3) 20:22	20:48	20:48	20:17	19:25 36	18:56 (3) 18:33	16:51	16:37
14	07:38	07:09	06:25	06:32	18:21 (3) 05:50	05:32	05:45	06:15	06:48	18:21 (3) 07:21	06:59	07:32
	17:01	17:40	18:15	19:50 42	19:03 (3) 20:23	20:48	20:47	20:16	19:23 32	18:53 (3) 18:31	16:50	16:38
15	07:38	07:08	06:24	06:30	18:22 (3) 05:49	05:32	05:46	06:16	06:49	18:22 (3) 07:22	07:01	07:32
	17:02	17:42	18:16	19:51 42	19:04 (3) 20:24	20:49	20:47	20:14	19:21 30	18:52 (3) 18:29	16:49	16:38
16	07:37	07:07	06:22	06:29	18:22 (3) 05:48	05:32	05:47	06:17	06:50	18:25 (3) 07:24	07:02	07:33
	17:03	17:43	18:17	19:52 40	19:02 (3) 20:25	20:49	20:46	20:13	19:20 24	18:49 (3) 18:28	16:48	16:38
17	07:37	07:05	06:20	06:27	18:23 (3) 05:47	05:32	05:47	06:18	06:51	18:26 (3) 07:25	07:03	07:34
	17:04	17:44	18:18	19:54 38	19:01 (3) 20:26	20:50	20:46	20:11	19:18 20	18:46 (3) 18:26	16:47	16:38
18	07:36	07:04	06:18	06:26	18:23 (3) 05:46	05:32	05:48	06:20	18:43 (3) 06:53	18:31 (3) 07:26	07:04	07:35
	17:05	17:45	18:19	19:55 38	19:01 (3) 20:27	20:50	20:45	20:10 8	18:51 (3) 19:16 10	18:41 (3) 18:25	16:46	16:39
19	07:36	07:02	06:17	06:24	18:24 (3) 05:45	05:33	05:49	06:21	18:38 (3) 06:54	07:27	07:06	07:35
	17:07	17:47	18:21	19:56 36	19:00 (3) 20:28	20:50	20:44	20:08 16	18:54 (3) 19:14	18:23	16:45	16:39
20	07:35	07:01	06:15	06:22	18:26 (3) 05:44	05:33	05:50	06:22	18:35 (3) 06:55	07:28	07:07	07:36
	17:08	17:48	18:22	19:57 32	18:58 (3) 20:29	20:51	20:43	20:07 22	18:57 (3) 19:12	18:21	16:44	16:39
21	07:34	06:59	06:13	06:21	18:27 (3) 05:44	05:33	05:51	06:23	18:32 (3) 06:56	07:30	07:08	07:36
	17:09	17:49	18:23	19:58 30	18:57 (3) 20:30	20:51	20:43	20:05 26	18:58 (3) 19:11	18:20	16:44	16:40
22	07:34	06:58	06:11	06:19	18:29 (3) 05:43	05:33	05:52	06:24	18:31 (3) 06:57	07:31	07:09	07:37
	17:10	17:50	18:24	19:59 24	18:53 (3) 20:31	20:51	20:42	20:04 30	19:01 (3) 19:09	18:18	16:43	16:40
23	07:33	06:56	06:10	06:18	18:30 (3) 05:42	05:33	05:53	06:25	18:30 (3) 06:58	07:32	07:10	07:37
	17:12	17:52	18:25	20:00 22	18:52 (3) 20:32	20:51	20:41	20:02 32	19:02 (3) 19:07	18:17	16:42	16:41
24	07:32	06:55	06:08	06:16	18:34 (3) 05:41	05:34	05:54	06:26	18:27 (3) 06:59	07:33	07:12	07:38
	17:13	17:53	18:26	20:00 14	18:48 (3) 20:33	20:51	20:40	20:01 36	19:03 (3) 19:05	18:15	16:42	16:41
25	07:31	06:53	06:06 17:46 (3)	06:15	05:40	05:34	05:55	06:27	18:26 (3) 07:00	06:34	07:13	07:38
	17:14	17:54	18:28 6	17:52 (3) 20:02	20:34	20:52	20:39	19:57 38	19:04 (3) 19:04	17:14	16:41	16:42
26	07:31	06:52	06:04 17:40 (3)	06:13	05:40	05:34	05:56	06:28	18:25 (3) 07:01	06:36	07:14	07:39
	17:15	17:56	18:29 16	17:56 (3) 20:03	20:35	20:52	20:38	19:56 38	19:03 (3) 19:02	17:13	16:41	16:43
27	07:30	06:50	06:03 17:36 (3)	06:12	05:39	05:35	05:57	06:29	18:24 (3) 07:02	06:37	07:15	07:39
	17:17	17:57	18:30 24	18:00 (3) 20:04	20:35	20:52	20:37	19:54 40	19:04 (3) 19:00	17:11	16:40	16:43
28	07:29	06:49	06:01 17:32 (3)	06:10	05:38	05:35	05:58	06:30	18:23 (3) 07:03	06:38	07:16	07:39
	17:18	17:58	18:31 30	18:02 (3) 20:05	20:36	20:52	20:36	19:52 42	19:05 (3) 18:58	17:10	16:40	16:44
29	07:28		05:59 17:31 (3)	06:09	05:38	05:35	05:59	06:31	18:22 (3) 07:04	06:39	07:17	07:39
	17:19		18:32 32	18:03 (3) 20:06	20:37	20:52	20:35	19:51 42	19:04 (3) 18:57	17:08	16:39	16:45
30	07:27		05:58 17:29 (3)	06:08	05:37	05:36	06:00	06:32	18:21 (3) 07:05	06:41	07:18	07:40
	17:21		18:33 36	18:05 (3) 20:07	20:38	20:52	20:34	19:49 44	19:05 (3) 18:55	17:07	16:39	16:46
31	07:26		05:56 17:27 (3)		05:36		06:01	06:33	18:20 (3)	06:42		07:40
	17:22		18:34 38	18:05 (3)	20:39		20:33	19:47 44	19:04 (3)	17:06		16:46
Potential sun hours	293	295	370	209	-292	-263	-280	-145	375	343	294	283
Total, worst case			182	928				458	672			
Sun reduction			0.45	0.55				0.55	0.55			
Oper. time red.			0.86	0.86				0.86	0.86			
Wind dir. red.			0.61	0.61				0.61	0.61			
Total reduction			0.24	0.29				0.29	0.29			
Total, real			43	269				133	194			

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	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, Southern part
11 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
1000 meter max shadow distance applied along with default 3° inclination
Sunshine probabilities applied (pdf plots)
Directional run-hours applied from tab file (tower 1)
.

Printed/Page
03/05/06 22:12 / 11
Licensed user:
Wind Engineers, Inc.
7660 Whitegate Avenue
US-RIVERSIDE, CA 92506

Calculated:
03/04/06 13:30/2.4.0.67

SHADOW - Calendar

Calculation: Southern part **Shadow receptor:** 776 - 776

Assumptions for shadow calculations

Maximum distance for influence	1,000 m
Minimum sun height over horizon for influence	3 °
Day step for calculation	1 days
Time step for calculation	2 minutes

Sun shine probabilities (part of time from sun rise to sun set with sun shine)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.35	0.45	0.45	0.55	0.55	0.55	0.65	0.55	0.55	0.45	0.35	0.30

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
475	585	238	199	220	474	1,184	813	840	1,246	803	479	7,555

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:40	07:25	06:47	05:54	06:06	18:56 (4)	05:36	05:36	06:02	19:10 (4)	06:34	07:07	06:43	07:20
	16:47	17:23	17:59	18:35	20:08 26	19:22 (4)	20:40	20:52	20:32 18	19:28 (4)	19:46	18:53	17:04	16:38
2	07:40	07:24	06:45	05:52	06:05	18:55 (4)	05:35	05:37	06:03	19:09 (4)	06:35	07:08	06:44	07:21
	16:48	17:25	18:00	18:37	20:09 26	19:21 (4)	20:40	20:52	20:31 20	19:29 (4)	19:44	18:51	17:03	16:38
3	07:40	07:23	06:44	05:51	06:04	18:56 (4)	05:35	05:37	06:04	19:08 (4)	06:37	07:09	06:45	07:22
	16:49	17:26	18:02	18:38	20:11 26	19:22 (4)	20:41	20:51	20:30 22	19:30 (4)	19:42	18:50	17:02	16:38
4	07:40	07:22	06:42	05:49	06:02	18:54 (4)	05:35	05:38	06:05	19:07 (4)	06:38	07:10	06:47	07:23
	16:50	17:27	18:03	18:39	20:12 28	19:22 (4)	20:42	20:51	20:29 24	19:31 (4)	19:41	18:48	17:00	16:38
5	07:40	07:21	06:41	06:47	06:01	18:55 (4)	05:34	05:38	06:06	19:06 (4)	06:39	07:11	06:48	07:24
	16:51	17:28	18:04	19:40	20:13 26	19:21 (4)	20:43	20:51	20:27 24	19:30 (4)	19:39	18:46	16:59	16:37
6	07:40	07:20	06:39	06:45	06:00	18:56 (4)	05:34	05:39	06:07	19:05 (4)	06:40	07:12	06:49	07:25
	16:52	17:30	18:05	19:41	20:14 26	19:22 (4)	20:43	20:51	20:26 26	19:31 (4)	19:37	18:44	16:58	16:37
7	07:40	07:18	06:37	06:44	05:58	18:57 (4)	05:33	05:40	06:08	19:06 (4)	06:41	07:13	06:51	07:26
	16:53	17:31	18:06	19:42	20:15 24	19:21 (4)	20:44	20:50	20:25 26	19:32 (4)	19:35	18:43	16:57	16:37
8	07:40	07:17	06:36	06:42	05:57	18:56 (4)	05:33	05:40	06:09	19:05 (4)	06:42	07:14	06:52	07:27
	16:54	17:32	18:08	19:43	20:16 24	19:20 (4)	20:45	20:50	20:24 26	19:31 (4)	19:34	18:41	16:56	16:37
9	07:40	07:16	06:34	06:40	05:56	18:57 (4)	05:33	05:41	06:10	19:04 (4)	06:43	07:15	06:53	07:28
	16:55	17:34	18:09	19:45	20:17 24	19:21 (4)	20:45	20:50	20:22 28	19:32 (4)	19:32	18:39	16:55	16:37
10	07:39	07:15	06:32	06:39	05:55	18:57 (4)	05:33	05:42	06:11	19:05 (4)	06:44	07:17	06:54	07:28
	16:56	17:35	18:10	19:46	20:18 22	19:19 (4)	20:46	20:49	20:21 26	19:31 (4)	19:30	18:38	16:54	16:37
11	07:39	07:13	06:30	06:37	05:54	18:58 (4)	05:33	05:43	06:12	19:04 (4)	06:45	07:18	06:56	07:29
	16:57	17:36	18:11	19:47	20:19 20	19:18 (4)	20:47	20:49	20:20 26	19:30 (4)	19:28	18:36	16:53	16:37
12	07:39	07:12	06:29	06:35	05:52	18:59 (4)	05:32	05:43	06:13	19:05 (4)	06:46	07:19	06:57	07:30
	16:58	17:38	18:12	19:48	20:20 18	19:17 (4)	20:47	20:48	20:18 26	19:31 (4)	19:27	18:34	16:51	16:37
13	07:39	07:11	06:27	06:34	05:51	19:00 (4)	05:32	05:44	06:14	19:04 (4)	06:47	07:20	06:58	07:31
	17:00	17:39	18:14	19:49	20:21 16	19:16 (4)	20:48	20:48	20:17 26	19:30 (4)	19:25	18:33	16:50	16:37
14	07:38	07:09	06:25	06:32	05:50	19:03 (4)	05:32	05:45	06:15	19:05 (4)	06:48	07:21	06:59	07:32
	17:01	17:40	18:15	19:50	20:23 10	19:13 (4)	20:48	20:47	20:16 24	19:29 (4)	19:23	18:31	16:50	16:38
15	07:38	07:08	06:24	06:30	05:49	19:06 (4)	05:32	05:46	06:16	19:06 (4)	06:49	07:22	07:01	07:32
	17:02	17:42	18:16	19:51	20:24 6	19:12 (4)	20:49	20:47	20:14 22	19:28 (4)	19:21	18:29	16:49	16:38
16	07:37	07:07	06:22	06:29	05:48		05:32	05:46	06:17	19:05 (4)	06:50	07:24	07:02	07:33
	17:03	17:43	18:17	19:52	20:25		20:49	20:46	20:13 22	19:27 (4)	19:20	18:28	16:48	16:38
17	07:37	07:05	06:20	06:27	05:47		05:32	05:47	06:18	19:06 (4)	06:51	07:25	07:03	07:34
	17:04	17:44	18:18	19:54	20:26		20:50	20:46	20:11 20	19:26 (4)	19:18	18:26	16:47	16:38
18	07:36	07:04	06:18	06:26	05:46		05:32	05:48	06:19	19:09 (4)	06:52	07:26	07:04	07:35
	17:05	17:45	18:19	19:55	20:27		20:50	20:45	20:10 14	19:23 (4)	19:16	18:25	16:46	16:39
19	07:36	07:02	06:17	06:24	05:45		05:32	05:49	06:21	19:10 (4)	06:54	07:27	07:05	07:35
	17:07	17:47	18:21	19:56	20:28		20:50	20:44	20:08 10	19:20 (4)	19:14	18:23	16:45	16:39
20	07:35	07:01	06:15	06:22	05:44		05:33	05:50	06:22		06:55	07:28	07:07	07:36
	17:08	17:48	18:22	19:57	20:29		20:51	20:43	20:07		19:12	18:21	16:44	16:39
21	07:34	06:59	06:13	06:21	05:43		05:33	05:51	06:23		06:56	07:29	07:08	07:36
	17:09	17:49	18:23	19:58	20:30		20:51	20:43	20:05		19:11	18:20	16:44	16:40
22	07:34	06:58	06:11	06:19	05:43		05:33	05:52	06:24		06:57	07:31	07:09	07:37
	17:10	17:50	18:24	19:59	20:31		20:51	20:42	20:04		19:09	18:18	16:43	16:40
23	07:33	06:56	06:10	06:18 19:10 (4)	05:42		05:33	05:53	06:25		06:58	07:32	07:10	07:37
	17:12	17:52	18:25	20:00 4 19:14 (4)	20:32		20:51	20:41	20:02		19:07	18:17	16:42	16:41
24	07:32	06:55	06:08	06:16 19:04 (4)	05:41		05:33	05:54	06:26		06:59	07:33	07:12	07:38
	17:13	17:53	18:26	20:00 12 19:16 (4)	20:33		20:51	20:40	20:00		19:05	18:15	16:42	16:41
25	07:31	06:53	06:06	06:15 19:03 (4)	05:40		05:34	05:55	06:27		07:00	06:34	07:13	07:38
	17:14	17:54	18:27	20:02 16 19:19 (4)	20:34		20:52	20:39	19:57		19:04	17:14	16:41	16:42
26	07:31	06:52	06:04	06:13 18:59 (4)	05:40		05:34	05:56	06:28		07:01	06:36	07:14	07:39
	17:15	17:55	18:29	20:03 20 19:19 (4)	20:35		20:52	20:38	19:56		19:02	17:13	16:41	16:43
27	07:30	06:50	06:03	06:12 18:58 (4)	05:39		05:34	05:57	06:29		07:02	06:37	07:15	07:39
	17:17	17:57	18:30	20:04 22 19:20 (4)	20:35		20:52	20:37	19:54		19:00	17:11	16:40	16:43
28	07:29	06:49	06:01	06:10 18:58 (4)	05:38		05:35	05:58	06:30		07:03	06:38	07:16	07:39
	17:18	17:58	18:31	20:05 22 19:20 (4)	20:36		20:52	20:36	19:52		18:58	17:10	16:40	16:44
29	07:28		05:59	06:09 18:57 (4)	05:38		05:35	05:59 19:15 (4)	06:31		07:04	06:39	07:17	07:39
	17:19		18:32	20:06 24 19:21 (4)	20:37		20:52	20:35 8 19:23 (4)	19:51		18:57	17:08	16:39	16:45
30	07:27		05:57	06:08 18:56 (4)	05:37		05:36	06:00 19:12 (4)	06:32		07:05	06:40	07:18	07:40
	17:21		18:33	20:07 26 19:22 (4)	20:38		20:52	20:34 14 19:26 (4)	19:49		18:55	17:07	16:39	16:46
31	07:26		05:56		05:36			06:01 19:11 (4)	06:33			06:42		07:40
	17:22		18:34		20:39			20:33 16 19:27 (4)	19:47			17:06		16:46
Potential sun hours	293	295	370	209	-292		-263	-280	-145		375	343	294	283
Total, worst case				146	322			38	430					
Sun reduction				0.55	0.55			0.65	0.55					
Oper. time red.				0.86	0.86			0.86	0.86					
Wind dir. red.				0.59	0.59			0.59	0.59					
Total reduction				0.28	0.28			0.33	0.28					
Total, real				41	91			13	121					

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	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, Southern part
11 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
1000 meter max shadow distance applied along with default 3° inclination
Sunshine probabilities applied (pdf plots)
Directional run-hours applied from tab file (tower 1)
.

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Wind Engineers, Inc.
7660 Whitegate Avenue
US-RIVERSIDE, CA 92506

Calculated:
03/04/06 13:30/2.4.0.67

SHADOW - Calendar

Calculation: Southern part **Shadow receptor:** 777 - 777

Assumptions for shadow calculations

Maximum distance for influence	1,000 m
Minimum sun height over horizon for influence	3 °
Day step for calculation	1 days
Time step for calculation	2 minutes

Sun shine probabilities (part of time from sun rise to sun set with sun shine)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.35	0.45	0.45	0.55	0.55	0.55	0.65	0.55	0.55	0.45	0.35	0.30

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
475	585	238	199	220	474	1,184	813	840	1,246	803	479	7,555

	January	February	March	April		May		June	July	August		September	October	November	December
1	07:40	07:25	06:47	05:54		06:06	19:00 (4)	05:36	05:36	06:02		06:34	07:07	06:43	07:19
	16:47	17:23	17:59	18:35		20:08	18 19:18 (4)	20:40	20:52	20:32		19:46	18:53	17:04	16:38
2	07:40	07:24	06:45	05:52		06:05	19:01 (4)	05:35	05:37	06:03		06:35	07:08	06:44	07:21
	16:48	17:25	18:00	18:37		20:09	16 19:17 (4)	20:40	20:52	20:31		19:44	18:51	17:03	16:38
3	07:40	07:23	06:44	05:51		06:04	19:02 (4)	05:35	05:37	06:04		06:37	07:09	06:45	07:22
	16:49	17:26	18:02	18:38		20:11	14 19:16 (4)	20:41	20:51	20:30		19:42	18:50	17:02	16:38
4	07:40	07:22	06:42	05:49		06:02	19:04 (4)	05:35	05:38	06:05		06:38	07:10	06:47	07:23
	16:50	17:27	18:03	18:39		20:12	8 19:12 (4)	20:42	20:51	20:29		19:41	18:48	17:00	16:38
5	07:40	07:21	06:41	06:47		06:01		05:34	05:38	06:06		06:39	07:11	06:48	07:24
	16:51	17:28	18:04	19:40		20:13		20:43	20:51	20:27		19:39	18:46	16:59	16:37
6	07:40	07:20	06:39	06:45		06:00		05:34	05:39	06:07		06:40	07:12	06:49	07:25
	16:52	17:30	18:05	19:41		20:14		20:43	20:51	20:26		19:37	18:44	16:58	16:37
7	07:40	07:18	06:37	06:44		05:58		05:33	05:40	06:08		06:41	07:13	06:50	07:26
	16:53	17:31	18:06	19:42		20:15		20:44	20:50	20:25		19:35	18:43	16:57	16:37
8	07:40	07:17	06:36	06:42		05:57		05:33	05:40	06:09		06:42	07:14	06:52	07:27
	16:54	17:32	18:08	19:43		20:16		20:45	20:50	20:24		19:34	18:41	16:56	16:37
9	07:40	07:16	06:34	06:40		05:56		05:33	05:41	06:10	19:14 (4)	06:43	07:15	06:53	07:28
	16:55	17:34	18:09	19:45		20:17		20:45	20:50	20:22	10 19:24 (4)	19:32	18:39	16:55	16:37
10	07:39	07:15	06:32	06:39		05:55		05:33	05:42	06:11	19:11 (4)	06:44	07:17	06:54	07:28
	16:56	17:35	18:10	19:46		20:18		20:46	20:49	20:21	14 19:25 (4)	19:30	18:38	16:54	16:37
11	07:39	07:13	06:30	06:37		05:54		05:33	05:43	06:12	19:10 (4)	06:45	07:18	06:56	07:29
	16:57	17:36	18:11	19:47		20:19		20:47	20:49	20:20	16 19:26 (4)	19:28	18:36	16:53	16:37
12	07:39	07:12	06:29	06:35		05:52		05:32	05:43	06:13	19:09 (4)	06:46	07:19	06:57	07:30
	16:58	17:38	18:12	19:48		20:20		20:47	20:48	20:18	18 19:27 (4)	19:27	18:34	16:51	16:37
13	07:39	07:11	06:27	06:34		05:51		05:32	05:44	06:14	19:08 (4)	06:47	07:20	06:58	07:31
	17:00	17:39	18:14	19:49		20:21		20:48	20:48	20:17	20 19:28 (4)	19:25	18:33	16:50	16:37
14	07:38	07:09	06:25	06:32		05:50		05:32	05:45	06:15	19:07 (4)	06:48	07:21	06:59	07:32
	17:01	17:40	18:15	19:50		20:23		20:48	20:47	20:16	22 19:29 (4)	19:23	18:31	16:50	16:38
15	07:38	07:08	06:24	06:30		05:49		05:32	05:46	06:16	19:06 (4)	06:49	07:22	07:01	07:32
	17:02	17:42	18:16	19:51		20:24		20:49	20:47	20:14	22 19:28 (4)	19:21	18:29	16:49	16:38
16	07:37	07:07	06:22	06:29		05:48		05:32	05:46	06:17	19:05 (4)	06:50	07:24	07:02	07:33
	17:03	17:43	18:17	19:52		20:25		20:49	20:46	20:13	24 19:29 (4)	19:20	18:28	16:48	16:38
17	07:37	07:05	06:20	06:27	19:09 (4)	05:47		05:32	05:47	06:18	19:04 (4)	06:51	07:25	07:03	07:34
	17:04	17:44	18:18	19:54	6 19:15 (4)	20:26		20:49	20:46	20:11	24 19:28 (4)	19:18	18:26	16:47	16:38
18	07:36	07:04	06:18	06:26	19:05 (4)	05:46		05:32	05:48	06:19	19:05 (4)	06:52	07:26	07:04	07:35
	17:05	17:45	18:19	19:55	14 19:19 (4)	20:27		20:50	20:45	20:10	24 19:29 (4)	19:16	18:25	16:46	16:39
19	07:36	07:02	06:17	06:24	19:04 (4)	05:45		05:32	05:49	06:21	19:04 (4)	06:54	07:27	07:05	07:35
	17:07	17:47	18:21	19:56	16 19:20 (4)	20:28		20:50	20:44	20:08	24 19:28 (4)	19:14	18:23	16:45	16:39
20	07:35	07:01	06:15	06:22	19:02 (4)	05:44		05:33	05:50	06:22	19:05 (4)	06:55	07:28	07:07	07:36
	17:08	17:48	18:22	19:57	18 19:20 (4)	20:29		20:51	20:43	20:07	22 19:27 (4)	19:12	18:21	16:44	16:39
21	07:34	06:59	06:13	06:21	19:01 (4)	05:43		05:33	05:51	06:23	19:04 (4)	06:56	07:29	07:08	07:36
	17:09	17:49	18:23	19:58	20 19:21 (4)	20:30		20:51	20:43	20:05	22 19:26 (4)	19:11	18:20	16:44	16:40
22	07:34	06:58	06:11	06:19	18:59 (4)	05:43		05:33	05:52	06:24	19:05 (4)	06:57	07:31	07:09	07:37
	17:10	17:50	18:24	19:59	22 19:21 (4)	20:31		20:51	20:42	20:04	20 19:25 (4)	19:09	18:18	16:43	16:40
23	07:33	06:56	06:10	06:18	19:00 (4)	05:42		05:33	05:53	06:25	19:06 (4)	06:58	07:32	07:10	07:37
	17:12	17:52	18:25	20:00	22 19:22 (4)	20:32		20:51	20:41	20:02	18 19:24 (4)	19:07	18:17	16:42	16:41
24	07:32	06:55	06:08	06:16	18:58 (4)	05:41		05:33	05:54	06:26	19:07 (4)	06:59	07:33	07:12	07:38
	17:13	17:53	18:26	20:00	24 19:22 (4)	20:33		20:51	20:40	20:00	16 19:23 (4)	19:05	18:15	16:42	16:41
25	07:31	06:53	06:06	06:15	18:59 (4)	05:40		05:34	05:55	06:27	19:08 (4)	07:00	06:34	07:13	07:38
	17:14	17:54	18:27	20:02	24 19:23 (4)	20:34		20:52	20:39	19:57	12 19:20 (4)	19:04	17:14	16:41	16:42
26	07:31	06:52	06:04	06:13	18:57 (4)	05:40		05:34	05:56	06:28	19:11 (4)	07:01	06:36	07:14	07:39
	17:15	17:55	18:29	20:03	24 19:21 (4)	20:35		20:52	20:38	19:56	6 19:17 (4)	19:02	17:13	16:41	16:43
27	07:30	06:50	06:03	06:12	18:58 (4)	05:39		05:34	05:57	06:29		07:02	06:37	07:15	07:39
	17:17	17:57	18:30	20:04	24 19:22 (4)	20:35		20:52	20:37	19:54		19:00	17:11	16:40	16:43
28	07:29	06:49	06:01	06:10	18:58 (4)	05:38		05:35	05:58	06:30		07:03	06:38	07:16	07:39
	17:18	17:58	18:31	20:05	22 19:20 (4)	20:36		20:52	20:36	19:52		18:58	17:10	16:40	16:44
29	07:28		05:59	06:09	18:59 (4)	05:38		05:35	05:59	06:31		07:04	06:39	07:17	07:39
	17:19		18:32	20:06	22 19:21 (4)	20:37		20:52	20:35	19:51		18:57	17:08	16:39	16:45
30	07:27		05:57	06:08	19:00 (4)	05:37		05:36	06:00	06:32		07:05	06:40	07:18	07:40
	17:21		18:33	20:07	20 19:20 (4)	20:38		20:52	20:34	19:49		18:55	17:07	16:39	16:46
31	07:26		05:56			05:36			06:01	06:33			06:42		07:40
	17:22		18:34			20:39			20:33	19:47			17:06		16:46
Potential sun hours	293	295	370	209		-292		-263	-280	-145		375	343	294	283
Total, worst case					278		56				334				
Sun reduction					0.55		0.55				0.55				
Oper. time red.					0.86		0.86				0.86				
Wind dir. red.					0.60		0.60				0.60				
Total reduction					0.28		0.28				0.28				
Total, real					79		16				95				

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	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, Southern part
11 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
1000 meter max shadow distance applied along with default 3° inclination
Sunshine probabilities applied (pdf plots)
Directional run-hours applied from tab file (tower 1)
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Printed/Page
03/05/06 22:12 / 13
Licensed user:
Wind Engineers, Inc.
7660 Whitegate Avenue
US-RIVERSIDE, CA 92506

Calculated:
03/04/06 13:30/2.4.0.67

SHADOW - Calendar

Calculation: Southern part **Shadow receptor:** 778 - 778

Assumptions for shadow calculations

Maximum distance for influence	1,000 m
Minimum sun height over horizon for influence	3 °
Day step for calculation	1 days
Time step for calculation	2 minutes

Sun shine probabilities (part of time from sun rise to sun set with sun shine)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.35	0.45	0.45	0.55	0.55	0.55	0.65	0.55	0.55	0.45	0.35	0.30

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
475	585	238	199	220	474	1,184	813	840	1,246	803	479	7,555

	January	February		March		April	May	June	July	August	September		October		November	December
1	07:40	07:25		06:47		07:43 (14)	05:54	06:06	05:36	05:36	06:02	06:34		07:07		08:27 (14)	06:43	07:20
	16:48	17:23		17:59	44	08:27 (14)	18:36	20:08	20:40	20:52	20:32	19:46		18:53	26	08:53 (14)	17:04	16:39
2	07:40	07:24		06:45		07:41 (14)	05:52	06:05	05:35	05:37	06:03	06:36		07:08		08:24 (14)	06:44	07:21
	16:48	17:25		18:00	44	08:25 (14)	18:37	20:09	20:41	20:52	20:31	19:44		18:51	30	08:54 (14)	17:03	16:38
3	07:40	07:23		06:44		07:42 (14)	05:51	06:04	05:35	05:37	06:04	06:37		07:09		08:23 (14)	06:46	07:22
	16:49	17:26		18:02	44	08:26 (14)	18:38	20:11	20:41	20:51	20:30	19:42		18:50	34	08:57 (14)	17:02	16:38
4	07:40	07:22		06:42		07:42 (14)	05:49	06:02	05:35	05:38	06:05	06:38		07:10		08:22 (14)	06:47	07:23
	16:50	17:27		18:03	42	08:24 (14)	18:39	20:12	20:42	20:51	20:29	19:41		18:48	34	08:56 (14)	17:01	16:38
5	07:40	07:21		06:41		07:42 (14)	06:47	06:01	05:34	05:39	06:06	06:39		07:11		08:19 (14)	06:48	07:24
	16:51	17:29		18:04	42	08:24 (14)	19:40	20:13	20:43	20:51	20:28	19:39		18:46	38	08:57 (14)	16:59	16:38
6	07:40	07:20		06:39		07:43 (14)	06:45	06:00	05:34	05:39	06:07	06:40		07:12		08:18 (14)	06:49	07:25
	16:52	17:30		18:05	40	08:23 (14)	19:41	20:14	20:44	20:51	20:26	19:37		18:44	40	08:58 (14)	16:58	16:37
7	07:40	07:18		06:37		07:43 (14)	06:44	05:58	05:34	05:40	06:08	06:41		07:13		08:18 (14)	06:51	07:26
	16:53	17:31		18:07	40	08:23 (14)	19:42	20:15	20:44	20:50	20:25	19:35		18:43	42	09:00 (14)	16:57	16:37
8	07:40	07:17		06:36		07:43 (14)	06:42	05:57	05:33	05:40	06:09	06:42		07:14		08:17 (14)	06:52	07:27
	16:54	17:32		18:08	38	08:21 (14)	19:43	20:16	20:45	20:50	20:24	19:34		18:41	42	08:59 (14)	16:56	16:37
9	07:40	07:16		06:34		07:44 (14)	06:40	05:56	05:33	05:41	06:10	06:43		07:16		08:16 (14)	06:53	07:28
	16:55	17:34		18:09	36	08:20 (14)	19:45	20:17	20:46	20:50	20:22	19:32		18:39	44	09:00 (14)	16:55	16:37
10	07:40	07:15		06:32		07:44 (14)	06:39	05:55	05:33	05:42	06:11	06:44		07:17		08:17 (14)	06:54	07:28
	16:56	17:35		18:10	34	08:18 (14)	19:46	20:18	20:46	20:49	20:21	19:30		18:38	42	08:59 (14)	16:54	16:37
11	07:39	07:13		06:31		07:46 (14)	06:37	05:54	05:33	05:43	06:12	06:45		07:18		08:16 (14)	06:56	07:29
	16:57	17:36		18:11	32	08:18 (14)	19:47	20:19	20:47	20:49	20:20	19:28		18:36	44	09:00 (14)	16:53	16:37
12	07:39	07:12		06:29		07:46 (14)	06:35	05:53	05:33	05:43	06:13	06:46		07:19		08:15 (14)	06:57	07:30
	16:58	17:38		18:12	28	08:14 (14)	19:48	20:20	20:47	20:48	20:18	19:27		18:34	44	08:59 (14)	16:52	16:37
13	07:39	07:11		06:27		07:49 (14)	06:34	05:51	05:32	05:44	06:14	06:47		07:20		08:15 (14)	06:58	07:31
	17:00	17:39		18:14	24	08:13 (14)	19:49	20:22	20:48	20:48	20:17	19:25		18:33	44	08:59 (14)	16:51	16:37
14	07:38	07:09		06:25		07:51 (14)	06:32	05:50	05:32	05:45	06:15	06:48		07:21		08:16 (14)	06:59	07:32
	17:01	17:40		18:15	18	08:09 (14)	19:50	20:23	20:48	20:47	20:16	19:23		18:31	42	08:58 (14)	16:50	16:38
15	07:38	07:08		08:04 (14)		06:24	07:53 (14)	06:30	05:49	05:32	05:46	06:16	06:49		07:22		08:15 (14)	07:01	07:33
	17:02	17:42	4	08:08 (14)		18:16	12	08:05 (14)	19:51	20:24	20:49	20:47	20:14	19:21		18:29	44	08:59 (14)	16:49	16:38
16	07:37	07:07		07:57 (14)		06:22		06:29	05:48	05:32	05:47	06:17	06:50		07:24		08:16 (14)	07:02	07:33
	17:03	17:43	18	08:15 (14)		18:17		19:53	20:25	20:49	20:46	20:13	19:20		18:28	42	08:58 (14)	16:48	16:38
17	07:37	07:05		07:56 (14)		06:20		06:27	05:47	05:32	05:47	06:18	06:51		07:25		08:16 (14)	07:03	07:34
	17:04	17:44	22	08:18 (14)		18:18		19:54	20:26	20:50	20:46	20:11	19:18		18:26	42	08:58 (14)	16:47	16:38
18	07:36	07:04		07:52 (14)		06:18		06:26	05:46	05:32	05:48	06:20	06:53		07:26		08:17 (14)	07:04	07:35
	17:05	17:45	28	08:20 (14)		18:20		19:55	20:27	20:50	20:45	20:10	19:16		18:25	40	08:57 (14)	16:46	16:39
19	07:36	07:02		07:51 (14)		06:17		06:24	05:45	05:33	05:49	06:21	06:54		07:27		08:18 (14)	07:06	07:35
	17:07	17:47	30	08:21 (14)		18:21		19:56	20:28	20:50	20:44	20:08	19:14		18:23	38	08:56 (14)	16:45	16:39
20	07:35	07:01		07:49 (14)		06:15		06:23	05:44	05:33	05:50	06:22	06:55		07:28		08:17 (14)	07:07	07:36
	17:08	17:48	34	08:23 (14)		18:22		19:57	20:29	20:51	20:43	20:07	19:13		18:22	38	08:55 (14)	16:45	16:40
21	07:34	07:00		07:48 (14)		06:13		06:21	05:44	05:33	05:51	06:23	06:56		07:30		08:19 (14)	07:08	07:36
	17:09	17:49	36	08:24 (14)		18:23		19:58	20:30	20:51	20:43	20:05	19:11		18:20	34	08:53 (14)	16:44	16:40
22	07:34	06:58		07:46 (14)		06:12		06:19	05:43	05:33	05:52	06:24	06:57		07:31		08:20 (14)	07:09	07:37
	17:10	17:51	38	08:24 (14)		18:24		19:59	20:31	20:51	20:42	20:04	19:09		18:18	32	08:52 (14)	16:43	16:40
23	07:33	06:57		07:46 (14)		06:10		06:18	05:42	05:33	05:53	06:25	06:58		07:32		08:21 (14)	07:10	07:37
	17:12	17:52	38	08:24 (14)		18:25		20:00	20:32	20:51	20:41	20:02	19:07		18:17	30	08:51 (14)	16:42	16:41
24	07:32	06:55		07:45 (14)		06:08		06:16	05:41	05:34	05:54	06:26	06:59		07:33		08:22 (14)	07:12	07:38
	17:13	17:53	40	08:25 (14)		18:26		20:00	20:33	20:51	20:40	20:01	19:05		18:15	26	08:48 (14)	16:42	16:42
25	07:31	06:53		07:43 (14)		06:06		06:15	05:40	05:34	05:55	06:27	07:00		06:34		07:26 (14)	07:13	07:38
	17:14	17:54	42	08:25 (14)		18:28		20:02	20:34	20:52	20:39	19:57	19:04		17:14	20	07:46 (14)	16:41	16:42
26	07:31	06:52		07:44 (14)		06:05		06:13	05:40	05:34	05:56	06:28	07:01		06:36		07:29 (14)	07:14	07:39
	17:15	17:56	42	08:26 (14)		18:29		20:03	20:35	20:52	20:38	19:56	19:02		17:13	14	07:43 (14)	16:41	16:43
27	07:30	06:50		07:44 (14)		06:03		06:12	05:39	05:35	05:57	06:29	07:02		06:37			07:15	07:39
	17:17	17:57	42	08:26 (14)		18:30		20:04	20:35	20:52	20:37	19:54	19:00		17:11			16:40	16:43
28	07:29	06:49		07:43 (14)		06:01		06:11	05:38	05:35	05:58	06:30	07:03	08:38 (14)	06:38			07:16	07:39
	17:18	17:58	44	08:27 (14)		18:31		20:05	20:36	20:52	20:36	19:52	18:58	6 08:44 (14)	17:10			16:40	16:44
29	07:28					05:59		06:09	05:38	05:35	05:59	06:31	07:04	08:33 (14)	06:39			07:17	07:39
	17:19					18:32		20:06	20:37	20:52	20:35	19:51	18:57	16 08:49 (14)	17:08			16:39	16:45
30	07:27					05:58		06:08	05:37	05:36	06:00	06:32	07:06	08:30 (14)	06:41			07:18	07:40
	17:21					18:33		20:07	20:38	20:52	20:34	19:49	18:55	22 08:52 (14)	17:07			16:39	16:46
31	07:26					05:56			05:36		06:01	06:33			06:42				07:40
	17:22					18:34			20:39		20:33	19:47			17:06				16:46
Potential sun hours	293	295		370			209	-292	-263	-280	-145	375		343			294	283
Total, worst case			458			518							44			946			
Sun reduction			0.45			0.45							0.55			0.45			
Oper. time red.			0.86			0.86							0.86			0.86			
Wind dir. red.			0.62			0.62							0.62			0.62			
Total reduction			0.24			0.24							0.29			0.24			
Total, real			110			125							13			228			

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	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, Southern part
11 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
1000 meter max shadow distance applied along with default 3° inclination
Sunshine probabilities applied (pdf plots)
Directional run-hours applied from tab file (tower 1)
.

Printed/Page
03/05/06 22:12 / 14

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Wind Engineers, Inc.
7660 Whitegate Avenue
US-RIVERSIDE, CA 92506

Calculated:
03/04/06 13:30/2.4.0.67

SHADOW - Calendar

Calculation: Southern part **Shadow receptor:** 779 - 779

Assumptions for shadow calculations

Maximum distance for influence	1,000	m
Minimum sun height over horizon for influence	3	°
Day step for calculation	1	days
Time step for calculation	2	minutes

Sun shine probabilities (part of time from sun rise to sun set with sun shine)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.35	0.45	0.45	0.55	0.55	0.55	0.65	0.55	0.55	0.45	0.35	0.30

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
475	585	238	199	220	474	1,184	813	840	1,246	803	479	7,555

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:40	07:25 16:18 (2)	06:47	05:54 16:51 (14)	06:06	05:36	05:36	06:02	06:34	07:07	06:43 15:43 (2)	07:20
	16:47	17:23 14 16:32 (2)	17:59	18:35 26 17:17 (14)	20:08	20:40	20:52	20:32	19:46	18:53	17:04 24 16:07 (2)	16:39
2	07:40	07:24 16:17 (2)	06:45	05:52 16:54 (14)	06:05	05:35	05:37	06:03	06:36	07:08	06:44 15:42 (2)	07:21
	16:48	17:25 18 16:35 (2)	18:00	18:37 22 17:16 (14)	20:09	20:40	20:52	20:31	19:44	18:51	17:03 26 16:08 (2)	16:38
3	07:40	07:23 16:16 (2)	06:44	05:51 16:56 (14)	06:04	05:35	05:37	06:04	06:37	07:09	06:45 15:44 (2)	07:22
	16:49	17:26 20 16:36 (2)	18:02	18:38 16 17:12 (14)	20:11	20:41	20:51	20:30	19:42	18:50	17:02 24 16:08 (2)	16:38
4	07:40	07:22 16:15 (2)	06:42	05:49 16:58 (14)	06:02	05:35	05:38	06:05	06:38	07:10	06:47 15:43 (2)	07:23
	16:50	17:27 22 16:37 (2)	18:03	18:39 12 17:10 (14)	20:12	20:42	20:51	20:29	19:41	18:48	17:01 24 16:07 (2)	16:38
5	07:40	07:21 16:13 (2)	06:41	06:47	06:01	05:34	05:39	06:06	06:39	07:11	06:48 15:44 (2)	07:24
	16:51	17:28 24 16:37 (2)	18:04	19:40	20:13	20:43	20:51	20:27	19:39	18:46	16:59 24 16:08 (2)	16:37
6	07:40	07:20 16:14 (2)	06:39	06:45	06:00	05:34	05:39	06:07	06:40	07:12	06:49 15:44 (2)	07:25
	16:52	17:30 24 16:38 (2)	18:05	19:41	20:14	20:43	20:51	20:26	19:37	18:44	16:58 24 16:08 (2)	16:37
7	07:40	07:18 16:13 (2)	06:37	06:44	05:58	05:34	05:40	06:08	06:41	07:13	06:51 15:45 (2)	07:26
	16:53	17:31 24 16:37 (2)	18:06	19:42	20:15	20:44	20:50	20:25	19:35	18:43	16:57 22 16:07 (2)	16:37
8	07:40	07:17 16:14 (2)	06:36	06:42	05:57	05:33	05:40	06:09	06:42 17:53 (14)	07:14	06:52 15:46 (2)	07:27
	16:54	17:32 24 16:38 (2)	18:08	19:43	20:16	20:45	20:50	20:24	19:34 10 18:03 (14)	18:41	16:56 20 16:06 (2)	16:37
9	07:40	07:16 16:14 (2)	06:34	06:40	05:56	05:33	05:41	06:10	06:43 17:50 (14)	07:16	06:53 15:48 (2)	07:28
	16:55	17:34 24 16:38 (2)	18:09	19:45	20:17	20:45	20:50	20:22	19:32 16 18:06 (14)	18:39	16:55 16 16:04 (2)	16:37
10	07:39	07:15 16:13 (2)	06:32	06:39	05:55	05:33	05:42	06:11	06:44 17:47 (14)	07:17	06:54 15:49 (2)	07:28
	16:56	17:35 26 16:39 (2)	18:10	19:46	20:18	20:46	20:49	20:21	19:30 22 18:09 (14)	18:38	16:54 14 16:03 (2)	16:37
11	07:39	07:13 16:14 (2)	06:30	06:37	05:54	05:33	05:43	06:12	06:45 17:46 (14)	07:18	06:56 15:50 (2)	07:29
	16:57	17:36 24 16:38 (2)	18:11	19:47	20:19	20:47	20:49	20:20	19:28 24 18:10 (14)	18:36	16:53 12 16:02 (2)	16:37
12	07:39	07:12 16:14 (2)	06:29	06:35	05:52	05:32	05:43	06:13	06:46 17:43 (14)	07:19	06:57 15:54 (2)	07:30
	16:58	17:38 24 16:38 (2)	18:12	19:48	20:20	20:47	20:48	20:18	19:27 26 18:09 (14)	18:34	16:52 4 15:58 (2)	16:37
13	07:39	07:11 16:15 (2)	06:27	06:34	05:51	05:32	05:44	06:14	06:47 17:42 (14)	07:20	06:58	07:31
	17:00	17:39 22 16:37 (2)	18:14	19:49	20:21	20:48	20:48	20:17	19:25 28 18:10 (14)	18:33	16:51	16:37
14	07:38	07:09 16:16 (2)	06:25	06:32	05:50	05:32	05:45	06:15	06:48 17:41 (14)	07:21	06:59	07:32
	17:01	17:40 20 16:36 (2)	18:15	19:50	20:23	20:48	20:47	20:16	19:23 30 18:11 (14)	18:31	16:50	16:38
15	07:38	07:08 16:18 (2)	06:24 17:07 (14)	06:30	05:49	05:32	05:46	06:16	06:49 17:40 (14)	07:22	07:01	07:32
	17:02	17:42 16 16:34 (2)	18:16 4 17:11 (14)	19:51	20:24	20:49	20:47	20:14	19:21 30 18:10 (14)	18:29	16:49	16:38
16	07:37	07:07 16:19 (2)	06:22 17:01 (14)	06:29	05:48	05:32	05:47	06:17	06:50 17:39 (14)	07:24	07:02	07:33
	17:03	17:43 14 16:33 (2)	18:17 14 17:15 (14)	19:52	20:25	20:49	20:46	20:13	19:20 32 18:11 (14)	18:28	16:48	16:38
17	07:37	07:05 16:21 (2)	06:20 16:58 (14)	06:27	05:47	05:32	05:47	06:18	06:51 17:38 (14)	07:25	07:03	07:34
	17:04	17:44 10 16:31 (2)	18:18 20 17:18 (14)	19:54	20:26	20:49	20:46	20:11	19:18 32 18:10 (14)	18:26	16:47	16:38
18	07:36	07:04	06:18 16:56 (14)	06:26	05:46	05:32	05:48	06:20	06:52 17:37 (14)	07:26	07:04	07:35
	17:05	17:45	18:19 24 17:20 (14)	19:55	20:27	20:50	20:45	20:10	19:16 34 18:11 (14)	18:25	16:46	16:39
19	07:36	07:02	06:17 16:54 (14)	06:24	05:45	05:32	05:49	06:21	06:54 17:38 (14)	07:27	07:06	07:35
	17:07	17:47	18:21 26 17:20 (14)	19:56	20:28	20:50	20:44	20:08	19:14 32 18:10 (14)	18:23	16:45	16:39
20	07:35	07:01	06:15 16:52 (14)	06:22	05:44	05:33	05:50	06:22	06:55 17:37 (14)	07:28	07:07	07:36
	17:08	17:48	18:22 30 17:22 (14)	19:57	20:29	20:51	20:43	20:07	19:12 32 18:09 (14)	18:21	16:44	16:39
21	07:34	06:59	06:13 16:53 (14)	06:21	05:44	05:33	05:51	06:23	06:56 17:36 (14)	07:29	07:08	07:36
	17:09	17:49	18:23 30 17:23 (14)	19:58	20:30	20:51	20:43	20:05	19:11 32 18:08 (14)	18:20	16:44	16:40
22	07:34	06:58	06:11 16:51 (14)	06:19	05:43	05:33	05:52	06:24	06:57 17:37 (14)	07:31	07:09	07:37
	17:10	17:50	18:24 32 17:23 (14)	19:59	20:31	20:51	20:42	20:04	19:09 30 18:07 (14)	18:18	16:43	16:40
23	07:33	06:56	06:10 16:51 (14)	06:18	05:42	05:33	05:53	06:25	06:58 17:38 (14)	07:32	07:10	07:37
	17:12	17:52	18:25 32 17:23 (14)	20:00	20:32	20:51	20:41	20:02	19:07 28 18:06 (14)	18:17	16:42	16:41
24	07:32	06:55	06:08 16:49 (14)	06:16	05:41	05:34	05:54	06:26	06:59 17:37 (14)	07:33	07:12	07:38
	17:13	17:53	18:26 34 17:23 (14)	20:00	20:33	20:51	20:40	20:00	19:05 28 18:05 (14)	18:15	16:42	16:41
25	07:31	06:53	06:06 16:50 (14)	06:15	05:40	05:34	05:55	06:27	07:00 17:38 (14)	06:34 15:52 (2)	07:13	07:38
	17:14	17:54	18:27 32 17:22 (14)	20:02	20:34	20:52	20:39	19:57	19:04 24 18:02 (14)	17:14 10 16:02 (2)	16:41	16:42
26	07:31	06:52	06:04 16:50 (14)	06:13	05:40	05:34	05:56	06:28	07:01 17:39 (14)	06:36 15:49 (2)	07:14	07:39
	17:15	17:55	18:29 32 17:22 (14)	20:03	20:35	20:52	20:38	19:56	19:02 22 18:01 (14)	17:13 14 16:03 (2)	16:41	16:43
27	07:30	06:50	06:03 16:50 (14)	06:12	05:39	05:35	05:57	06:29	07:02 17:42 (14)	06:37 15:46 (2)	07:15	07:39
	17:17	17:57	18:30 32 17:22 (14)	20:04	20:35	20:52	20:37	19:54	19:00 16 17:58 (14)	17:11 18 16:04 (2)	16:40	16:43
28	07:29	06:49	06:01 16:50 (14)	06:10	05:38	05:35	05:58	06:30	07:03 17:45 (14)	06:38 15:46 (2)	07:16	07:39
	17:18	17:58	18:31 30 17:20 (14)	20:05	20:36	20:52	20:36	19:52	18:58 8 17:53 (14)	17:10 20 16:06 (2)	16:40	16:44
29	07:28		05:59 16:51 (14)	06:09	05:38	05:35	05:59	06:31	07:04	06:39 15:45 (2)	07:17	07:39
	17:19		18:32 30 17:21 (14)	20:06	20:37	20:52	20:35	19:51	18:57	17:08 22 16:07 (2)	16:39	16:45
30	07:27 16:22 (2)		05:57 16:51 (14)	06:08	05:37	05:36	06:00	06:32	07:05	06:40 15:44 (2)	07:18	07:40
	17:21 6 16:28 (2)		18:33 28 17:19 (14)	20:07	20:38	20:52	20:34	19:49	18:55	17:07 24 16:08 (2)	16:39	16:46
31	07:26 16:19 (2)		05:56 16:51 (14)		05:36		06:01	06:33		06:42 15:44 (2)		07:40
	17:22 12 16:31 (2)		18:34 26 17:17 (14)		20:39		20:33	19:47		17:06 24 16:08 (2)		16:46
Potential sun hours	293	295	370	209	-292	-263	-280	-145	375	343	294	283
Total, worst case	18	350	456	76					536	132	234	
Sun reduction	0.35	0.45	0.45	0.55					0.55	0.45	0.35	
Oper. time red.	0.86	0.86	0.86	0.86					0.86	0.86	0.86	
Wind dir. red.	0.64	0.64	0.60	0.60					0.60	0.64	0.64	
Total reduction	0.19	0.25	0.23	0.29					0.29	0.25	0.19	
Total, real	3	87	107	22					153	33	45	

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	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, Southern part
11 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
1000 meter max shadow distance applied along with default 3° inclination
Sunshine probabilities applied (pdf plots)
Directional run-hours applied from tab file (tower 1)
.

Licensed user:
Wind Engineers, Inc.
7660 Whitegate Avenue
US-RIVERSIDE, CA 92506

Calculated:
03/04/06 13:30/2.4.0.67

SHADOW - Calendar

Calculation: Southern part **Shadow receptor:** 780 - 780

Assumptions for shadow calculations

Maximum distance for influence	1,000 m
Minimum sun height over horizon for influence	3 °
Day step for calculation	1 days
Time step for calculation	2 minutes

Sun shine probabilities (part of time from sun rise to sun set with sun shine)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.35	0.45	0.45	0.55	0.55	0.55	0.65	0.55	0.55	0.45	0.35	0.30

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
475	585	238	199	220	474	1,184	813	840	1,246	803	479	7,555

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:40 - 16:47	07:25 - 17:23	06:47 - 17:59 (24) 16:39 (2) - 17:03 (2)	05:54 - 18:35	06:06 - 20:08	05:36 - 20:40	05:36 - 20:52	06:02 - 20:32	06:34 - 19:46 (24) 18:17 (14) - 18:41 (14)	07:07 - 18:53	06:43 - 17:04	07:19 - 16:39
2	07:40 - 16:48	07:24 - 17:25	06:45 - 18:00 (22) 16:39 (2) - 17:01 (2)	05:52 - 18:37	06:05 - 20:09	05:35 - 20:40	05:37 - 20:52	06:03 - 20:31	06:36 - 19:44 (24) 18:16 (14) - 18:40 (14)	07:08 - 18:51	06:44 - 17:03	07:21 - 16:38
3	07:40 - 16:49	07:23 - 17:26	06:44 - 18:02 (22) 16:40 (2) - 17:02 (2)	05:51 - 18:38	06:04 - 20:11	05:35 - 20:41	05:37 - 20:51	06:04 - 20:30	06:37 - 19:42 (22) 18:17 (14) - 18:39 (14)	07:09 - 18:50	06:45 - 17:02	07:22 - 16:38
4	07:40 - 16:50	07:22 - 17:27	06:42 - 18:03 (20) 16:40 (2) - 17:00 (2)	05:49 - 18:39	06:02 - 20:12	05:35 - 20:42	05:38 - 20:51	06:05 - 20:29	06:38 - 19:41 (18) 18:19 (14) - 18:37 (14)	07:10 - 18:48	06:47 - 17:01	07:23 - 16:38
5	07:40 - 16:51	07:21 - 17:28	06:41 - 18:04 (18) 16:40 (2) - 16:58 (2)	06:47 - 19:40	06:01 - 20:13	05:34 - 20:43	05:39 - 20:51	06:06 - 20:27	06:39 - 19:39 (12) 18:22 (14) - 18:34 (14)	07:11 - 18:46	06:48 - 16:59	07:24 - 16:37
6	07:40 - 16:52	07:20 - 17:30	06:39 - 18:05 (16) 16:41 (2) - 16:57 (2)	06:45 - 19:41	06:00 - 20:14	05:34 - 20:43	05:39 - 20:51	06:07 - 20:26	06:40 - 19:37	07:12 - 18:44 (10) 17:20 (2) - 17:30 (2)	06:49 - 16:58	07:25 - 16:37
7	07:40 - 16:53	07:18 - 17:31	06:37 - 18:06 (12) 16:43 (2) - 16:55 (2)	06:44 - 19:42 (12) 18:25 (14) - 18:37 (14)	05:58 - 20:15	05:34 - 20:44	05:40 - 20:50	06:08 - 20:25	06:41 - 19:35	07:13 - 18:43 (14) 17:18 (2) - 17:32 (2)	06:51 - 16:57	07:26 - 16:37
8	07:40 - 16:54	07:17 - 17:32	06:36 - 18:08 (4) 16:47 (2) - 16:51 (2)	06:42 - 19:43 (16) 18:23 (14) - 18:39 (14)	05:57 - 20:16	05:33 - 20:45	05:40 - 20:50	06:09 - 20:24	06:42 - 19:34	07:14 - 18:41 (16) 17:17 (2) - 17:33 (2)	06:52 - 16:56	07:27 - 16:37
9	07:40 - 16:55	07:16 - 17:34	06:34 - 18:09	06:40 - 19:45 (22) 18:20 (14) - 18:42 (14)	05:56 - 20:17	05:33 - 20:45	05:41 - 20:50	06:10 - 20:22	06:43 - 19:32	07:16 - 18:39 (20) 17:14 (2) - 17:34 (2)	06:53 - 16:55	07:27 - 16:37
10	07:39 - 16:56	07:15 - 17:35	06:32 - 18:10	06:39 - 19:46 (24) 18:18 (14) - 18:42 (14)	05:55 - 20:18	05:33 - 20:46	05:42 - 20:49	06:11 - 20:21	06:44 - 19:30	07:17 - 18:38 (22) 17:13 (2) - 17:35 (2)	06:54 - 16:54	07:28 - 16:37
11	07:39 - 16:57	07:13 - 17:36	06:30 - 18:11	06:37 - 19:47 (24) 18:18 (14) - 18:42 (14)	05:54 - 20:19	05:33 - 20:47	05:43 - 20:49	06:12 - 20:20	06:45 - 19:28	07:18 - 18:36 (22) 17:12 (2) - 17:34 (2)	06:56 - 16:53	07:29 - 16:37
12	07:39 - 16:58	07:12 - 17:38	06:29 - 18:12	06:35 - 19:48 (28) 18:17 (14) - 18:45 (14)	05:52 - 20:20	05:32 - 20:47	05:43 - 20:48	06:13 - 20:18	06:46 - 19:27	07:19 - 18:34 (24) 17:11 (2) - 17:35 (2)	06:57 - 16:52	07:30 - 16:37
13	07:39 - 17:00	07:11 - 17:39	06:27 - 18:14	06:34 - 19:49 (30) 18:15 (14) - 18:45 (14)	05:51 - 20:21	05:32 - 20:48	05:44 - 20:48	06:14 - 20:17	06:47 - 19:25	07:20 - 18:33 (24) 17:11 (2) - 17:35 (2)	06:58 - 16:51	07:31 - 16:37
14	07:38 - 17:01	07:09 - 17:40	06:25 - 18:15	06:32 - 19:50 (28) 18:15 (14) - 18:43 (14)	05:50 - 20:23	05:32 - 20:48	05:45 - 20:47	06:15 - 20:16	06:48 - 19:23	07:21 - 18:31 (22) 17:12 (2) - 17:34 (2)	06:59 - 16:50	07:32 - 16:38
15	07:38 - 17:02	07:08 - 17:42	06:24 - 18:16	06:30 - 19:51 (30) 18:14 (14) - 18:44 (14)	05:49 - 20:24	05:32 - 20:49	05:46 - 20:47	06:16 - 20:14	06:49 - 19:21	07:22 - 18:29 (24) 17:11 (2) - 17:35 (2)	07:01 - 16:49	07:32 - 16:38
16	07:37 - 17:03	07:07 - 17:43	06:22 - 18:17	06:29 - 19:52 (30) 18:14 (14) - 18:44 (14)	05:48 - 20:25	05:32 - 20:49	05:47 - 20:46	06:17 - 20:13 (8) 18:31 (14) - 18:39 (14)	06:50 - 19:20	07:24 - 18:28 (22) 17:12 (2) - 17:34 (2)	07:02 - 16:48	07:33 - 16:38
17	07:37 - 17:04	07:05 - 17:44	06:20 - 18:18	06:27 - 19:54 (30) 18:15 (14) - 18:45 (14)	05:47 - 20:26	05:32 - 20:49	05:47 - 20:46	06:18 - 20:11 (16) 18:26 (14) - 18:42 (14)	06:51 - 19:18	07:25 - 18:26 (22) 17:11 (2) - 17:33 (2)	07:03 - 16:47	07:34 - 16:38
18	07:36 - 17:05	07:04 - 17:45	06:18 - 18:19	06:26 - 19:55 (30) 18:13 (14) - 18:43 (14)	05:46 - 20:27	05:32 - 20:50	05:48 - 20:45	06:20 - 20:10 (18) 18:25 (14) - 18:43 (14)	06:52 - 19:16	07:26 - 18:25 (18) 17:13 (2) - 17:31 (2)	07:04 - 16:46	07:35 - 16:39
19	07:36 - 17:07	07:02 - 17:47	06:17 - 18:21	06:24 - 19:56 (30) 18:14 (14) - 18:44 (14)	05:45 - 20:28	05:33 - 20:50	05:49 - 20:44	06:21 - 20:08 (22) 18:22 (14) - 18:44 (14)	06:54 - 19:14	07:27 - 18:23 (16) 17:14 (2) - 17:30 (2)	07:05 - 16:45	07:35 - 16:39
20	07:35 - 17:08	07:01 - 17:48	06:15 - 18:22	06:22 - 19:57 (28) 18:14 (14) - 18:42 (14)	05:44 - 20:29	05:33 - 20:51	05:50 - 20:43	06:22 - 20:07 (24) 18:21 (14) - 18:45 (14)	06:55 - 19:12	07:28 - 18:21 (12) 17:15 (2) - 17:27 (2)	07:07 - 16:44	07:36 - 16:39
21	07:34 - 17:09	06:59 - 17:49 (8) 16:48 (2) - 16:56 (2)	06:13 - 18:23	06:21 - 19:58 (28) 18:15 (14) - 18:43 (14)	05:44 - 20:30	05:33 - 20:51	05:51 - 20:43	06:23 - 20:05 (26) 18:20 (14) - 18:46 (14)	06:56 - 19:11	07:29 - 18:20 (6) 17:18 (2) - 17:24 (2)	07:08 - 16:44	07:36 - 16:40
22	07:34 - 17:10	06:58 - 17:50 (14) 16:44 (2) - 16:58 (2)	06:11 - 18:24	06:19 - 19:59 (26) 18:15 (14) - 18:41 (14)	05:43 - 20:31	05:33 - 20:51	05:52 - 20:42	06:24 - 20:04 (28) 18:19 (14) - 18:47 (14)	06:57 - 19:09	07:31 - 18:18	07:09 - 16:43	07:37 - 16:40
23	07:33 - 17:12	06:56 - 17:52 (16) 16:42 (2) - 16:58 (2)	06:10 - 18:25	06:18 - 20:00 (24) 18:16 (14) - 18:40 (14)	05:42 - 20:32	05:33 - 20:51	05:53 - 20:41	06:25 - 20:02 (28) 18:18 (14) - 18:46 (14)	06:58 - 19:07	07:32 - 18:17	07:10 - 16:42	07:37 - 16:41
24	07:32 - 17:13	06:55 - 17:53 (20) 16:41 (2) - 17:01 (2)	06:08 - 18:26	06:16 - 20:00 (20) 18:18 (14) - 18:38 (14)	05:41 - 20:33	05:34 - 20:51	05:54 - 20:40	06:26 - 20:00 (30) 18:17 (14) - 18:47 (14)	06:59 - 19:05	07:33 - 18:15	07:12 - 16:42	07:38 - 16:41
25	07:31 - 17:14	06:53 - 17:54 (22) 16:39 (2) - 17:01 (2)	06:06 - 18:27	06:15 - 20:02 (18) 18:19 (14) - 18:37 (14)	05:40 - 20:34	05:34 - 20:52	05:55 - 20:39	06:27 - 19:57 (30) 18:16 (14) - 18:46 (14)	07:00 - 19:04	06:34 - 17:14	07:13 - 16:41	07:38 - 16:42
26	07:31 - 17:15	06:52 - 17:55 (22) 16:40 (2) - 17:02 (2)	06:04 - 18:29	06:13 - 20:03 (14) 18:21 (14) - 18:35 (14)	05:39 - 20:34	05:34 - 20:52	05:56 - 20:38	06:28 - 19:56 (30) 18:17 (14) - 18:47 (14)	07:01 - 19:02	06:36 - 17:13	07:14 - 16:41	07:39 - 16:43
27	07:30 - 17:17	06:50 - 17:57 (24) 16:38 (2) - 17:02 (2)	06:03 - 18:30	06:12 - 20:04 (8) 18:24 (14) - 18:32 (14)	05:39 - 20:35	05:35 - 20:52	05:57 - 20:37	06:29 - 19:54 (30) 18:16 (14) - 18:46 (14)	07:02 - 19:00	06:37 - 17:11	07:15 - 16:40	07:39 - 16:43
28	07:29 - 17:18	06:49 - 17:58 (24) 16:39 (2) - 17:03 (2)	06:01 - 18:31	06:10 - 20:05	05:38 - 20:36	05:35 - 20:52	05:58 - 20:36	06:30 - 19:52 (30) 18:15 (14) - 18:45 (14)	07:03 - 18:58	06:38 - 17:10	07:16 - 16:40	07:39 - 16:44
29	07:28 - 17:19		05:59 - 18:32	06:09 - 20:06	05:38 - 20:37	05:35 - 20:52	05:59 - 20:35	06:31 - 19:51 (28) 18:16 (14) - 18:44 (14)	07:04 - 18:57	06:39 - 17:08	07:17 - 16:39	07:39 - 16:45
30	07:27 - 17:21		05:57 - 18:33	06:08 - 20:07	05:37 - 20:38	05:36 - 20:52	06:00 - 20:34	06:32 - 19:49 (28) 18:15 (14) - 18:43 (14)	07:05 - 18:55	06:40 - 17:07	07:18 - 16:39	07:40 - 16:46
31	07:26 - 17:22		05:56 - 18:34		05:36 - 20:39		06:01 - 20:33	06:33 - 19:47 (28) 18:16 (14) - 18:44 (14)		06:42 - 17:06		07:40 - 16:46
Potential sun hours	293	295	370	209	-292	-263	-280	-145	375	343	294	283
Total, worst case		150	138	500				404	100	294		
Sun reduction		0.45	0.45	0.55				0.55	0.55	0.45		
Oper. time red.		0.86	0.86	0.86				0.86	0.86	0.86		
Wind dir. red.		0.61	0.61	0.61				0.61	0.61	0.61		
Total reduction		0.24	0.24	0.29				0.29	0.29	0.24		
Total, real		35	33	145				117	29	70		

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	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, Southern part
11 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
1000 meter max shadow distance applied along with default 3° inclination
Sunshine probabilities applied (pdf plots)
Directional run-hours applied from tab file (tower 1)
.

Printed/Page
03/05/06 22:12 / 16
Licensed user:
Wind Engineers, Inc.
7660 Whitegate Avenue
US-RIVERSIDE, CA 92506
Calculated:
03/04/06 13:30/2.4.0.67

SHADOW - Calendar

Calculation: Southern part **Shadow receptor:** 781 - 781

Assumptions for shadow calculations

Maximum distance for influence	1,000	m
Minimum sun height over horizon for influence	3	°
Day step for calculation	1	days
Time step for calculation	2	minutes

Sun shine probabilities (part of time from sun rise to sun set with sun shine)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.35	0.45	0.45	0.55	0.55	0.55	0.65	0.55	0.55	0.45	0.35	0.30

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
475	585	238	199	220	474	1,184	813	840	1,246	803	479	7,555

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:40 - 16:47	07:25 - 17:23	06:47 - 17:59 (4)	05:54 - 16:51 (2)	17:13 (14) - 18:35 (26)	06:06 - 20:08	05:36 - 20:40	05:36 - 20:52	06:02 - 20:32	06:34 - 18:17 (14)	07:07 - 18:53	06:43 - 17:04	07:19 - 16:39
2	07:40 - 16:48	07:24 - 17:25	06:45 - 18:00	05:52 - 17:14 (14)	06:05 - 20:09	05:35 - 20:40	05:37 - 20:52	06:03 - 20:31	06:35 - 19:44 (16)	18:14 (14) - 18:30 (16)	07:08 - 18:51	06:44 - 17:03	07:21 - 16:38
3	07:40 - 16:49	07:23 - 17:26	06:44 - 18:02	05:51 - 17:12 (14)	06:04 - 20:11	05:35 - 20:41	05:37 - 20:51	06:04 - 20:30	06:37 - 19:42 (18)	18:13 (14) - 18:31 (18)	07:09 - 18:50	06:45 - 17:02	07:22 - 16:38
4	07:40 - 16:50	07:22 - 17:27	06:42 - 18:03	05:49 - 17:12 (14) - 18:39 (26)	06:02 - 20:12	05:35 - 20:42	05:38 - 20:51	06:05 - 20:29	06:38 - 19:41 (22)	18:10 (14) - 18:32 (14)	07:10 - 18:48	06:47 - 17:01	07:23 - 16:38
5	07:40 - 16:51	07:21 - 17:28	06:41 - 18:04	06:47 - 18:12 (14) - 19:40 (26)	06:01 - 20:13	05:34 - 20:43	05:39 - 20:51	06:06 - 20:27	06:39 - 19:39 (24)	18:10 (14) - 18:34 (14)	07:11 - 18:46	06:48 - 16:59	07:24 - 16:37
6	07:40 - 16:52	07:20 - 17:30	06:39 - 18:05	06:45 - 18:13 (14) - 19:41 (26)	06:00 - 20:14	05:34 - 20:43	05:39 - 20:51	06:07 - 20:26	06:40 - 19:37 (26)	18:09 (14) - 18:35 (14)	07:12 - 18:44	06:49 - 16:58	07:25 - 16:37
7	07:40 - 16:53	07:18 - 17:31	06:37 - 18:06	06:44 - 18:13 (14) - 19:42 (24)	05:58 - 20:15	05:34 - 20:44	05:40 - 20:50	06:08 - 20:25	06:41 - 19:35 (26)	18:08 (14) - 18:34 (14)	07:13 - 18:43	06:50 - 16:57	07:26 - 16:37
8	07:40 - 16:54	07:17 - 17:32	06:36 - 18:08	06:42 - 18:13 (14) - 19:43 (22)	05:57 - 20:16	05:33 - 20:45	05:40 - 20:50	06:09 - 20:24	06:42 - 19:34 (28)	18:07 (14) - 18:35 (14)	07:14 - 18:41	06:52 - 16:56	07:27 - 16:37
9	07:40 - 16:55	07:16 - 17:34	06:34 - 18:09	06:40 - 18:16 (14) - 19:45 (18)	05:56 - 20:17	05:33 - 20:45	05:41 - 20:50	06:10 - 20:22	06:43 - 19:32 (26)	18:08 (14) - 18:34 (14)	07:15 - 18:39	06:53 - 16:55	07:27 - 16:37
10	07:39 - 16:56	07:15 - 17:35	06:32 - 18:10	06:39 - 18:16 (14) - 19:46 (16)	05:55 - 20:18	05:33 - 20:46	05:42 - 20:49	06:11 - 20:21	06:44 - 19:30 (26)	18:07 (14) - 18:33 (14)	07:17 - 18:38	06:54 - 16:54	07:28 - 16:37
11	07:39 - 16:57	07:13 - 17:36	06:30 - 18:11	06:37 - 18:18 (14) - 19:47 (10)	05:54 - 20:19	05:33 - 20:47	05:43 - 20:49	06:12 - 20:20	06:45 - 19:28 (26)	18:06 (14) - 18:32 (14)	07:18 - 18:36	06:56 - 16:53	07:29 - 16:37
12	07:39 - 16:58	07:12 - 17:38	06:29 - 18:12	06:35 - 18:28 (14) - 19:48	05:52 - 20:20	05:32 - 20:47	05:43 - 20:48	06:13 - 20:18	06:46 - 19:27 (24)	18:07 (14) - 18:31 (14)	07:19 - 18:34	06:57 - 16:52	07:30 - 16:37
13	07:39 - 17:00	07:11 - 17:39	06:27 - 18:14	06:34 - 19:49	05:51 - 20:21	05:32 - 20:48	05:44 - 20:48	06:14 - 20:17	06:47 - 19:25 (24)	18:06 (14) - 18:30 (14)	07:20 - 18:33 (8)	17:19 (2) - 16:58	07:31 - 16:37
14	07:38 - 17:01	07:09 - 17:40	06:25 - 18:15	06:32 - 19:50	05:50 - 20:23	05:32 - 20:48	05:45 - 20:47	06:15 - 20:16	06:48 - 19:23 (22)	18:07 (14) - 18:29 (14)	07:21 - 18:31 (14)	17:16 (2) - 16:59	07:32 - 16:38
15	07:38 - 17:02	07:08 - 17:42 (8)	16:46 (2) - 16:54 (2)	06:24 - 18:16	05:49 - 20:24	05:32 - 20:49	05:46 - 20:47	06:16 - 20:14	06:49 - 19:21 (20)	18:08 (14) - 18:28 (18)	07:22 - 18:29 (18)	17:13 (2) - 17:01	07:32 - 16:38
16	07:37 - 17:03	07:07 - 17:43 (12)	16:45 (2) - 16:57 (2)	06:22 - 18:17	05:48 - 20:25	05:32 - 20:49	05:47 - 20:46	06:17 - 20:13	06:50 - 19:20 (18)	18:09 (14) - 18:27 (14)	07:24 - 18:28 (18)	17:12 (2) - 17:30 (2)	07:02 - 16:48	07:33 - 16:38
17	07:37 - 17:04	07:05 - 17:44 (16)	16:41 (2) - 16:57 (2)	06:20 - 18:18	05:47 - 20:26	05:32 - 20:49	05:47 - 20:46	06:18 - 20:11	06:51 - 19:18 (14)	18:10 (14) - 18:24 (14)	07:25 - 18:26 (20)	17:11 (2) - 17:31 (2)	07:03 - 16:47	07:34 - 16:38
18	07:36 - 17:05	07:04 - 17:45 (18)	16:42 (2) - 17:00 (2)	06:18 - 18:19	05:46 - 20:27	05:32 - 20:50	05:48 - 20:45	06:19 - 20:10	06:52 - 19:16 (4)	18:15 (14) - 18:19 (14)	07:26 - 18:25 (22)	17:11 (2) - 17:33 (2)	07:04 - 16:46	07:35 - 16:39
19	07:36 - 17:07	07:02 - 17:47 (20)	16:41 (2) - 17:01 (2)	06:17 - 18:21	05:45 - 20:28	05:32 - 20:50	05:49 - 20:44	06:21 - 20:08	06:54 - 19:14	18:18 (14) - 18:23 (22)	07:27 - 18:23 (22)	17:10 (2) - 17:32 (2)	07:05 - 16:45	07:35 - 16:39
20	07:35 - 17:08	07:01 - 17:48 (22)	16:39 (2) - 17:01 (2)	06:15 - 18:22	05:44 - 20:29	05:33 - 20:51	05:50 - 20:43	06:22 - 20:07	06:55 - 19:12	18:17 (14) - 18:21 (22)	07:28 - 18:21 (22)	17:09 (2) - 17:31 (2)	07:07 - 16:44	07:36 - 16:39
21	07:34 - 17:09	06:59 - 17:49 (22)	16:40 (2) - 17:02 (2)	06:13 - 18:23	05:43 - 20:30	05:33 - 20:51	05:51 - 20:43	06:23 - 20:05	06:56 - 19:11	18:16 (14) - 18:20 (20)	07:29 - 18:20 (20)	17:10 (2) - 17:30 (2)	07:08 - 16:44	07:36 - 16:40
22	07:34 - 17:10	06:58 - 17:50 (22)	16:40 (2) - 17:02 (2)	06:11 - 18:24	05:43 - 20:31	05:33 - 20:51	05:52 - 20:42	06:24 - 20:04	06:57 - 19:09	18:15 (14) - 18:18 (22)	07:31 - 18:18 (22)	17:10 (2) - 17:32 (2)	07:09 - 16:43	07:37 - 16:40
23	07:33 - 17:12	06:56 - 17:52 (20)	16:40 (2) - 17:00 (2)	06:10 - 18:25	05:42 - 20:32	05:33 - 20:51	05:53 - 20:41	06:25 - 20:02	06:58 - 19:07	18:14 (14) - 18:17 (20)	07:32 - 18:17 (20)	17:11 (2) - 17:31 (2)	07:10 - 16:42	07:37 - 16:41
24	07:32 - 17:13	06:55 - 17:53 (22)	16:39 (2) - 17:01 (2)	06:08 - 18:26	05:41 - 20:33	05:34 - 20:51	05:54 - 20:40	06:26 - 20:00	06:59 - 19:05	18:13 (14) - 18:15 (16)	07:33 - 18:15 (16)	17:12 (2) - 17:28 (2)	07:12 - 16:42	07:38 - 16:41
25	07:31 - 17:14	06:53 - 17:54 (20)	16:39 (2) - 16:59 (2)	06:06 - 18:27	05:40 - 20:34	05:34 - 20:52	05:55 - 20:39	06:27 - 19:57	07:00 - 19:04	18:12 (14) - 18:14 (16)	06:34 - 17:14 (16)	16:12 (2) - 16:28 (2)	07:13 - 16:41	07:38 - 16:42
26	07:31 - 17:15	06:52 - 17:55 (18)	16:42 (2) - 17:00 (2)	06:04 - 18:29 (12) - 17:22 (14) - 17:34 (14)	06:13 - 20:03	05:40 - 20:34	05:34 - 20:52	05:56 - 20:38	06:28 - 19:56	07:01 - 19:02	06:36 - 17:13 (10)	16:15 (2) - 16:25 (2)	07:14 - 16:41	07:39 - 16:43
27	07:30 - 17:17	06:50 - 17:57 (16)	16:42 (2) - 16:58 (2)	06:03 - 18:30 (16) - 17:20 (14) - 17:36 (14)	06:12 - 20:04	05:39 - 20:35	05:35 - 20:52	05:57 - 20:37	06:29 - 19:54	07:02 - 19:00	06:37 - 17:11 (4)	16:18 (2) - 16:22 (2)	07:15 - 16:40	07:39 - 16:43
28	07:29 - 17:18	06:49 - 17:58 (12)	16:45 (2) - 16:57 (2)	06:01 - 18:31 (20) - 17:18 (14) - 17:38 (14)	06:10 - 20:05	05:38 - 20:36	05:35 - 20:52	05:58 - 20:36	06:30 - 19:52	07:03 - 18:58	06:38 - 17:10		07:16 - 16:40	07:39 - 16:44
29	07:28 - 17:19			05:59 - 18:32 (22) - 17:17 (14) - 17:39 (14)	06:09 - 20:06	05:38 - 20:37	05:35 - 20:52	05:59 - 20:35	06:31 - 19:51	07:04 - 18:57	06:39 - 17:08		07:17 - 16:39	07:39 - 16:45
30	07:27 - 17:21			05:57 - 18:33 (24) - 17:15 (14) - 17:39 (14)	06:08 - 20:07	05:37 - 20:38	05:36 - 20:52	06:00 - 20:34	06:32 - 19:49	07:05 - 18:55	06:40 - 17:07		07:18 - 16:39	07:40 - 16:46
31	07:26 - 17:22			05:56 - 18:34 (24) - 17:15 (14) - 17:39 (14)		05:36 - 20:39	06:01 - 20:33	06:33 - 19:47			06:42 - 17:06			07:40 - 16:46
Potential sun hours	293	295	370	209	-292	-263	-280	-145	375	343	294		283	
Total, worst case		248	122	248					374	252				
Sun reduction		0.45	0.45	0.55					0.55	0.45				
Oper. time red.		0.86	0.86	0.86					0.86	0.86				
Wind dir. red.		0.62	0.61	0.61					0.61	0.62				
Total reduction		0.24	0.24	0.29					0.29	0.24				
Total, real		59	29	72					108	60				

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	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, Southern part
11 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
1000 meter max shadow distance applied along with default 3° inclination
Sunshine probabilities applied (pdf plots)
Directional run-hours applied from tab file (tower 1)
.

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Wind Engineers, Inc.
7660 Whitegate Avenue
US-RIVERSIDE, CA 92506

Calculated:
03/04/06 13:30/2.4.0.67

SHADOW - Calendar

Calculation: Southern part **Shadow receptor:** 800 - 800

Assumptions for shadow calculations

Maximum distance for influence	1,000 m
Minimum sun height over horizon for influence	3 °
Day step for calculation	1 days
Time step for calculation	2 minutes

Sun shine probabilities (part of time from sun rise to sun set with sun shine)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.35	0.45	0.45	0.55	0.55	0.55	0.65	0.55	0.55	0.45	0.35	0.30

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
475	585	238	199	220	474	1,184	813	840	1,246	803	479	7,555

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:40	07:25	06:47	05:54	06:06	05:36	05:36	06:02	06:34	18:59 (13)	07:07	18:09 (1)	06:43	07:19
	16:48	17:23	17:59	18:35	20:08	20:40	20:52	20:32	19:46	19:19 (13)	18:53	18:29 (1)	17:04	16:39
2	07:40	07:24	06:45	05:52	06:05	05:35	05:37	06:03	06:36	19:00 (13)	07:08	18:08 (1)	06:44	07:21
	16:48	17:25	18:00	18:37	20:09	20:40	20:52	20:31	19:44	19:18 (13)	18:51	18:28 (1)	17:03	16:38
3	07:40	07:23	06:44	05:51	06:04	05:35	05:37	06:04	06:37	19:02 (13)	07:09	18:09 (1)	06:45	07:22
	16:49	17:26	18:02	18:38	20:11	20:41	20:51	20:30	19:42	19:18 (13)	18:50	18:27 (1)	17:02	16:38
4	07:40	07:22	06:42	05:49	06:02	05:35	05:38	06:05	06:38	19:05 (13)	07:10	18:08 (1)	06:47	07:23
	16:50	17:27	18:03	18:39	20:12	20:42	20:51	20:29	19:41	19:13 (13)	18:48	18:24 (1)	17:01	16:38
5	07:40	07:21	06:41	06:47	06:01	05:34	05:39	06:06	06:39		07:11	18:09 (1)	06:48	07:24
	16:51	17:29	18:04	19:40	20:13	20:43	20:51	20:27	19:39		18:46	18:23 (1)	16:59	16:38
6	07:40	07:20	06:39	06:45	06:00	05:34	05:39	06:07	06:40		07:12	18:10 (1)	06:49	07:25
	16:52	17:30	18:05	19:41	20:14	20:43	20:51	20:26	19:37		18:44	18:20 (1)	16:58	16:37
7	07:40	07:18	06:37	17:37 (1) 06:44	05:58	05:34	05:40	06:08	06:41		07:13	18:14 (1)	06:51	07:26
	16:53	17:31	18:07	8 17:45 (1) 19:42	20:15	20:44	20:50	20:25	19:35		18:43	6 18:20 (1)	16:57	16:37
8	07:40	07:17	06:36	17:33 (1) 06:42	19:07 (13) 05:57	05:33	05:40	06:09	06:42		07:14		06:52	07:27
	16:54	17:32	18:08	12 17:45 (1) 19:43	8 19:15 (13) 20:16	20:45	20:50	20:24	19:34		18:41		16:56	16:37
9	07:40	07:16	06:34	17:31 (1) 06:40	19:04 (13) 05:56	05:33	05:41	06:10	06:43		07:16		06:53	07:27
	16:55	17:34	18:09	16 17:47 (1) 19:45	16 19:20 (13) 20:17	20:45	20:50	20:22	19:32		18:39		16:55	16:37
10	07:39	07:15	06:32	17:30 (1) 06:39	19:02 (13) 05:55	05:33	05:42	06:11	06:44		07:17		06:54	07:28
	16:56	17:35	18:10	18 17:48 (1) 19:46	18 19:20 (13) 20:18	20:46	20:49	20:21	19:30		18:38		16:54	16:37
11	07:39	07:13	06:30	17:30 (1) 06:37	19:00 (13) 05:54	05:33	05:43	06:12	06:45		07:18		06:56	07:29
	16:57	17:36	18:11	18 17:48 (1) 19:47	20 19:20 (13) 20:19	20:47	20:49	20:20	19:28		18:36		16:53	16:37
12	07:39	07:12	06:29	17:28 (1) 06:35	18:59 (13) 05:53	05:33	05:43	06:13	06:46		07:19		06:57	07:30
	16:58	17:38	18:12	20 17:48 (1) 19:48	24 19:23 (13) 20:20	20:47	20:48	20:18	19:27		18:34		16:52	16:37
13	07:39	07:11	06:27	17:29 (1) 06:34	18:59 (13) 05:51	05:32	05:44	06:14	06:47		07:20		06:58	07:31
	17:00	17:39	18:14	20 17:49 (1) 19:49	24 19:23 (13) 20:21	20:48	20:48	20:17	19:25		18:33		16:51	16:37
14	07:38	07:09	06:25	17:29 (1) 06:32	18:58 (13) 05:50	05:32	05:45	06:15	06:48		07:21		06:59	07:32
	17:01	17:40	18:15	20 17:49 (1) 19:50	26 19:24 (13) 20:23	20:48	20:47	20:16	19:23		18:31		16:50	16:38
15	07:38	07:08	06:24	17:29 (1) 06:30	18:58 (13) 05:49	05:32	05:46	06:16	06:49		07:22		07:01	07:32
	17:02	17:42	18:16	18 17:47 (1) 19:51	24 19:22 (13) 20:24	20:49	20:47	20:14	19:21		18:29		16:49	16:38
16	07:37	07:07	06:22	17:29 (1) 06:29	18:56 (13) 05:48	05:32	05:47	06:17	06:50		07:24		07:02	07:33
	17:03	17:43	18:17	18 17:47 (1) 19:52	26 19:22 (13) 20:25	20:49	20:46	20:13	19:20		18:28		16:48	16:38
17	07:37	07:05	06:20	17:32 (1) 06:27	18:57 (13) 05:47	05:32	05:47	06:18	06:51		07:25		07:03	07:34
	17:04	17:44	18:18	14 17:46 (1) 19:54	26 19:23 (13) 20:26	20:49	20:46	20:11	19:18		18:26		16:47	16:38
18	07:36	07:04	06:18	17:32 (1) 06:26	18:57 (13) 05:46	05:32	05:48	06:20	19:09 (13) 06:53		07:26		07:04	07:35
	17:05	17:45	18:19	12 17:44 (1) 19:55	24 19:21 (13) 20:27	20:50	20:45	20:10	10 19:19 (13) 19:16		18:25		16:46	16:39
19	07:36	07:02	06:17	17:36 (1) 06:24	18:58 (13) 05:45	05:33	05:49	06:21	19:06 (13) 06:54		07:27		07:05	07:35
	17:07	17:47	18:21	4 17:40 (1) 19:56	24 19:22 (13) 20:28	20:50	20:44	20:08	16 19:22 (13) 19:14		18:23		16:45	16:39
20	07:35	07:01	06:15	06:22	18:58 (13) 05:44	05:33	05:50	06:22	19:05 (13) 06:55		07:28		07:07	07:36
	17:08	17:48	18:22	19:57 22	19:20 (13) 20:29	20:51	20:43	20:07	18 19:23 (13) 19:12		18:21		16:45	16:40
21	07:34	06:59	06:13	06:21	18:59 (13) 05:44	05:33	05:51	06:23	19:04 (13) 06:56		07:29		07:08	07:36
	17:09	17:49	18:23	19:58 22	19:21 (13) 20:30	20:51	20:43	20:05	20 19:24 (13) 19:11		18:20		16:44	16:40
22	07:34	06:58	06:11	06:19	18:59 (13) 05:43	05:33	05:52	06:24	19:01 (13) 06:57		07:31		07:09	07:37
	17:10	17:51	18:24	19:59 20	19:19 (13) 20:31	20:51	20:42	20:04	22 19:23 (13) 19:09		18:18		16:43	16:40
23	07:33	06:56	06:10	06:18	19:00 (13) 05:42	05:33	05:53	06:25	19:00 (13) 06:58		07:32		07:10	07:37
	17:12	17:52	18:25	20:00 18	19:18 (13) 20:32	20:51	20:41	20:02	24 19:24 (13) 19:07		18:17		16:42	16:41
24	07:32	06:55	06:08	06:16	19:02 (13) 05:41	05:34	05:54	06:26	18:59 (13) 06:59		07:33		07:12	07:38
	17:13	17:53	18:26	20:00 12	19:14 (13) 20:33	20:51	20:40	20:00	26 19:25 (13) 19:05		18:15		16:42	16:42
25	07:31	06:53	06:06	06:15	19:03 (13) 05:40	05:34	05:55	06:27	19:00 (13) 07:00	18:16 (1)	06:34		07:13	07:38
	17:14	17:54	18:28	20:02 10	19:13 (13) 20:34	20:52	20:39	19:57	24 19:24 (13) 19:04	10 18:26 (1)	17:14		16:41	16:42
26	07:31	06:52	06:04	06:13	05:40	05:34	05:56	06:28	18:59 (13) 07:01	18:13 (1)	06:36		07:14	07:39
	17:15	17:56	18:29	20:03	20:34	20:52	20:38	19:56	26 19:25 (13) 19:02	14 18:27 (1)	17:13		16:41	16:43
27	07:30	06:50	06:03	06:12	05:39	05:35	05:57	06:29	18:58 (13) 07:02	18:12 (1)	06:37		07:15	07:39
	17:17	17:57	18:30	20:04	20:35	20:52	20:37	19:54	26 19:24 (13) 19:00	16 18:28 (1)	17:11		16:40	16:43
28	07:29	06:49	06:01	06:10	05:38	05:35	05:58	06:30	18:59 (13) 07:03	18:10 (1)	06:38		07:16	07:39
	17:18	17:58	18:31	20:05	20:36	20:52	20:36	19:52	24 19:23 (13) 18:58	20 18:30 (1)	17:10		16:40	16:44
29	07:28		05:59	06:09	05:38	05:35	05:59	06:31	18:58 (13) 07:04	18:09 (1)	06:39		07:17	07:39
	17:19		18:32	20:06	20:37	20:52	20:35	19:51	26 19:24 (13) 18:57	20 18:29 (1)	17:08		16:39	16:45
30	07:27		05:58	06:08	05:37	05:36	06:00	06:32	18:59 (13) 07:05	18:10 (1)	06:40		07:18	07:40
	17:21		18:33	20:07	20:38	20:52	20:34	19:49	24 19:23 (13) 18:55	20 18:30 (1)	17:07		16:39	16:46
31	07:26		05:56		05:36		06:01	06:33	18:58 (13)		06:42			07:40
	17:22		18:34		20:39		20:33	19:47	24 19:22 (13)		17:06			16:46
Potential sun hours	293	295	370	209	-292	-263	-280	-145	375	343	294	283
Total, worst case			198	364				310	162	104		
Sun reduction			0.45	0.55				0.55	0.55	0.45		
Oper. time red.			0.86	0.86				0.86	0.86	0.86		
Wind dir. red.			0.60	0.60				0.60	0.60	0.60		
Total reduction			0.23	0.29				0.29	0.29	0.23		
Total, real			46	104				89	46	24		

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	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, Southern part
11 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
1000 meter max shadow distance applied along with default 3° inclination
Sunshine probabilities applied (pdf plots)
Directional run-hours applied from tab file (tower 1)
.

Licensed user:
Wind Engineers, Inc.
7660 Whitegate Avenue
US-RIVERSIDE, CA 92506

Calculated:
03/04/06 13:30/2.4.0.67

SHADOW - Calendar

Calculation: Southern part **Shadow receptor:** 803 - 803

Assumptions for shadow calculations

Maximum distance for influence	1,000	m
Minimum sun height over horizon for influence	3	°
Day step for calculation	1	days
Time step for calculation	2	minutes

Sun shine probabilities (part of time from sun rise to sun set with sun shine)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.35	0.45	0.45	0.55	0.55	0.55	0.65	0.55	0.55	0.45	0.35	0.30

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
475	585	238	199	220	474	1,184	813	840	1,246	803	479	7,555

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:40	07:25	06:47	05:54	06:06	05:36	06:30 (5)	05:36	06:31 (5)	06:02	06:34	07:06	06:43	07:19
	16:47	17:23	17:59	18:35	20:08	20:40 16	06:46 (5)	20:52 26	06:57 (5)	20:32	19:46	18:53	17:04	16:38
2	07:40	07:24	06:45	05:52	06:05	05:35	06:30 (5)	05:37	06:32 (5)	06:03	06:35	07:08	06:44	07:20
	16:48	17:24	18:00	18:37	20:09	20:40 18	06:48 (5)	20:51 26	06:58 (5)	20:31	19:44	18:51	17:03	16:38
3	07:40	07:23	06:44	05:51	06:03	05:35	06:29 (5)	05:37	06:31 (5)	06:04	06:36	07:09	06:45	07:22
	16:49	17:26	18:02	18:38	20:10	20:41 20	06:49 (5)	20:51 26	06:57 (5)	20:30	19:42	18:49	17:02	16:38
4	07:40	07:22	06:42	05:49	06:02	05:35	06:27 (5)	05:38	06:31 (5)	06:05	06:38	07:10	06:47	07:23
	16:50	17:27	18:03	18:39	20:12	20:42 22	06:49 (5)	20:51 26	06:57 (5)	20:29	19:41	18:48	17:00	16:38
5	07:40	07:21	06:40	06:47	06:01	05:34	06:27 (5)	05:38	06:32 (5)	06:06	06:39	07:11	06:48	07:24
	16:51	17:28	18:04	19:40	20:13	20:43 24	06:51 (5)	20:51 26	06:58 (5)	20:27	19:39	18:46	16:59	16:37
6	07:40	07:19	06:39	06:45	06:00	05:34	06:26 (5)	05:39	06:32 (5)	06:07	06:40	07:12	06:49	07:25
	16:52	17:30	18:05	19:41	20:14	20:43 24	06:50 (5)	20:51 24	06:56 (5)	20:26	19:37	18:44	16:58	16:37
7	07:40	07:18	06:37	06:44	05:58	05:33	06:26 (5)	05:40	06:33 (5)	06:08	06:41	07:13	06:50	07:26
	16:53	17:31	18:06	19:42	20:15	20:44 26	06:52 (5)	20:50 24	06:57 (5)	20:25	19:35	18:43	16:57	16:37
8	07:40	07:17	06:35	06:42	05:57	05:33	06:26 (5)	05:40	06:34 (5)	06:09	06:42	07:14	06:52	07:26
	16:54	17:32	18:08	19:43	20:16	20:45 26	06:52 (5)	20:50 22	06:56 (5)	20:24	19:34	18:41	16:56	16:37
9	07:40	07:16	06:34	06:40	05:56	05:33	06:26 (5)	05:41	06:34 (5)	06:10	06:43	07:15	06:53	07:27
	16:55	17:34	18:09	19:44	20:17	20:45 26	06:52 (5)	20:50 22	06:56 (5)	20:22	19:32	18:39	16:55	16:37
10	07:39	07:15	06:32	06:39	05:55	05:33	06:25 (5)	05:42	06:37 (5)	06:11	06:44	07:17	06:54	07:28
	16:56	17:35	18:10	19:46	20:18	20:46 28	06:53 (5)	20:49 18	06:55 (5)	20:21	19:30	18:38	16:54	16:37
11	07:39	07:13	06:30	06:37	05:54	05:33	06:27 (5)	05:43	06:38 (5)	06:12	06:45	07:18	06:55	07:29
	16:57	17:36	18:11	19:47	20:19	20:47 26	06:53 (5)	20:49 18	06:56 (5)	20:20	19:28	18:36	16:52	16:37
12	07:39	07:12	06:29	06:35	05:52	05:32	06:27 (5)	05:43	06:38 (5)	06:13	06:46	07:19	06:57	07:30
	16:58	17:38	18:12	19:48	20:20	20:47 26	06:53 (5)	20:48 16	06:54 (5)	20:18	19:27	18:34	16:51	16:37
13	07:38	07:11	06:27	06:34	05:51	05:32	06:27 (5)	05:44	06:39 (5)	06:14	06:47	07:20	06:58	07:31
	16:59	17:39	18:14	19:49	20:21	20:48 26	06:53 (5)	20:48 14	06:53 (5)	20:17	19:25	18:33	16:50	16:37
14	07:38	07:09	06:25	06:32	05:50	05:32	06:27 (5)	05:45	06:42 (5)	06:15	06:48	07:21	06:59	07:32
	17:01	17:40	18:15	19:50	20:22	20:48 26	06:53 (5)	20:47 10	06:52 (5)	20:15	19:23	18:31	16:49	16:38
15	07:38	07:08	06:24	06:30	05:49	05:32	06:27 (5)	05:46	06:45 (5)	06:16	06:49	07:22	07:00	07:32
	17:02	17:41	18:16	19:51	20:24	20:49 28	06:55 (5)	20:47 4	06:49 (5)	20:14	19:21	18:29	16:49	16:38
16	07:37	07:07	06:22	06:29	05:48	05:32	06:27 (5)	05:46		06:17	06:50	07:23	07:02	07:33
	17:03	17:43	18:17	19:52	20:25	20:49 28	06:55 (5)	20:46		20:13	19:19	18:28	16:48	16:38
17	07:37	07:05	06:20	06:27	05:47	05:32	06:27 (5)	05:47		06:18	06:51	07:25	07:03	07:34
	17:04	17:44	18:18	19:54	20:26	20:49 28	06:55 (5)	20:45		20:11	19:18	18:26	16:47	16:38
18	07:36	07:04	06:18	06:26	05:46	05:32	06:27 (5)	05:48		06:19	06:52	07:26	07:04	07:34
	17:05	17:45	18:19	19:55	20:27	20:50 28	06:55 (5)	20:45		20:10	19:16	18:25	16:46	16:39
19	07:36	07:02	06:17	06:24	05:45	05:32	06:28 (5)	05:49		06:20	06:53	07:27	07:05	07:35
	17:07	17:47	18:21	19:56	20:28	20:50 28	06:56 (5)	20:44		20:08	19:14	18:23	16:45	16:39
20	07:35	07:01	06:15	06:22	05:44	05:33	06:28 (5)	05:50		06:22	06:55	07:28	07:07	07:36
	17:08	17:48	18:22	19:57	20:29	20:50 28	06:56 (5)	20:43		20:07	19:12	18:21	16:44	16:39
21	07:34	06:59	06:13	06:21	05:43	05:33	06:28 (5)	05:51		06:23	06:56	07:29	07:08	07:36
	17:09	17:49	18:23	19:58	20:30	20:51 28	06:56 (5)	20:43		20:05	19:11	18:20	16:44	16:40
22	07:34	06:58	06:11	06:19	05:43	05:33	06:28 (5)	05:52		06:24	06:57	07:31	07:09	07:37
	17:10	17:50	18:24	19:59	20:31	20:51 28	06:56 (5)	20:42		20:04	19:09	18:18	16:43	16:40
23	07:33	06:56	06:10	06:18	05:42	05:33	06:28 (5)	05:53		06:25	06:58	07:32	07:10	07:37
	17:12	17:52	18:25	20:00	20:32	20:51 28	06:56 (5)	20:41		20:02	19:07	18:17	16:42	16:41
24	07:32	06:55	06:08	06:16	05:41	05:33	06:29 (5)	05:54		06:26	06:59	07:33	07:11	07:38
	17:13	17:53	18:26	20:00	20:33	20:51 28	06:57 (5)	20:40		20:00	19:05	18:15	16:42	16:41
25	07:31	06:53	06:06	06:15	05:40	05:34	06:29 (5)	05:55		06:27	07:00	06:34	07:13	07:38
	17:14	17:54	18:27	20:01	20:33	20:51 28	06:57 (5)	20:39		19:57	19:04	17:14	16:41	16:42
26	07:31	06:52	06:04	06:13	05:39	05:34	06:29 (5)	05:56		06:28	07:01	06:35	07:14	07:38
	17:15	17:55	18:29	20:03	20:34	20:52 28	06:57 (5)	20:38		19:56	19:02	17:12	16:41	16:43
27	07:30	06:50	06:03	06:12	05:39	05:34	06:30 (5)	05:57		06:29	07:02	06:37	07:15	07:39
	17:17	17:57	18:30	20:04	20:35	20:52 28	06:58 (5)	20:37		19:54	19:00	17:11	16:40	16:43
28	07:29	06:49	06:01	06:10	05:38	05:35	06:30 (5)	05:58		06:30	07:03	06:38	07:16	07:39
	17:18	17:58	18:31	20:05	20:36	20:52 28	06:58 (5)	20:36		19:52	18:58	17:10	16:40	16:44
29	07:28		05:59	06:09	05:38	06:34 (5)	05:35	06:31 (5)	05:59	06:31	07:04	06:39	07:17	07:39
	17:19		18:32	20:06	20:37 8	06:42 (5)	20:52 26	06:57 (5)	20:35	19:51	18:56	17:08	16:39	16:45
30	07:27		05:57	06:08	05:37	06:31 (5)	05:36	06:31 (5)	06:00	06:32	07:05	06:40	07:18	07:40
	17:21		18:33	20:07	20:38 12	06:43 (5)	20:52 26	06:57 (5)	20:34	19:49	18:55	17:07	16:39	16:46
31	07:26		05:56		05:36	06:31 (5)		06:01		06:33		06:42		07:40
	17:22		18:34		20:39 14	06:45 (5)		20:33		19:47		17:06		16:46
Potential sun hours	293	295	370	209	-292	-263		-280		-145	375	343	294	283
Total, worst case					34	778		302						
Sun reduction					0.55	0.55		0.65						
Oper. time red.					0.86	0.86		0.86						
Wind dir. red.					0.62	0.62		0.62						
Total reduction					0.29	0.29		0.35						
Total, real					10	227		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	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, Southern part
11 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
1000 meter max shadow distance applied along with default 3° inclination
Sunshine probabilities applied (pdf plots)
Directional run-hours applied from tab file (tower 1)
.

Printed/Page
03/05/06 22:12 / 19
Licensed user:
Wind Engineers, Inc.
7660 Whitegate Avenue
US-RIVERSIDE, CA 92506

Calculated:
03/04/06 13:30/2.4.0.67

SHADOW - Calendar

Calculation: Southern part **Shadow receptor:** 805 - 805

Assumptions for shadow calculations

Maximum distance for influence	1,000	m
Minimum sun height over horizon for influence	3	°
Day step for calculation	1	days
Time step for calculation	2	minutes

Sun shine probabilities (part of time from sun rise to sun set with sun shine)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.35	0.45	0.45	0.55	0.55	0.55	0.65	0.55	0.55	0.45	0.35	0.30

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
475	585	238	199	220	474	1,184	813	840	1,246	803	479	7,555

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:40	07:25	06:47	05:54	06:06	06:58 (5)	05:36	06:50 (5)	06:57 (5)	06:02	06:58 (5)	06:34	07:06	06:43	07:19
	16:47	17:23	17:59	18:35	20:08	24 07:22 (5)	20:40	40 07:30 (5)	20:52	36 07:33 (5)	20:32	44 07:42 (5)	19:46	18:53	17:04	16:38
2	07:40	07:24	06:45	05:52	06:05	06:57 (5)	05:35	06:50 (5)	05:37	06:58 (5)	06:03	06:59 (5)	06:35	07:08	06:44	07:20
	16:48	17:24	18:00	18:37	20:09	28 07:25 (5)	20:40	40 07:30 (5)	20:51	36 07:34 (5)	20:31	42 07:41 (5)	19:44	18:51	17:03	16:38
3	07:40	07:23	06:44	05:50	06:03	06:56 (5)	05:35	06:51 (5)	05:37	06:59 (5)	06:04	06:58 (5)	06:36	07:09	06:45	07:22
	16:49	17:26	18:02	18:38	20:10	30 07:26 (5)	20:41	38 07:29 (5)	20:51	36 07:35 (5)	20:30	42 07:40 (5)	19:42	18:49	17:02	16:38
4	07:40	07:22	06:42	05:49	06:02	06:54 (5)	05:34	06:51 (5)	05:38	06:57 (5)	06:05	06:59 (5)	06:38	07:10	06:47	07:23
	16:50	17:27	18:03	18:39	20:12	32 07:26 (5)	20:42	38 07:29 (5)	20:51	38 07:35 (5)	20:29	42 07:41 (5)	19:41	18:48	17:00	16:38
5	07:40	07:21	06:40	06:47	06:01	06:53 (5)	05:34	06:51 (5)	05:38	06:58 (5)	06:06	07:00 (5)	06:39	07:11	06:48	07:24
	16:51	17:28	18:04	19:40	20:13	34 07:27 (5)	20:43	40 07:31 (5)	20:51	38 07:36 (5)	20:27	40 07:40 (5)	19:39	18:46	16:59	16:37
6	07:40	07:19	06:39	06:45	06:00	06:52 (5)	05:34	06:52 (5)	05:39	06:58 (5)	06:07	07:01 (5)	06:40	07:12	06:49	07:25
	16:52	17:30	18:05	19:41	20:14	36 07:28 (5)	20:43	38 07:30 (5)	20:51	38 07:36 (5)	20:26	38 07:39 (5)	19:37	18:44	16:58	16:37
7	07:40	07:18	06:37	06:44	05:58	06:51 (5)	05:33	06:52 (5)	05:40	06:57 (5)	06:08	07:02 (5)	06:41	07:13	06:50	07:26
	16:53	17:31	18:06	19:42	20:15	38 07:29 (5)	20:44	38 07:30 (5)	20:50	40 07:37 (5)	20:25	36 07:38 (5)	19:35	18:43	16:57	16:37
8	07:40	07:17	06:35	06:42	05:57	06:50 (5)	05:33	06:52 (5)	05:40	06:58 (5)	06:09	07:03 (5)	06:42	07:14	06:52	07:26
	16:54	17:32	18:08	19:43	20:16	40 07:30 (5)	20:45	38 07:30 (5)	20:50	40 07:38 (5)	20:24	34 07:37 (5)	19:34	18:41	16:56	16:37
9	07:40	07:16	06:34	06:40	05:56	06:48 (5)	05:33	06:54 (5)	05:41	06:58 (5)	06:10	07:04 (5)	06:43	07:15	06:53	07:27
	16:55	17:34	18:09	19:44	20:17	42 07:30 (5)	20:45	36 07:30 (5)	20:50	38 07:36 (5)	20:22	32 07:36 (5)	19:32	18:39	16:55	16:37
10	07:39	07:15	06:32	06:39	05:55	06:49 (5)	05:33	06:53 (5)	05:42	06:57 (5)	06:11	07:05 (5)	06:44	07:17	06:54	07:28
	16:56	17:35	18:10	19:46	20:18	42 07:31 (5)	20:46	36 07:29 (5)	20:49	40 07:37 (5)	20:21	30 07:35 (5)	19:30	18:38	16:54	16:37
11	07:39	07:13	06:30	06:37	05:54	06:48 (5)	05:33	06:53 (5)	05:42	06:58 (5)	06:12	07:06 (5)	06:45	07:18	06:55	07:29
	16:57	17:36	18:11	19:47	20:19	42 07:30 (5)	20:47	36 07:29 (5)	20:49	40 07:38 (5)	20:20	26 07:32 (5)	19:28	18:36	16:52	16:37
12	07:39	07:12	06:29	06:35	05:52	06:47 (5)	05:32	06:53 (5)	05:43	06:56 (5)	06:13	07:07 (5)	06:46	07:19	06:57	07:30
	16:58	17:38	18:12	19:48	20:20	44 07:31 (5)	20:47	36 07:29 (5)	20:48	42 07:38 (5)	20:18	24 07:31 (5)	19:27	18:34	16:51	16:37
13	07:38	07:11	06:27	06:34	05:51	06:46 (5)	05:32	06:55 (5)	05:44	06:57 (5)	06:14	07:10 (5)	06:47	07:20	06:58	07:31
	16:59	17:39	18:14	19:49	20:21	46 07:32 (5)	20:48	34 07:29 (5)	20:48	42 07:39 (5)	20:17	18 07:28 (5)	19:25	18:33	16:50	16:37
14	07:38	07:09	06:25	06:32	05:50	06:47 (5)	05:32	06:55 (5)	05:45	06:58 (5)	06:15	07:15 (5)	06:48	07:21	06:59	07:32
	17:01	17:40	18:15	19:50	20:22	44 07:31 (5)	20:48	34 07:29 (5)	20:47	42 07:40 (5)	20:15	8 07:23 (5)	19:23	18:31	16:49	16:38
15	07:38	07:08	06:24	06:30	05:49	06:46 (5)	05:32	06:55 (5)	05:46	06:57 (5)	06:16		06:49	07:22	07:00	07:32
	17:02	17:41	18:16	19:51	20:24	46 07:32 (5)	20:49	34 07:29 (5)	20:47	44 07:41 (5)	20:14		19:21	18:29	16:49	16:38
16	07:37	07:07	06:22	06:29	05:48	06:47 (5)	05:32	06:55 (5)	05:46	06:57 (5)	06:17		06:50	07:23	07:02	07:33
	17:03	17:43	18:17	19:52	20:25	44 07:31 (5)	20:49	34 07:29 (5)	20:46	42 07:39 (5)	20:13		19:19	18:28	16:48	16:38
17	07:37	07:05	06:20	06:27	05:47	06:46 (5)	05:32	06:55 (5)	05:47	06:56 (5)	06:18		06:51	07:25	07:03	07:34
	17:04	17:44	18:18	19:54	20:26	46 07:32 (5)	20:49	34 07:29 (5)	20:45	44 07:40 (5)	20:11		19:18	18:26	16:47	16:38
18	07:36	07:04	06:18	06:26	05:46	06:45 (5)	05:32	06:57 (5)	05:48	06:57 (5)	06:19		06:52	07:26	07:04	07:34
	17:05	17:45	18:19	19:55	20:27	46 07:31 (5)	20:50	32 07:29 (5)	20:45	44 07:41 (5)	20:10		19:16	18:24	16:46	16:39
19	07:36	07:02	06:17	06:24	05:45	06:47 (5)	05:32	06:58 (5)	05:49	06:56 (5)	06:20		06:53	07:27	07:05	07:35
	17:07	17:47	18:21	19:56	20:28	46 07:33 (5)	20:50	32 07:30 (5)	20:44	46 07:42 (5)	20:08		19:14	18:23	16:45	16:39
20	07:35	07:01	06:15	06:22	05:44	06:46 (5)	05:33	06:58 (5)	05:50	06:57 (5)	06:22		06:55	07:28	07:07	07:36
	17:08	17:48	18:22	19:57	20:29	46 07:32 (5)	20:50	32 07:30 (5)	20:43	44 07:41 (5)	20:07		19:12	18:21	16:44	16:39
21	07:34	06:59	06:13	06:21	05:43	06:47 (5)	05:33	06:58 (5)	05:51	06:56 (5)	06:23		06:56	07:29	07:08	07:36
	17:09	17:49	18:23	19:58	20:30	44 07:31 (5)	20:51	32 07:30 (5)	20:43	46 07:42 (5)	20:05		19:11	18:20	16:44	16:40
22	07:34	06:58	06:11	06:19	05:43	06:46 (5)	05:33	06:58 (5)	05:52	06:57 (5)	06:24		06:57	07:31	07:09	07:37
	17:10	17:50	18:24	19:59	20:31	46 07:32 (5)	20:51	32 07:30 (5)	20:42	46 07:43 (5)	20:04		19:09	18:18	16:43	16:40
23	07:33	06:56	06:10	06:18	05:42	06:47 (5)	05:33	06:58 (5)	05:53	06:58 (5)	06:25		06:58	07:32	07:10	07:37
	17:12	17:52	18:25	20:00	20:32	44 07:31 (5)	20:51	32 07:30 (5)	20:41	44 07:42 (5)	20:02		19:07	18:17	16:42	16:41
24	07:32	06:55	06:08	06:16	05:41	06:47 (5)	05:33	06:59 (5)	05:54	06:56 (5)	06:26		06:59	07:33	07:11	07:38
	17:13	17:53	18:26	20:00	20:33	44 07:31 (5)	20:51	32 07:31 (5)	20:40	46 07:42 (5)	20:00		19:05	18:15	16:42	16:41
25	07:31	06:53	06:06	06:15	05:40	06:48 (5)	05:34	06:57 (5)	05:55	06:57 (5)	06:27		07:00	06:34	07:13	07:38
	17:14	17:54	18:27	20:01	20:33	44 07:32 (5)	20:51	34 07:31 (5)	20:39	44 07:41 (5)	19:57		19:03	17:14	16:41	16:42
26	07:31	06:52	06:04	06:13	05:39	06:47 (5)	05:34	06:57 (5)	05:56	06:56 (5)	06:28		07:01	06:35	07:14	07:38
	17:15	17:55	18:29	20:03	20:34	44 07:31 (5)	20:52	34 07:31 (5)	20:38	46 07:42 (5)	19:56		19:02	17:12	16:41	16:43
27	07:30	06:50	06:03	06:12	05:39	06:47 (5)	05:34	06:58 (5)	05:57	06:57 (5)	06:29		07:02	06:37	07:15	07:39
	17:17	17:57	18:30	20:04	20:35	44 07:31 (5)	20:52	34 07:32 (5)	20:37	46 07:43 (5)	19:54		19:00	17:11	16:40	16:43
28	07:29	06:49	06:01	06:10	05:38	06:48 (5)	05:35	06:58 (5)	05:58	06:56 (5)	06:30		07:03	06:38	07:16	07:39
	17:18	17:58	18:31	20:05	20:36	42 07:30 (5)	20:52	34 07:32 (5)	20:36	46 07:42 (5)	19:52		18:58	17:10	16:40	16:44
29	07:28		05:59	06:09	07:05 (5) 05:38	06:48 (5)	05:35	06:59 (5)	05:58	06:57 (5)	06:31		07:04	06:39	07:17	07:39
	17:19		18:32	20:06	12 07:17 (5) 20:37	44 07:32 (5)	20:52	34 07:33 (5)	20:35	46 07:43 (5)	19:51		18:56	17:08	16:39	16:45
30	07:27		05:57	06:08	07:02 (5) 05:37	06:49 (5)	05:36	06:59 (5)	05:59	06:58 (5)	06:32		07:05	06:40	07:18	07:40
	17:21		18:33	20:07	18 07:20 (5) 20:38	42 07:31 (5)	20:52	34 07:33 (5)	20:34	44 07:42 (5)	19:49		18:55	17:07	16:39	16:46
31	07:26		05:56		05:36	06:49 (5)			06:01	06:57 (5)	06:33			06:42		07:40
	17:22		18:34		20:39	42 07:31 (5)			20:33	44 07:41 (5)	19:47			17:06		16:46
Potential sun hours	293	295	370	209	-292		-263		-280		-145		375	343	294	283
Total, worst case				30	1276		1052		1308		456					
Sun reduction				0.55	0.55		0.55		0.65		0.55					
Oper. time red.				0.86	0.86		0.86		0.86		0.86					
Wind dir. red.				0.59	0.59		0.59		0.59		0.59					
Total reduction				0.28	0.28		0.28		0.33		0.28					
Total, real				8	360		297		436		129					

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	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, Southern part
11 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
1000 meter max shadow distance applied along with default 3° inclination
Sunshine probabilities applied (pdf plots)
Directional run-hours applied from tab file (tower 1)
.

Licensed user:
Wind Engineers, Inc.
7660 Whitegate Avenue
US-RIVERSIDE, CA 92506

Calculated:
03/04/06 13:30/2.4.0.67

SHADOW - Calendar

Calculation: Southern part **Shadow receptor:** 806 - 806

Assumptions for shadow calculations

Maximum distance for influence	1,000 m
Minimum sun height over horizon for influence	3 °
Day step for calculation	1 days
Time step for calculation	2 minutes

Sun shine probabilities (part of time from sun rise to sun set with sun shine)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.35	0.45	0.45	0.55	0.55	0.55	0.65	0.55	0.55	0.45	0.35	0.30

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
475	585	238	199	220	474	1,184	813	840	1,246	803	479	7,555

	January	February	March		April		May	June	July	August	September		October	November	December
1	07:40	07:25	06:47		05:54		06:53 (5)	06:06	05:36	05:36	06:02	06:34		07:06	06:43	07:19
	16:47	17:23	17:59		18:35	36	07:29 (5)	20:08	20:40	20:52	20:32	19:46		18:53	17:04	16:38
2	07:40	07:24	06:45		05:52		06:54 (5)	06:05	05:35	05:37	06:03	06:35		07:08	06:44	07:20
	16:48	17:24	18:00		18:37	36	07:30 (5)	20:09	20:40	20:51	20:31	19:44		18:51	17:03	16:38
3	07:40	07:23	06:44		05:50		06:54 (5)	06:03	05:35	05:37	06:04	06:36	08:01 (5)	07:09	06:45	07:22
	16:49	17:26	18:02		18:38	34	07:28 (5)	20:10	20:41	20:51	20:30	19:42	8 08:09 (5)	18:49	17:02	16:38
4	07:40	07:22	06:42		05:49		06:54 (5)	06:02	05:34	05:38	06:05	06:38	07:58 (5)	07:10	06:47	07:23
	16:50	17:27	18:03		18:39	32	07:26 (5)	20:12	20:42	20:51	20:29	19:41	16 08:14 (5)	18:48	17:00	16:38
5	07:40	07:21	06:40		06:47		07:56 (5)	06:01	05:34	05:38	06:06	06:39	07:55 (5)	07:11	06:48	07:24
	16:51	17:28	18:04		19:40	28	08:24 (5)	20:13	20:43	20:51	20:27	19:39	22 08:17 (5)	18:46	16:59	16:37
6	07:40	07:19	06:39		06:45		07:57 (5)	06:00	05:34	05:39	06:07	06:40	07:52 (5)	07:12	06:49	07:25
	16:52	17:30	18:05		19:41	26	08:23 (5)	20:14	20:43	20:51	20:26	19:37	26 08:18 (5)	18:44	16:58	16:37
7	07:40	07:18	06:37		06:44		07:59 (5)	05:58	05:33	05:40	06:08	06:41	07:51 (5)	07:13	06:50	07:26
	16:53	17:31	18:06		19:42	22	08:21 (5)	20:15	20:44	20:50	20:25	19:35	28 08:19 (5)	18:43	16:57	16:37
8	07:40	07:17	06:35		06:42		08:01 (5)	05:57	05:33	05:40	06:09	06:42	07:48 (5)	07:14	06:52	07:26
	16:54	17:32	18:08		19:43	16	08:17 (5)	20:16	20:45	20:50	20:24	19:34	32 08:20 (5)	18:41	16:56	16:37
9	07:40	07:16	06:34		06:40		08:04 (5)	05:56	05:33	05:41	06:10	06:43	07:48 (5)	07:15	06:53	07:27
	16:55	17:34	18:09		19:44	8	08:12 (5)	20:17	20:45	20:50	20:22	19:32	34 08:22 (5)	18:39	16:55	16:37
10	07:39	07:15	06:32		06:39			05:55	05:33	05:42	06:11	06:44	07:47 (5)	07:17	06:54	07:28
	16:56	17:35	18:10		19:46			20:18	20:46	20:49	20:21	19:30	36 08:23 (5)	18:38	16:54	16:37
11	07:39	07:13	06:30		06:37			05:54	05:33	05:42	06:12	06:45	07:46 (5)	07:18	06:55	07:29
	16:57	17:36	18:11		19:47			20:19	20:47	20:49	20:20	19:28	36 08:22 (5)	18:36	16:52	16:37
12	07:39	07:12	06:29		06:35			05:52	05:32	05:43	06:13	06:46	07:45 (5)	07:19	06:57	07:30
	16:58	17:38	18:12		19:48			20:20	20:47	20:48	20:18	19:27	38 08:23 (5)	18:34	16:51	16:37
13	07:38	07:11	06:27		06:34			05:51	05:32	05:44	06:14	06:47	07:44 (5)	07:20	06:58	07:31
	16:59	17:39	18:14		19:49			20:21	20:48	20:48	20:17	19:25	40 08:24 (5)	18:33	16:50	16:37
14	07:38	07:09	06:25		06:32			05:50	05:32	05:45	06:15	06:48	07:43 (5)	07:21	06:59	07:32
	17:01	17:40	18:15		19:50			20:22	20:48	20:47	20:15	19:23	40 08:23 (5)	18:31	16:49	16:38
15	07:38	07:08	06:24		07:13 (5)	06:30		05:49	05:32	05:46	06:16	06:49	07:44 (5)	07:22	07:00	07:32
	17:02	17:41	18:16	10	07:23 (5)	19:51		20:24	20:49	20:47	20:14	19:21	38 08:22 (5)	18:29	16:49	16:38
16	07:37	07:07	06:22		07:07 (5)	06:29		05:48	05:32	05:46	06:17	06:50	07:43 (5)	07:23	07:02	07:33
	17:03	17:43	18:17	20	07:27 (5)	19:52		20:25	20:49	20:46	20:13	19:19	40 08:23 (5)	18:28	16:48	16:38
17	07:37	07:05	06:20		07:06 (5)	06:27		05:47	05:32	05:47	06:18	06:51	07:42 (5)	07:25	07:03	07:34
	17:04	17:44	18:18	24	07:30 (5)	19:54		20:26	20:49	20:45	20:11	19:18	40 08:22 (5)	18:26	16:47	16:38
18	07:36	07:04	06:18		07:02 (5)	06:26		05:46	05:32	05:48	06:19	06:52	07:43 (5)	07:26	07:04	07:34
	17:05	17:45	18:19	28	07:30 (5)	19:55		20:27	20:50	20:45	20:10	19:16	38 08:21 (5)	18:24	16:46	16:39
19	07:36	07:02	06:17		07:00 (5)	06:24		05:45	05:32	05:49	06:20	06:53	07:42 (5)	07:27	07:05	07:35
	17:07	17:47	18:21	32	07:32 (5)	19:56		20:28	20:50	20:44	20:08	19:14	40 08:22 (5)	18:23	16:45	16:39
20	07:35	07:01	06:15		07:00 (5)	06:22		05:44	05:33	05:50	06:22	06:55	07:43 (5)	07:28	07:07	07:36
	17:08	17:48	18:22	32	07:32 (5)	19:57		20:29	20:50	20:43	20:07	19:12	38 08:21 (5)	18:21	16:44	16:39
21	07:34	06:59	06:13		06:59 (5)	06:21		05:43	05:33	05:51	06:23	06:56	07:42 (5)	07:29	07:08	07:36
	17:09	17:49	18:23	34	07:33 (5)	19:58		20:30	20:51	20:43	20:05	19:11	38 08:20 (5)	18:20	16:44	16:40
22	07:34	06:58	06:11		06:57 (5)	06:19		05:43	05:33	05:52	06:24	06:57	07:43 (5)	07:31	07:09	07:37
	17:10	17:50	18:24	36	07:33 (5)	19:59		20:31	20:51	20:42	20:04	19:09	36 08:19 (5)	18:18	16:43	16:40
23	07:33	06:56	06:10		06:55 (5)	06:18		05:42	05:33	05:53	06:25	06:58	07:44 (5)	07:32	07:10	07:37
	17:12	17:52	18:25	38	07:33 (5)	20:00		20:32	20:51	20:41	20:02	19:07	32 08:16 (5)	18:17	16:42	16:41
24	07:32	06:55	06:08		06:55 (5)	06:16		05:41	05:33	05:54	06:26	06:59	07:43 (5)	07:33	07:11	07:38
	17:13	17:53	18:26	38	07:33 (5)	20:00		20:33	20:51	20:40	20:00	19:05	32 08:15 (5)	18:15	16:42	16:41
25	07:31	06:53	06:06		06:53 (5)	06:15		05:40	05:34	05:55	06:27	07:00	07:44 (5)	06:34	07:13	07:38
	17:14	17:54	18:27	40	07:33 (5)	20:01		20:33	20:51	20:39	19:57	19:03	30 08:14 (5)	17:14	16:41	16:42
26	07:31	06:52	06:04		06:54 (5)	06:13		05:39	05:34	05:56	06:28	07:01	07:47 (5)	06:35	07:14	07:38
	17:15	17:55	18:29	40	07:34 (5)	20:03		20:34	20:52	20:38	19:56	19:02	24 08:11 (5)	17:12	16:41	16:43
27	07:30	06:50	06:03		06:54 (5)	06:12		05:39	05:34	05:57	06:29	07:02	07:48 (5)	06:37	07:15	07:39
	17:17	17:57	18:30	40	07:34 (5)	20:04		20:35	20:52	20:37	19:54	19:00	20 08:08 (5)	17:11	16:40	16:43
28	07:29	06:49	06:01		06:52 (5)	06:10		05:38	05:35	05:57	06:30	07:03	07:51 (5)	06:38	07:16	07:39
	17:18	17:58	18:31	40	07:32 (5)	20:05		20:36	20:52	20:36	19:52	18:58	14 08:05 (5)	17:10	16:40	16:44
29	07:28		05:59		06:52 (5)	06:09		05:38	05:35	05:58	06:31	07:04		06:39	07:17	07:39
	17:19		18:32	40	07:32 (5)	20:06		20:37	20:52	20:35	19:51	18:56		17:08	16:39	16:45
30	07:27		05:57		06:53 (5)	06:08		05:37	05:36	05:59	06:32	07:05		06:40	07:18	07:40
	17:21		18:33	38	07:31 (5)	20:07		20:38	20:52	20:34	19:49	18:55		17:07	16:39	16:46
31	07:26		05:56		06:53 (5)			05:36		06:01	06:33			06:42		07:40
	17:22		18:34	38	07:31 (5)			20:39		20:33	19:47			17:06		16:46
Potential sun hours	293	295	370		209			-292	-263	-280	-145	375		343	294	283
Total, worst case				568		238							816			
Sun reduction				0.45		0.55							0.55			
Oper. time red.				0.86		0.86							0.86			
Wind dir. red.				0.60		0.60							0.60			
Total reduction				0.23		0.29							0.29			
Total, real				133		68							233			

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	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, Southern part
11 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
1000 meter max shadow distance applied along with default 3° inclination
Sunshine probabilities applied (pdf plots)
Directional run-hours applied from tab file (tower 1)
.

Licensed user:
Wind Engineers, Inc.
7660 Whitegate Avenue
US-RIVERSIDE, CA 92506

Calculated:
03/04/06 13:30/2.4.0.67

SHADOW - Calendar

Calculation: Southern part **Shadow receptor:** 807 - 807

Assumptions for shadow calculations

Maximum distance for influence	1,000	m
Minimum sun height over horizon for influence	3	°
Day step for calculation	1	days
Time step for calculation	2	minutes

Sun shine probabilities (part of time from sun rise to sun set with sun shine)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.35	0.45	0.45	0.55	0.55	0.55	0.65	0.55	0.55	0.45	0.35	0.30

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
475	585	238	199	220	474	1,184	813	840	1,246	803	479	7,555

	January		February		March	April		May		June	
1	07:40		07:25	08:02 (5)	06:47	05:54		06:06	06:58 (6)	05:36	
	16:47		17:23 38	08:40 (5)	17:59	18:35		20:08 46	07:44 (6)	20:40	
2	07:40		07:24	08:01 (5)	06:45	05:52		06:05	06:59 (6)	05:35	
	16:48		17:24 40	08:41 (5)	18:00	18:37		20:09 46	07:45 (6)	20:40	
3	07:40		07:23	08:02 (5)	06:44	05:50		06:03	06:58 (6)	05:35	
	16:49		17:26 40	08:42 (5)	18:02	18:38		20:10 46	07:44 (6)	20:41	
4	07:40		07:22	08:02 (5)	06:42	05:49		06:02	06:58 (6)	05:34	
	16:50		17:27 38	08:40 (5)	18:03	18:39		20:12 46	07:44 (6)	20:42	
5	07:40		07:21	08:01 (5)	06:40	06:47		06:01	06:57 (6)	05:34	
	16:51		17:28 40	08:41 (5)	18:04	19:40		20:13 46	07:43 (6)	20:43	
6	07:40		07:19	08:02 (5)	06:39	06:45		06:00	06:58 (6)	05:34	
	16:52		17:30 38	08:40 (5)	18:05	19:41		20:14 46	07:44 (6)	20:43	
7	07:40		07:18	08:03 (5)	06:37	06:44		05:58	06:57 (6)	05:33	
	16:53		17:31 38	08:41 (5)	18:06	19:42		20:15 46	07:43 (6)	20:44	
8	07:40		07:17	08:04 (5)	06:35	06:42		05:57	06:58 (6)	05:33	
	16:54		17:32 36	08:40 (5)	18:08	19:43		20:16 46	07:44 (6)	20:45	
9	07:40		07:16	08:04 (5)	06:34	06:40		05:56	06:58 (6)	05:33	
	16:55		17:34 36	08:40 (5)	18:09	19:44		20:17 44	07:42 (6)	20:45	
10	07:39		07:15	08:05 (5)	06:32	06:39		05:55	06:57 (6)	05:33	
	16:56		17:35 34	08:39 (5)	18:10	19:46		20:18 46	07:43 (6)	20:46	
11	07:39		07:13	08:06 (5)	06:30	06:37		05:54	06:58 (6)	05:33	
	16:57		17:36 32	08:38 (5)	18:11	19:47		20:19 44	07:42 (6)	20:47	
12	07:39		07:12	08:06 (5)	06:29	06:35		05:52	06:59 (6)	05:32	
	16:58		17:38 30	08:36 (5)	18:12	19:48		20:20 42	07:41 (6)	20:47	
13	07:38		07:11	08:07 (5)	06:27	06:34		05:51	06:58 (6)	05:32	
	16:59		17:39 28	08:35 (5)	18:14	19:49		20:21 44	07:42 (6)	20:48	
14	07:38		07:09	08:08 (5)	06:25	06:32		05:50	06:59 (6)	05:32	
	17:01		17:40 26	08:34 (5)	18:15	19:50		20:22 42	07:41 (6)	20:48	
15	07:38	08:12 (5)	07:08	08:10 (5)	06:24	06:30		05:49	07:00 (6)	05:32	
	17:02 10	08:22 (5)	17:41 22	08:32 (5)	18:16	19:51		20:24 40	07:40 (6)	20:49	
16	07:37	08:11 (5)	07:07	08:13 (5)	06:22	06:29		05:48	06:59 (6)	05:32	
	17:03 12	08:23 (5)	17:43 18	08:31 (5)	18:17	19:52		20:25 40	07:39 (6)	20:49	
17	07:37	08:09 (5)	07:05	08:15 (5)	06:20	06:27		05:47	07:00 (6)	05:32	
	17:04 18	08:27 (5)	17:44 12	08:27 (5)	18:18	19:54		20:26 38	07:38 (6)	20:49	
18	07:36	08:08 (5)	07:04		06:18	06:26	07:17 (6)	05:46	07:01 (6)	05:32	
	17:05 20	08:28 (5)	17:45		18:19	19:55 16	07:33 (6)	20:27 36	07:37 (6)	20:50	
19	07:36	08:07 (5)	07:02		06:17	06:24	07:14 (6)	05:45	07:03 (6)	05:32	
	17:07 22	08:29 (5)	17:47		18:21	19:56 22	07:36 (6)	20:28 34	07:37 (6)	20:50	
20	07:35	08:05 (5)	07:01		06:15	06:22	07:10 (6)	05:44	07:04 (6)	05:33	
	17:08 26	08:31 (5)	17:48		18:22	19:57 28	07:38 (6)	20:29 32	07:36 (6)	20:50	
21	07:34	08:04 (5)	06:59		06:13	06:21	07:08 (6)	05:43	07:03 (6)	05:33	
	17:09 28	08:32 (5)	17:49		18:23	19:58 30	07:38 (6)	20:30 32	07:35 (6)	20:51	
22	07:34	08:05 (5)	06:58		06:11	06:19	07:07 (6)	05:43	07:04 (6)	05:33	
	17:10 28	08:33 (5)	17:50		18:24	19:59 34	07:41 (6)	20:31 30	07:34 (6)	20:51	
23	07:33	08:04 (5)	06:56		06:10	06:18	07:05 (6)	05:42	07:05 (6)	05:33	
	17:12 30	08:34 (5)	17:52		18:25	20:00 36	07:41 (6)	20:32 28	07:33 (6)	20:51	
24	07:32	08:04 (5)	06:55		06:08	06:16	07:04 (6)	05:41	07:07 (6)	05:33	
	17:13 32	08:36 (5)	17:53		18:26	20:00 38	07:42 (6)	20:33 26	07:33 (6)	20:51	
25	07:31	08:03 (5)	06:53		06:06	06:15	07:03 (6)	05:40	07:08 (6)	05:34	
	17:14 34	08:37 (5)	17:54		18:27	20:01 40	07:43 (6)	20:33 24	07:32 (6)	20:51	
26	07:31	08:02 (5)	06:52		06:04	06:13	07:01 (6)	05:39	07:09 (6)	05:34	
	17:15 36	08:38 (5)	17:55		18:29	20:03 42	07:43 (6)	20:34 22	07:31 (6)	20:52	
27	07:30	08:03 (5)	06:50		06:03	06:12	07:02 (6)	05:39	07:11 (6)	05:34	
	17:17 36	08:39 (5)	17:57		18:30	20:04 42	07:44 (6)	20:35 18	07:29 (6)	20:52	
28	07:29	08:02 (5)	06:49		06:01	06:10	07:00 (6)	05:38	07:12 (6)	05:35	
	17:18 36	08:38 (5)	17:58		18:31	20:05 44	07:44 (6)	20:36 16	07:28 (6)	20:52	
29	07:28	08:01 (5)			05:59	06:09	06:59 (6)	05:38	07:16 (6)	05:35	
	17:19 38	08:39 (5)			18:32	20:06 46	07:45 (6)	20:37 10	07:26 (6)	20:52	
30	07:27	08:02 (5)			05:57	06:08	07:00 (6)	05:37		05:36	
	17:21 38	08:40 (5)			18:33	20:07 44	07:44 (6)	20:38		20:52	
31	07:26	08:01 (5)			05:56			05:36			
	17:22 40	08:41 (5)			18:34			20:39			
Potential sun hours	293		295		370	209		-292		-263	
Total, worst case		484		546			462		1056		
Sun reduction		0.35		0.45			0.55		0.55		
Oper. time red.		0.86		0.86			0.86		0.86		
Wind dir. red.		0.63		0.63			0.60		0.60		
Total reduction		0.19		0.25			0.29		0.29		
Total, real		92		134			133		303		

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	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, Southern part
11 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
1000 meter max shadow distance applied along with default 3° inclination
Sunshine probabilities applied (pdf plots)
Directional run-hours applied from tab file (tower 1)
.

Licensed user:
Wind Engineers, Inc.
7660 Whitegate Avenue
US-RIVERSIDE, CA 92506

Calculated:
03/04/06 13:30/2.4.0.67

SHADOW - Calendar

Calculation: Southern part **Shadow receptor:** 807 - 807

Assumptions for shadow calculations

Maximum distance for influence	1,000	m
Minimum sun height over horizon for influence	3	°
Day step for calculation	1	days
Time step for calculation	2	minutes

Sun shine probabilities (part of time from sun rise to sun set with sun shine)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.35	0.45	0.45	0.55	0.55	0.55	0.65	0.55	0.55	0.45	0.35	0.30

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
475	585	238	199	220	474	1,184	813	840	1,246	803	479	7,555

	July		August		September	October		November		December
1	05:36		06:02		07:08 (6)	06:34	07:06		06:43	07:33 (5)	07:19
	20:52		20:32	44	07:52 (6)	19:46	18:53		17:04	36	08:09 (5)	16:38
2	05:37		06:03		07:09 (6)	06:35	07:08		06:44		07:32 (5)	07:20
	20:51		20:31	44	07:53 (6)	19:44	18:51		17:03	38	08:10 (5)	16:38
3	05:37		06:04		07:08 (6)	06:36	07:09		06:45		07:33 (5)	07:22
	20:51		20:30	46	07:54 (6)	19:42	18:49		17:02	36	08:09 (5)	16:38
4	05:38		06:05		07:07 (6)	06:38	07:10		06:47		07:33 (5)	07:23
	20:51		20:29	46	07:53 (6)	19:41	18:48		17:00	38	08:11 (5)	16:38
5	05:38		06:06		07:08 (6)	06:39	07:11		06:48		07:32 (5)	07:24
	20:51		20:27	46	07:54 (6)	19:39	18:46		16:59	38	08:10 (5)	16:37
6	05:39		06:07		07:07 (6)	06:40	07:12		06:49		07:31 (5)	07:25
	20:51		20:26	46	07:53 (6)	19:37	18:44		16:58	40	08:11 (5)	16:37
7	05:40		06:08		07:08 (6)	06:41	07:13		06:50		07:33 (5)	07:26
	20:50		20:25	46	07:54 (6)	19:35	18:43		16:57	38	08:11 (5)	16:37
8	05:40		06:09		07:07 (6)	06:42	07:14		06:52		07:32 (5)	07:27
	20:50		20:24	46	07:53 (6)	19:34	18:41		16:56	40	08:12 (5)	16:37
9	05:41		06:10		07:06 (6)	06:43	07:15		06:53		07:32 (5)	07:27
	20:50		20:22	48	07:54 (6)	19:32	18:39		16:55	40	08:12 (5)	16:37
10	05:42		06:11		07:07 (6)	06:44	07:17		06:54		07:33 (5)	07:28
	20:49		20:21	46	07:53 (6)	19:30	18:38		16:54	38	08:11 (5)	16:37
11	05:42		06:12		07:06 (6)	06:45	07:18		06:55		07:32 (5)	07:29
	20:49		20:20	48	07:54 (6)	19:28	18:36		16:52	40	08:12 (5)	16:37
12	05:43		06:13		07:07 (6)	06:46	07:19		06:57		07:34 (5)	07:30
	20:48		20:18	46	07:53 (6)	19:27	18:34		16:51	38	08:12 (5)	16:37
13	05:44		06:14		07:08 (6)	06:47	07:20		06:58		07:33 (5)	07:31
	20:48		20:17	44	07:52 (6)	19:25	18:33		16:50	38	08:11 (5)	16:37
14	05:45		07:26 (6)	06:15		07:07 (6)	06:48	07:21		06:59		07:34 (5)	07:32
	20:47	6	07:32 (6)	20:15	44	07:51 (6)	19:23	18:31		16:49	36	08:10 (5)	16:38
15	05:46		07:23 (6)	06:16		07:08 (6)	06:49	07:22		07:00		07:36 (5)	07:32
	20:47	12	07:35 (6)	20:14	44	07:52 (6)	19:21	18:29		16:49	36	08:12 (5)	16:38
16	05:46		07:21 (6)	06:17		07:09 (6)	06:50	07:23		07:02		07:35 (5)	07:33
	20:46	16	07:37 (6)	20:13	42	07:51 (6)	19:19	18:28		16:48	36	08:11 (5)	16:38
17	05:47		07:20 (6)	06:18		07:08 (6)	06:51	07:25		07:03		07:36 (5)	07:34
	20:45	18	07:38 (6)	20:11	42	07:50 (6)	19:18	18:26		16:47	34	08:10 (5)	16:38
18	05:48		07:19 (6)	06:19		07:09 (6)	06:52	07:26		07:04		07:38 (5)	07:34
	20:45	22	07:41 (6)	20:10	40	07:49 (6)	19:16	18:24		16:46	32	08:10 (5)	16:39
19	05:49		07:18 (6)	06:20		07:10 (6)	06:53	07:27		07:05		07:39 (5)	07:35
	20:44	24	07:42 (6)	20:08	38	07:48 (6)	19:14	18:23		16:45	30	08:09 (5)	16:39
20	05:50		07:17 (6)	06:22		07:11 (6)	06:55	07:28		07:07		07:40 (5)	07:36
	20:43	26	07:43 (6)	20:07	36	07:47 (6)	19:12	18:21		16:44	28	08:08 (5)	16:39
21	05:51		07:16 (6)	06:23		07:12 (6)	06:56	07:29		07:08		07:39 (5)	07:36
	20:43	28	07:44 (6)	20:05	32	07:44 (6)	19:11	18:20		16:44	28	08:07 (5)	16:40
22	05:52		07:15 (6)	06:24		07:13 (6)	06:57	07:31		07:09		07:41 (5)	07:37
	20:42	30	07:45 (6)	20:04	30	07:43 (6)	19:09	18:18		16:43	26	08:07 (5)	16:40
23	05:53		07:13 (6)	06:25		07:14 (6)	06:58	07:32		07:10		07:44 (5)	07:37
	20:41	32	07:45 (6)	20:02	26	07:40 (6)	19:07	18:17		16:42	22	08:06 (5)	16:41
24	05:54		07:12 (6)	06:26		07:17 (6)	06:59	07:33		07:11		07:45 (5)	07:38
	20:40	34	07:46 (6)	20:00	22	07:39 (6)	19:05	18:15		16:42	20	08:05 (5)	16:41
25	05:55		07:11 (6)	06:27		07:20 (6)	07:00	06:34	07:46 (5)	07:13		07:47 (5)	07:38
	20:39	36	07:47 (6)	19:57	14	07:34 (6)	19:03	17:14	12	07:58 (5)	16:41	18	08:05 (5)	16:42
26	05:56		07:12 (6)	06:28			07:01	06:35	07:41 (5)	07:14		07:48 (5)	07:38
	20:38	36	07:48 (6)	19:56			19:02	17:12	20	08:01 (5)	16:41	14	08:02 (5)	16:43
27	05:57		07:11 (6)	06:29			07:02	06:37	07:40 (5)	07:15		07:51 (5)	07:39
	20:37	38	07:49 (6)	19:54			19:00	17:11	22	08:02 (5)	16:40	10	08:01 (5)	16:43
28	05:57		07:10 (6)	06:30			07:03	06:38	07:37 (5)	07:16				07:39
	20:36	40	07:50 (6)	19:52			18:58	17:10	26	08:03 (5)	16:40			16:44
29	05:58		07:09 (6)	06:31			07:04	06:39	07:37 (5)	07:17				07:39
	20:35	42	07:51 (6)	19:51			18:56	17:08	28	08:05 (5)	16:39			16:45
30	05:59		07:10 (6)	06:32			07:05	06:40	07:36 (5)	07:18				07:40
	20:34	42	07:52 (6)	19:49			18:55	17:07	30	08:06 (5)	16:39			16:46
31	06:01		07:09 (6)	06:33				06:42	07:33 (5)					07:40
	20:33	42	07:51 (6)	19:47				17:06	34	08:07 (5)				16:46
Potential sun hours	-280			-145		375		343			294			283
Total, worst case		524			1006				172			868		
Sun reduction		0.65			0.55				0.45			0.35		
Oper. time red.		0.86			0.86				0.86			0.86		
Wind dir. red.		0.60			0.60				0.63			0.63		
Total reduction		0.34			0.29				0.25			0.19		
Total, real		178			289				42			166		

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	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, Southern part
11 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
1000 meter max shadow distance applied along with default 3° inclination
Sunshine probabilities applied (pdf plots)
Directional run-hours applied from tab file (tower 1)
.

Printed/Page
03/05/06 22:12 / 23

Licensed user:
Wind Engineers, Inc.
7660 Whitegate Avenue
US-RIVERSIDE, CA 92506

Calculated:
03/04/06 13:30/2.4.0.67

SHADOW - Calendar

Calculation: Southern part **Shadow receptor:** 811 - 811

Assumptions for shadow calculations

Maximum distance for influence	1,000 m
Minimum sun height over horizon for influence	3 °
Day step for calculation	1 days
Time step for calculation	2 minutes

Sun shine probabilities (part of time from sun rise to sun set with sun shine)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.35	0.45	0.45	0.55	0.55	0.55	0.65	0.55	0.55	0.45	0.35	0.30

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
475	585	238	199	220	474	1,184	813	840	1,246	803	479	7,555

	January		February		March	April	May	June	July	August	September	October	November	December
1	07:40		07:25	08:22 (6)	06:47	05:54	06:06	05:36	05:36	06:02	06:34	07:06	06:43	07:19
	16:47		17:23 40	09:02 (6)	17:59	18:35	20:08	20:40	20:52 26	06:39 (7) 20:32	19:46	18:53	17:04 28	08:25 (6) 16:38 28
2	07:40	08:31 (6)	07:24	08:21 (6)	06:45	05:52	06:05	05:35 06:16 (7)	05:37	06:13 (7) 06:03	06:35	07:08	06:44	07:56 (6) 07:20
	16:48 4	08:35 (6)	17:24 40	09:01 (6)	18:00	18:37	20:09	20:40 8 06:24 (7)	20:51 24	06:38 (7) 20:31	19:44	18:51	17:03 30	08:26 (6) 16:38 24
3	07:40	08:27 (6)	07:23	08:22 (6)	06:44	05:50	06:03	05:35 06:13 (7)	05:37	06:14 (7) 06:04	06:36	07:09	06:45	07:55 (6) 07:22
	16:49 10	08:37 (6)	17:26 40	09:02 (6)	18:02	18:38	20:10	20:41 14 06:27 (7)	20:51 24	06:38 (7) 20:30	19:42	18:49	17:02 32	08:27 (6) 16:38 22
4	07:40	08:27 (6)	07:22	08:22 (6)	06:42	05:49	06:02	05:34 06:13 (7)	05:38	06:15 (7) 06:05	06:38	07:10	06:47	07:55 (6) 07:23
	16:50 12	08:39 (6)	17:27 38	09:00 (6)	18:03	18:39	20:12	20:42 16 06:29 (7)	20:51 22	06:37 (7) 20:29	19:41	18:48	17:00 34	08:29 (6) 16:38 22
5	07:40	08:25 (6)	07:21	08:23 (6)	06:40	06:47	06:01	05:34 06:11 (7)	05:38	06:16 (7) 06:06	06:39	07:11	06:48	07:54 (6) 07:24
	16:51 16	08:41 (6)	17:28 38	09:01 (6)	18:04	19:40	20:13	20:43 18 06:29 (7)	20:51 22	06:38 (7) 20:27	19:39	18:46	16:59 36	08:30 (6) 16:37 20
6	07:40	08:25 (6)	07:19	08:24 (6)	06:39	06:45	06:00	05:34 06:10 (7)	05:39	06:16 (7) 06:07	06:40	07:12	06:49	07:53 (6) 07:25
	16:52 18	08:43 (6)	17:30 36	09:00 (6)	18:05	19:41	20:14	20:43 20 06:30 (7)	20:51 20	06:36 (7) 20:26	19:37	18:44	16:58 38	08:31 (6) 16:37 18
7	07:40	08:25 (6)	07:18	08:25 (6)	06:37	06:44	05:58	05:33 06:10 (7)	05:40	06:17 (7) 06:08	06:41	07:13	06:50	07:53 (6) 07:26
	16:53 20	08:45 (6)	17:31 34	08:59 (6)	18:06	19:42	20:15	20:44 22 06:32 (7)	20:50 20	06:37 (7) 20:25	19:35	18:43	16:57 38	08:31 (6) 16:37 16
8	07:40	08:24 (6)	07:17	08:26 (6)	06:35	06:42	05:57	05:33 06:10 (7)	05:40	06:18 (7) 06:09	06:42	07:14	06:52	07:52 (6) 07:27
	16:54 20	08:44 (6)	17:32 32	08:58 (6)	18:08	19:43	20:16	20:45 22 06:32 (7)	20:50 18	06:36 (7) 20:24	19:34	18:41	16:56 40	08:32 (6) 16:37 12
9	07:40	08:24 (6)	07:16	08:26 (6)	06:34	06:40	05:56	05:33 06:10 (7)	05:41	06:20 (7) 06:10	06:43	07:15	06:53	07:52 (6) 07:27
	16:55 22	08:46 (6)	17:34 30	08:56 (6)	18:09	19:44	20:17	20:45 24 06:34 (7)	20:50 14	06:34 (7) 20:22	19:32	18:39	16:55 40	08:32 (6) 16:37 10
10	07:39	08:24 (6)	07:15	08:29 (6)	06:32	06:39	05:55	05:33 06:09 (7)	05:42	06:21 (7) 06:11	06:44	07:17	06:54	07:53 (6) 07:28
	16:56 24	08:48 (6)	17:35 26	08:55 (6)	18:10	19:46	20:18	20:46 24 06:33 (7)	20:49 12	06:33 (7) 20:21	19:30	18:38	16:53 40	08:33 (6) 16:37 6
11	07:39	08:22 (6)	07:13	08:30 (6)	06:30	06:37	05:54	05:33 06:09 (7)	05:42	06:24 (7) 06:12	06:45	07:18	06:55	07:52 (6) 07:29
	16:57 28	08:50 (6)	17:36 24	08:54 (6)	18:11	19:47	20:19	20:47 24 06:33 (7)	20:49 6	06:30 (7) 20:20	19:28	18:36	16:52 40	08:32 (6) 16:37
12	07:39	08:21 (6)	07:12	08:32 (6)	06:29	06:35	05:52	05:32 06:09 (7)	05:43	06:13	06:46	07:19	06:57	07:52 (6) 07:30
	16:58 30	08:51 (6)	17:38 20	08:52 (6)	18:12	19:48	20:20	20:47 26 06:35 (7)	20:48	20:18	19:27	18:34	16:51 42	08:34 (6) 16:37
13	07:38	08:21 (6)	07:11	08:35 (6)	06:27	06:34	05:51	05:32 06:09 (7)	05:44	06:14	06:47	07:20	06:58	07:53 (6) 07:31
	16:59 30	08:51 (6)	17:39 14	08:49 (6)	18:14	19:49	20:21	20:48 26 06:35 (7)	20:48	20:17	19:25	18:33	16:50 40	08:33 (6) 16:37
14	07:38	08:22 (6)	07:09		06:25	06:32	05:50	05:32 06:09 (7)	05:45	06:15	06:48	07:21	06:59	07:52 (6) 07:32
	17:01 30	08:52 (6)	17:40		18:15	19:50	20:22	20:48 26 06:35 (7)	20:47	20:15	19:23	18:31	16:49 42	08:34 (6) 16:37
15	07:38	08:22 (6)	07:08		06:24	06:30	05:49	05:32 06:09 (7)	05:46	06:16	06:49	07:22	07:00	07:52 (6) 07:32
	17:02 32	08:54 (6)	17:41		18:16	19:51	20:24	20:49 26 06:35 (7)	20:47	20:14	19:21	18:29	16:49 42	08:34 (6) 16:38
16	07:37	08:21 (6)	07:07		06:22	06:29	05:48	05:32 06:09 (7)	05:46	06:17	06:50	07:23	07:02	07:53 (6) 07:33
	17:03 34	08:55 (6)	17:43		18:17	19:52	20:25	20:49 28 06:37 (7)	20:46	20:13	19:19	18:28	16:48 42	08:35 (6) 16:38
17	07:37	08:21 (6)	07:05		06:20	06:27	05:47	05:32 06:09 (7)	05:47	06:18	06:51	07:25	07:03	07:52 (6) 07:34
	17:04 34	08:55 (6)	17:44		18:18	19:54	20:26	20:49 28 06:37 (7)	20:45	20:11	19:18	18:26	16:47 42	08:34 (6) 16:38
18	07:36	08:20 (6)	07:04		06:18	06:26	05:46	05:32 06:09 (7)	05:48	06:19	06:52	07:26	07:04	07:54 (6) 07:34
	17:05 36	08:56 (6)	17:45		18:19	19:55	20:27	20:50 28 06:37 (7)	20:45	20:10	19:16	18:24	16:46 40	08:34 (6) 16:39
19	07:36	08:19 (6)	07:02		06:17	06:24	05:45	05:32 06:09 (7)	05:49	06:20	06:53	07:27	07:05	07:55 (6) 07:35
	17:07 38	08:57 (6)	17:47		18:21	19:56	20:28	20:50 28 06:37 (7)	20:44	20:08	19:14	18:23	16:45 40	08:35 (6) 16:39
20	07:35	08:21 (6)	07:01		06:15	06:22	05:44	05:33 06:10 (7)	05:50	06:22	06:55	07:28	07:07	07:54 (6) 07:36
	17:08 38	08:59 (6)	17:48		18:22	19:57	20:29	20:50 28 06:38 (7)	20:43	20:07	19:12	18:21	16:44 40	08:34 (6) 16:39
21	07:34	08:20 (6)	06:59		06:13	06:21	05:43	05:33 06:10 (7)	05:51	06:23	06:56	07:29	07:08	07:55 (6) 07:36
	17:09 38	08:58 (6)	17:49		18:23	19:58	20:30	20:51 28 06:38 (7)	20:43	20:05	19:11	18:20	16:44 38	08:33 (6) 16:40
22	07:34	08:19 (6)	06:58		06:11	06:19	05:43	05:33 06:10 (7)	05:52	06:24	06:57	07:31	07:09	07:57 (6) 07:37
	17:10 40	08:59 (6)	17:50		18:24	19:59	20:31	20:51 28 06:38 (7)	20:42	20:04	19:09	18:18	16:43 38	08:35 (6) 16:40
23	07:33	08:20 (6)	06:56		06:10	06:18	05:42	05:33 06:10 (7)	05:53	06:25	06:58	07:32	07:10	07:56 (6) 07:37
	17:11 40	09:00 (6)	17:52		18:25	20:00	20:32	20:51 28 06:38 (7)	20:41	20:02	19:07	18:17	16:42 38	08:34 (6) 16:41
24	07:32	08:20 (6)	06:55		06:08	06:16	05:41	05:33 06:11 (7)	05:54	06:26	06:59	07:33	07:11	07:57 (6) 07:38
	17:13 40	09:00 (6)	17:53		18:26	20:00	20:33	20:51 28 06:39 (7)	20:40	20:00	19:05	18:15	16:42 36	08:33 (6) 16:41
25	07:31	08:19 (6)	06:53		06:06	06:15	05:40	05:34 06:11 (7)	05:55	06:27	07:00	06:34	07:13	07:59 (6) 07:38
	17:14 42	09:01 (6)	17:54		18:27	20:01	20:34	20:51 28 06:39 (7)	20:39	19:57	19:03	17:14	16:41 34	08:33 (6) 16:42
26	07:31	08:20 (6)	06:52		06:04	06:13	05:39	05:34 06:11 (7)	05:56	06:28	07:01	06:35	07:14	08:00 (6) 07:38
	17:15 42	09:02 (6)	17:55		18:29	20:03	20:34	20:52 28 06:39 (7)	20:38	19:56	19:02	17:12	16:41 34	08:34 (6) 16:43
27	07:30	08:19 (6)	06:50		06:03	06:12	05:39	05:34 06:12 (7)	05:56	06:29	07:02	06:37	07:15	08:01 (6) 07:39
	17:17 42	09:01 (6)	17:57		18:30	20:04	20:35	20:52 28 06:40 (7)	20:37	19:54	19:00	17:11	16:40 32	08:33 (6) 16:43
28	07:29	08:20 (6)	06:49		06:01	06:10	05:38	05:35 06:12 (7)	05:57	06:30	07:03	06:38 08:09 (6)	07:16	08:02 (6) 07:39
	17:18 42	09:02 (6)	17:58		18:31	20:05	20:36	20:52 26 06:38 (7)	20:36	19:52	18:58	17:10 4 08:13 (6)	16:40 30	08:32 (6) 16:44
29	07:28	08:21 (6)			05:59	06:09	05:37	05:35 06:13 (7)	05:58	06:31	07:04	06:39 08:03 (6)	07:17	08:01 (6) 07:39
	17:19 40	09:01 (6)			18:32	20:06	20:37	20:52 26 06:39 (7)	20:35	19:51	18:56	17:08 16 08:19 (6)	16:39 30	08:31 (6) 16:45
30	07:27	08:20 (6)			05:57	06:08	05:37	05:36 06:13 (7)	05:59	06:32	07:05	06:40 08:00 (6)	07:18	08:02 (6) 07:40
	17:21 42	09:02 (6)			18:33	20:07	20:38	20:52 26 06:39 (7)	20:34	19:49	18:55	17:07 22 08:22 (6)	16:39 30	08:32 (6) 16:45
31	07:26	08:21 (6)			05:56		05:36		06:00	06:33		06:42 07:59 (6)		07:40
	17:22 40	09:01 (6)			18:34		20:39		20:33	19:47		17:06 24 08:23 (6)		16:46
Potential sun hours	293		295		370	209	-292	-263	-280	-145	375	343	294	283
Total, worst case		924		412				710	208			66	1106	178
Sun reduction		0.35		0.45				0.55	0.65			0.45	0.35	0.30
Oper. time red.		0.86		0.86				0.86	0.86			0.86	0.86	0.86
Wind dir. red.		0.63		0.63				0.63	0.63			0.63	0.63	0.63
Total reduction		0.19		0.24				0.30	0.35			0.24	0.19	0.16
Total, real		176		101				212	73			16	210	29

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	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, Southern part
11 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
1000 meter max shadow distance applied along with default 3° inclination
Sunshine probabilities applied (pdf plots)
Directional run-hours applied from tab file (tower 1)
.

Licensed user:
Wind Engineers, Inc.
7660 Whitegate Avenue
US-RIVERSIDE, CA 92506

Calculated:
03/04/06 13:30/2.4.0.67

SHADOW - Calendar

Calculation: Southern part **Shadow receptor:** 837 - 837

Assumptions for shadow calculations

Maximum distance for influence	1,000	m
Minimum sun height over horizon for influence	3	°
Day step for calculation	1	days
Time step for calculation	2	minutes

Sun shine probabilities (part of time from sun rise to sun set with sun shine)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.35	0.45	0.45	0.55	0.55	0.55	0.65	0.55	0.55	0.45	0.35	0.30

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
475	585	238	199	220	474	1,184	813	840	1,246	803	479	7,555

	January	February		March	April	May	June	July	August	September	October		November		December
1	07:40	07:25		06:47	05:54	06:06	05:36	05:36	06:02	06:34	07:07		06:43	07:15 (14)	07:20
	16:48	17:23		17:59	18:36	20:08	20:40	20:52	20:32	19:46	18:53		17:04	26 07:41 (14)	16:39
2	07:40	07:24		06:46	05:52	06:05	05:35	05:37	06:03	06:36	07:08		06:44	07:16 (14)	07:21
	16:48	17:25		18:00	18:37	20:09	20:41	20:52	20:31	19:44	18:51		17:03	24 07:40 (14)	16:38
3	07:40	07:23		06:44	05:51	06:04	05:35	05:37	06:04	06:37	07:09		06:46	07:18 (14)	07:22
	16:49	17:26		18:02	18:38	20:11	20:41	20:51	20:30	19:42	18:50		17:02	22 07:40 (14)	16:38
4	07:40	07:22		07:57 (14)	06:42	05:49	06:02	05:35	05:38	06:05	06:38	07:10		06:47	07:19 (14)	07:23
	16:50	17:27	4	08:01 (14)	18:03	18:39	20:12	20:42	20:51	20:29	19:41	18:48		17:01	20 07:39 (14)	16:38
5	07:40	07:21		07:51 (14)	06:41	06:47	06:01	05:34	05:39	06:06	06:39	07:11		06:48	07:20 (14)	07:24
	16:51	17:29	14	08:05 (14)	18:04	19:40	20:13	20:43	20:51	20:28	19:39	18:46		16:59	16 07:36 (14)	16:38
6	07:40	07:20		07:50 (14)	06:39	06:45	06:00	05:34	05:39	06:07	06:40	07:12		06:49	07:24 (14)	07:25
	16:52	17:30	18	08:08 (14)	18:05	19:41	20:14	20:44	20:51	20:26	19:37	18:44		16:58	12 07:36 (14)	16:37
7	07:40	07:18		07:49 (14)	06:37	06:44	05:58	05:34	05:40	06:08	06:41	07:13		06:51		07:26
	16:53	17:31	20	08:09 (14)	18:07	19:42	20:15	20:44	20:50	20:25	19:35	18:43		16:57		16:37
8	07:40	07:17		07:48 (14)	06:36	06:42	05:57	05:33	05:40	06:09	06:42	07:14		06:52		07:27
	16:54	17:32	22	08:10 (14)	18:08	19:43	20:16	20:45	20:50	20:24	19:34	18:41		16:56		16:37
9	07:40	07:16		07:46 (14)	06:34	06:40	05:56	05:33	05:41	06:10	06:43	07:16		06:53		07:28
	16:55	17:34	26	08:12 (14)	18:09	19:45	20:17	20:46	20:50	20:22	19:32	18:39		16:55		16:37
10	07:40	07:15		07:45 (14)	06:32	06:39	05:55	05:33	05:42	06:11	06:44	07:17		06:54		07:28
	16:56	17:35	28	08:13 (14)	18:10	19:46	20:18	20:46	20:49	20:21	19:30	18:38		16:54		16:37
11	07:39	07:13		07:46 (14)	06:31	06:37	05:54	05:33	05:43	06:12	06:45	07:18		06:56		07:29
	16:57	17:36	28	08:14 (14)	18:11	19:47	20:19	20:47	20:49	20:20	19:28	18:36		16:53		16:37
12	07:39	07:12		07:45 (14)	06:29	06:35	05:53	05:33	05:43	06:13	06:46	07:19		06:57		07:30
	16:58	17:38	30	08:15 (14)	18:13	19:48	20:20	20:47	20:48	20:18	19:27	18:34		16:52		16:37
13	07:39	07:11		07:43 (14)	06:27	06:34	05:51	05:32	05:44	06:14	06:47	07:20		06:58		07:31
	17:00	17:39	30	08:13 (14)	18:14	19:49	20:22	20:48	20:48	20:17	19:25	18:33		16:51		16:37
14	07:38	07:10		07:44 (14)	06:25	06:32	05:50	05:32	05:45	06:15	06:48	07:21		06:59		07:32
	17:01	17:40	30	08:14 (14)	18:15	19:50	20:23	20:48	20:47	20:16	19:23	18:31		16:50		16:38
15	07:38	07:08		07:44 (14)	06:24	06:30	05:49	05:32	05:46	06:16	06:49	07:22		07:01		07:33
	17:02	17:42	30	08:14 (14)	18:16	19:51	20:24	20:49	20:47	20:14	19:21	18:29		16:49		16:38
16	07:37	07:07		07:43 (14)	06:22	06:29	05:48	05:32	05:47	06:17	06:50	07:24		08:26 (14)	07:02	07:33
	17:03	17:43	32	08:15 (14)	18:17	19:53	20:25	20:49	20:46	20:13	19:20	18:28	6	08:32 (14)	16:48	16:38
17	07:37	07:05		07:44 (14)	06:20	06:27	05:47	05:32	05:47	06:18	06:51	07:25		08:22 (14)	07:03	07:34
	17:04	17:44	30	08:14 (14)	18:18	19:54	20:26	20:50	20:46	20:11	19:18	18:26	14	08:36 (14)	16:47	16:38
18	07:36	07:04		07:44 (14)	06:18	06:26	05:46	05:32	05:48	06:20	06:53	07:26		08:21 (14)	07:04	07:35
	17:05	17:45	30	08:14 (14)	18:20	19:55	20:27	20:50	20:45	20:10	19:16	18:25	18	08:39 (14)	16:46	16:39
19	07:36	07:02		07:45 (14)	06:17	06:24	05:45	05:33	05:49	06:21	06:54	07:27		08:18 (14)	07:06	07:35
	17:07	17:47	28	08:13 (14)	18:21	19:56	20:28	20:50	20:44	20:08	19:14	18:23	22	08:40 (14)	16:45	16:39
20	07:35	07:01		07:45 (14)	06:15	06:23	05:44	05:33	05:50	06:22	06:55	07:28		08:17 (14)	07:07	07:36
	17:08	17:48	28	08:13 (14)	18:22	19:57	20:29	20:51	20:43	20:07	19:13	18:22	24	08:41 (14)	16:45	16:40
21	07:34	07:00		07:46 (14)	06:13	06:21	05:44	05:33	05:51	06:23	06:56	07:30		08:17 (14)	07:08	07:36
	17:09	17:49	26	08:12 (14)	18:23	19:58	20:30	20:51	20:43	20:05	19:11	18:20	26	08:43 (14)	16:44	16:40
22	07:34	06:58		07:46 (14)	06:12	06:19	05:43	05:33	05:52	06:24	06:57	07:31		08:16 (14)	07:09	07:37
	17:10	17:51	24	08:10 (14)	18:24	19:59	20:31	20:51	20:42	20:04	19:09	18:18	26	08:42 (14)	16:43	16:40
23	07:33	06:57		07:49 (14)	06:10	06:18	05:42	05:33	05:53	06:25	06:58	07:32		08:15 (14)	07:10	07:37
	17:12	17:52	20	08:09 (14)	18:25	20:00	20:32	20:51	20:41	20:02	19:07	18:17	28	08:43 (14)	16:42	16:41
24	07:32	06:55		07:49 (14)	06:08	06:16	05:41	05:34	05:54	06:26	06:59	07:33		08:14 (14)	07:12	07:38
	17:13	17:53	18	08:07 (14)	18:26	20:00	20:33	20:51	20:40	20:01	19:05	18:15	30	08:44 (14)	16:42	16:42
25	07:32	06:53		07:51 (14)	06:06	06:15	05:40	05:34	05:55	06:27	07:00	06:34		07:14 (14)	07:13	07:38
	17:14	17:54	12	08:03 (14)	18:28	20:02	20:34	20:52	20:39	19:57	19:04	17:14	30	07:44 (14)	16:41	16:42
26	07:31	06:52			06:05	06:13	05:40	05:34	05:56	06:28	07:01	06:36		07:13 (14)	07:14	07:39
	17:15	17:56			18:29	20:03	20:35	20:52	20:38	19:56	19:02	17:13	30	07:43 (14)	16:41	16:43
27	07:30	06:50			06:03	06:12	05:39	05:35	05:57	06:29	07:02	06:37		07:12 (14)	07:15	07:39
	17:17	17:57			18:30	20:04	20:35	20:52	20:37	19:54	19:00	17:11	32	07:44 (14)	16:40	16:43
28	07:29	06:49			06:01	06:11	05:38	05:35	05:58	06:30	07:03	06:38		07:14 (14)	07:16	07:39
	17:18	17:58			18:31	20:05	20:36	20:52	20:36	19:52	18:58	17:10	30	07:44 (14)	16:40	16:44
29	07:28				05:59	06:09	05:38	05:35	05:59	06:31	07:04	06:39		07:13 (14)	07:17	07:40
	17:19				18:32	20:06	20:37	20:52	20:35	19:51	18:57	17:08	30	07:43 (14)	16:39	16:45
30	07:27				05:58	06:08	05:37	05:36	06:00	06:32	07:06	06:41		07:14 (14)	07:18	07:40
	17:21				18:33	20:07	20:38	20:52	20:34	19:49	18:55	17:07	28	07:42 (14)	16:39	16:46
31	07:26				05:56		05:36		06:01	06:33		06:42		07:14 (14)		07:40
	17:22				18:34		20:39		20:33	19:47		17:06	28	07:42 (14)		16:46
Potential sun hours	293	295		370	209	-292	-263	-280	-145	375	343		294		283
Total, worst case			528									402		120	
Sun reduction			0.45									0.45		0.35	
Oper. time red.			0.86									0.86		0.86	
Wind dir. red.			0.62									0.62		0.62	
Total reduction			0.24									0.24		0.19	
Total, real			128									97		23	

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	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, Southern part
11 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
1000 meter max shadow distance applied along with default 3° inclination
Sunshine probabilities applied (pdf plots)
Directional run-hours applied from tab file (tower 1)
.

Licensed user:
Wind Engineers, Inc.
7660 Whitegate Avenue
US-RIVERSIDE, CA 92506

Calculated:
03/04/06 13:30/2.4.0.67

SHADOW - Calendar

Calculation: Southern part **Shadow receptor:** 838 - 838

Assumptions for shadow calculations

Maximum distance for influence	1,000	m
Minimum sun height over horizon for influence	3	°
Day step for calculation	1	days
Time step for calculation	2	minutes

Sun shine probabilities (part of time from sun rise to sun set with sun shine)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.35	0.45	0.45	0.55	0.55	0.55	0.65	0.55	0.55	0.45	0.35	0.30

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
475	585	238	199	220	474	1,184	813	840	1,246	803	479	7,555

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:40 - 16:47	07:25 - 17:23	06:47 - 17:59	05:54 - 18:35	06:06 - 20:08	05:36 - 20:40	05:36 - 06:11 (15) - 20:52 - 06:27 (15) - 16	06:02 - 19:46	06:34	07:06 - 07:33 (7) - 18:53 - 07:53 (7) - 20	06:43 - 17:04	07:19 - 16:38
2	07:40 - 16:48	07:24 - 17:24	06:45 - 18:00	05:52 - 18:37	06:05 - 20:09	05:35 - 20:40	05:37 - 06:12 (15) - 20:51 - 06:28 (15) - 16	06:03 - 20:31	06:35 - 19:44	07:08 - 07:32 (7) - 18:51 - 07:54 (7) - 22	06:44 - 17:03	07:21 - 16:38
3	07:40 - 16:49	07:23 - 17:26	06:44 - 18:02	05:51 - 18:38	06:03 - 20:10	05:35 - 20:41	05:37 - 06:15 (15) - 20:51 - 06:29 (15) - 14	06:04 - 20:30	06:36 - 19:42	07:09 - 07:33 (7) - 18:49 - 07:53 (7) - 20	06:45 - 17:02	07:22 - 16:38
4	07:40 - 16:50	07:22 - 17:27	06:42 - 18:03	05:49 - 18:39	06:02 - 20:12	05:34 - 20:42	05:38 - 06:15 (15) - 20:51 - 06:27 (15) - 12	06:05 - 20:29	06:38 - 19:41	07:10 - 07:32 (7) - 18:48 - 07:52 (7) - 20	06:47 - 17:00	07:23 - 16:38
5	07:40 - 16:51	07:21 - 17:28	06:40 - 18:04 - 10	07:00 (7) - 07:10 (7) - 19:40	06:01 - 20:13	05:34 - 20:43	05:38 - 06:16 (15) - 20:51 - 06:26 (15) - 10	06:06 - 20:27	06:39 - 19:39	07:11 - 07:33 (7) - 18:46 - 07:51 (7) - 18	06:48 - 16:59	07:24 - 16:37
6	07:40 - 16:52	07:20 - 17:30	06:39 - 18:05 - 14	06:59 (7) - 07:13 (7) - 19:41	06:00 - 20:14	05:34 - 20:43 - 6 - 06:12 (15) - 06:18 (15) - 20:51 - 8	05:39 - 06:16 (15) - 06:24 (15) - 20:26	06:07 - 19:37	06:40 - 19:37	07:12 - 07:32 (7) - 18:44 - 07:50 (7) - 18	06:49 - 16:58	07:25 - 16:37
7	07:40 - 16:53	07:18 - 17:31	06:37 - 18:06 - 18	06:57 (7) - 07:15 (7) - 19:42	05:58 - 20:15	05:33 - 20:44 - 10 - 06:10 (15) - 06:20 (15) - 20:50 - 4	05:40 - 06:19 (15) - 06:23 (15) - 20:25	06:08 - 19:35	06:41 - 19:35	07:13 - 07:34 (7) - 18:43 - 07:50 (7) - 16	06:50 - 16:57	07:26 - 16:37
8	07:40 - 16:54	07:17 - 17:32	06:35 - 18:08 - 20	06:55 (7) - 07:15 (7) - 19:43	05:57 - 20:16	05:33 - 20:45 - 12 - 06:10 (15) - 06:22 (15) - 20:50	05:40 - 06:09	06:09 - 20:24	06:42 - 19:34	07:14 - 07:35 (7) - 18:41 - 07:47 (7) - 12	06:52 - 16:56	07:27 - 16:37
9	07:40 - 16:55	07:16 - 17:34	06:34 - 18:09 - 20	06:55 (7) - 07:15 (7) - 19:44	05:56 - 20:17	05:33 - 20:45 - 12 - 06:10 (15) - 06:22 (15) - 20:50	05:41 - 06:10	06:10 - 20:22	06:43 - 19:32	07:15 - 07:38 (7) - 18:39 - 07:44 (7) - 6	06:53 - 16:55	07:27 - 16:37
10	07:39 - 16:56	07:15 - 17:35	06:32 - 18:10 - 22	06:54 (7) - 07:16 (7) - 19:46	05:55 - 20:18	05:33 - 20:46 - 16 - 06:07 (15) - 06:23 (15) - 20:49	05:42 - 06:11	06:11 - 20:21	06:44 - 19:30	07:17 - 18:38	06:54 - 16:54	07:28 - 16:37
11	07:39 - 16:57	07:13 - 17:36	06:30 - 18:11 - 20	06:54 (7) - 07:14 (7) - 19:47	05:54 - 20:19	05:33 - 20:47 - 16 - 06:07 (15) - 06:23 (15) - 20:49	05:42 - 06:12	06:12 - 20:20	06:45 - 19:28	07:18 - 18:36	06:55 - 16:52	07:29 - 16:37
12	07:39 - 16:58	07:12 - 17:38	06:29 - 18:12 - 20	06:54 (7) - 07:14 (7) - 19:48	05:52 - 20:20	05:32 - 20:47 - 18 - 06:07 (15) - 06:25 (15) - 20:48	05:43 - 06:13	06:13 - 20:18	06:46 - 19:27	07:19 - 18:34	06:57 - 16:51	07:30 - 16:37
13	07:38 - 16:59	07:11 - 17:39	06:27 - 18:14 - 20	06:55 (7) - 07:15 (7) - 19:49	06:34 - 20:21	05:51 - 20:48 - 18 - 06:07 (15) - 06:25 (15) - 20:48	05:44 - 06:14	06:14 - 20:17	06:47 - 19:25	07:20 - 18:33	06:58 - 16:50	07:31 - 16:37
14	07:38 - 17:01	07:09 - 17:40	06:25 - 18:15 - 18	06:55 (7) - 07:13 (7) - 19:50	06:32 - 20:23	05:50 - 20:48 - 18 - 06:07 (15) - 06:25 (15) - 20:47	05:45 - 06:15	06:15 - 20:16	06:48 - 19:23	07:21 - 18:31	06:59 - 16:49	07:32 - 16:38
15	07:38 - 17:02	07:08 - 17:41	06:24 - 18:16 - 16	06:55 (7) - 07:11 (7) - 19:51	06:30 - 20:24	05:49 - 20:49 - 18 - 06:07 (15) - 06:25 (15) - 20:47	05:46 - 06:16	06:16 - 20:14	06:49 - 19:21	07:22 - 18:29	07:01 - 16:49	07:32 - 16:38
16	07:37 - 17:03	07:07 - 17:43	06:22 - 18:17 - 12	06:57 (7) - 07:09 (7) - 19:52	06:29 - 20:25	05:48 - 20:49 - 20 - 06:07 (15) - 06:27 (15) - 20:46	05:46 - 06:17	06:17 - 20:13	06:50 - 19:20	07:24 - 18:28	07:02 - 16:48	07:33 - 16:38
17	07:37 - 17:04	07:05 - 17:44	06:20 - 18:18 - 6	07:00 (7) - 07:06 (7) - 19:54	06:27 - 20:26	05:47 - 20:49 - 20 - 06:07 (15) - 06:27 (15) - 20:46	05:47 - 06:18	06:18 - 20:11	06:51 - 19:18	07:25 - 18:26	07:03 - 16:47	07:34 - 16:38
18	07:36 - 17:05	07:04 - 17:45	06:18 - 18:19	06:26 - 19:55	05:46 - 20:27	05:32 - 20:50 - 20 - 06:07 (15) - 06:27 (15) - 20:45	05:48 - 06:19	06:19 - 20:10	06:52 - 19:16	07:26 - 18:25	07:04 - 16:46	07:34 - 16:39
19	07:36 - 17:07	07:02 - 17:47	06:17 - 18:21	06:24 - 19:56	05:45 - 20:28	05:32 - 20:50 - 20 - 06:07 (15) - 06:27 (15) - 20:44	05:49 - 06:20	06:20 - 20:08	06:53 - 19:14	07:27 - 18:23	07:05 - 16:45	07:35 - 16:39
20	07:35 - 17:08	07:01 - 17:48	06:15 - 18:22	06:22 - 19:57	05:44 - 20:29	05:33 - 20:50 - 20 - 06:08 (15) - 06:28 (15) - 20:43	05:50 - 06:22	06:22 - 20:07	06:55 - 19:12	07:28 - 18:21	07:07 - 16:44	07:36 - 16:39
21	07:34 - 17:09	06:59 - 17:49	06:13 - 18:23	06:21 - 19:58	05:43 - 20:30	05:33 - 20:51 - 20 - 06:08 (15) - 06:28 (15) - 20:43	05:51 - 06:23	06:23 - 20:05	06:56 - 19:11	07:29 - 18:20	07:08 - 16:44	07:36 - 16:40
22	07:34 - 17:10	06:58 - 17:50	06:11 - 18:24	06:19 - 19:59	05:43 - 20:31	05:33 - 20:51 - 20 - 06:08 (15) - 06:28 (15) - 20:42	05:52 - 06:24	06:24 - 20:04	06:57 - 19:09	07:31 - 18:18	07:09 - 16:43	07:37 - 16:40
23	07:33 - 17:12	06:56 - 17:52	06:10 - 18:25	06:18 - 20:00	05:42 - 20:32	05:33 - 20:51 - 20 - 06:08 (15) - 06:28 (15) - 20:41	05:53 - 06:25	06:25 - 20:02	06:58 - 19:07	07:32 - 18:17	07:10 - 16:42	07:37 - 16:41
24	07:32 - 17:13	06:55 - 17:53	06:08 - 18:26	06:16 - 20:00	05:41 - 20:33	05:33 - 20:51 - 20 - 06:09 (15) - 06:29 (15) - 20:40	05:54 - 06:26	06:26 - 20:00	06:59 - 19:05	07:33 - 18:15	07:11 - 16:42	07:38 - 16:41
25	07:31 - 17:14	06:53 - 17:54	06:06 - 18:27	06:15 - 20:01	05:40 - 20:34	05:34 - 20:51 - 20 - 06:09 (15) - 06:29 (15) - 20:39	05:55 - 06:27	06:27 - 19:57	07:00 - 19:04	06:34 - 17:14	07:13 - 16:41	07:38 - 16:42
26	07:31 - 17:15	06:52 - 17:55	06:04 - 18:29	06:13 - 20:03	05:39 - 20:34	05:34 - 20:52 - 20 - 06:09 (15) - 06:29 (15) - 20:38	05:56 - 06:28	06:28 - 19:56	07:01 - 19:02 - 4 - 07:43 (7) - 07:47 (7)	06:35 - 17:12	07:14 - 16:41	07:39 - 16:43
27	07:30 - 17:17	06:50 - 17:57	06:03 - 18:30	06:12 - 20:04	05:39 - 20:35	05:34 - 20:52 - 20 - 06:10 (15) - 06:30 (15) - 20:37	05:57 - 06:29	06:29 - 19:54	07:02 - 19:00 - 12 - 07:38 (7) - 07:50 (7)	06:37 - 17:11	07:15 - 16:40	07:39 - 16:43
28	07:29 - 17:18	06:49 - 17:58	06:01 - 18:31	06:10 - 20:05	05:38 - 20:36	05:35 - 20:52 - 18 - 06:10 (15) - 06:28 (15) - 20:36	05:57 - 06:30	06:30 - 19:52	07:03 - 18:58 - 14 - 07:37 (7) - 07:51 (7)	06:38 - 17:10	07:16 - 16:40	07:39 - 16:44
29	07:28 - 17:19		05:59 - 18:32	06:09 - 20:06	05:37 - 20:37	05:35 - 20:52 - 18 - 06:11 (15) - 06:29 (15) - 20:35	05:58 - 06:31	06:31 - 19:51	07:04 - 18:56 - 18 - 07:35 (7) - 07:53 (7)	06:39 - 17:08	07:17 - 16:39	07:39 - 16:45
30	07:27 - 17:21		05:57 - 18:33	06:08 - 20:07	05:37 - 20:38	05:36 - 20:52 - 18 - 06:11 (15) - 06:29 (15) - 20:34	05:59 - 06:32	06:32 - 19:49	07:05 - 18:55 - 20 - 07:34 (7) - 07:54 (7)	06:40 - 17:07	07:18 - 16:39	07:40 - 16:46
31	07:26 - 17:22		05:56 - 18:34		05:36 - 20:39		06:01 - 20:33	06:33 - 19:47		06:42 - 17:06		07:40 - 16:46
Potential sun hours	293	295	370	209	-292	-263	-280	-145	375	343	294	283
Total, worst case			216			438	80		68	152		
Sun reduction			0.45			0.55	0.65		0.55	0.45		
Oper. time red.			0.86			0.86	0.86		0.86	0.86		
Wind dir. red.			0.60			0.63	0.63		0.60	0.60		
Total reduction			0.23			0.30	0.35		0.28	0.23		
Total, real			50			131	28		19	35		

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	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, Southern part
11 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
1000 meter max shadow distance applied along with default 3° inclination
Sunshine probabilities applied (pdf plots)
Directional run-hours applied from tab file (tower 1)
.

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US-RIVERSIDE, CA 92506

Calculated:
03/04/06 13:30/2.4.0.67

SHADOW - Calendar

Calculation: Southern part **Shadow receptor:** 839 - 839

Assumptions for shadow calculations

Maximum distance for influence	1,000	m
Minimum sun height over horizon for influence	3	°
Day step for calculation	1	days
Time step for calculation	2	minutes

Sun shine probabilities (part of time from sun rise to sun set with sun shine)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.35	0.45	0.45	0.55	0.55	0.55	0.65	0.55	0.55	0.45	0.35	0.30

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
475	585	238	199	220	474	1,184	813	840	1,246	803	479	7,555

	January	February	March	April	May	June	July	August	September	October	November	December
1	07:40	07:25	06:47	05:54	06:06	05:36	05:36	06:02	06:24 (8)	06:34	07:07	06:43	07:19
	16:47	17:23	17:59	18:35	20:08	20:40	20:52	20:32	14 06:38 (8)	19:46	18:53	17:04	16:38
2	07:40	07:24	06:45	05:52	06:05	05:35	05:37	06:03	06:25 (8)	06:35	07:08	06:44	07:21
	16:48	17:24	18:00	18:37	20:09	20:40	20:52	20:31	14 06:39 (8)	19:44	18:51	17:03	16:38
3	07:40	07:23	06:44	05:51	06:03	05:35	05:37	06:04	06:26 (8)	06:37	07:09	06:45	07:22
	16:49	17:26	18:02	18:38	20:11	20:41	20:51	20:30	12 06:38 (8)	19:42	18:50	17:02	16:38
4	07:40	07:22	06:42	05:49	06:02	05:34	05:38	06:05	06:27 (8)	06:38	07:10	06:47	07:23
	16:50	17:27	18:03	18:39	20:12	20:42	20:51	20:29	10 06:37 (8)	19:41	18:48	17:00	16:38
5	07:40	07:21	06:41	06:47	06:01	05:34	05:38	06:06	06:28 (8)	06:39	07:11	06:48	07:24
	16:51	17:28	18:04	19:40	20:13	20:43	20:51	20:27	8 06:36 (8)	19:39	18:46	16:59	16:37
6	07:40	07:20	06:39	06:45	06:00	06:20 (8) 05:34	05:39	06:07	06:29 (8)	06:40	07:12	06:49	07:25
	16:52	17:30	18:05	19:41	20:14	4 06:24 (8) 20:43	20:51	20:26	6 06:35 (8)	19:37	18:44	16:58	16:37
7	07:40	07:18	06:37	06:44	05:58	06:19 (8) 05:33	05:40	06:08	06:30 (8)	06:41	07:13	06:50	07:26
	16:53	17:31	18:06	19:42	20:15	6 06:25 (8) 20:44	20:50	20:25	4 06:34 (8)	19:35	18:43	16:57	16:37
8	07:40	07:17	06:36	06:42	05:57	06:18 (8) 05:33	05:40	06:09		06:42	07:14	06:52	07:27
	16:54	17:32	18:08	19:43	20:16	8 06:26 (8) 20:45	20:50	20:24		19:34	18:41	16:56	16:37
9	07:40	07:16	06:34	06:40	05:56	06:16 (8) 05:33	05:41	06:10		06:43	07:15	06:53	07:27
	16:55	17:34	18:09	19:45	20:17	10 06:26 (8) 20:45	20:50	20:22		19:32	18:39	16:55	16:37
10	07:39	07:15	06:32	06:39	05:55	06:15 (8) 05:33	05:42	06:11		06:44	07:17	06:54	07:28
	16:56	17:35	18:10	19:46	20:18	12 06:27 (8) 20:46	20:49	20:21		19:30	18:38	16:54	16:37
11	07:39	07:13	06:30	06:37	05:54	06:14 (8) 05:33	05:43	06:12		06:45	07:18	06:56	07:29
	16:57	17:36	18:11	19:47	20:19	14 06:28 (8) 20:47	20:49	20:20		19:28	18:36	16:52	16:37
12	07:39	07:12	06:29	06:35	05:52	06:13 (8) 05:32	05:43	06:13		06:46	07:19	06:57	07:30
	16:58	17:38	18:12	19:48	20:20	16 06:29 (8) 20:47	20:48	20:18		19:27	18:34	16:51	16:37
13	07:39	07:11	06:27	06:34	05:51	06:12 (8) 05:32	05:44	06:14		06:47	07:20	06:58	07:31
	16:59	17:39	18:14	19:49	20:21	16 06:28 (8) 20:48	20:48	20:17		19:25	18:33	16:50	16:37
14	07:38	07:09	06:25	06:32	05:50	06:11 (8) 05:32	05:45	06:15		06:48	07:21	06:59	07:32
	17:01	17:40	18:15	19:50	20:23	18 06:29 (8) 20:48	20:47	20:16		19:23	18:31	16:50	16:38
15	07:38	07:08	06:24	06:30	05:49	06:10 (8) 05:32	05:46	06:16		06:49	07:22	07:01	07:32
	17:02	17:42	18:16	19:51	20:24	18 06:28 (8) 20:49	20:47	20:14		19:21	18:29	16:49	16:38
16	07:37	07:07	06:22	06:29	05:48	06:09 (8) 05:32	05:46	06:25 (8) 06:17		06:50	07:24	07:02	07:33
	17:03	17:43	18:17	19:52	20:25	20 06:29 (8) 20:49	20:46	4 06:29 (8) 20:13		19:20	18:28	16:48	16:38
17	07:37	07:05	06:20	06:27	05:47	06:08 (8) 05:32	05:47	06:22 (8) 06:18		06:51	07:25	07:03	07:34
	17:04	17:44	18:18	19:54	20:26	20 06:28 (8) 20:49	20:46	10 06:32 (8) 20:11		19:18	18:26	16:47	16:38
18	07:36	07:04	06:18	06:26	05:46	06:07 (8) 05:32	05:48	06:21 (8) 06:19		06:52	07:26	07:04	07:35
	17:05	17:45	18:19	19:55	20:27	20 06:27 (8) 20:50	20:45	12 06:33 (8) 20:10		19:16	18:25	16:46	16:39
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	17:07	17:47	18:21	19:56	20:28	22 06:29 (8) 20:50	20:44	14 06:34 (8) 20:08		19:14	18:23	16:45	16:39
20	07:35	07:01	06:15	06:22	05:44	06:08 (8) 05:33	05:50	06:19 (8) 06:22		06:55	07:28	07:07	07:36
	17:08	17:48	18:22	19:57	20:29	20 06:28 (8) 20:51	20:43	16 06:35 (8) 20:07		19:12	18:21	16:44	16:39
21	07:34	06:59	06:13	06:21	05:43	06:09 (8) 05:33	05:51	06:20 (8) 06:23		06:56	07:29	07:08	07:36
	17:09	17:49	18:23	19:58	20:30	18 06:27 (8) 20:51	20:43	16 06:36 (8) 20:05		19:11	18:20	16:44	16:40
22	07:34	06:58	06:11	06:19	05:43	06:08 (8) 05:33	05:52	06:19 (8) 06:24		06:57	07:31	07:09	07:37
	17:10	17:50	18:24	19:59	20:31	18 06:26 (8) 20:51	20:42	18 06:37 (8) 20:04		19:09	18:18	16:43	16:40
23	07:33	06:56	06:10	06:18	05:42	06:09 (8) 05:33	05:53	06:18 (8) 06:25		06:58	07:32	07:10	07:37
	17:12	17:52	18:25	20:00	20:32	16 06:25 (8) 20:51	20:41	20 06:38 (8) 20:02		19:07	18:17	16:42	16:41
24	07:32	06:55	06:08	06:16	05:41	06:11 (8) 05:33	05:54	06:18 (8) 06:26		06:59	07:33	07:12	07:38
	17:13	17:53	18:26	20:00	20:33	14 06:25 (8) 20:51	20:40	20 06:38 (8) 20:00		19:05	18:15	16:42	16:41
25	07:31	06:53	06:06	06:15	05:40	06:12 (8) 05:34	05:55	06:17 (8) 06:27		07:00	06:34	07:13	07:38
	17:14	17:54	18:27	20:01	20:34	12 06:24 (8) 20:52	20:39	22 06:39 (8) 19:57		19:04	17:14	16:41	16:42
26	07:31	06:52	06:04	06:13	05:39	06:13 (8) 05:34	05:56	06:18 (8) 06:28		07:01	06:36	07:14	07:39
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28	07:29	06:49	06:01	06:10	05:38	05:35	05:58	06:20 (8) 06:30		07:03	06:38	07:16	07:39
	17:18	17:58	18:31	20:05	20:36	20:52	20:36	20 06:40 (8) 19:52		18:58	17:10	16:40	16:44
29	07:28		05:59	06:09	05:38	05:35	05:59	06:21 (8) 06:31		07:04	06:39	07:17	07:39
	17:19		18:32	20:06	20:37	20:52	20:35	18 06:39 (8) 19:51		18:56	17:08	16:39	16:45
30	07:27		05:57	06:08	05:37	05:36	06:00	06:22 (8) 06:32		07:05	06:40	07:18	07:40
	17:21		18:33	20:07	20:38	20:52	20:34	18 06:40 (8) 19:49		18:55	17:07	16:39	16:46
31	07:26		05:56		05:36		06:01	06:23 (8) 06:33			06:42		07:40
	17:22		18:34		20:39		20:33	16 06:39 (8) 19:47			17:06		16:46
Potential sun hours	293	295	370	209	-292	-263	-280	-145	375	343	294	283
Total, worst case					318		264	68				
Sun reduction					0.55		0.65	0.55				
Oper. time red.					0.86		0.86	0.86				
Wind dir. red.					0.61		0.61	0.61				
Total reduction					0.29		0.34	0.29				
Total, real					92		90	20				

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	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, Southern part
11 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
1000 meter max shadow distance applied along with default 3° inclination
Sunshine probabilities applied (pdf plots)
Directional run-hours applied from tab file (tower 1)
.

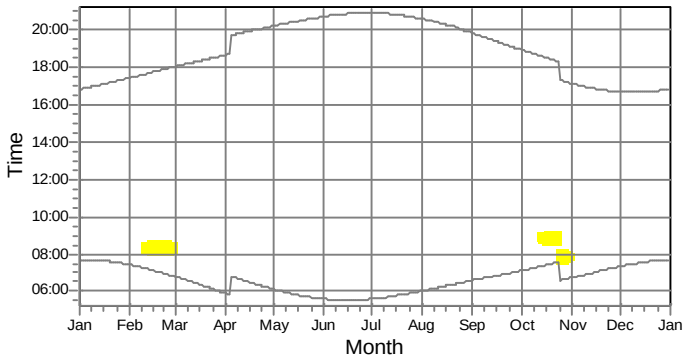
Licensed user:
Wind Engineers, Inc.
7660 Whitegate Avenue
US-RIVERSIDE, CA 92506

Calculated:
03/04/06 13:30/2.4.0.67

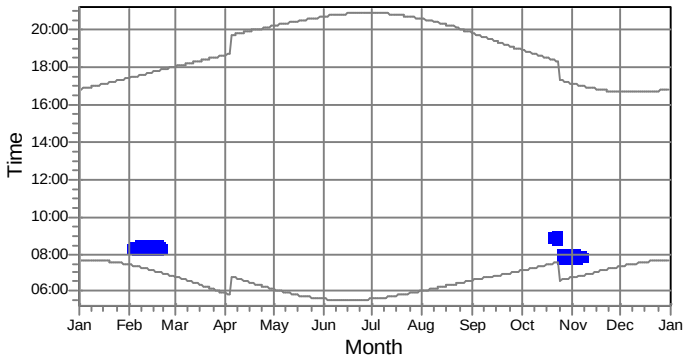
SHADOW - Calendar, graphical

Calculation: Southern part

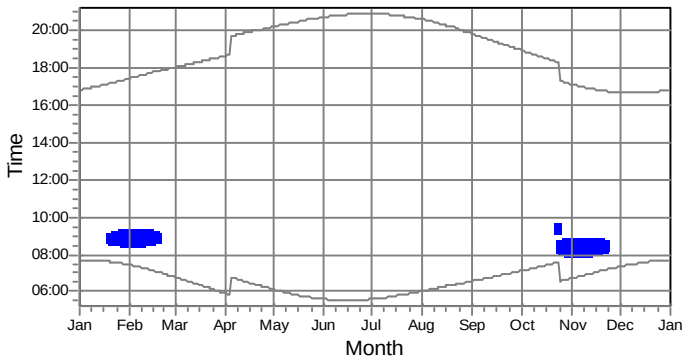
769: 769



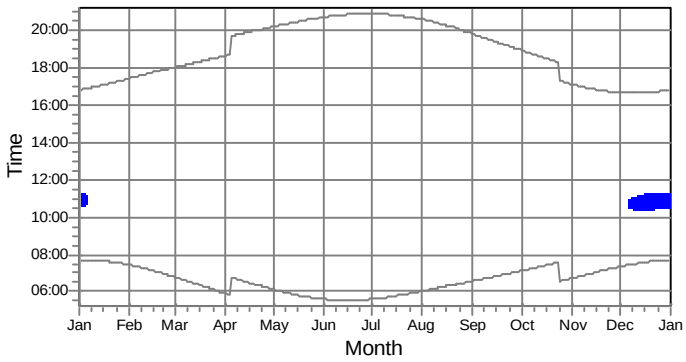
770: 770



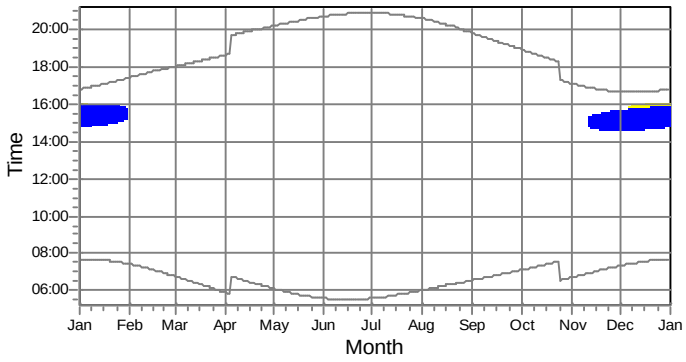
771: 771



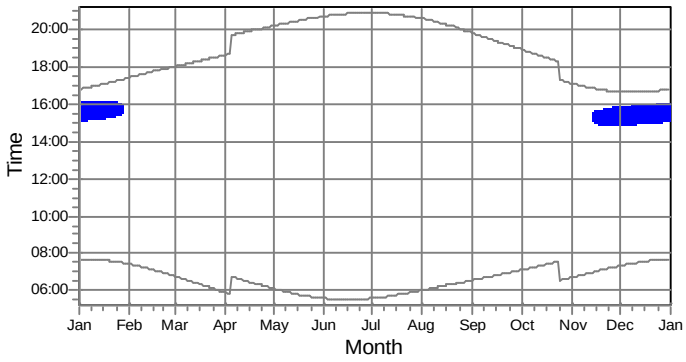
772: 772



773: 773



774: 774



WTGs

40

39

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, Southern part
11 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
1000 meter max shadow distance applied along with default 3° inclination
Sunshine probabilities applied (pdf plots)
Directional run-hours applied from tab file (tower 1)
.

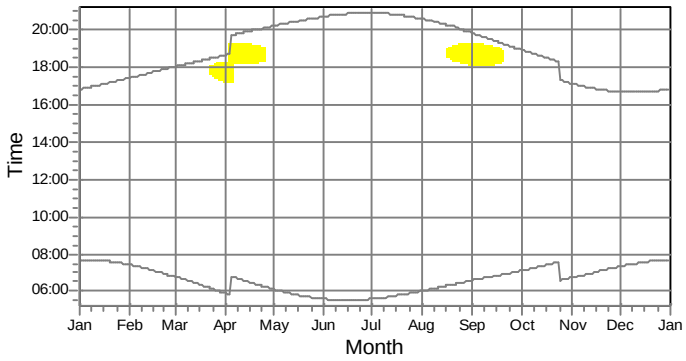
Licensed user:
Wind Engineers, Inc.
7660 Whitegate Avenue
US-RIVERSIDE, CA 92506

Calculated:
03/04/06 13:30/2.4.0.67

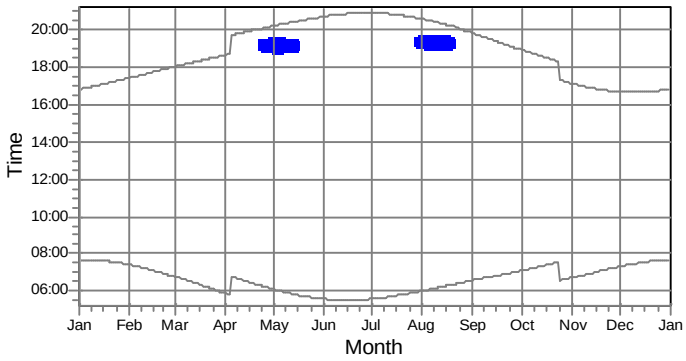
SHADOW - Calendar, graphical

Calculation: Southern part

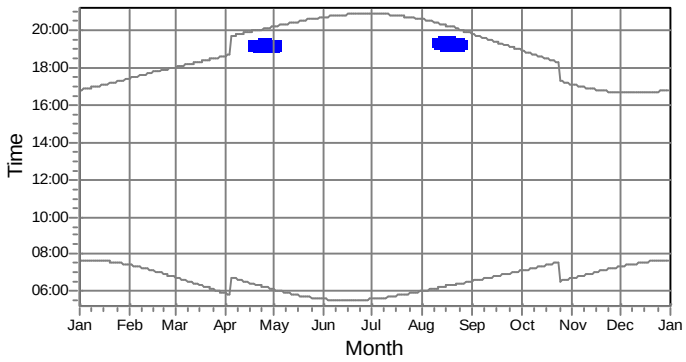
775: 775



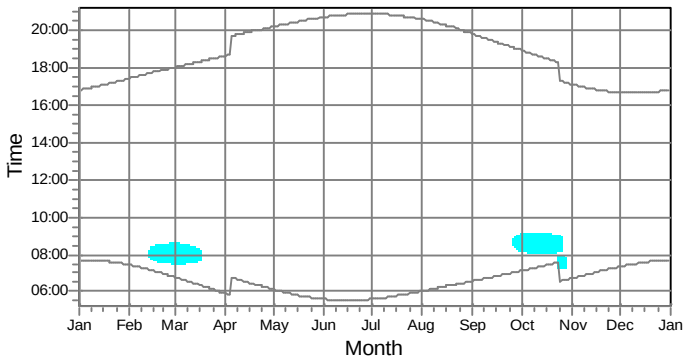
776: 776



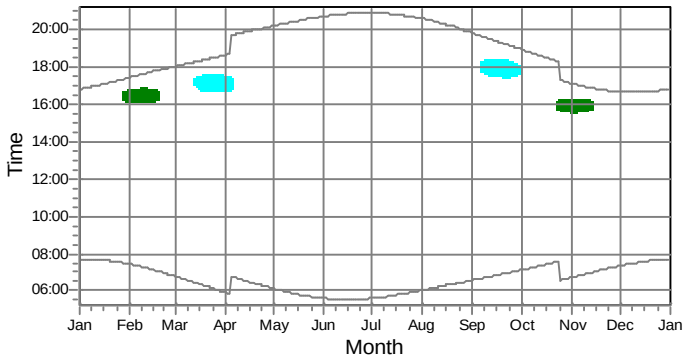
777: 777



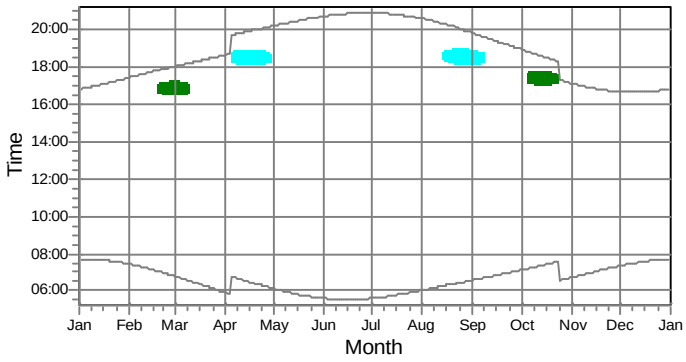
778: 778



779: 779



780: 780



WTGs

42 40 39 41

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, Southern part
11 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
1000 meter max shadow distance applied along with default 3° inclination
Sunshine probabilities applied (pdf plots)
Directional run-hours applied from tab file (tower 1)
.

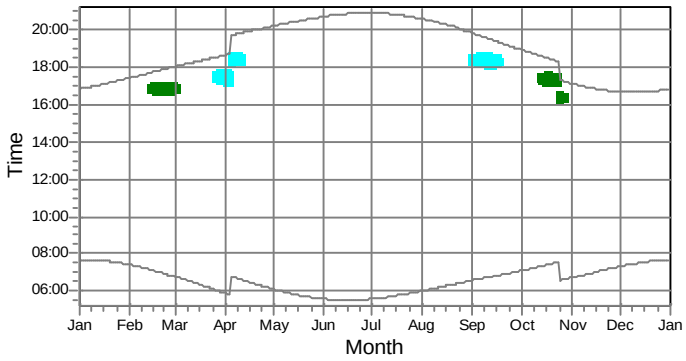
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03/05/06 22:12 / 29
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US-RIVERSIDE, CA 92506

Calculated:
03/04/06 13:30/2.4.0.67

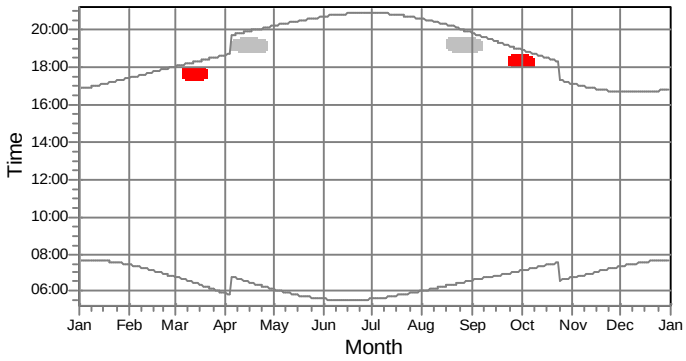
SHADOW - Calendar, graphical

Calculation: Southern part

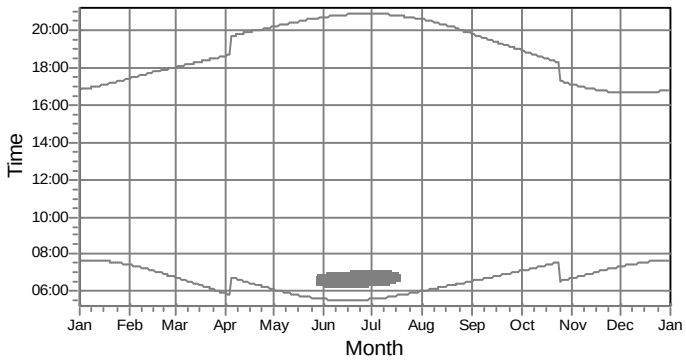
781: 781



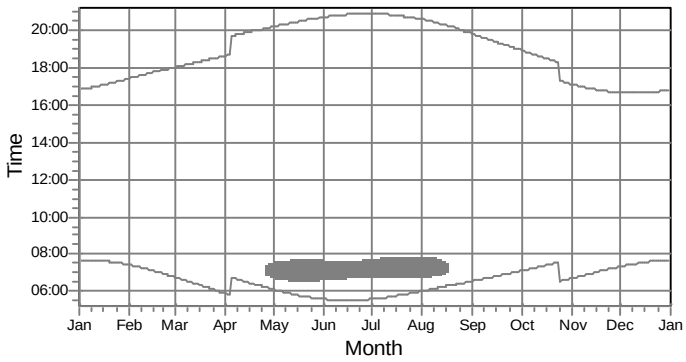
800: 800



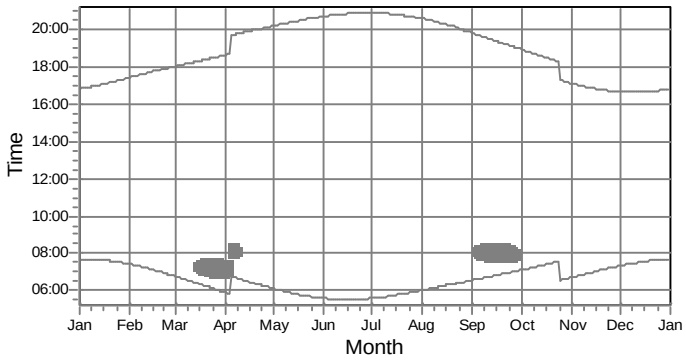
803: 803



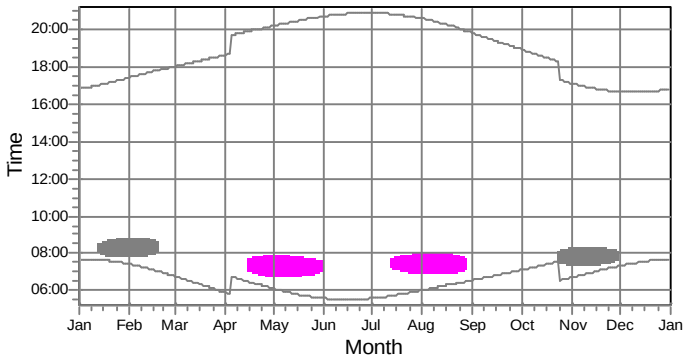
805: 805



806: 806



807: 807



WTGs

44 42 38 37 43 41

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, Southern part
11 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
1000 meter max shadow distance applied along with default 3° inclination
Sunshine probabilities applied (pdf plots)
Directional run-hours applied from tab file (tower 1)
.

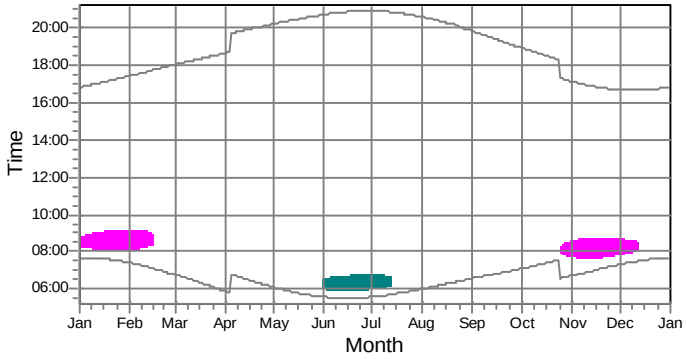
Licensed user:
Wind Engineers, Inc.
7660 Whitegate Avenue
US-RIVERSIDE, CA 92506

Calculated:
03/04/06 13:30/2.4.0.67

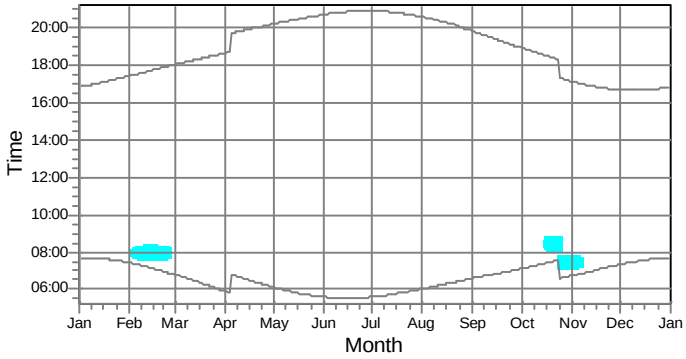
SHADOW - Calendar, graphical

Calculation: Southern part

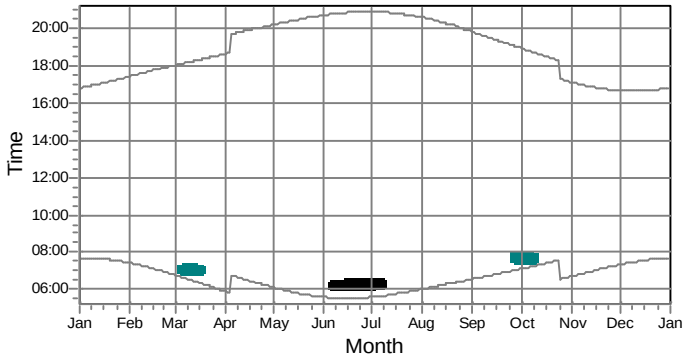
811: 811



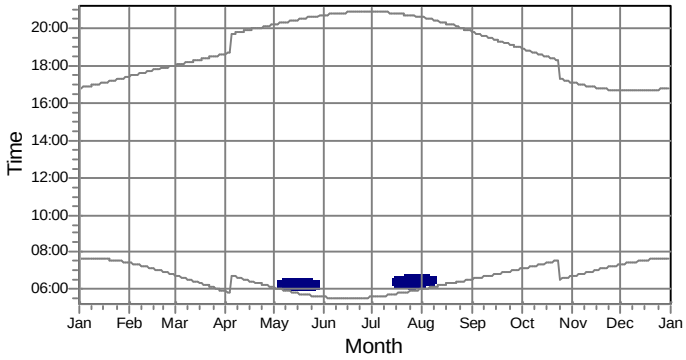
837: 837



838: 838



839: 839



WTGs

37 36 34 41 35

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, Southern part
11 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
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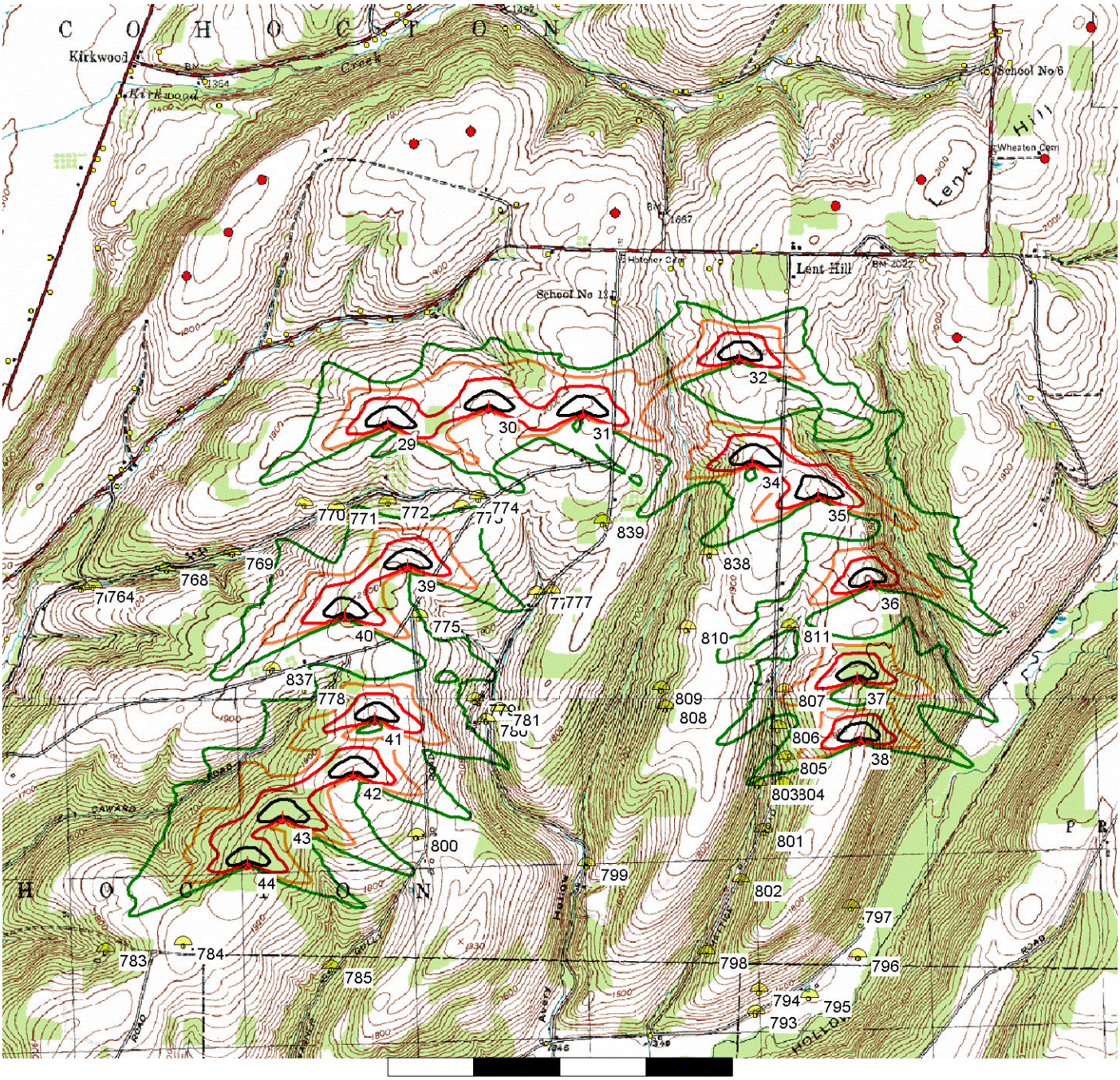
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Calculated:
03/04/06 13:30/2.4.0.67

SHADOW - 060226 Cohocton USGS z13 w, 50k, 30x30

Calculation: Southern part **File:** 060226 Cohocton USGS z13 w, 50k, 30x30.bmi



Map: 060226 Cohocton USGS z13 w, 50k, 30x30 , Print scale 1:35,000, Map center UTM NAD27 Zone: 18 East: 300,000 North: 4,709,000

New WTG Shadow receptor

Isolines showing shadow in Shadow hours|per year. Real value calculation.

10 25 50 100

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, Southwest part
4 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
1000 meter max shadow distance applied along with default 3° inclination
Sunshine probabilities applied (pdf plots)
Directional run-hours applied from tab file (tower 1)
.

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Calculated:
03/02/06 09:03/2.4.0.67

SHADOW - Main Result

Calculation: Southwest part

Assumptions for shadow calculations

Maximum distance for influence	1,000	m
Minimum sun height over horizon for influence	3	°
Day step for calculation	1	days
Time step for calculation	2	minutes

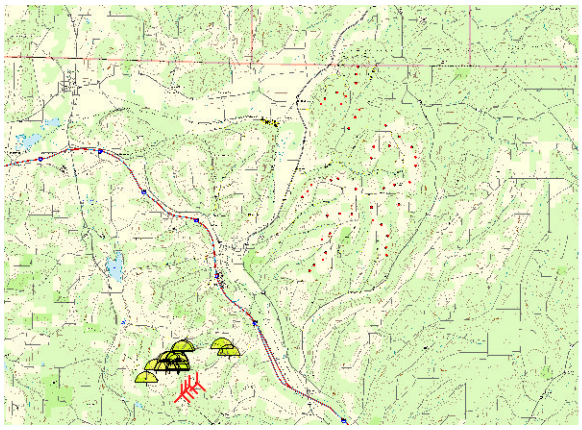
Sun shine probabilities (part of time from sun rise to sun set with sun shine)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.35	0.45	0.45	0.55	0.55	0.55	0.65	0.55	0.55	0.45	0.35	0.30

Operational hours are calculated from WTGs in calculation and wind distribution:
'Cohocton-1 80m LT projection'

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
475	585	238	199	220	474	1,184	813	840	1,246	803	479	7,555



Scale 1:350,000
New WTG Shadow receptor

WTGs

	UTM NAD27 Zone: 18				WTG type						
	East	North	Z [m]	Row data/Description	Valid	Manufact.	Type	Power [kW]	Diam. [m]	Height [m]	RPM [RPM]
45	292,626	4,702,047	619	45	Yes	GAMESA	G87/2000	2,000	87.0	78.0	16.7
46	292,287	4,701,939	620	46	Yes	GAMESA	G87/2000	2,000	87.0	78.0	16.7
47	292,119	4,701,698	610	47	Yes	GAMESA	G87/2000	2,000	87.0	78.0	16.7
48	291,910	4,701,549	599	48	Yes	GAMESA	G87/2000	2,000	87.0	78.0	16.7

Shadow receptor-Input

		UTM NAD27 Zone: 18							
No.	Name	East	North	Z [m]	Width [m]	Height [m]	Height a.g.l. [m]	Degrees from south cw [°]	Slope of window [°]
514	514	290,307	4,702,099	602	1.0	1.0	1.0	0.0	0.0
515	515	290,752	4,702,692	620	1.0	1.0	1.0	0.0	0.0
516	516	291,180	4,702,632	609	1.0	1.0	1.0	0.0	0.0
517	517	291,177	4,702,654	610	1.0	1.0	1.0	0.0	0.0
518	518	291,390	4,702,645	600	1.0	1.0	1.0	0.0	0.0
519	519	291,740	4,702,627	580	1.0	1.0	1.0	0.0	0.0
520	520	291,755	4,702,595	580	1.0	1.0	1.0	0.0	0.0
521	521	291,834	4,702,676	562	1.0	1.0	1.0	0.0	0.0
522	522	291,776	4,702,897	591	1.0	1.0	1.0	0.0	0.0
523	523	291,431	4,703,001	598	1.0	1.0	1.0	0.0	0.0
524	524	291,324	4,702,995	604	1.0	1.0	1.0	0.0	0.0
525	525	291,743	4,703,022	590	1.0	1.0	1.0	0.0	0.0
526	526	291,702	4,703,036	587	1.0	1.0	1.0	0.0	0.0
531	531	291,995	4,703,494	533	1.0	1.0	1.0	0.0	0.0
532	532	292,044	4,703,507	526	1.0	1.0	1.0	0.0	0.0
538	538	293,871	4,703,545	474	1.0	1.0	1.0	0.0	0.0
539	539	294,147	4,703,252	440	1.0	1.0	1.0	0.0	0.0

Calculation Results

		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]
514	514	0:00	0	0:00	0:00
515	515	0:00	0	0:00	0:00

Continued on next page...

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, Southwest part
4 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
1000 meter max shadow distance applied along with default 3° inclination
Sunshine probabilities applied (pdf plots)
Directional run-hours applied from tab file (tower 1)
.

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Calculated:
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SHADOW - Main Result

Calculation: Southwest part

...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]
516	516	0:00	0	0:00	0:00
517	517	0:00	0	0:00	0:00
518	518	0:00	0	0:00	0:00
519	519	0:00	0	0:00	0:00
520	520	0:00	0	0:00	0:00
521	521	0:00	0	0:00	0:00
522	522	0:00	0	0:00	0:00
523	523	0:00	0	0:00	0:00
524	524	0:00	0	0:00	0:00
525	525	0:00	0	0:00	0:00
526	526	0:00	0	0:00	0:00
531	531	0:00	0	0:00	0:00
532	532	0:00	0	0:00	0:00
538	538	0:00	0	0:00	0:00
539	539	0:00	0	0:00	0:00

Project:
060226 Cohocton

Description:
Cohocton Project
Shadow-Flicker, Southwest part
4 of 48 Gamesa G-87 (87m rotor) on 78 meter towers
Shadow / no-shadow (worst case intensity wise)
Window properties: 1m2 horizontal, 1m above ground
1000 meter max shadow distance applied along with default 3° inclination
Sunshine probabilities applied (pdf plots)
Directional run-hours applied from tab file (tower 1)
.

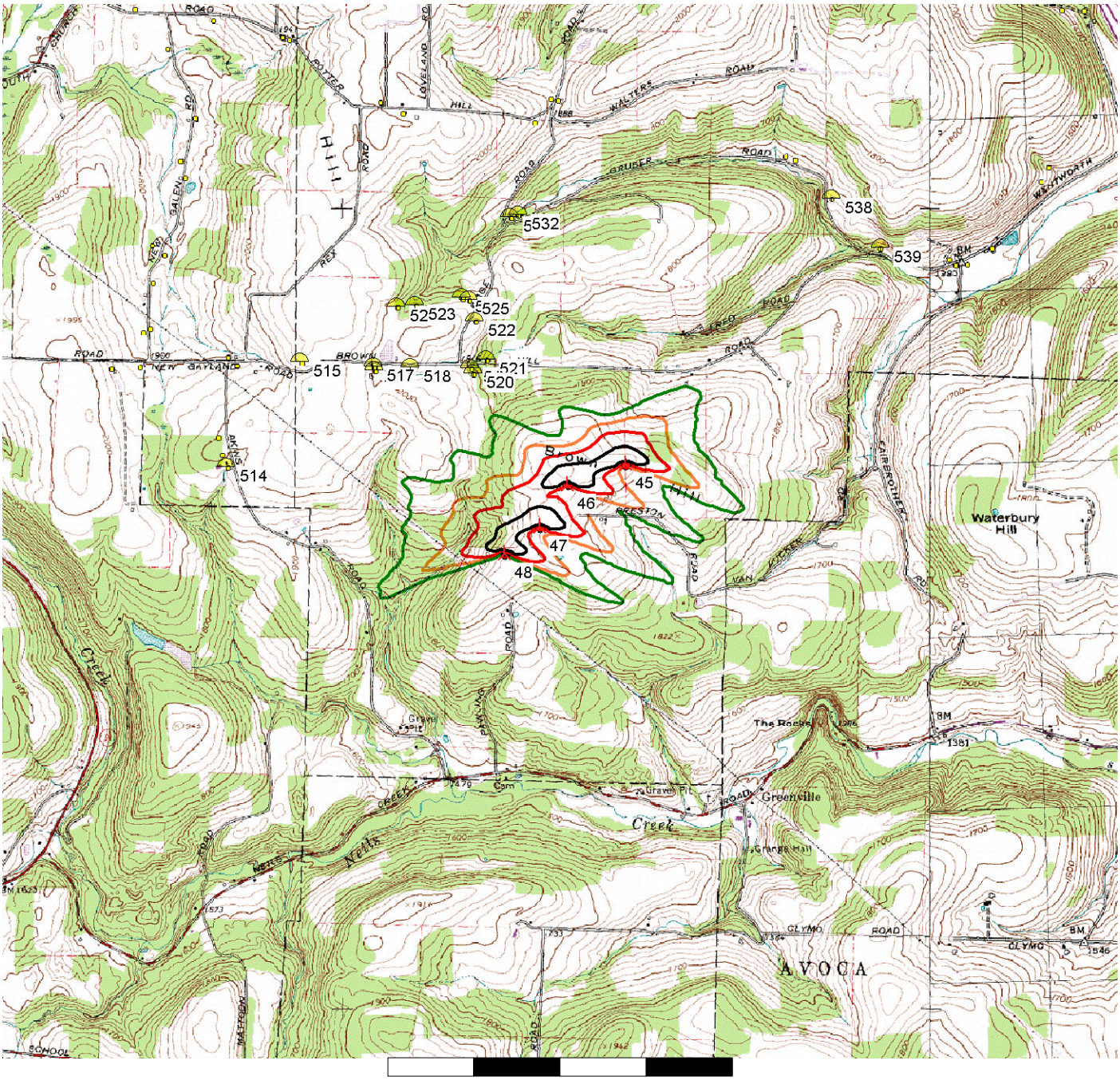
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03/05/06 22:28 / 3

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US-RIVERSIDE, CA 92506

Calculated:
03/02/06 09:03/2.4.0.67

SHADOW - 060226 Cohocton USGS z13 w, 50k, 30x30

Calculation: Southwest part **File:** 060226 Cohocton USGS z13 w, 50k, 30x30.bmi



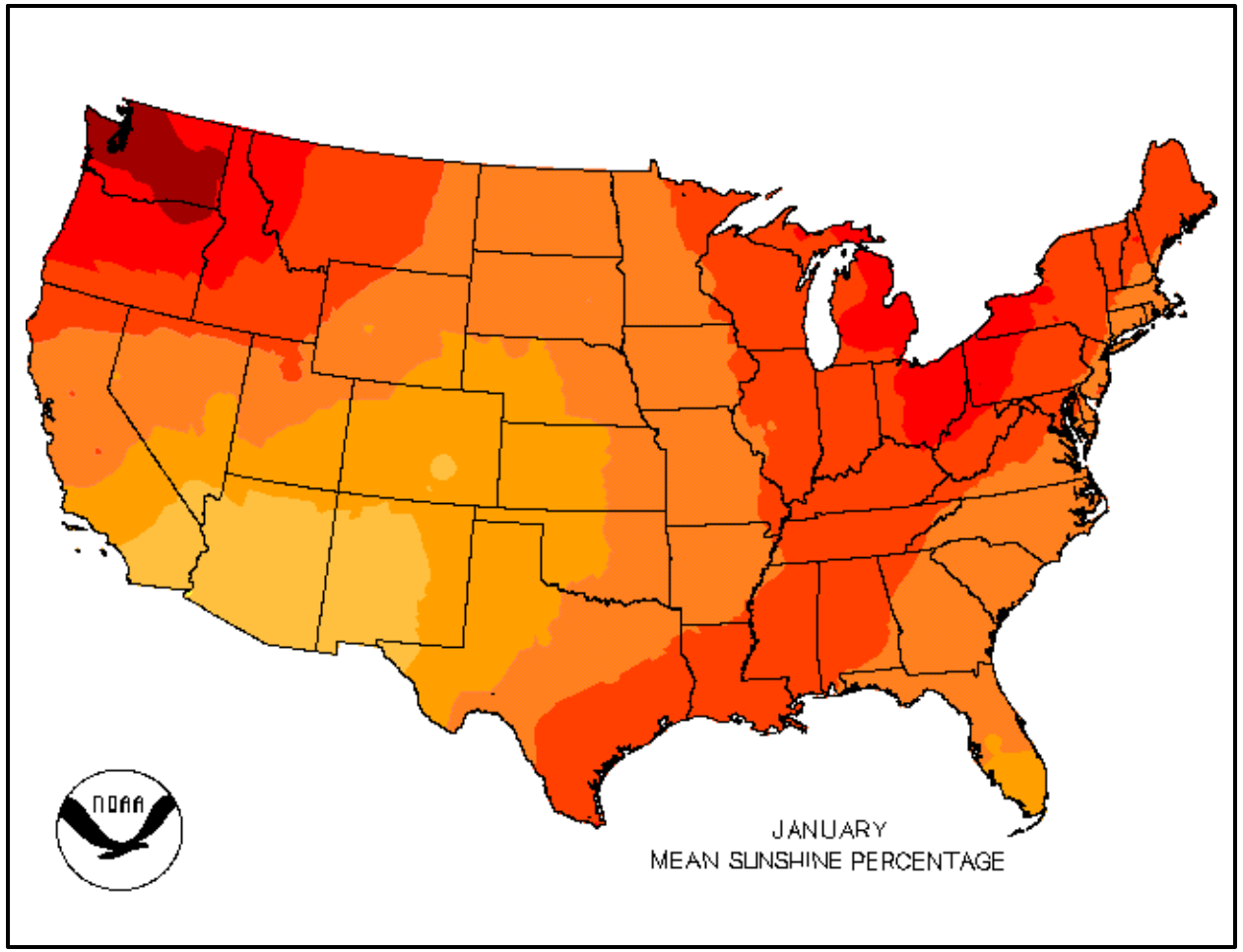
Map: 060226 Cohocton USGS z13 w, 50k, 30x30 , Print scale 1:35,000, Map center UTM NAD27 Zone: 18 East: 292,318 North: 4,701,754

New WTG Shadow receptor

Isolines showing shadow in Shadow hours|per year. Real value calculation.

10 25 50 100

ESRI ArcExplorer 1.1



STATES

01 MEAN SUNSHINE (PERCENT)

- JANUARY -

A < 21

B 21 - 30

C 31 - 40

D 41 - 50

E 51 - 60

F 61 - 70

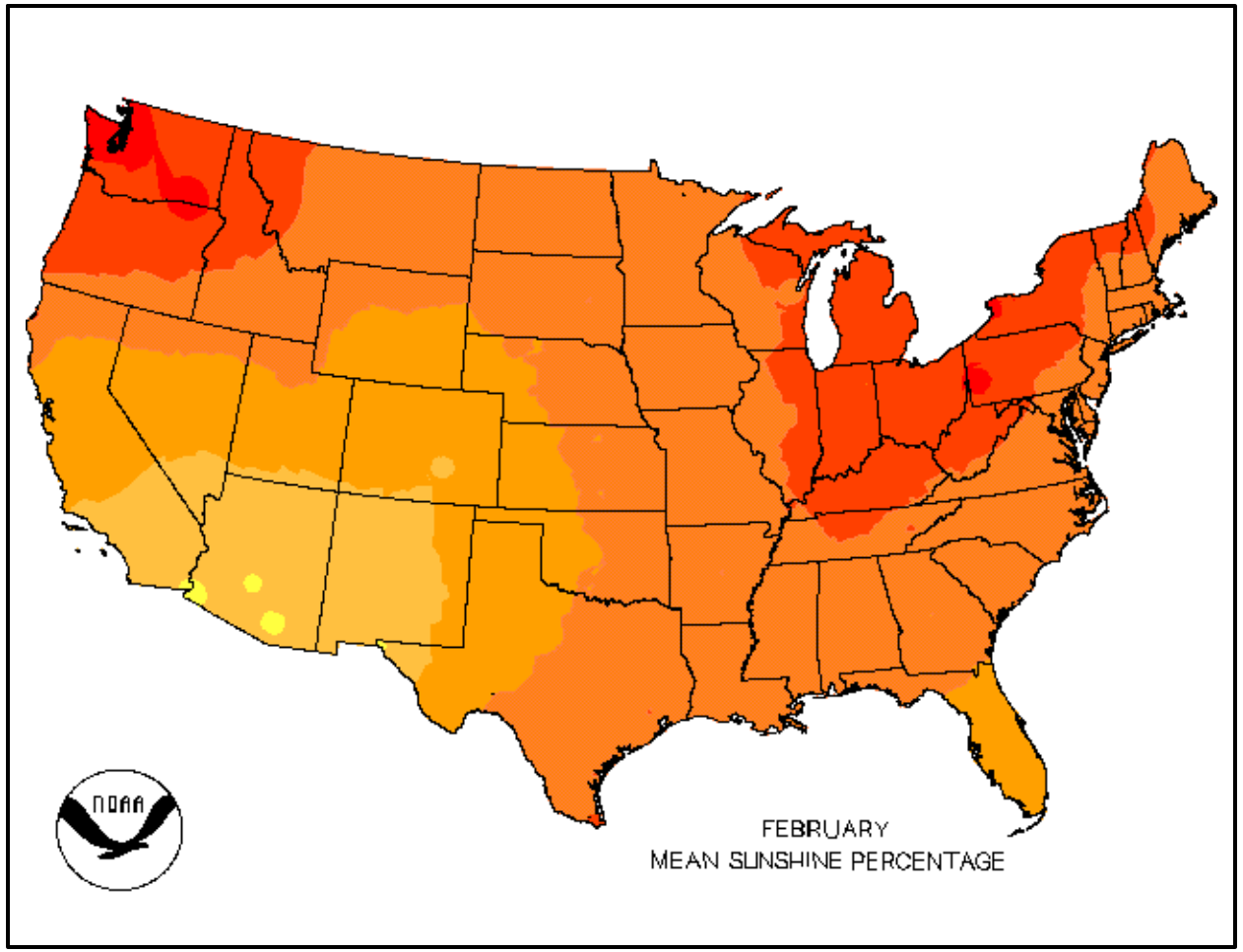
G 71 - 80

H 81 - 90

TITLE

N

ESRI ArcExplorer 1.1



STATES

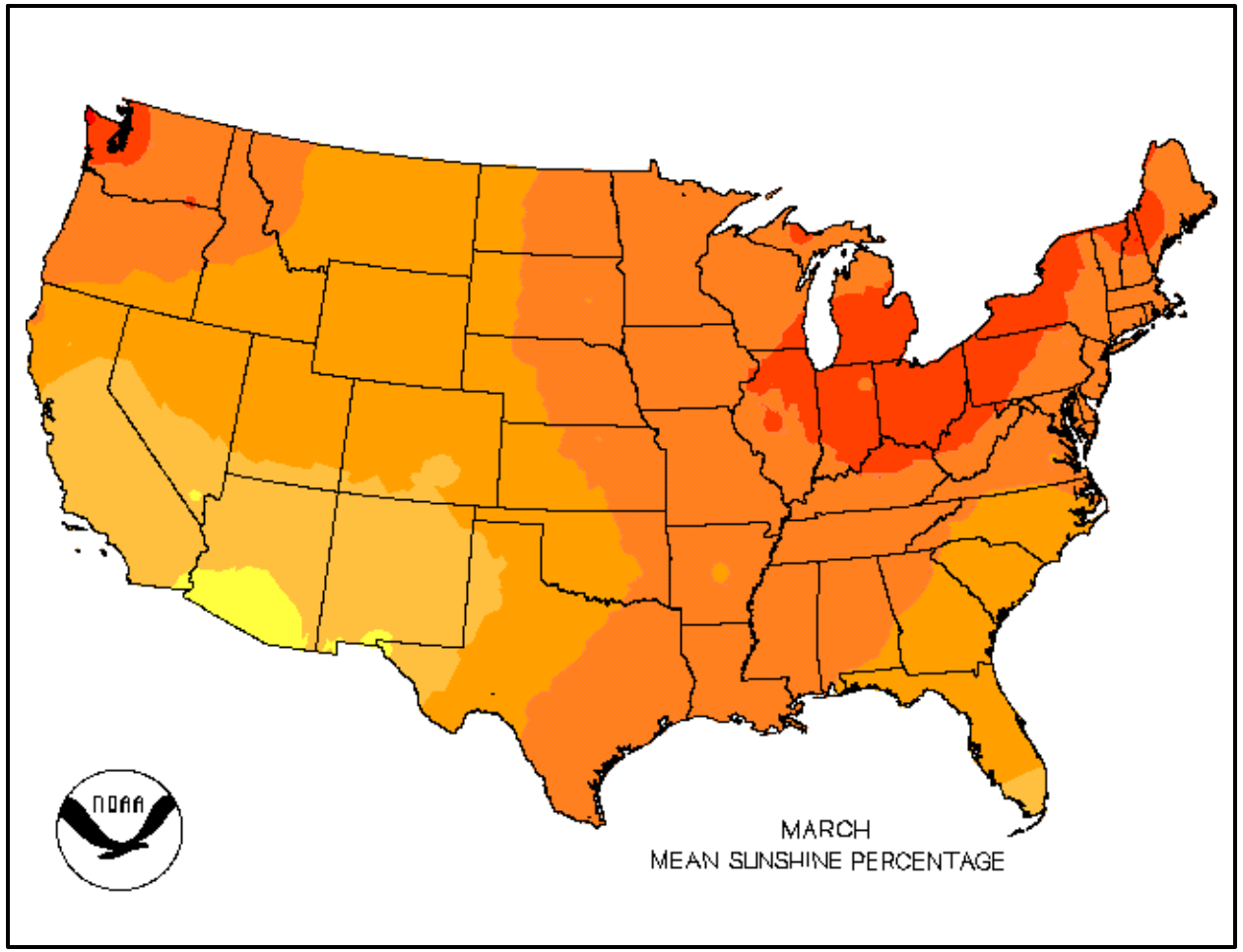
02 MEAN SUNSHINE (PERCENT)

- FEBRUARY -
B 21 - 30
C 31 - 40
D 41 - 50
E 51 - 60
F 61 - 70
G 71 - 80
H 81 - 90

TITLE

N

ESRI ArcExplorer 1.1



STATES

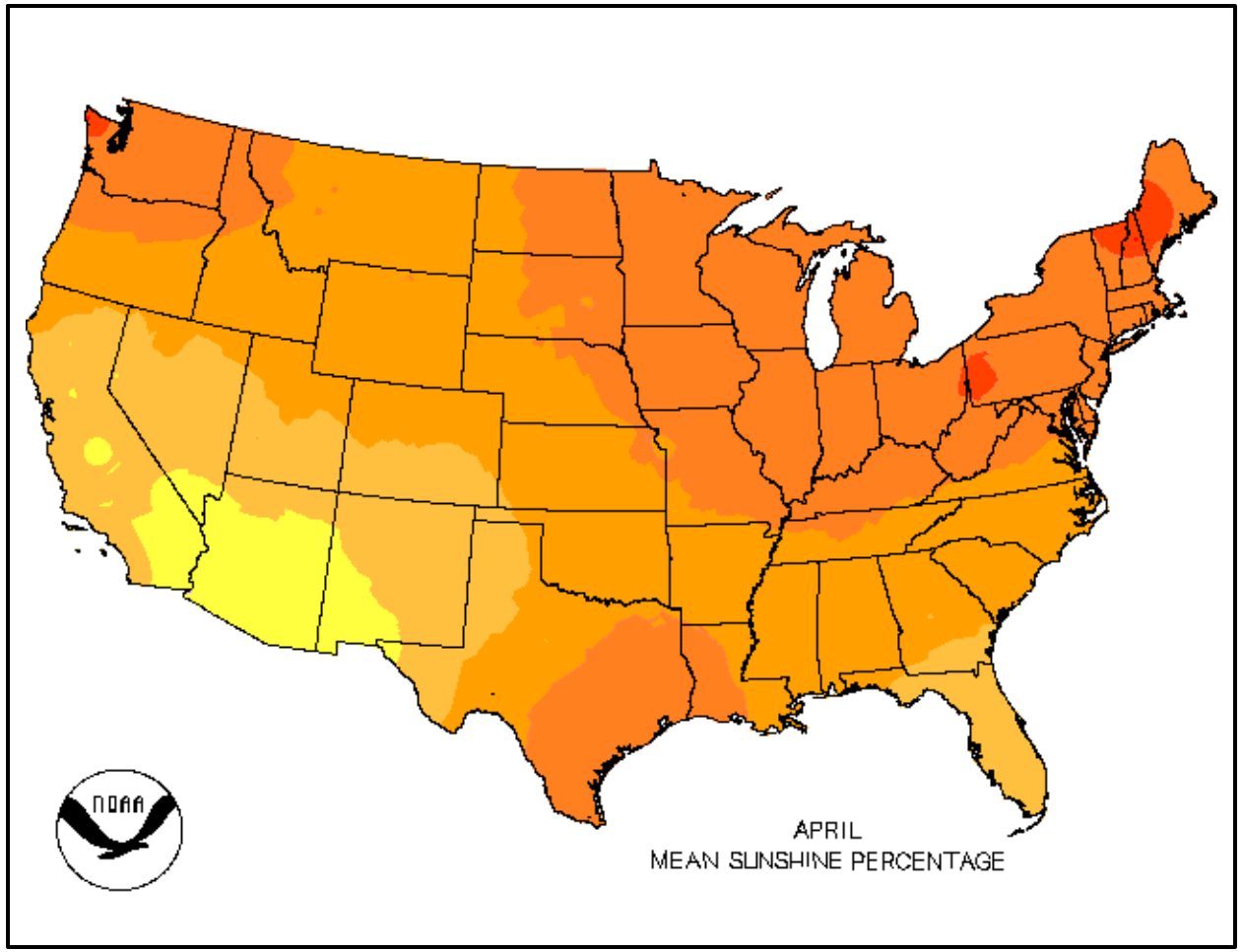
03 MEAN SUNSHINE (PERCENT)

- MARCH -
C 31 - 40
D 41 - 50
E 51 - 60
F 61 - 70
G 71 - 80
H 81 - 90

TITLE

N

ESRI ArcExplorer 1.1



STATES

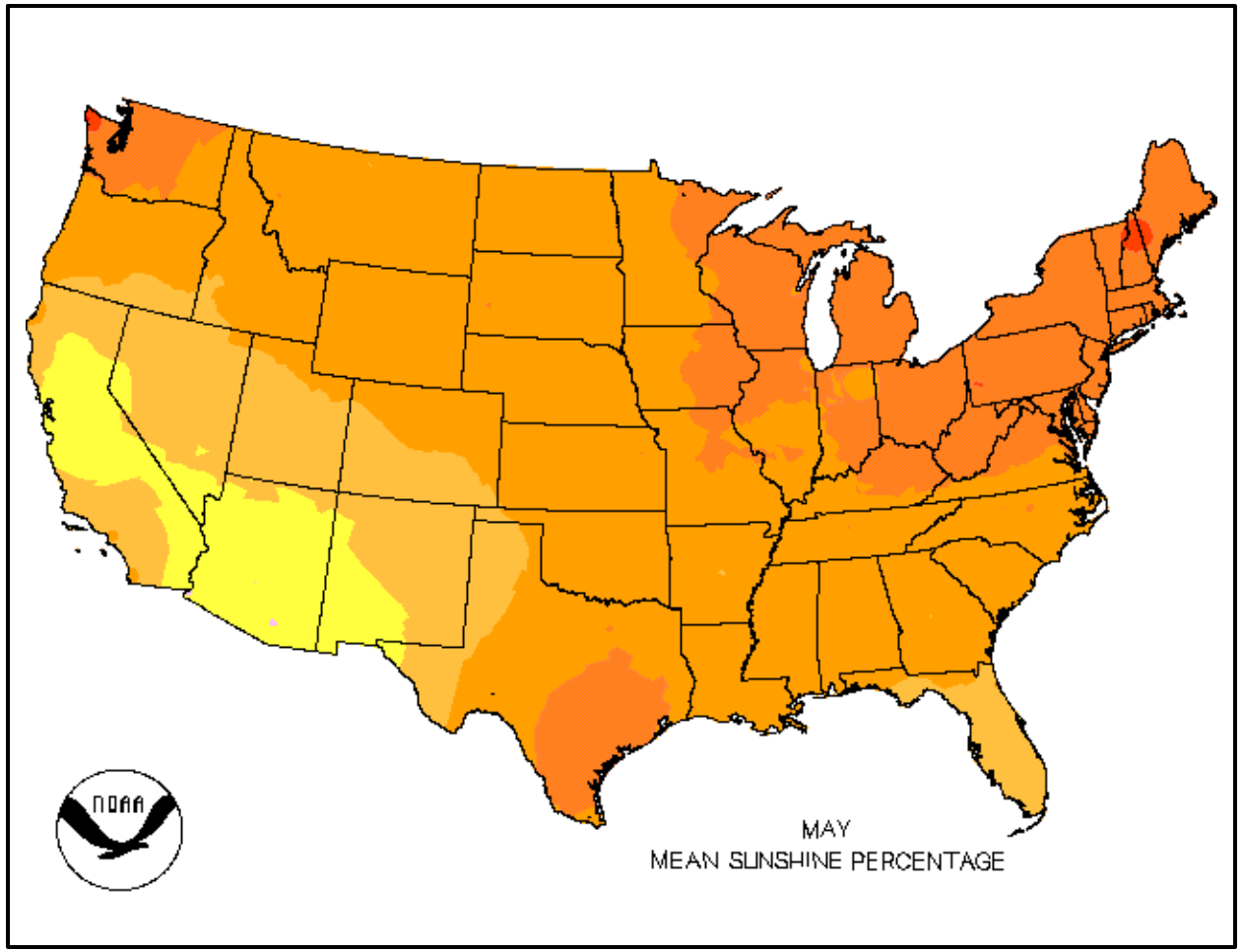
04 MEAN SUNSHINE (PERCENT)

- APRIL -
C 31 - 40
D 41 - 50
E 51 - 60
F 61 - 70
G 71 - 80
H 81 - 90
I > 90

TITLE

N

ESRI ArcExplorer 1.1



STATES

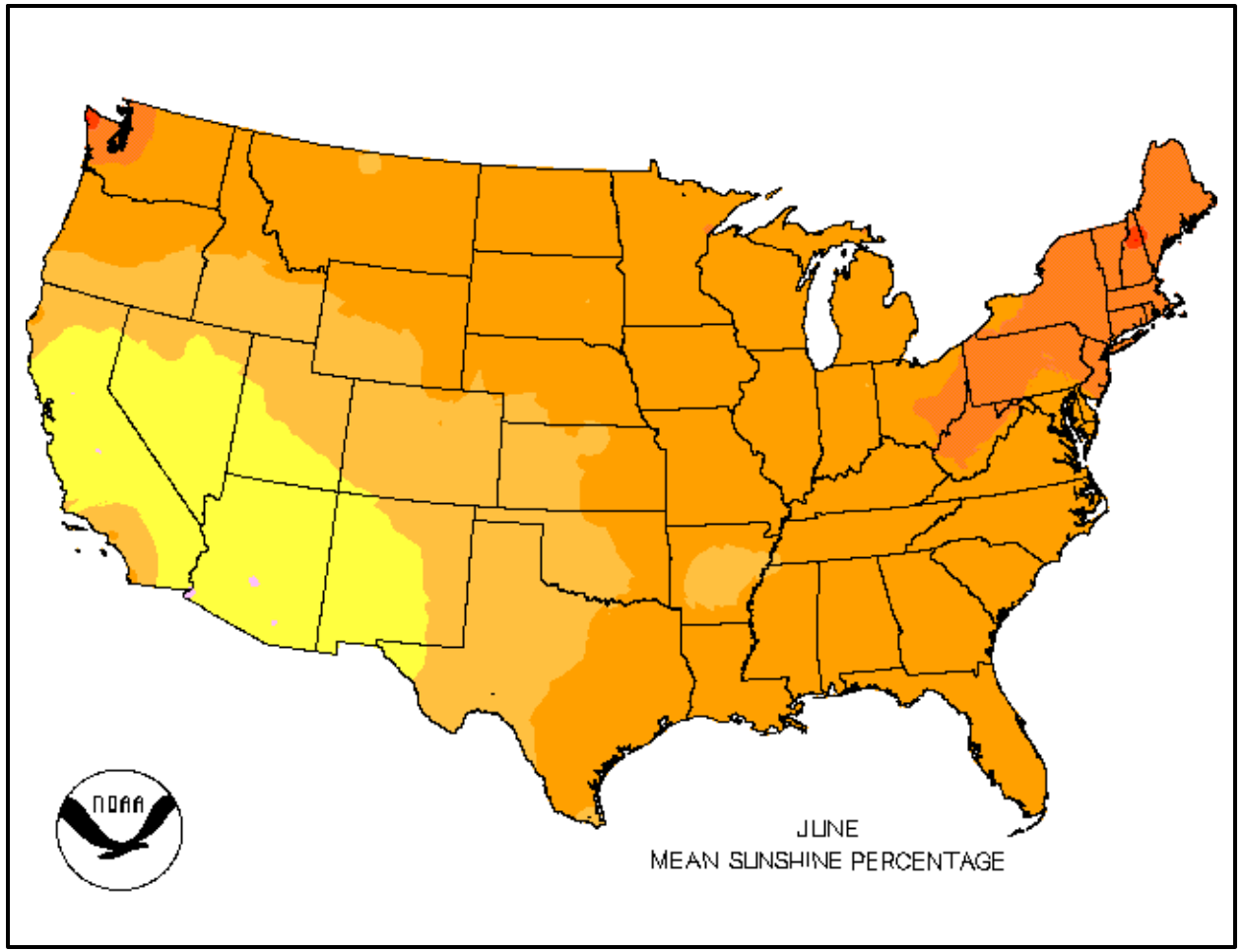
05 MEAN SUNSHINE (PERCENT)

- MAY -
C 31 - 40
D 41 - 50
E 51 - 60
F 61 - 70
G 71 - 80
H 81 - 90
I > 90

TITLE

N

ESRI ArcExplorer 1.1



STATES

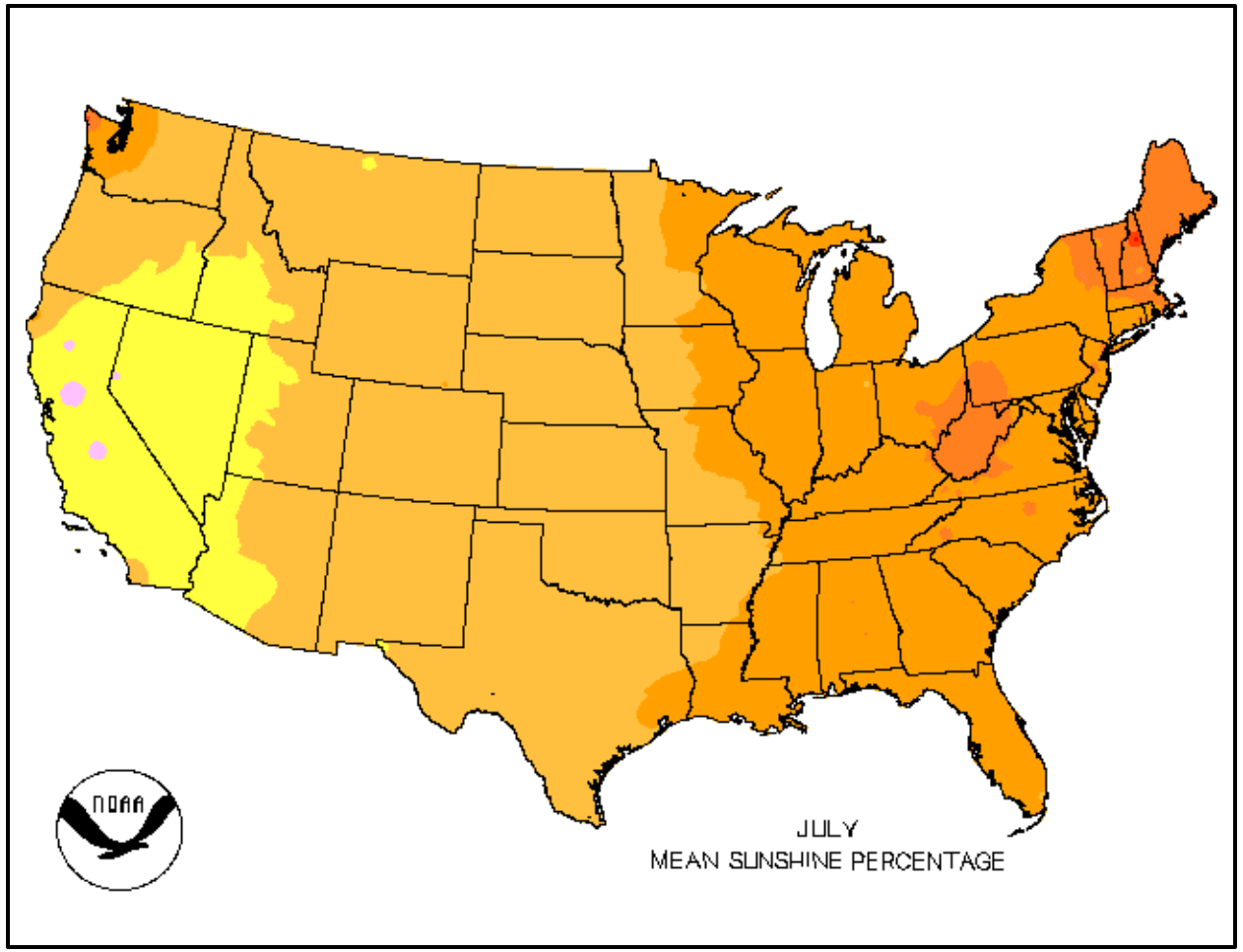
06 MEAN SUNSHINE (PERCENT)

- JUNE -
C 31 - 40
D 41 - 50
E 51 - 60
F 61 - 70
G 71 - 80
H 81 - 90
I > 90

TITLE

N

ESRI ArcExplorer 1.1



STATES

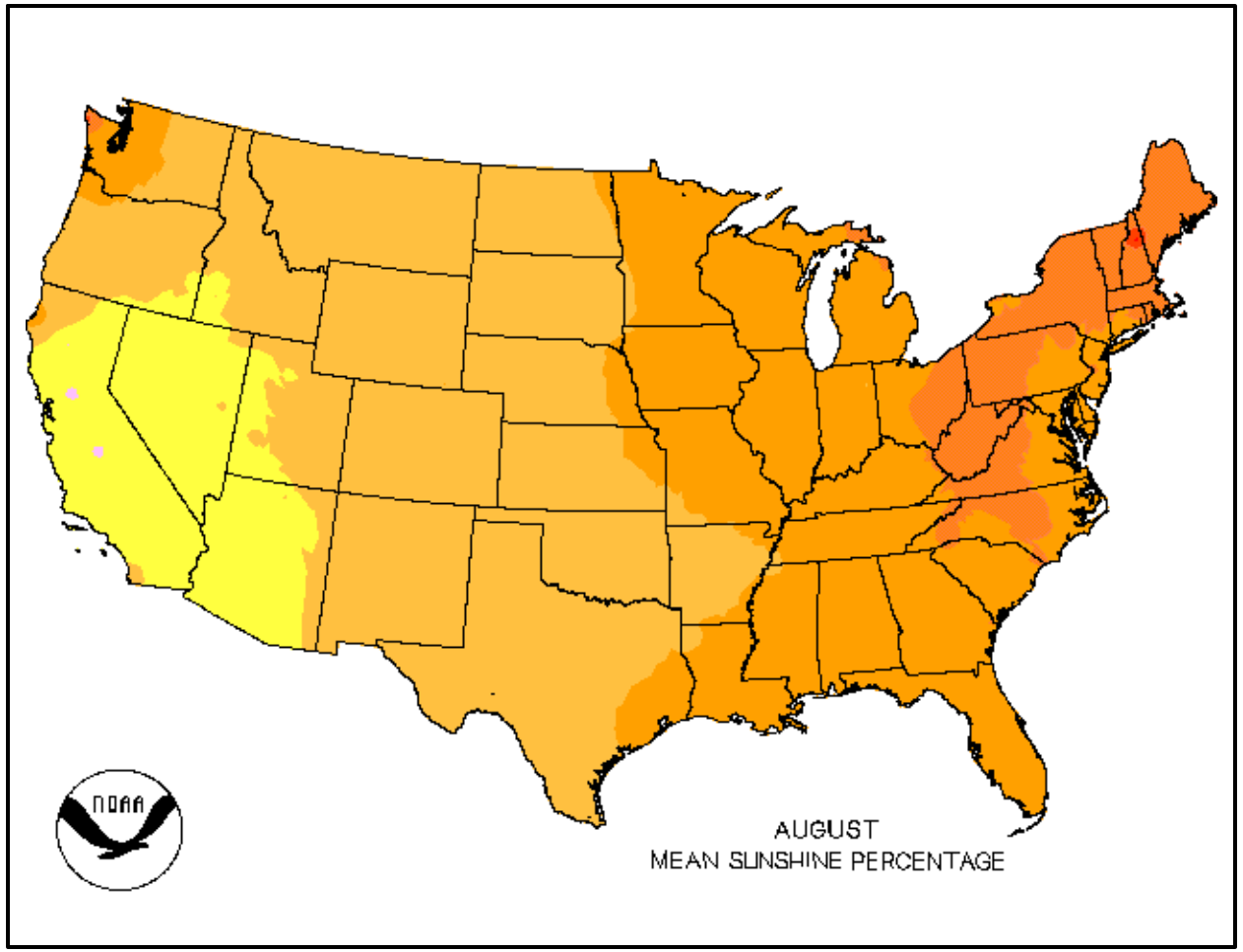
07 MEAN SUNSHINE (PERCENT)

- JULY -
C 31 - 40
D 41 - 50
E 51 - 60
F 61 - 70
G 71 - 80
H 81 - 90
I > 90

TITLE

N

ESRI ArcExplorer 1.1



STATES

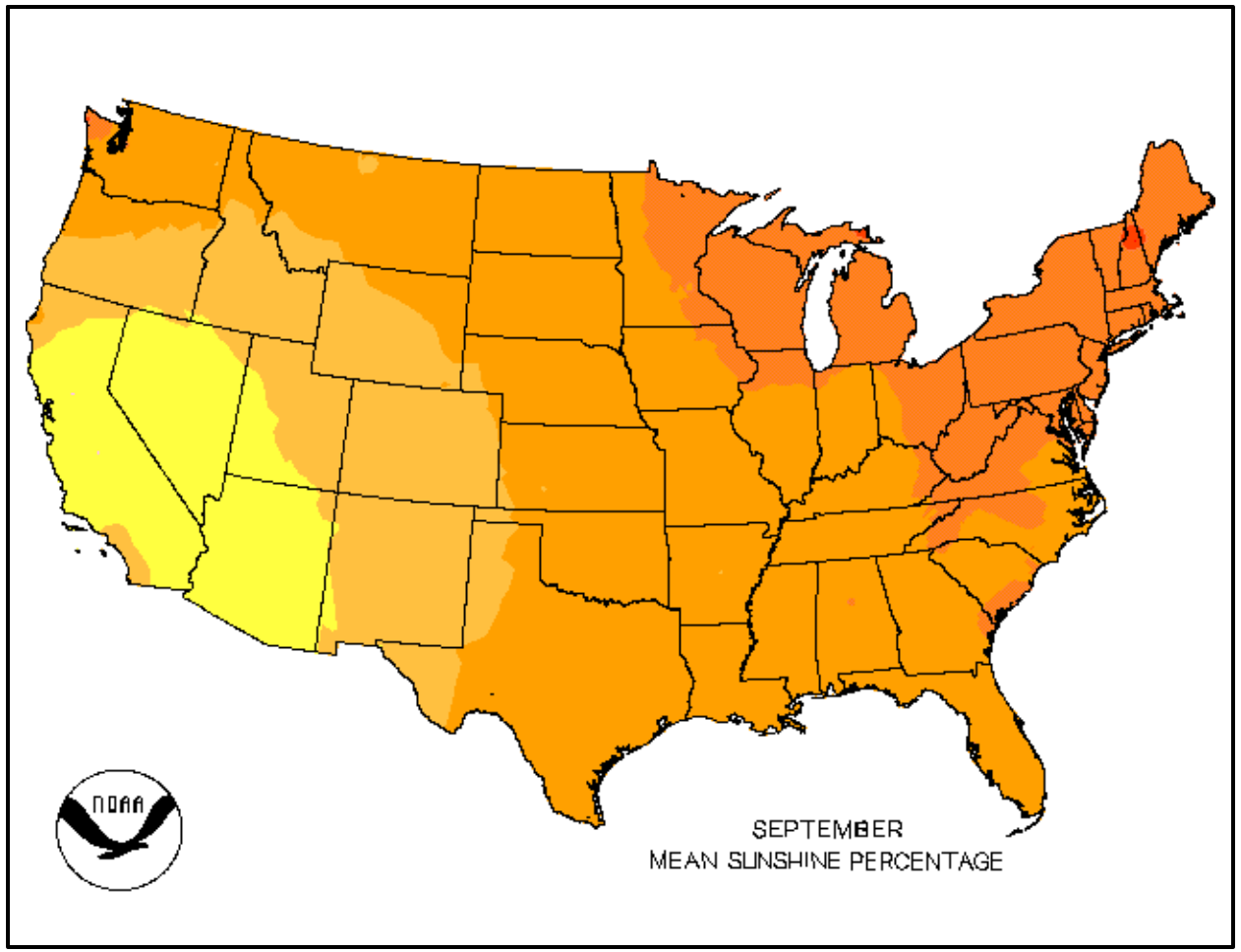
08 MEAN SUNSHINE (PERCENT)

- AUGUST -
B 21 - 30
C 31 - 40
D 41 - 50
E 51 - 60
F 61 - 70
G 71 - 80
H 81 - 90
I > 90

TITLE

N

ESRI ArcExplorer 1.1



STATES

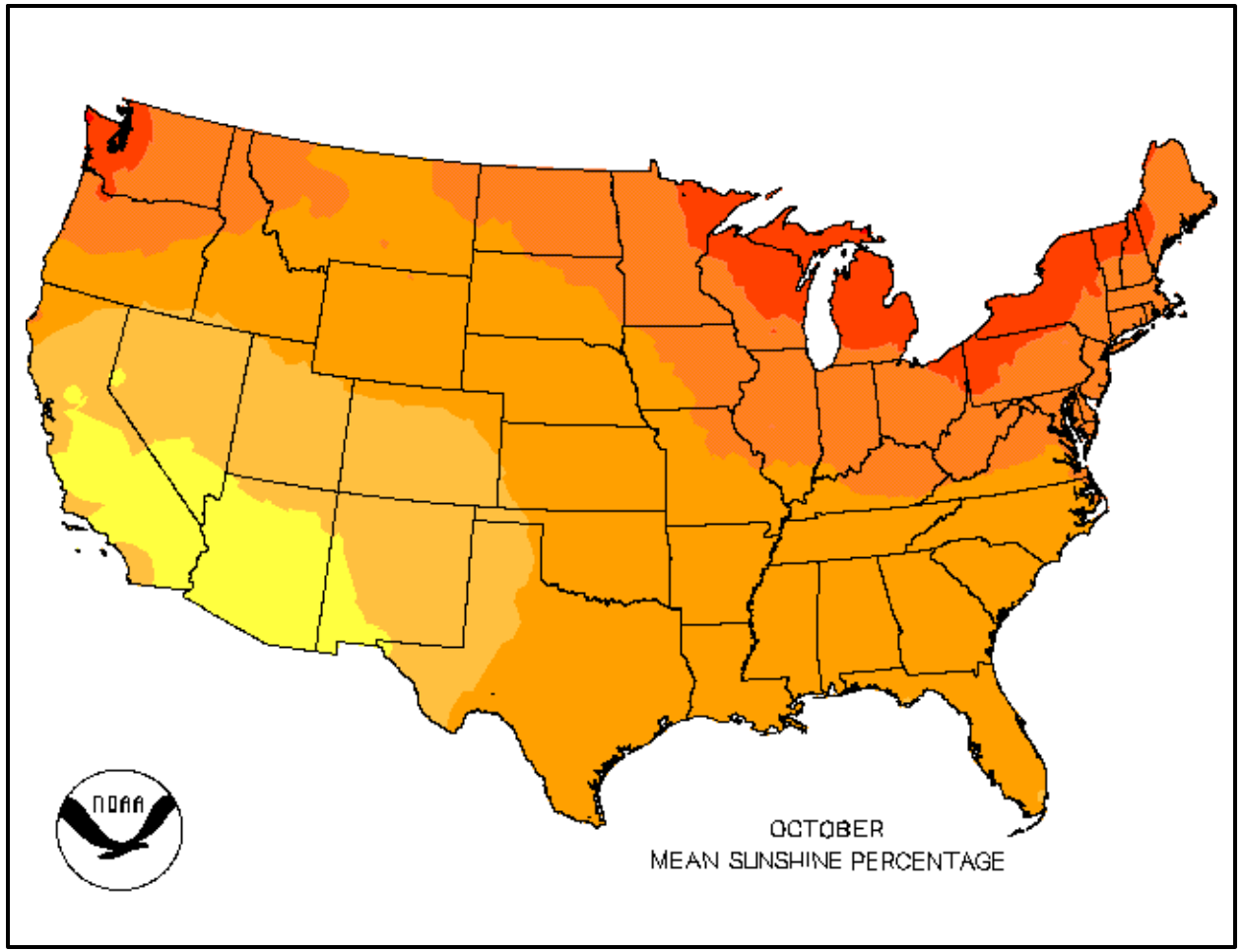
09 MEAN SUNSHINE (PERCENT)

- SEPTEMBER -
C 31 - 40
D 41 - 50
E 51 - 60
F 61 - 70
G 71 - 80
H 81 - 90
I > 90

TITLE

N

ESRI ArcExplorer 1.1



STATES

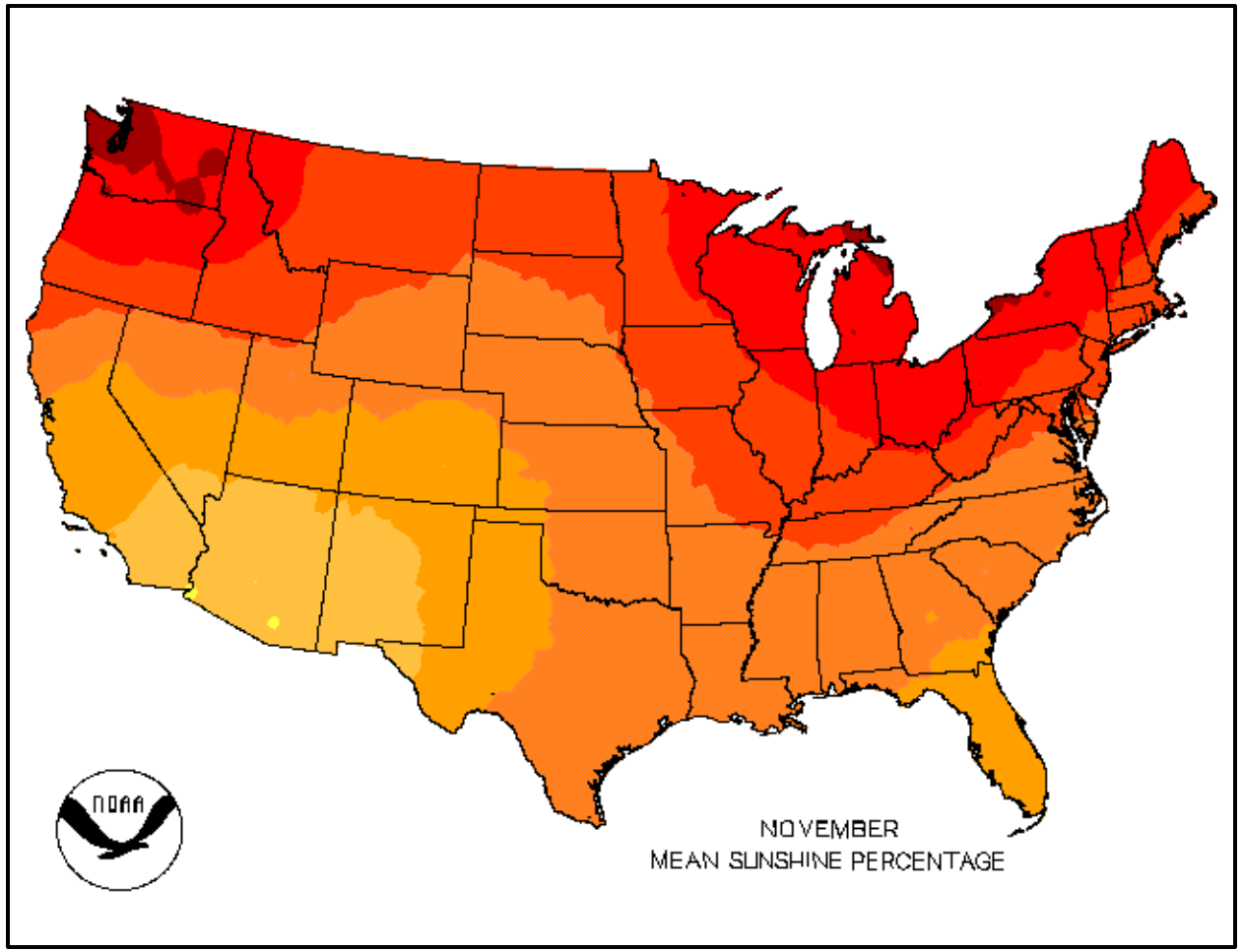
10 MEAN SUNSHINE (PERCENT)

- OCTOBER -
C 31 - 40
D 41 - 50
E 51 - 60
F 61 - 70
G 71 - 80
H 81 - 90

TITLE

N

ESRI ArcExplorer 1.1



STATES

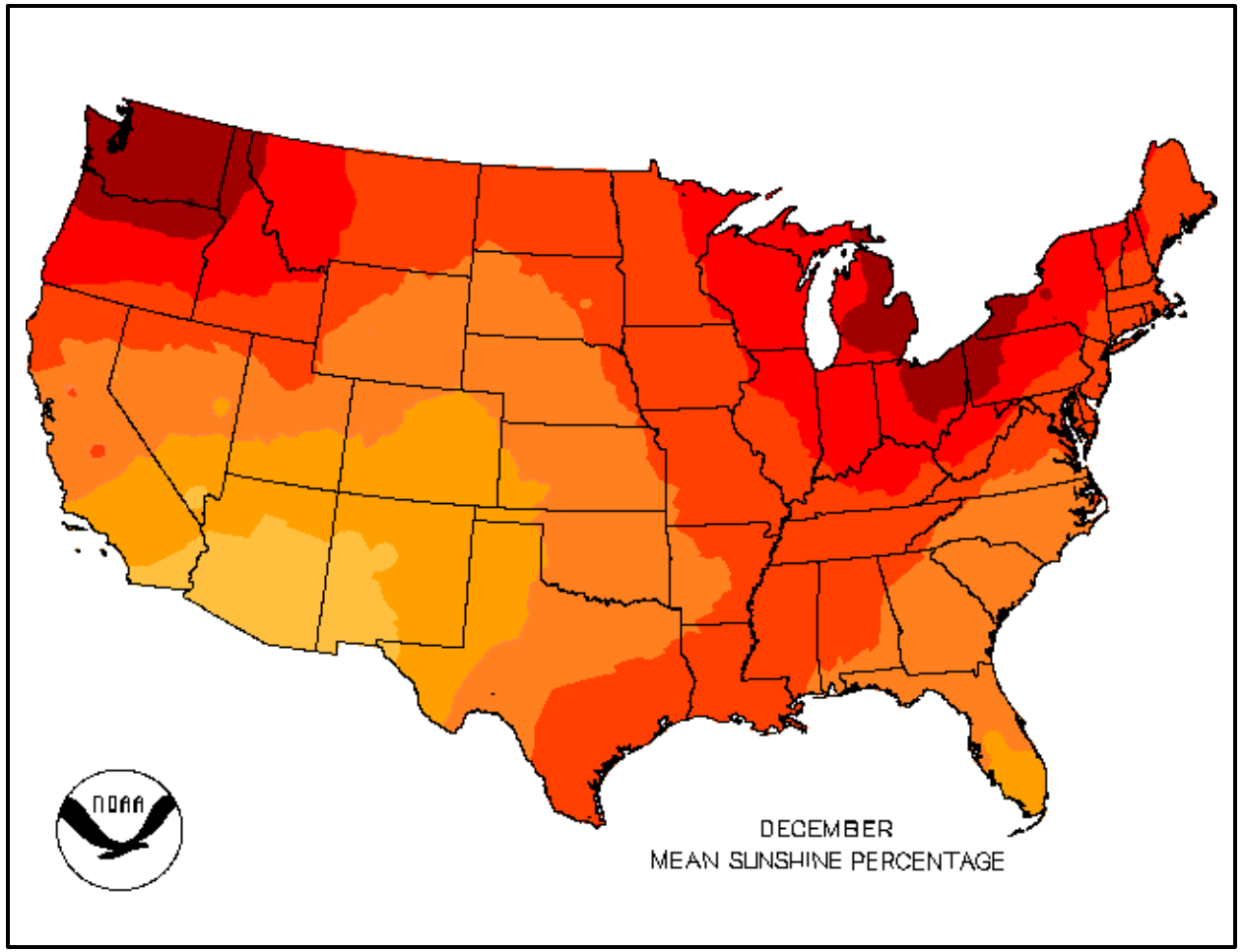
11 MEAN SUNSHINE (PERCENT)

- NOVEMBER -
A < 21
B 21 - 30
C 31 - 40
D 41 - 50
E 51 - 60
F 61 - 70
G 71 - 80
H 81 - 90

TITLE

N

ESRI ArcExplorer 1.1



STATES

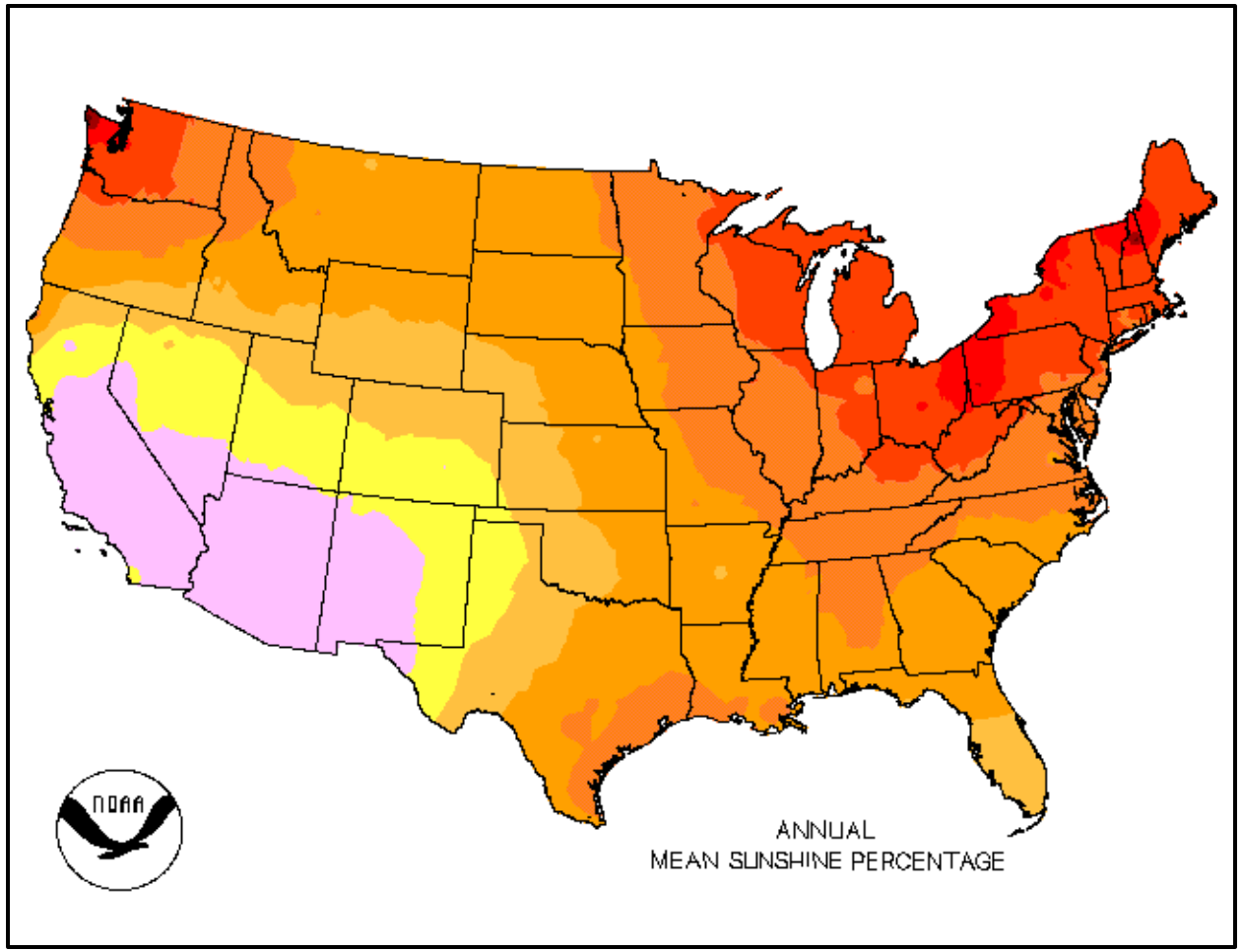
12 MEAN SUNSHINE (PERCENT)

- DECEMBER -
A < 21
B 21 - 30
C 31 - 40
D 41 - 50
E 51 - 60
F 61 - 70
G 71 - 80

TITLE

N

ESRI ArcExplorer 1.1



STATES

13 MEAN SUNSHINE (PERCENT)

- ANNUAL -
A < 41
B 41 - 45
C 46 - 50
D 51 - 55
E 56 - 60
F 61 - 65
G 66 - 70
H 71 - 75
I > 75

TITLE

N