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Meering West Wind Farm

Shadow Flicker and Blade Glint Assessment

Meering West Wind Farm Pty Ltd as trustee for the Meering West Wind Farm Trust

Reference: 527201

Revision:

2026-04-23

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Document prepared by:

Aurecon Australasia Pty Ltd

ABN 54 005 139 873

Aurecon Centre

Level 8, 850 Collins Street

Docklands, Melbourne VIC 3008

PO Box 23061

Docklands VIC 8012

Australia

T +61 3 9975 3000

F +61 3 9975 3444

E melbourne@aurecongroup.com

W aurecongroup.com

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Name	C West	Name	S Stewart
Title	Senior Engineer	Title	Practice Leader, Environment and Planning

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Executive Summary

Aurecon Australasia Pty Ltd (Aurecon) has been engaged by Meering West Wind Farm Pty Ltd as trustee for the Meering West Wind Farm Trust to facilitate the environmental and planning assessments and approvals for the Meering West Wind Farm Project (the Project), located near Meering West in Northern Victoria. This Project is situated approximately 250 kilometres (km) north of Melbourne and 100 km north of Bendigo. The Project encompasses around 20,000 hectares (ha) of farmland within the Loddon and Gannawarra Local Government Areas.

The Project includes the development of up to 164 wind turbines, complemented by ancillary infrastructure including, a meteorological mast, a Battery Energy Storage System (BESS), a terminal substation, collector stations, underground electricity cables and an internal above ground powerline. A temporary construction compound and two concrete batching plants will be established during the construction phase. The construction phase is expected to span approximately three years, and the Project will have an operational life projected at around 40 years.

Aurecon has carried out a Shadow Flicker and Blade Glint assessment for the Project to the support planning permit applications. Shadow flicker can occur due to the interaction of the sun with the turning turbine blades and can affect viewers if the moving shadow of the turbine blades passes over a window that provides natural light. Blade glint refers to the intermittent reflection of the sun's light from the surface of wind turbine blades.

Aurecon has determined that non-host landowners are not affected by shadow flicker effects greater than the recommended limits.

Blade glint is not expected to be an issue for the Project due to non-reflective paint used on modern wind turbines.

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Glossary

Acronym	Definition
Aurecon	Aurecon Australasia Pty Ltd.
BESS	Battery Energy Storage System
GW	Gigawatt
ha	Hectares
Hz	Hertz
km	Kilometres
kV	Kilovolt
m	Meters
MW	Megawatts
MWh	Megawatt hours
The Project	Meering West Wind Farm Project
Project Area	The area in which construction will take place and for which approvals will be sought.
The Proponent	Meering West Wind Farm Pty Ltd as trustee for the Meering West Wind Farm Trust
VNI West	Victoria to New South Wales Interconnector West
WTG	Wind Turbine Generator

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1 Introduction

Aurecon Australasia Pty Ltd (Aurecon) has been engaged by Meering West Wind Farm Pty Ltd as trustee for the Meering West Wind Farm Trust to facilitate the environmental and planning assessments and approvals for the Meering West Wind Farm Project (the Project), located near Meering West in Northern Victoria.

1.1 Purpose

The purpose of this report is to provide an assessment of the potential shadow flicker effects and potential impacts on nearby residences for the Project. Matters required to be considered under the *Planning Guidelines for Development of Wind Energy Facilities* (DTP, 2023) and the Australian Draft National Guidelines (2010) are identified and addressed in this report.

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2 The Project

The following section provides an overview of the Project, including highlighting the key infrastructure components, as well as important details regarding construction and operational information for the Project.

2.1 Project Background

The Meering West Wind Farm is a proposed wind energy project by Meering West Wind Farm Pty Ltd as trustee for the Meering West Wind Farm Trust located approximately 25 kilometres south-west of Kerang, Victoria (to the centre of the project). The Project is located within the Loddon and Gannawarra municipalities. The Project supports Victoria's transition towards a renewable energy.

The Project involves over 30 host landowners, and the Project has been co-designed with the landowners and environmental specialists to minimise the impacts to the ongoing agricultural practises and native vegetation. Key design features from the process include positioning wind turbines out of pivot irrigation areas, providing property by property access to minimise weed spread and positioning access tracks on the edge of paddocks.

2.2 Project Area

The Meering West Wind Farm is situated in Northern Victoria, approximately 250 km north of Melbourne and around 110 km north of Bendigo.

The Project encompasses approximately 20,000 ha, with the majority of the area located within the Shire of Gannawarra. The landscape is predominantly characterized by agricultural land, featuring cropped fields that are well-maintained and utilised for various farming practices. The environment is largely flat to gently rolling terrain.

VNI West (Victoria to New South Wales Interconnector West) is a proposed new high capacity 500 kV transmission line between Victoria and New South Wales. The exact location of the VNI West has not been finalised however it is expected VNI West will run through the Project Area and Meering West Wind Farm will connect directly to the new transmission line.

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Legend

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- ▭ Project Area
- - - LGA

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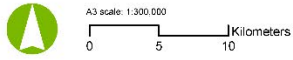
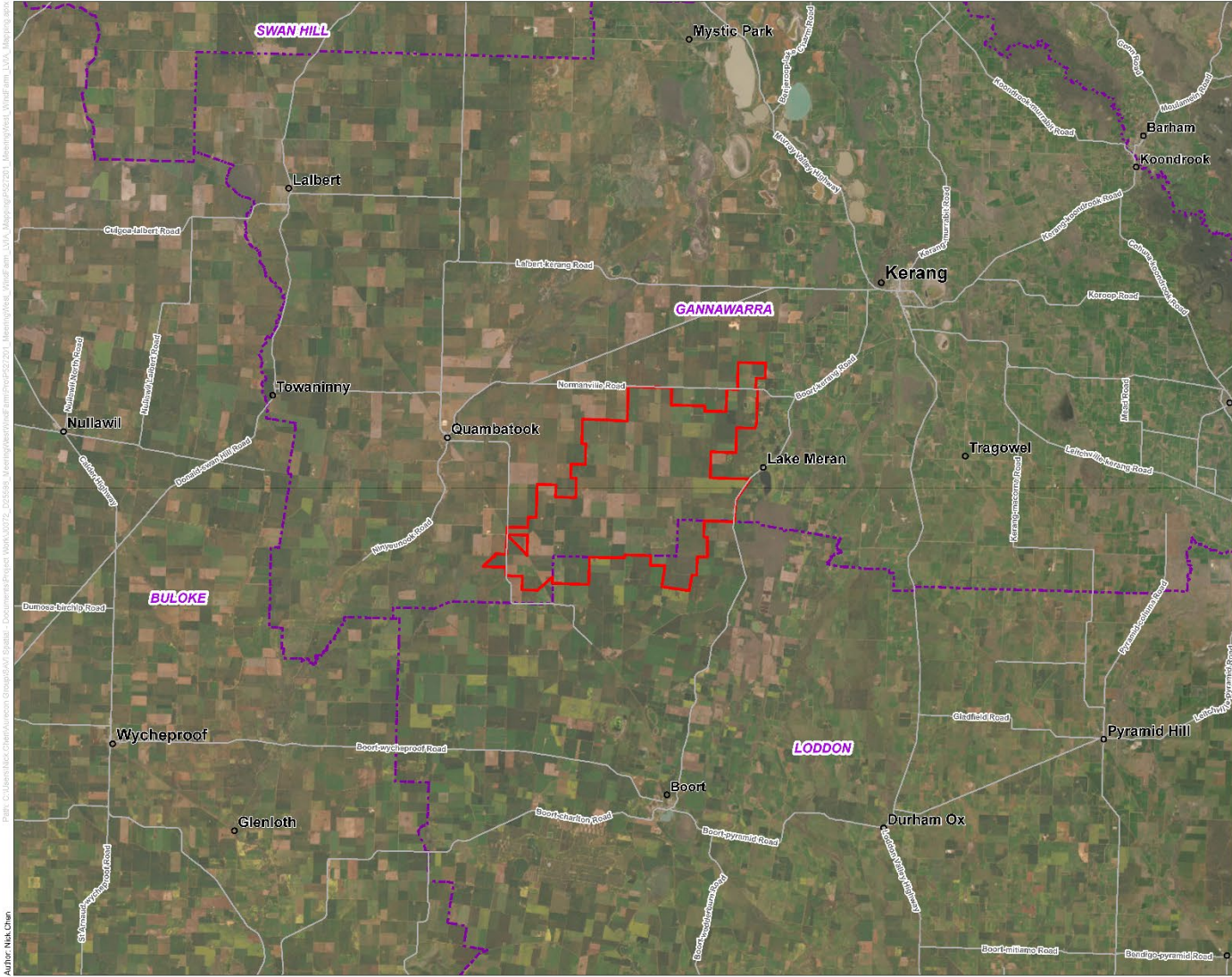
Notes:

Base maps: ViMAP, Esri, TomTom, Garmin, FAO, NOAA,
USGS, Earthstar Geographics

Data source: DEWLP (2023), Aurecon (2023)

Date: 19/03/2025 Version: 1

Meering West Wind Farm
Regional Context



Job No: P527201
Coordinate System: GDA 1984 MGA Zone 54

Figure 2-1 Regional Context
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2.3 Project Description

The Project includes the following permanent and ancillary infrastructure, further details on the project infrastructure is shown in Table 2-1 and Figure 2-2.

Permanent core and ancillary infrastructure

- Up to 164 wind turbines.
- An operation and maintenance building, including a car park and an office
- Internal access tracks
- 1000 MW / MWh Battery Energy Storage System (BESS).
- A terminal station
- Collector stations
- A permanent meteorological monitoring mast
- Internal access tracks
- Internal feeder transmission lines

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Temporary ancillary infrastructure:

- A construction office and compounds, including site offices, car parking, storage and amenities.
- Concrete batching plant
- Temporary civil works
- Concrete batching plant
- Hard stands and laydown areas.

Table 2-1 Key Parameters

Feature	Parameters	Quantity
Turbines		
Maximum Hub Heights	194 m	164
Maximum Blade Length	84.6 m	
Maximum Tip Height	280 m	
Rotor Swept Area	23,235 m ²	
Clearance (space between ground and lowest point of blade)	80-104 m	
Indicative Cut-in wind speed	3 m/s	
Indicative Cut-out wind speed	25 m/s	

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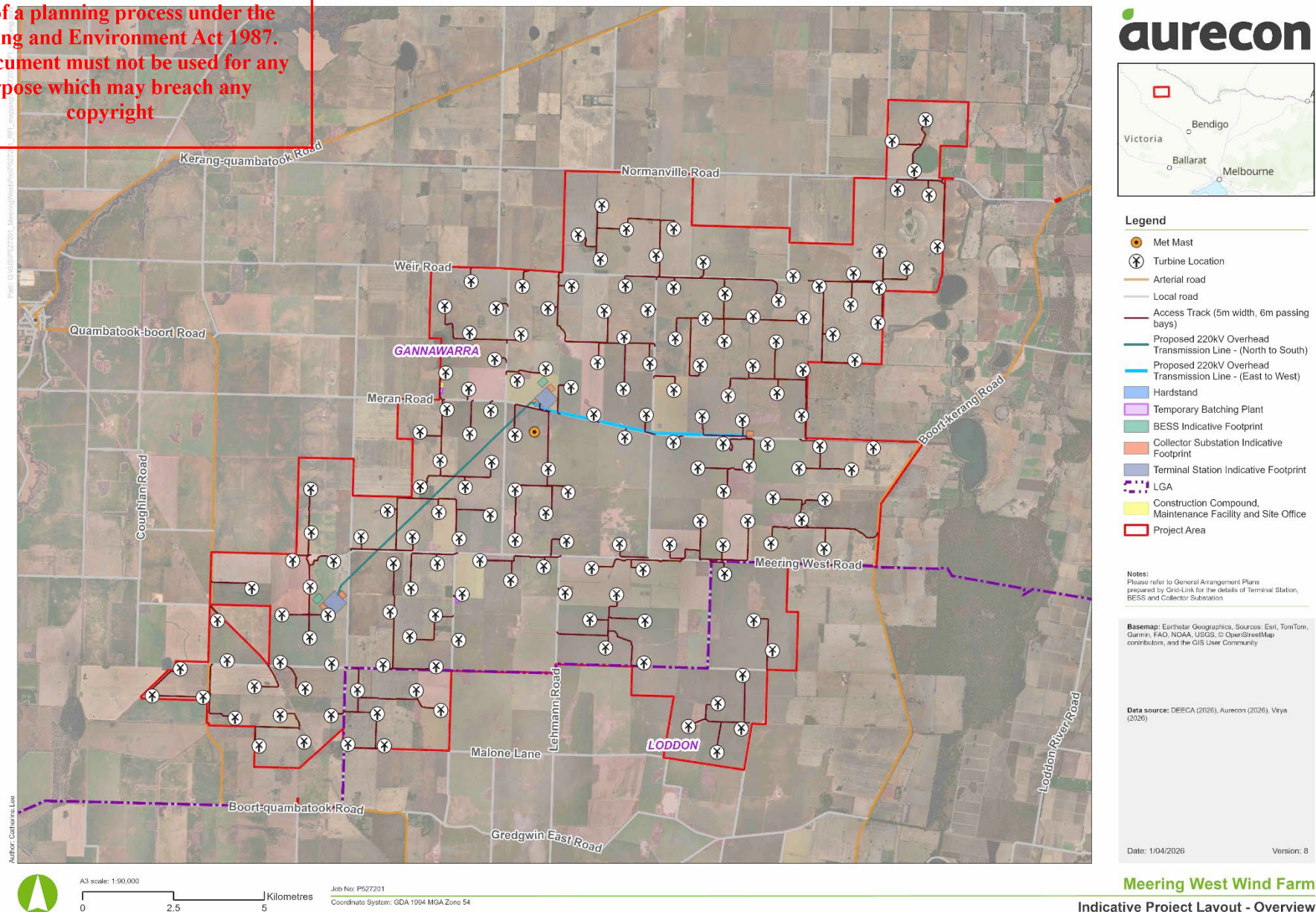


Figure 2-2 Indicative Project Layout

3 Legislative and policy context

The follow sections detail the legislation and policies applicable to this report.

3.1 Planning Guidelines for Development of Wind Energy Facilities

The Victorian State Government *Planning Guidelines for Development of Wind Energy Facilities* (DTP, 2023), provide a framework aimed at promoting the sustainable and effective deployment of wind energy projects while balancing environmental, social, and economic considerations.

These guidelines mention shadow flicker and a limit of 30 hours per year as the compliance standard to be met in Victoria. However, the guidelines have no detail on how the calculation should be implemented and the limit assessed (whether it is theoretical or realistic, as discussed in Section 5.1). To provide additional criteria for assessment, the Australian national guidelines are relied upon (see below).

3.2 Australian Draft National Guidelines

The Australian national guidelines for shadow flicker assessment are the Australian Draft National Guidelines¹ (2010). Aurecon considers the Draft National Guidelines to be appropriate, detailed and in accordance with other international guidelines and they have been used for reference in this assessment.

The Draft National Guidelines recommended limits are outlined in Section 5.

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¹ Commonwealth of Australia Environment Protection and Heritage Council (EPHC), "National Wind Farm Development Guidelines", DRAFT July 2010

4 Shadow Flicker

Shadow flicker is the fluctuation of light levels from the intermittent blocking of the sun, for example at a fixed ground position where the rotating blades block the sun, or when moving past objects such as closely spaced trees. In terms of a wind turbine, the shadow flicker effect will occur under circumstances where the wind turbine location and orientation are such that at certain times of the day, the sun's rays pass through the swept area of the rotating blades and cast a moving shadow. This effect is most pronounced within a building receiving natural light from outside via a window. Figure 4-1 shows an example of a wind turbine shadow on nearby land, which under the right conditions would cause shadow flicker.



Figure 4-1 Wind turbine shadow with potential to cause shadow flicker

4.1 Shadow Flicker Conditions

For a wind turbine to cause shadow flicker at a given location, the following conditions must be satisfied. If any one of these conditions is not met, then shadow flicker will either be greatly reduced, or potentially not occur from the viewpoint location:

- The sun must be in the correct position in the sky to cast a shadow of the turbine onto a particular viewpoint location. As the position of the sun relative to the turbine is continually changing the effect is limited in duration to certain times of the day and certain days of the year for each location.
- The wind turbine must be operational (i.e., the wind must be blowing and the blades rotating).
- The sun must not be significantly obscured by cloud.
- The sun must not be diffused by the atmosphere (typically occurs at low sun angles, see Figure 4-2).
- There must be an unobstructed line-of-sight between the wind turbine and the viewpoint location (i.e., the turbine is not hidden by buildings, trees).
- The dimension of the part of the blade causing the shadow must be large enough to cast significant shadow. The widest part of the blade (the chord near the root of the blade, which may be up to 5-6 m across) causes the most shadowing; the smallest part of the blade (the tip, which may be up to 0.5 m) is not sufficient to cast any noticeable shadow.

Once all the above factors are met, and shadow flicker is present, the intensity of its effect can vary. This is dependent on the positioning and orientation between the sun, the wind turbine and the receptor, in terms of position and intensity of the sun, distance between the turbine and viewpoint location and the angle of the turbine relative to the sun and the receptor.

When the receptor is close to the turbine, direct sunlight is blocked by the blade and the receptor experiences alternate full sunlight and full shade. As the distance between the receptor and wind turbine increases, the apparent size (angle) of the sun remains effectively constant, but the apparent size of the blade decreases, so less of the sun is blocked and the shadow is less strong.



Figure 4-2 Diffuse sunlight at low sun elevation angle, resulting in insignificant shadow flicker effects

4.2 Shadow flicker potential effects

The effects of shadow flicker can generally be classified as an annoyance or general discomfort to the affected residents living near the Project.

A perceived concern with shadow flicker is the potential to cause epileptic seizures. However, the evidence on shadow flicker does not support a health concern. According to the Draft National Guidelines (Section E.2.2 p 149), conventional three-bladed horizontal axis wind turbines with a rotor speed of 20 revolutions per minute cause shadow flicker at frequencies of around 1 Hz or less. This is considered well below the flicker frequency ranges identified for potential human health effects that may trigger epileptic seizures. Seizures are generally triggered by flashing lights between the frequencies of 5 to 30 Hz (flashes per second)². Additionally, 20 revolutions per minute was appropriate for typical wind turbines of the time (15 years ago), but modern larger turbines like the ones proposed at the Project rotate slower, at less than 10 revolutions per minute.

The primary effect of shadow flicker is annoyance or discomfort with no serious negative health effects anticipated or proven.

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² Epilepsy Foundation of America, <https://www.epilepsy.com/article/2014/3/shedding-light-photosensitivity-one-epilepsys-most-complex-conditions-0#:~:text=Generally%2C%20flashing%20lights%20between%20the,greater%20than%20three%20per%20second.>

5 Guidelines and limits

Shadow flicker can be classified in terms of having two potential limits. Firstly, the distance from which shadow flicker is noticeable, secondly the duration in which shadow flicker is felt. These limits are applicable to any residence other than residences owned by landowners hosting wind turbines.

The most appropriate Australian guidelines (based on international guidelines) for shadow flicker assessment and setting limits are the Australian Draft National Guidelines, as noted above.

Both the Draft National Guidelines and Victoria State Guidelines recommend assessing shadow flicker as the maximum value within 50m of the nominal residence location to account for outdoor residential areas (gardens) and uncertainty in the modelling and extent and location of the residence.

5.1 Distance

The Draft National Guidelines suggest a distance equivalent to 265 times the maximum blade width (chord) as an appropriate shadow flicker limit, beyond which shadow flicker from turbines is unlikely to cause annoyance. This corresponds to approximately 1,060 m to 1,325 m for current modern wind turbines (which typically have blade chord lengths of 4 m to 5 m). At this distance the blade covers 50% of the sun area.

The Draft National Guidelines were developed over 10 years ago when wind turbine sizes were significantly smaller and designs were less advanced. Aurecon considers that the recommended distance of 265 times maximum blade width is less appropriate for large modern wind turbines, as the ratio of blade width to length has decreased as wind turbine designs have progressed. Using this limit can cut off the modelling of shadow flicker before the extent of the 30-hour limit is reached. In other words, some locations predicted to experience over 30 hours of theoretical shadow flicker (albeit of a slightly lower intensity) are determined to have no effects when the limit of 265 times blade width is applied.

Therefore, a more conservative limit of 683 times the average blade width is used by Aurecon. At this distance only 20% of the sun is covered by the blade, so the shadows cast by the wind turbine are less pronounced and shadow flicker effects are less noticeable than at a closer distance to the turbine. The blade width used in the calculation is the average of the maximum blade width (chord) and blade width at 90% radius.

This alternative threshold was also considered in the Draft National Guidelines as it was (and still is) implemented as regulation in Germany³, in what the Draft National Guidelines noted were “by far the most comprehensive and well researched [international] regulations” reviewed. However, this alternative threshold was not recommended in the Draft National Guidelines at the time of publication as it was more conservative than the then-current Australian approaches of approximately 1 km distance from ~2MW wind turbines. The Draft National Guidelines’ recommendation of 265 times maximum blade width was more in line with the ~1 km distances typically used in Australian wind farm developments at the time. This is now significantly out of date and so the more conservative limit of 683 times the average blade width is used as the distance limit in this assessment.

The two thresholds are summarised in Table 5-1 and Figure 5-1 below.

Table 5-1 Turbine distance and proportion of sun blocked

Distance to turbine (metres)	Blade subtended angle	Proportion of the sun blocked
265 x blade width	0.216°	50%
683 x blade width	0.0844°	20%

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³ “Hinweise zur Ermittlung und Beurteilung der optischen Immissionen von Windenergieanlagen (WEA-Schattenwurf-Hinweise)” (Guideline for Identification and Evaluation of the Optical Emissions of Wind Turbines)

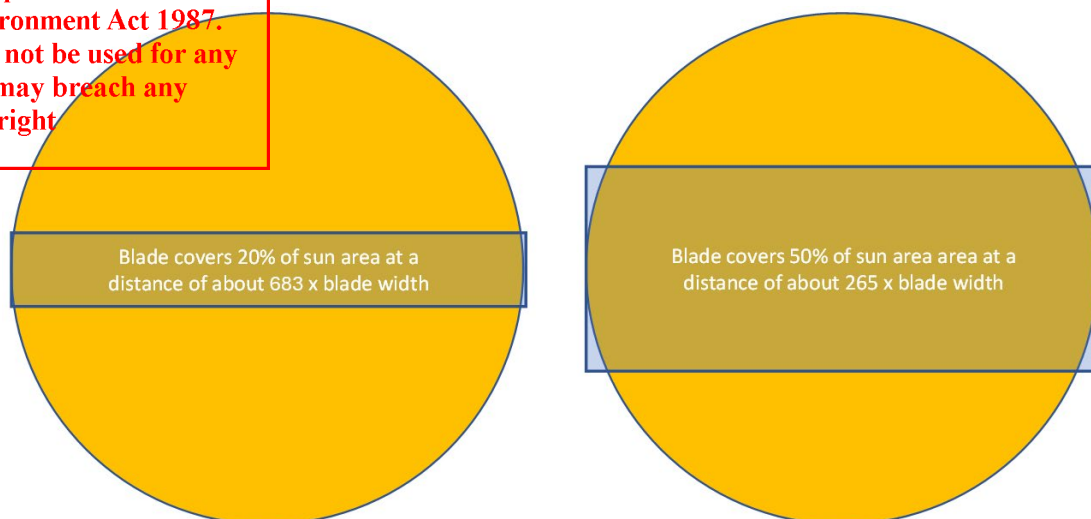


Figure 5-1 Proportion of sun blocked by blade

5.2 Duration

The accepted shadow flicker duration limits within the Australian Draft National Guidelines are:

- Limit of **30** hours per year and 30 minutes per day **theoretical** (modelled) duration

If the theoretical duration limit is exceeded:

- Limit of **10** hours per year and 30 minutes per day **realistic** (modelled) or **actual** (measured) duration.

Aurecon considers these to be appropriate and in accordance with other international guidelines. A more in-depth explanation of theoretical, realistic and actual duration is outlined below. If the limit based on theoretical duration is exceeded, then the realistic duration should be considered. If the realistic duration is exceeded at a residence, then the effect must be mitigated ensuring that the limit on actual duration is met.

Theoretical Duration

Limit of 30 hours per year and 30 minutes per day **theoretical** (modelled) duration, based on:

- Turbine rotor assumed to be orientated towards the sun at all times
- Minimum sun elevation angle 3° (see Figure 4-2 which shows diffuse sunlight resulting in poorly defined shadows and therefore minimal shadow flicker impact at low sun elevation)
- Time and duration of modelling: one full non-leap year
- Receptor height of between 1.5 - 2 m and window / balcony height where residences have more than one storey
- No shadow if the turbine is behind the terrain (no line of sight)

If the limit on theoretical duration is not met:

Realistic Duration

Limit of 10 hours per year and 30 minutes per day **realistic** duration, based on theoretical plus:

- Duration reduced by proportion of time that there is cloud cover (using relevant local data)
- Duration reduced by proportion of time that turbine is not operating, due to wind speed being too high or too low or turbine stopped for maintenance or fault

- No shadow if the view of a source turbine is blocked by dense vegetation (tree, hedge) or structure⁴ (fence, building)

If the limit on realistic duration is not met:

Actual Duration

Limit of 10 hours per year and 30 minutes per day **actual** duration, using a pre-programmed timer to shut down turbine(s) at times the sun is in a position that shadow flicker will occur, unless the turbine rotor is parallel to the line from residence to sun or the sun is behind cloud.

Appendix E of the Draft National Guideline provides details on how the durations are calculated. These are explained in more detail in Sections 6.1 and 6.2.

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⁴ Only where the obstruction completely blocks the view, from the receptor, of a turbine that is contributing to shadow flicker.

6 Methodology

Aurecon has undertaken a shadow flicker assessment for nearby residences within approximately 8 km of the wind farm, using WindPRO version 4.0 software. Terrain data used in the modelling was Copernicus Digital Surface Model (DSM) contour data (30 m resolution, 10 m contours) for the Project and surrounding area. This is relatively low resolution but sufficient for shadow flicker modelling given the simple terrain.

While the quantity, model and layout of the turbines have not been finalised for construction yet, this assessment has applied a conservative approach to determine the 'worst case' shadow flicker effect. The analysis is based on 164 turbines and uses the largest possible turbine dimensions being considered in the planning application (see Section 2.3). These parameters are outlined as follows:

- Blade tip height: 280 m
- Hub height: 194 m
- Rotor diameter: 172 m

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A generic turbine of these dimensions has been modelled. The blade width at the widest point and at 90% radius have been estimated as 4.6 m and 1.6 m respectively based on benchmarking of available turbines of these dimensions, giving an average blade width of 3.1 m.

The locations and addresses of surrounding residences were identified from satellite imagery and confirmed by the Proponent, and are listed in Appendix 1. The residences are divided into "involved" (host residences, within the Project Area or as advised by the Proponent) and "non-involved." Shadow flicker limits typically do not apply to involved residents as they will be financially compensated for hosting the wind farm.

The modelling has been carried out using the following factors:

- Calculations are performed at 1-minute time intervals and 1-day intervals with a resolution of 1 m
- The digital terrain model was used to calculate turbine/sun visibility with visibility line-of-sight calculated with a resolution of 15 m
- The viewing window for each location was assumed to be 1 x 1 m in size with viewer located at 2.0 m above ground level
- The average blade width for the modelled turbine is 3.1 m. Shadow flicker is not calculated beyond 2,103 m (683 x average blade width).

The following sections outline how the theoretical and realistic duration are determined.

6.1 Theoretical duration

The WindPRO model simulates the path of the sun during the year and can calculate the relative positions of the sun, wind turbines, residences and terrain to predict the possible shadow flicker durations in the vicinity of the Project Area from a purely geometrical standpoint. This calculation gives the theoretical number of shadow flicker hours experienced at each nearby residence.

6.2 Realistic duration

As outlined in Section 5.2, the actual shadow flicker hours per year will be less than the theoretical as there are a number of factors the analysis does not consider, including the presence of cloud cover, vegetation screening or intervening structures, the orientation of the wind turbine and periods when the wind turbines are not operating. Aside from screening vegetation and objects, it is generally cloud cover that provides the most substantial reduction from theoretical to realistic in the amount of shadow flicker experienced by receptors.

The realistic duration reduction is only applicable for the total hours per year limitation (30 hours), as the theoretical predicted number of minutes per day may still be achieved despite all of these factors e.g. on a sunny day with the turbine operational.

The reductions applied to calculate realistic shadow flicker from theoretical are:

- Sunshine hours: approximately 60% of yearly daylight hours at the Project location, according to the Australian Bureau of Meteorology⁵
- Availability of turbines: 97% (proportion of time not operating due to maintenance, faults, or other non-operation such as cable unwinding = 3%)
- Operating time: 95% (proportion of time not operating due to high or low wind = 5%).

Combining these factors, realistic duration is assessed to be 56.1% of theoretical duration.

Some factors, outlined below, were not accounted for in this analysis, despite being mentioned in Section 5.2. If the below factors were considered it would further reduce the realistic duration percentage, making this analysis more conservative.

- Rotor orientation relative to the sun
- Orientation of residence windows
- Dense vegetation blocking sunlight.

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⁵ Bureau of Meteorology, <http://www.bom.gov.au/watl/sunshine/>

The potential shadow flicker effect at each residence location affected by shadow flicker is outlined in Table 7-1 (non-involved residences) and Table 7-2 (involved residences). Other residences are too far away or at the wrong orientation relative to the wind farm to experience any significant shadow flicker. The results are displayed in descending order of total predicted shadow flicker per year. Realistic shadow flicker duration is only displayed if the theoretical shadow flicker limit (30 hours per year) is exceeded, in accordance with the Draft National Guidelines.

The shadow flicker results presented below are generally for the residence location rather than the highest value within 50m as recommended by the Draft National Guidelines because Aurecon has checked and confirmed that using the highest value within 50m of the residence location does not change whether any residences are above the shadow flicker limits. The exceptions to this are:

- Dwellings #64, 65, 98, and 138 (all non-involved), which are just beyond the shadow flicker range limit i.e. no shadow flicker is predicted at the residence coordinates but some is predicted within 50m of the residence. The result for these residences has been determined by extending the shadow flicker calculation to cover them.
- Dwellings #50, 115, and 126 (all involved), which are within the shadow flicker limits at the residence location but above the limit for minutes per day within 50m of the residence location. The results for these residences has been estimated using the shadow flicker map.

Seven non-involved residences are predicted to experience shadow flicker, but none are above the shadow flicker limits. Almost all (11 out of 12) involved (landowner) residences will experience shadow flicker. Of these, seven are above the shadow flicker limits due to their proximity to many turbines, but shadow flicker limits typically do not apply to these residents as they will be financially compensated for hosting the wind farm. As per DTP's model planning permit conditions⁶, the Project may enter into an agreement with landholders to waive shadow flicker requirements.

Table 7-1 Non-involved residences affected by shadow flicker

Dwelling ID	Turbine(s) causing shadow flicker	Distance to turbine causing most shadow flicker [km]	Theoretical shadow flicker per year [hh:mm]	Realistic shadow flicker per year [hh:mm]	Max shadow flicker per day [hh:mm]	Shadow flicker limits exceeded
52	WTG2, WTG4	2.0	19:04	n/a	0:21	No
138*	WTG165	2.1	18:52	n/a	0:21	No
51	WTG2, WTG4	2.1	17:53	n/a	0:21	No
98*	WTG76	2.1	10:17	n/a	0:20	No
65*	WTG9	2.1	7:16	n/a	0:19	No
60	WTG5	2.0	6:20	n/a	0:20	No
64*	WTG4	2.1	5:56	n/a	0:18	No

* Result at residence location, even though residence is outside of the shadow flicker distance limit

Table 7-2 Involved residences affected by shadow flicker

Dwelling ID	Turbine(s) causing shadow flicker	Distance to turbine causing most shadow flicker [km]	Theoretical shadow flicker per year [hh:mm]	Realistic shadow flicker per year [hh:mm]	Max shadow flicker per day [hh:mm]	Shadow flicker limits exceeded
80	WTG32, WTG39, WTG44, WTG40, WTG29	1.3	83:44	46:56	0:57	Yes, n/a
100	WTG70, WTG63, WTG62, WTG71, WTG78	1.0	69:05	38:43	0:41	Yes, n/a
108	WTG86, WTG92	0.9	59:44	33:29	0:47	Yes, n/a

⁶ <https://www.planning.vic.gov.au/guides-and-resources/guides/all-guides/renewable-energy-facilities/wind-energy-facilities#:~:text=Read%20more-,Model%20permit%20conditions,of%20each%20wind%20energy%20proposal.>

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Dwelling ID	Turbine(s) causing shadow flicker	Distance to turbine causing most shadow flicker [km]	Theoretical shadow flicker per year [hh:mm]	Realistic shadow flicker per year [hh:mm]	Max shadow flicker per day [hh:mm]	Shadow flicker limits exceeded
72	WTG16, WTG23, WTG11	0.9	50:40	28:24	0:42	Yes, n/a
69	WTG14, WTG21, WTG15	1.3	35:55	20:08	0:30	Yes, n/a
121	WTG118	0.9	35:00	19:37	0:43	Yes, n/a
127	WTG132, WTG133, WTG138	1.5	30:15	16:57	0:46	Yes, n/a
50**	WTG3, WTG4	1.4	23:38	n/a	0:30**	Yes, n/a
126**	WTG136, WTG124, WTG123	1.5	22:33	n/a	0:30**	Yes, n/a
115**	WTG109, WTG98	1.4	20:47	n/a	0:30**	Yes, n/a
105	WTG88, WTG79	1.6	18:04	n/a	0:25	No

** Highest result within 50m of the residence location

The above shadow flicker results are illustrated in Figure 7-1 for the theoretical duration per year. We note that the map is produced at a lower calculation resolution than the results for each receptor shown in the table above, so the results above are more precise than the map illustration below.

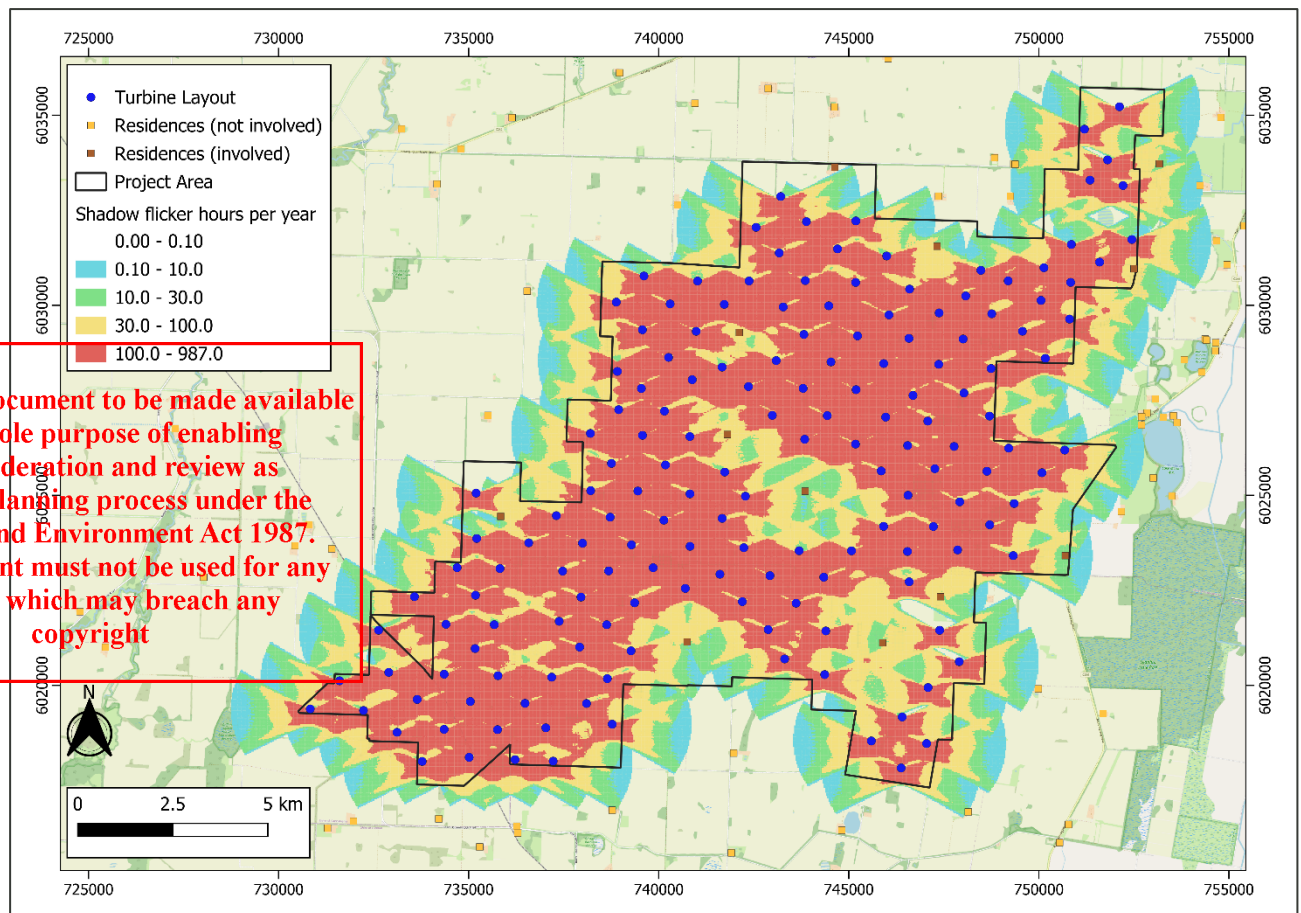


Figure 7-1 Shadow flicker map showing theoretical (worst-case) annual shadow flicker

See Appendix 1 for a graphical report showing shadow flicker effects for affected residences throughout the year.

The results presented in this report are for the largest turbine rotor size and the greatest number of turbines. If a smaller turbine is installed, then the duration will be less. The final assessment of compliance should be performed when the turbine model and layout are finalised.

Mitigation strategies are likely not to be required as no non-involved residences exceed the duration limits. However, mitigation may be required if the turbine model or layout is adjusted.

7.1 Cumulative assessment

Cumulative effects of shadow flicker have been assessed due to the proximity of the proposed Normanville Energy Park wind farm immediately to the north of the Project.

The layout and maximum turbine dimensions for the neighbouring wind farm were obtained from the development application shadow flicker report⁷. The development will comprise of up to 17 turbines with dimensions of up to:

- Blade tip height: 280 m
- Hub height: 180 m
- Rotor diameter: 175 m

Shadow flicker was modelled for these turbines following the same process outlined in Section 6.

No residences are predicted to be affected by cumulative shadow flicker from the neighbouring Normanville Energy Park as the closest residences are outside of the maximum distance for which shadow flicker is assessed from turbines of both the Project and Normanville Energy Park.

The shadow flicker from the Project and Normanville Energy Park is shown with the locations of nearby residences in Figure 7-2.

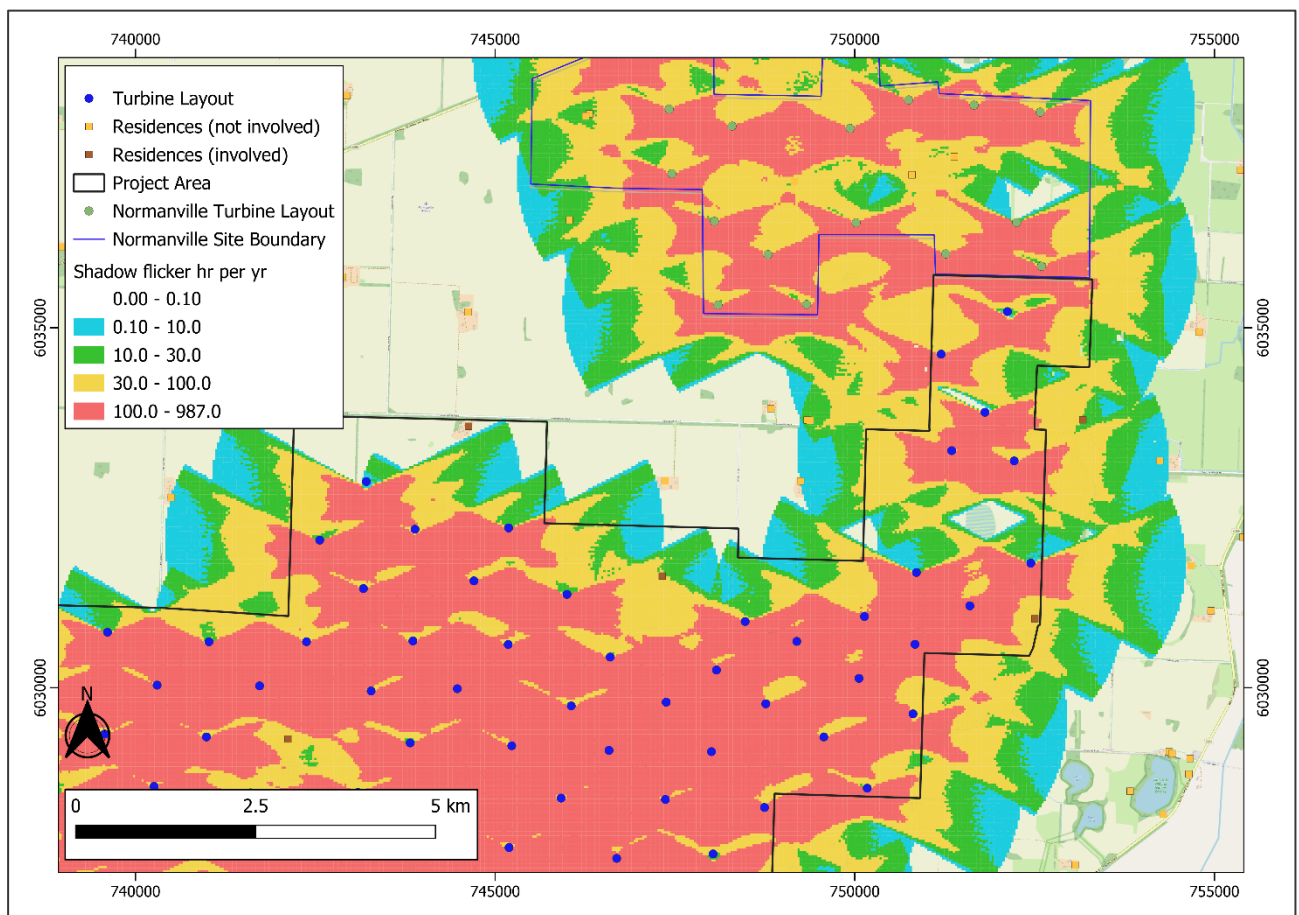


Figure 7-2 Shadow flicker map showing theoretical (worst-case) annual shadow flicker with cumulative impacts

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⁷ GHD Pty Ltd, "Normanville Energy Park - Shadow Flicker and Blade Glint Assessment", copyright dated 13/11/2024, obtained from <https://www.planning.vic.gov.au/planning-approvals/ministerial-permits-register/ministerial-permits/64441b05-6ebe-ef11-b8e8-002248938a9c>

8 Mitigation

Aurecon notes that no mitigation strategies are needed with the current turbine model and layout. However, should the layout change and mitigation be required effective strategies can be:

- Screening vegetation. Vegetation has not been included in this shadow flicker assessment as no site visit has been conducted, so the height and thickness of vegetation could not be modelled. If mitigation is recommended as a result of a shadow flicker assessment later in the Project development, then the existing vegetation should be included in the assessment to determine whether mitigation is still required.
- Turbine shut-down protocol which will switch off the turbines causing shadow flicker so that the total actual duration at receptors is no more than the allowable limit. “Flicker timers” are standard additions to the turbine SCADA (Supervisory Control and Data Acquisition) system that can automate this process by stopping each relevant turbine at the date and time of day when the sun is in a position that would cause shadow flicker. In addition, each relevant turbine can be fitted with a light sensor so that the turbine is only stopped when there is direct sunlight, and rotor orientation can also be considered so that the turbine is not shut down if the rotor is near-parallel to the line from the residence to the sun.

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9 Blade glint

Blade glint refers to the intermittent reflection of the sun's light from the surface of wind turbine blades. The occurrence of blade glint depends on several conditions including the reflectivity of the surface of the blades, influenced to some extent by the colour and age of the blade as well as the orientation of the nacelle, the angle of the blade, and the angle of the sun. Blade glint can be a temporary effect at any particular location.

The Draft National Guidelines and Victorian State Government Guidelines provide guidelines on mitigating blade glint by recommending developers ensure that blades from their supplier are of low reflectivity. All major wind turbine blade manufacturers currently finish their blades with a low reflectivity treatment. This is also a common requirement of planning permit conditions under DTP's model permit conditions. This prevents the potentially annoying reflective glint from the surface of the blades and the possibility of a strobing reflection when the turbine blades are spinning. Therefore, the risk of blade glint from the Project is very low.

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10 Conclusions and Recommendations

Shadow flicker is the fluctuation of light levels from the intermittent blocking of the sun due to wind turbine blades spinning and can be an annoyance for nearby residences. No non-involved residences are predicted to experience shadow flicker duration above the allowable limit of 30 hours per year and/or 30 minutes per day (theoretical duration) in accordance with the relevant guidelines.

Aurecon recommends the following process to ensure that the effects of shadow flicker are no more than minor at the relevant residences:

- Reassess realistic shadow flicker for final layout and turbine model, taking into account the visibility of the turbines from the residence due to vegetation and other screening if necessary
- After revision of the assessment, if the shadow flicker theoretical duration limit is exceeded, then mitigation should be applied to meet the limit for actual duration.

As discussed in Section 8, mitigation if needed for the final layout and turbine type may involve enhancement of the existing vegetation between the residences and the turbines, or a shadow flicker timer in the turbine control system (SCADA) to ensure that actual shadow flicker does not exceed the relevant limit.

Blade glint and cumulative shadow flicker effects are not expected to be an issue for the Project. Blade glint will be mitigated due to non-reflective paint used on wind turbine components. Cumulative shadow flicker does not have an effect as there are no residences that have an overlapping shadow from turbines in both projects.

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Appendix 1 - Shadow flicker reports

The following attached results from the WindPRO software outline the shadow flicker calculation inputs, settings and outputs. They also illustrate the times at which shadow flicker will occur and turbines causing shadow flicker for each residence.

Sunrise and sunset are shown as solid lines on the graphs, and the time is given as local time so sunrise and sunset shift by an hour in April and September due to daylight savings.

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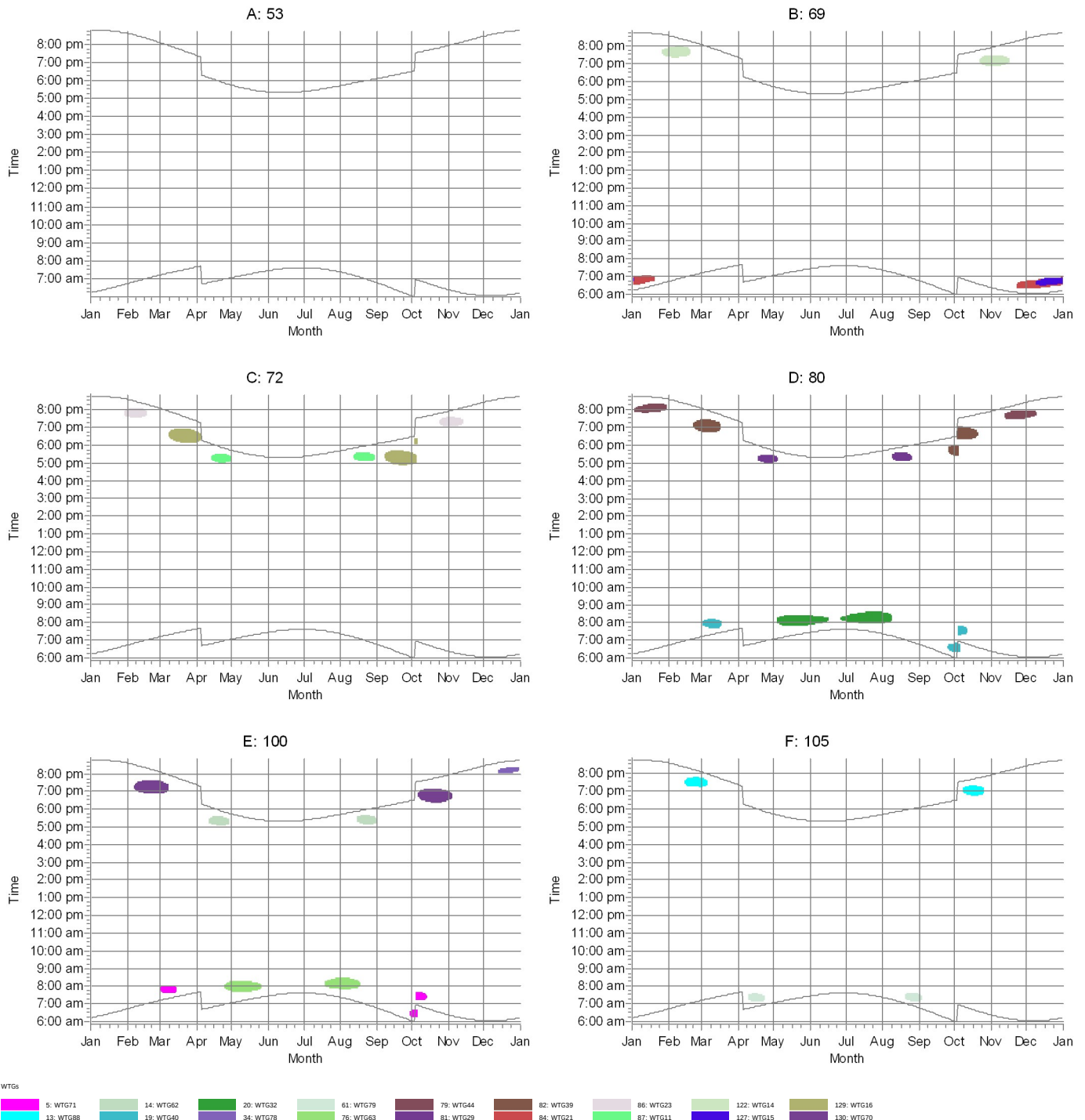
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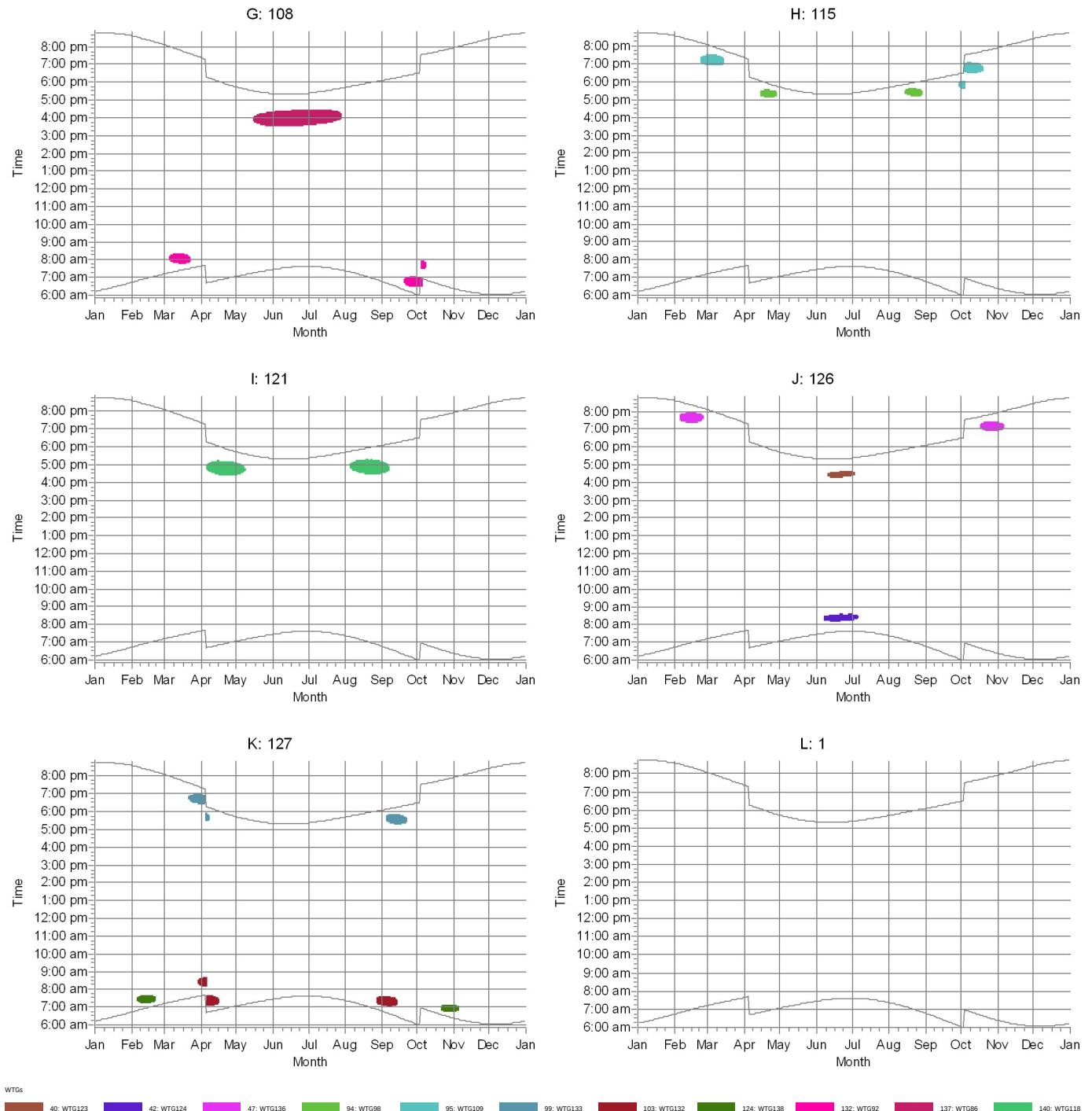
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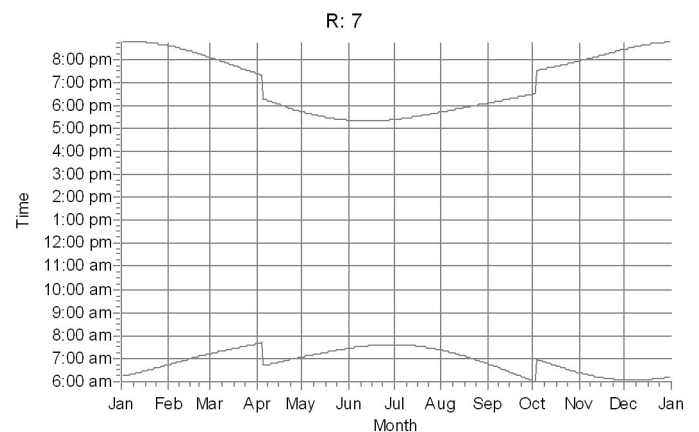
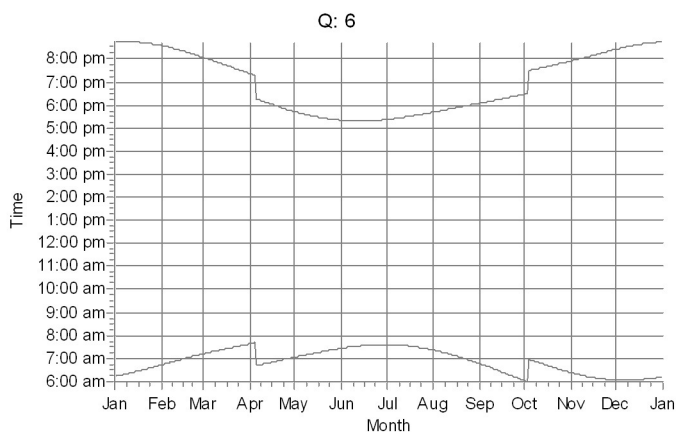
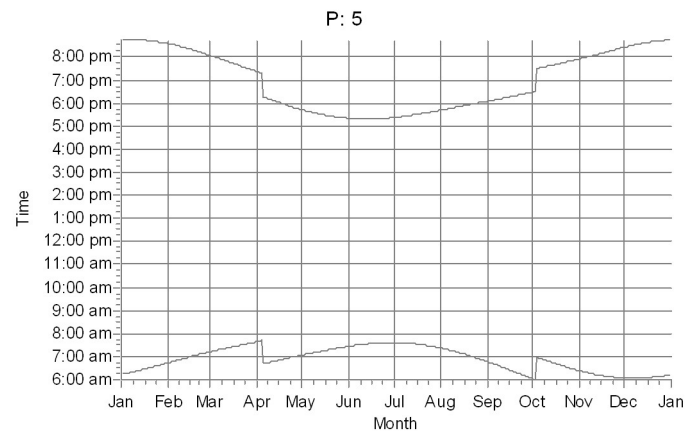
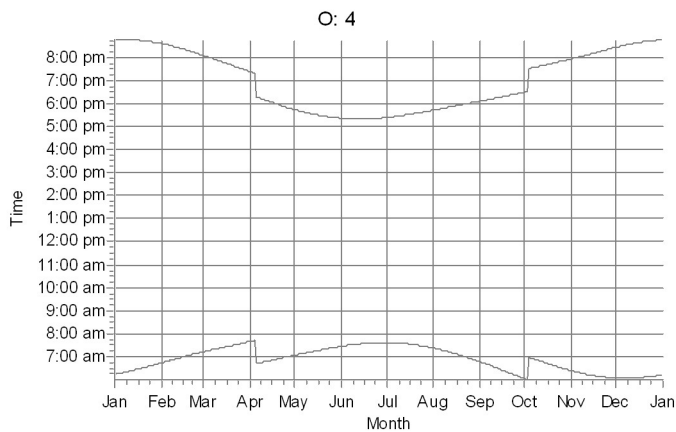
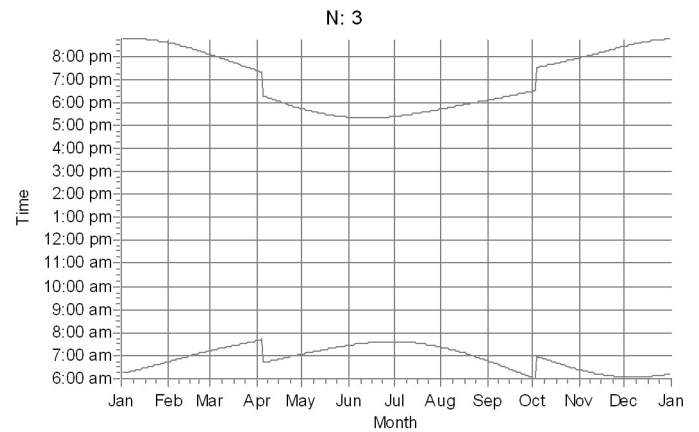
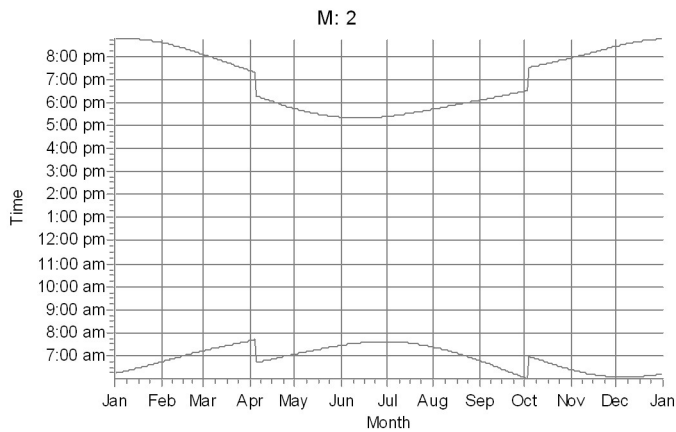


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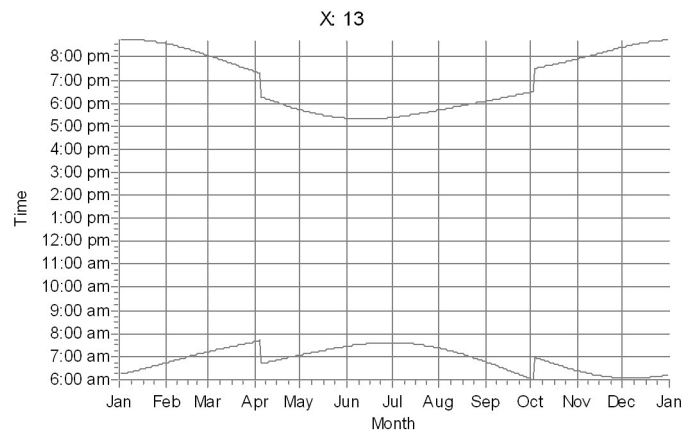
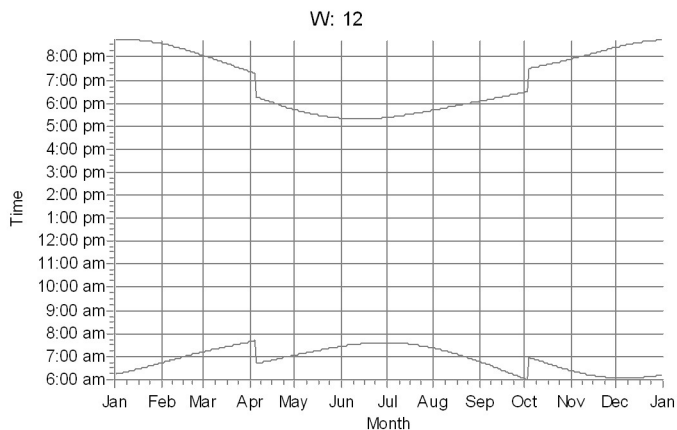
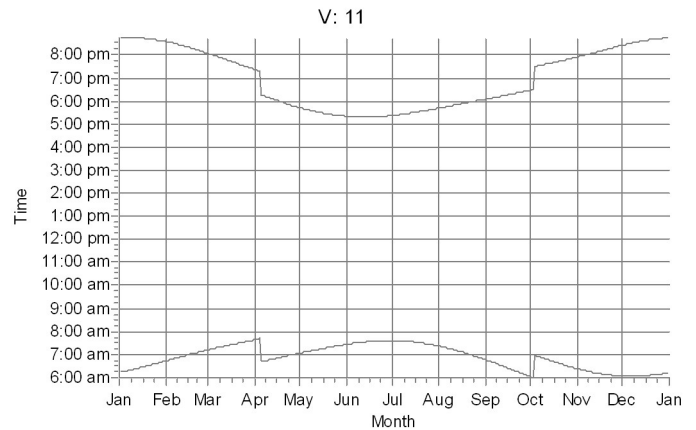
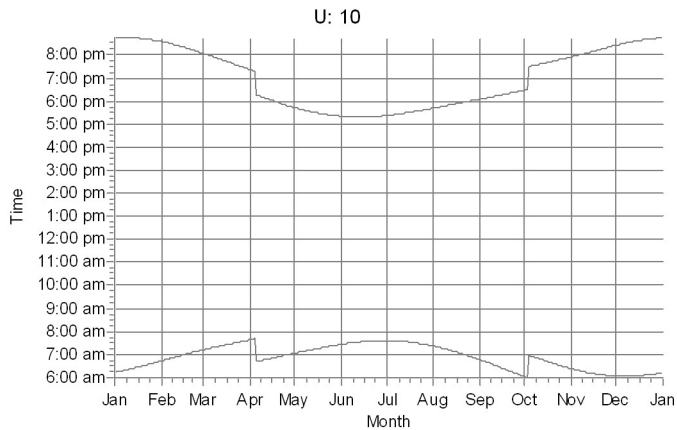
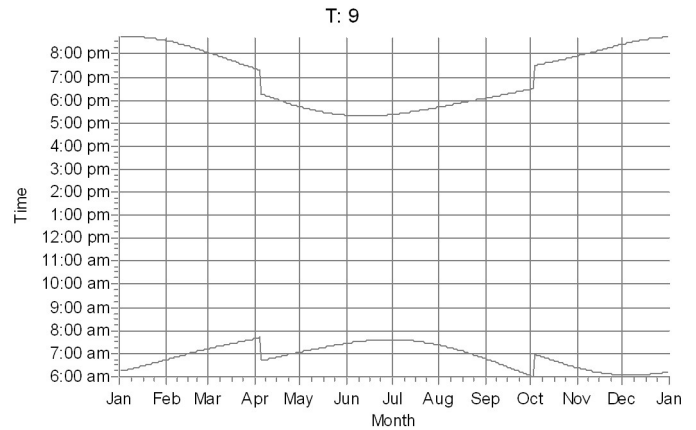
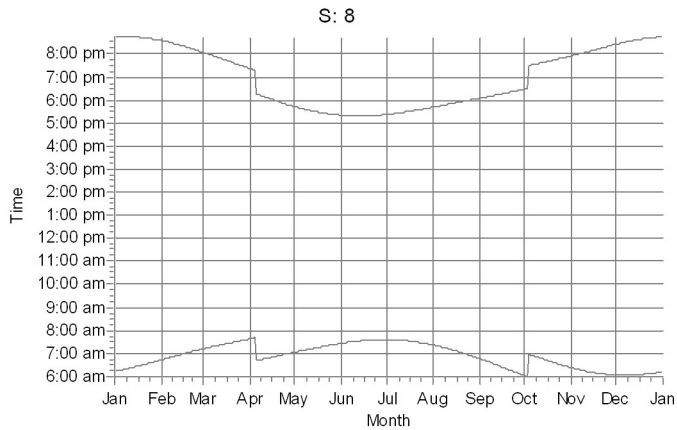
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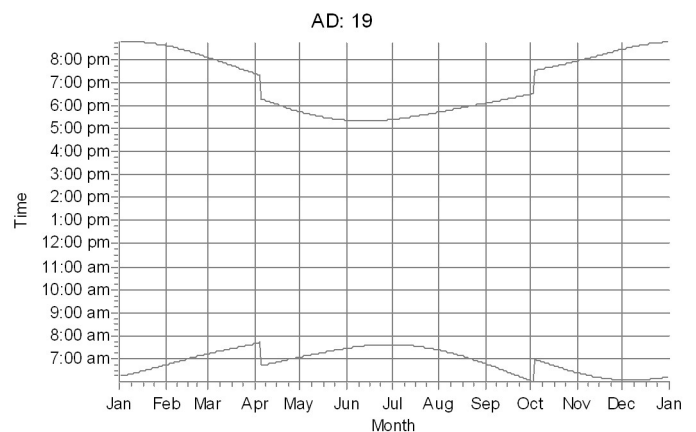
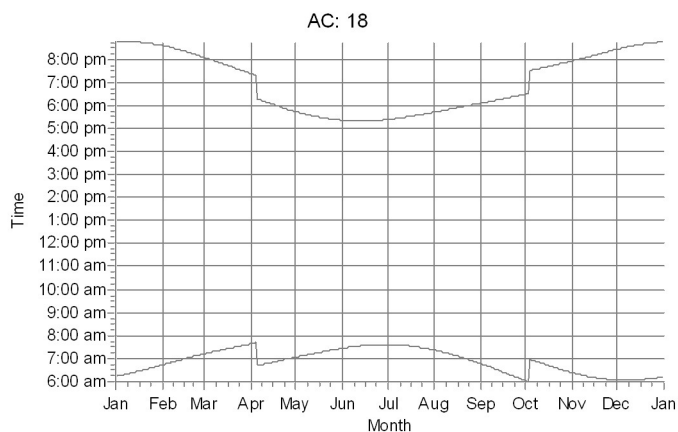
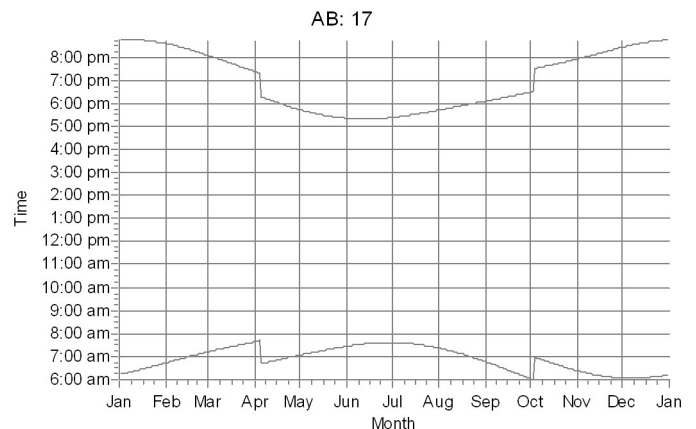
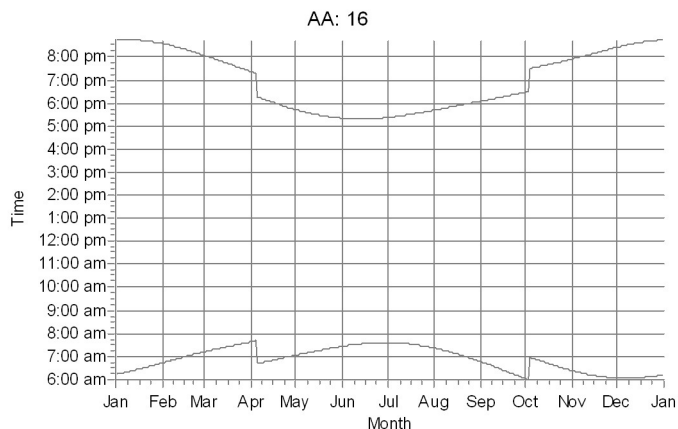
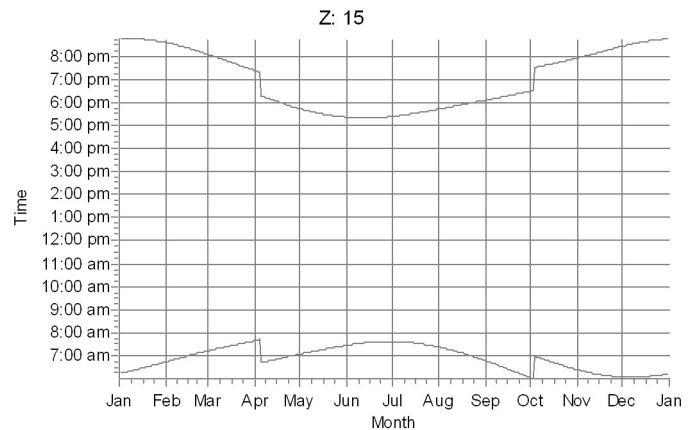
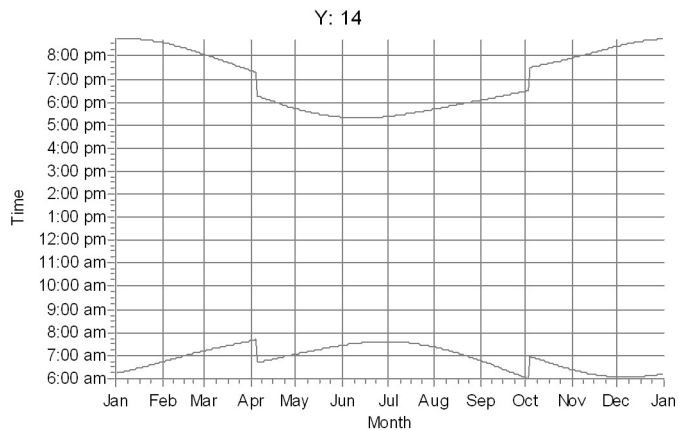
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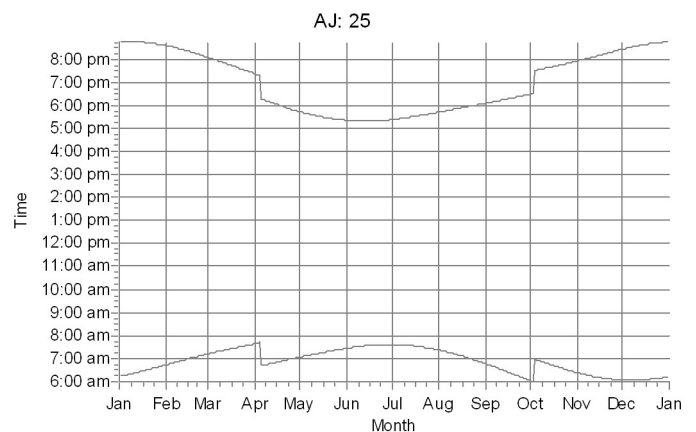
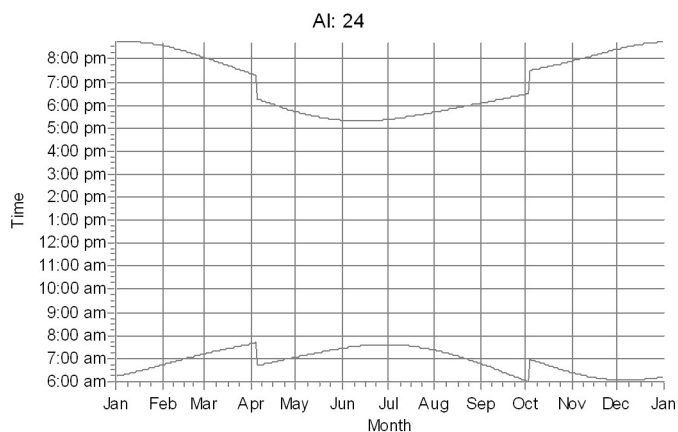
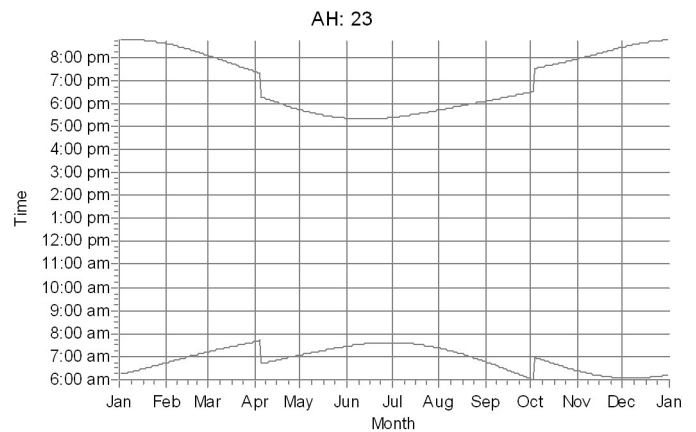
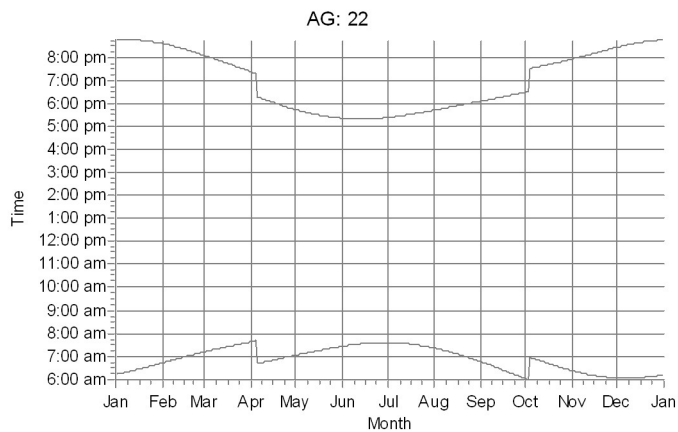
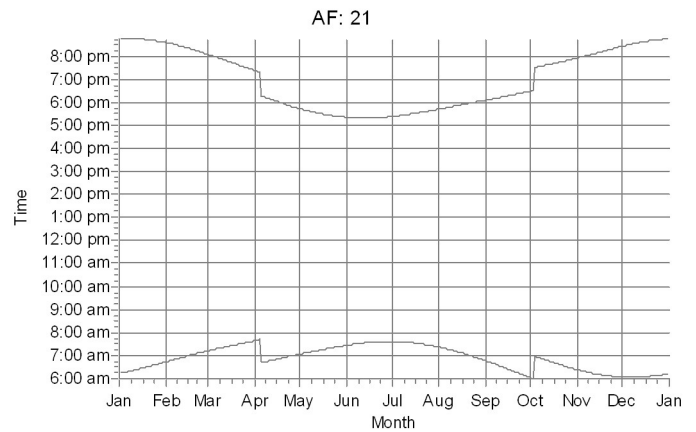
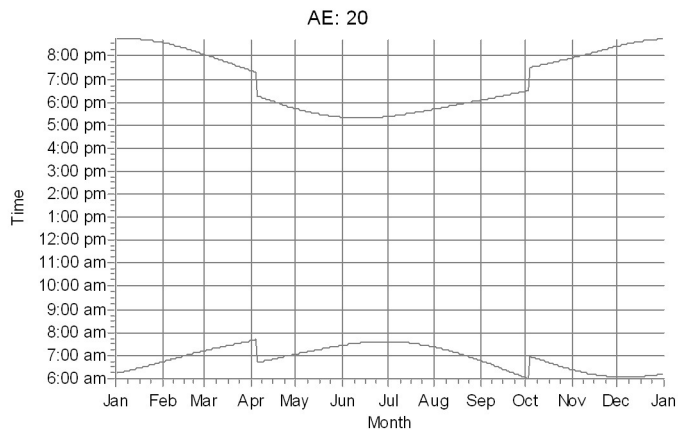
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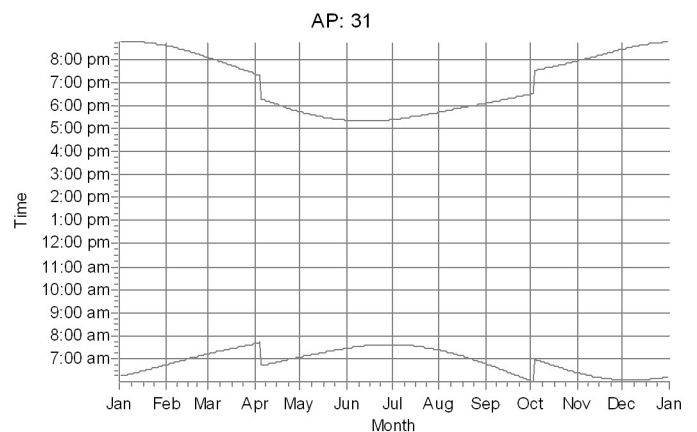
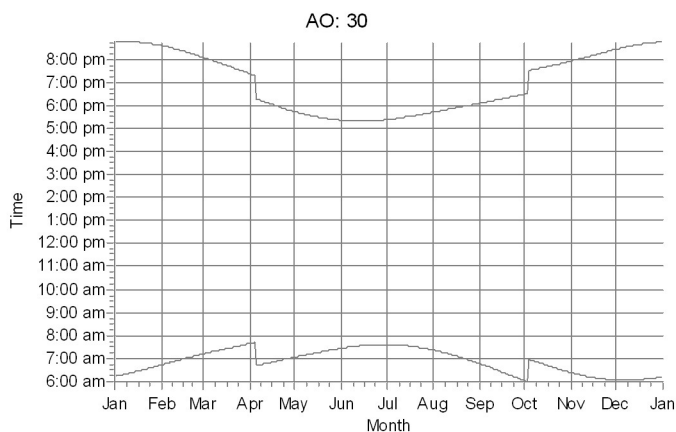
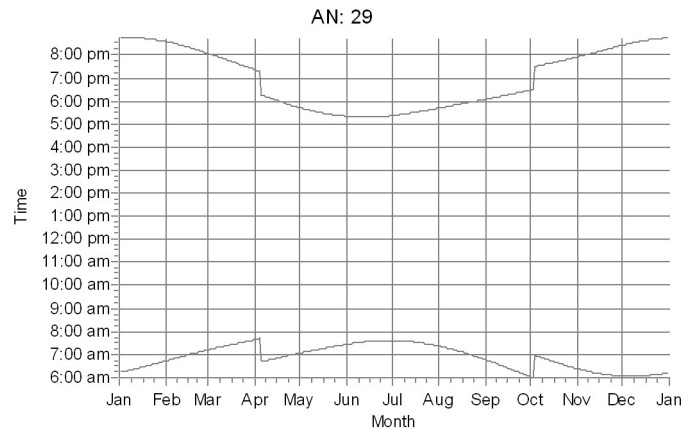
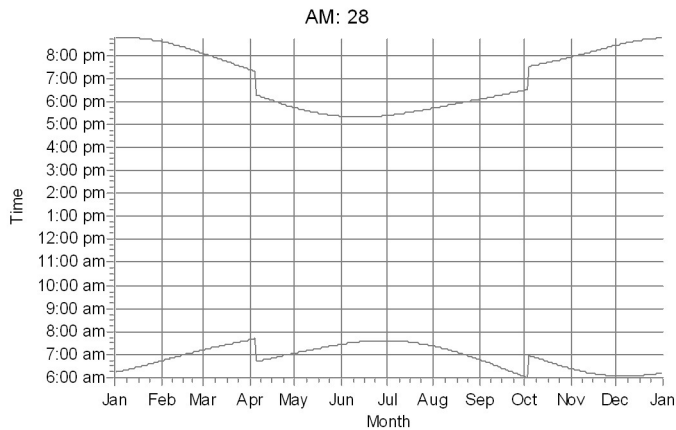
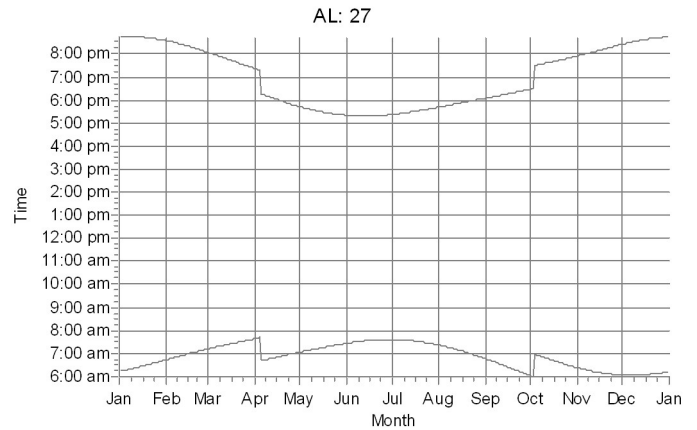
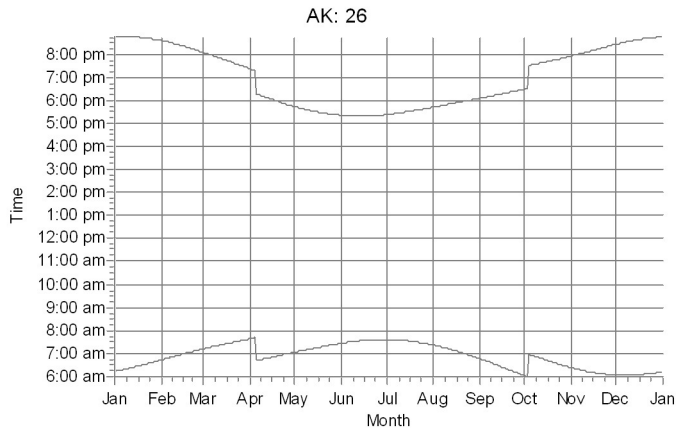
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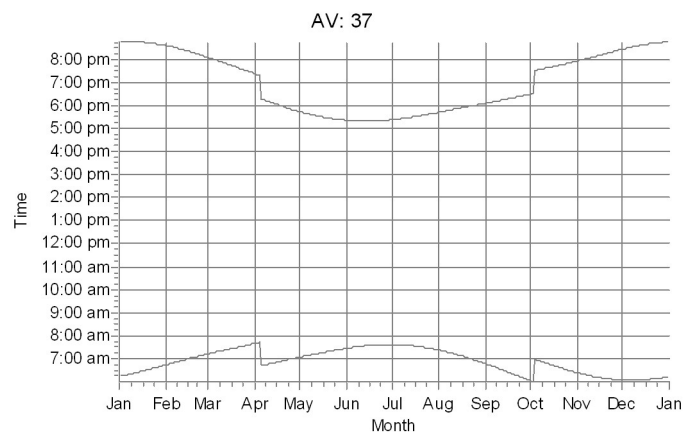
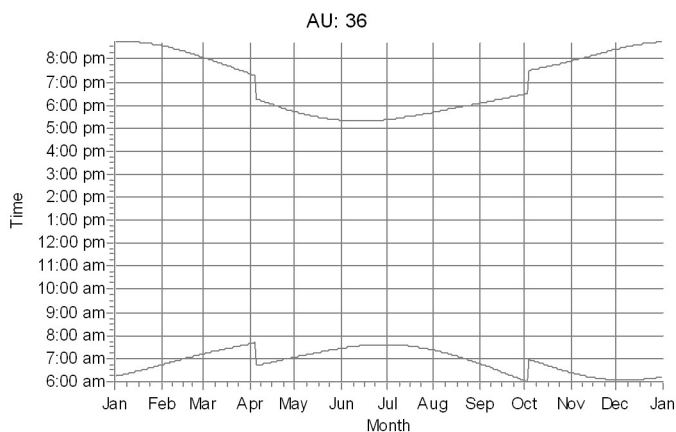
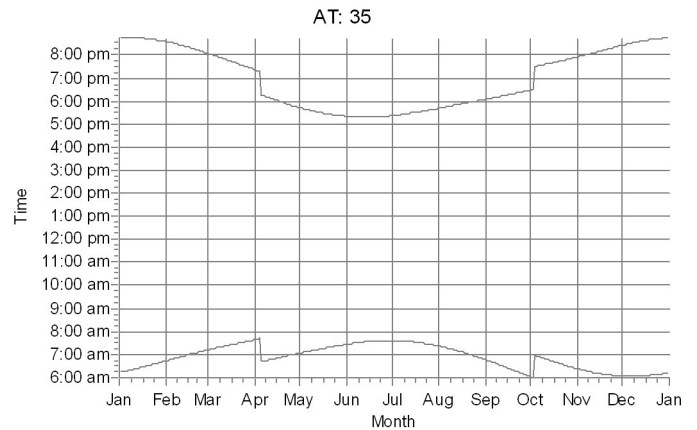
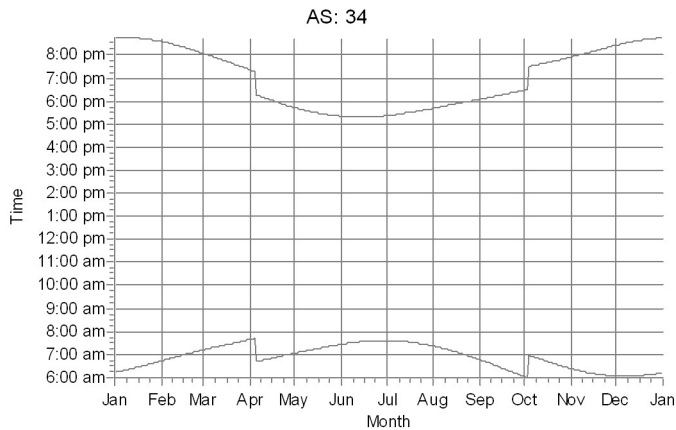
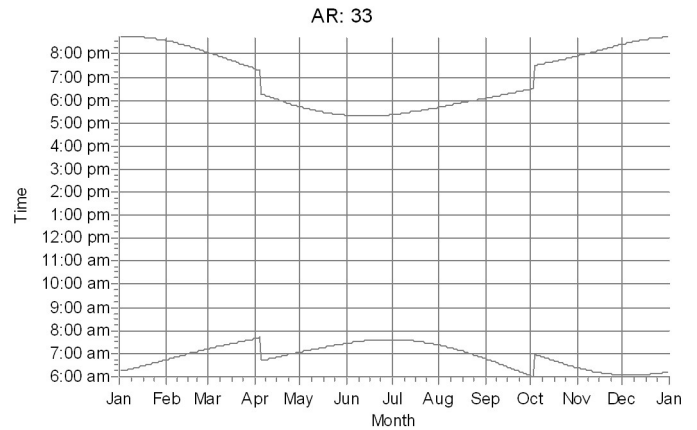
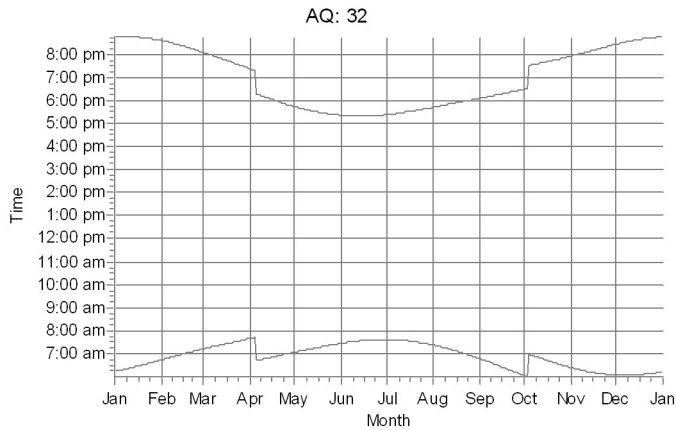
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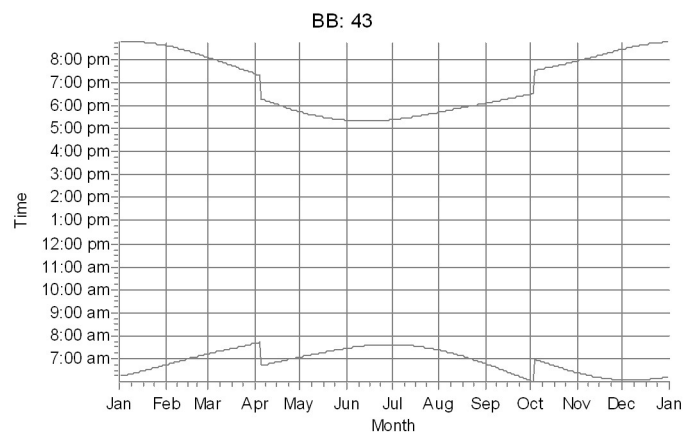
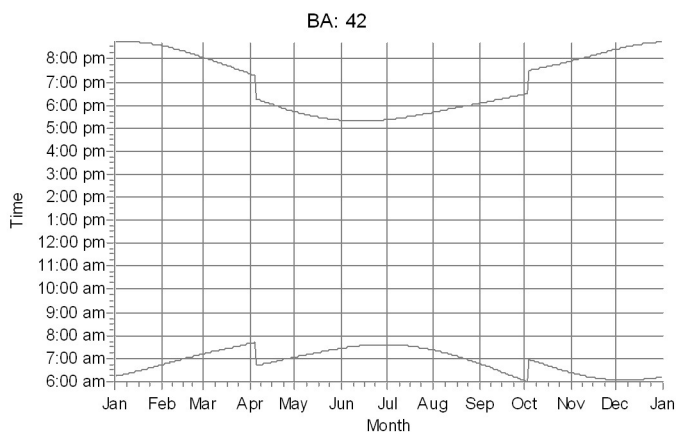
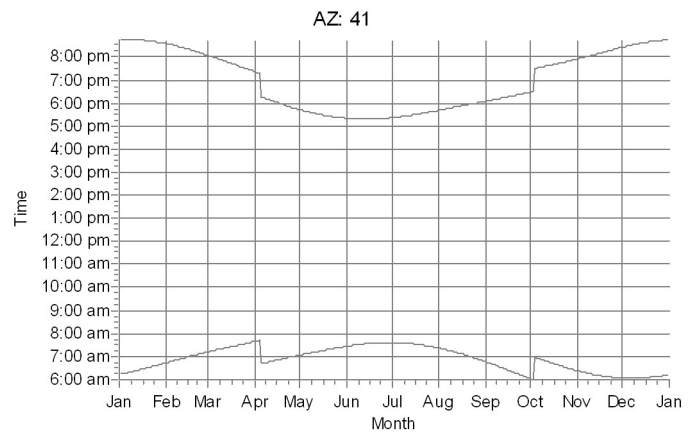
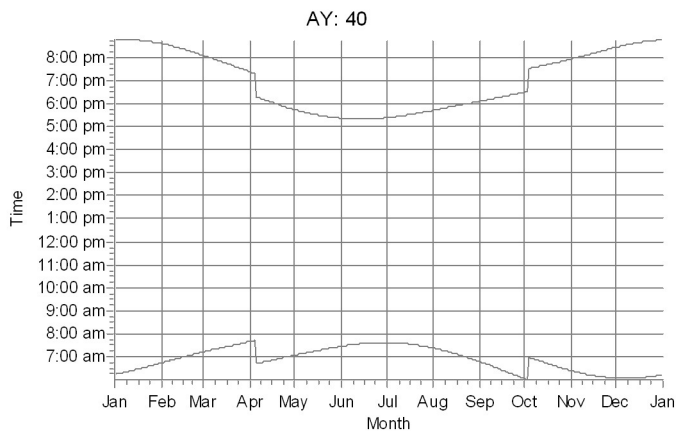
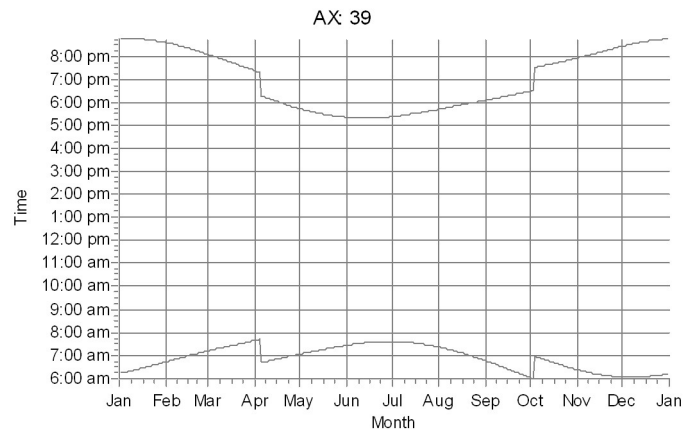
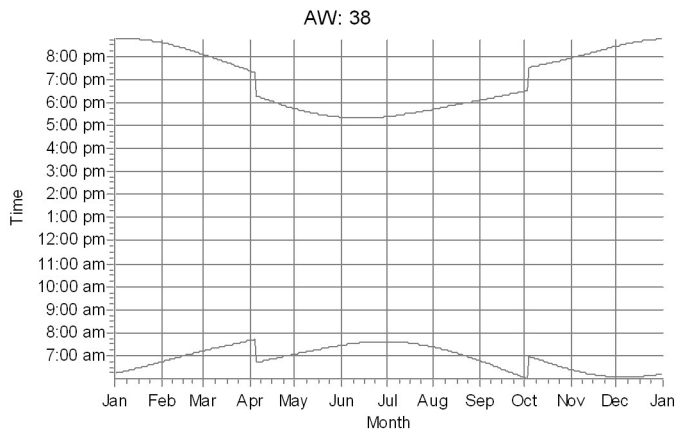
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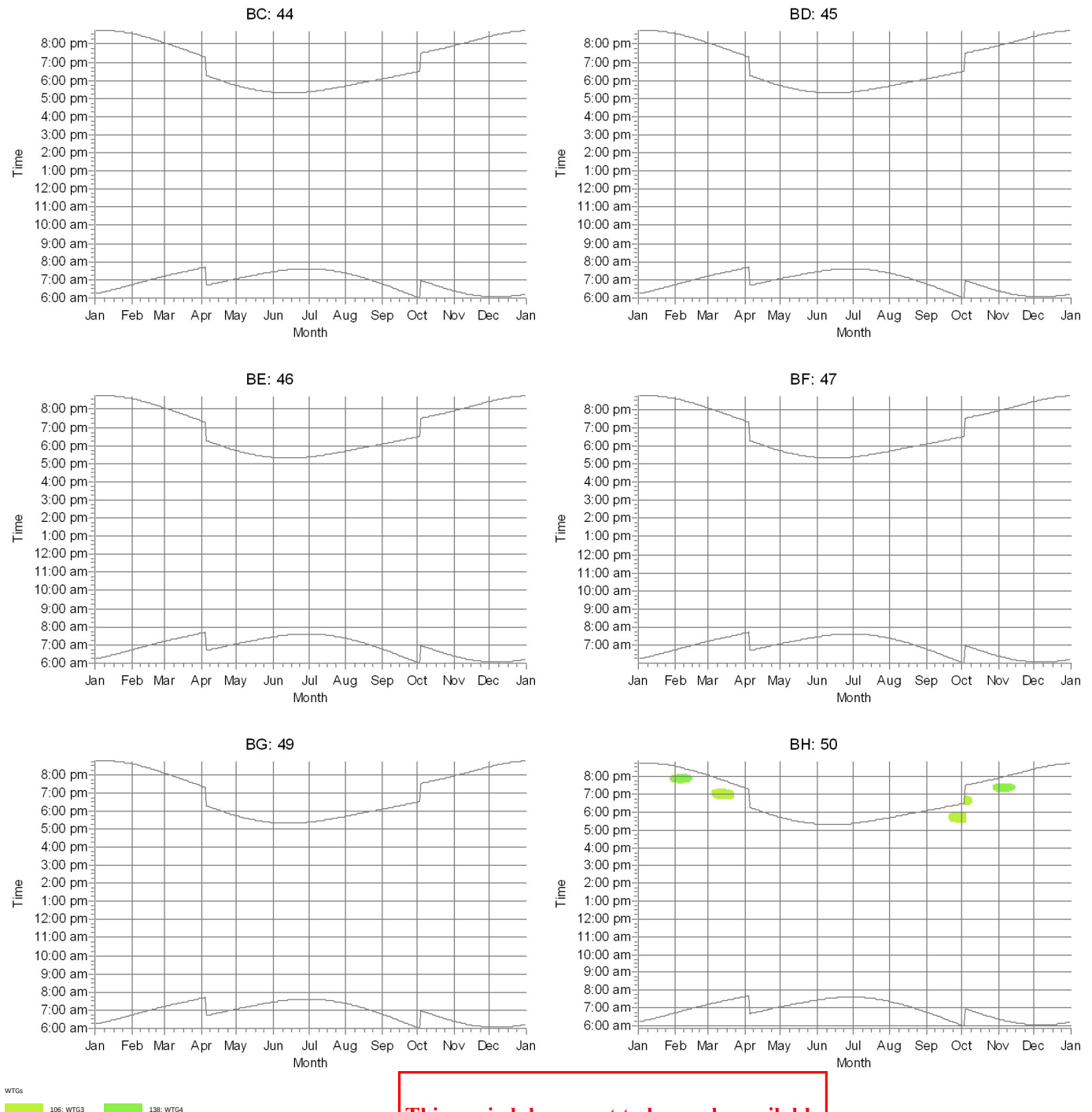
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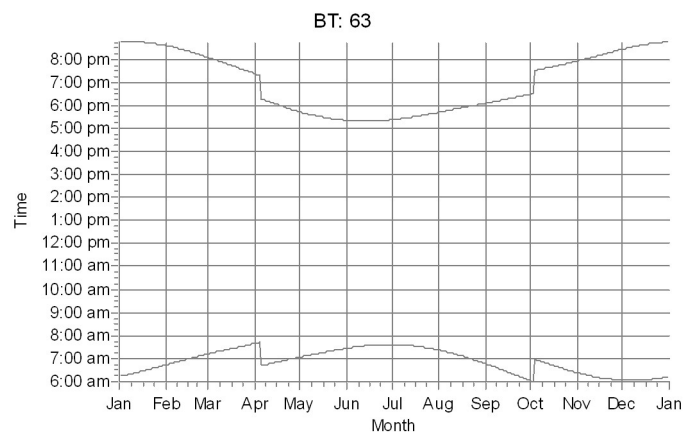
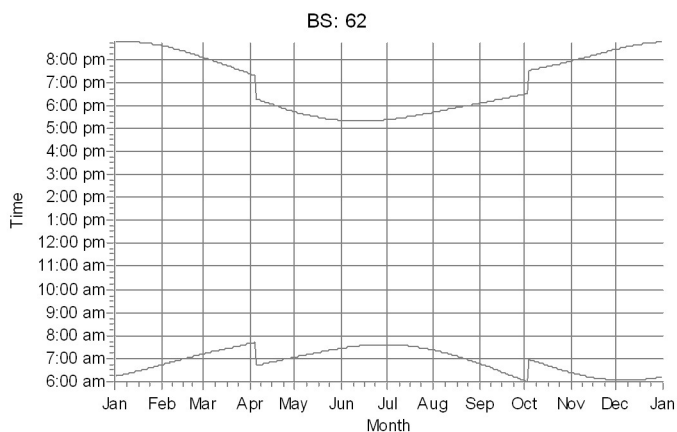
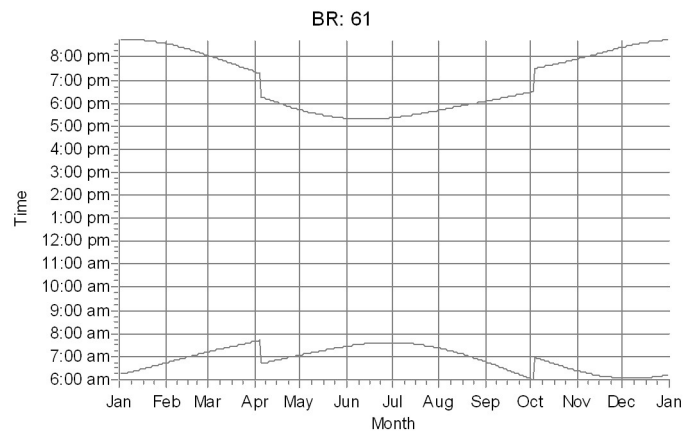
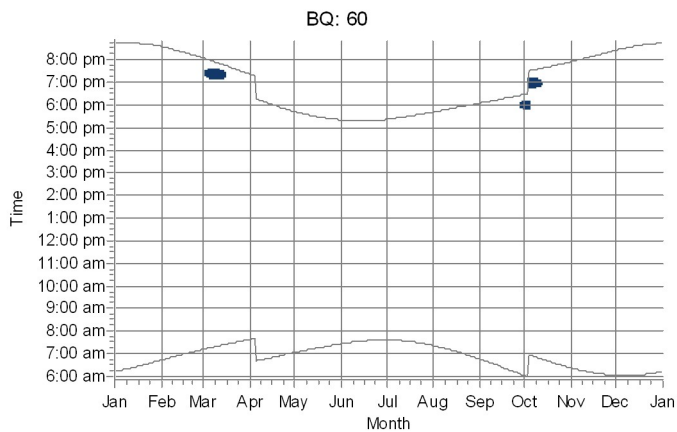
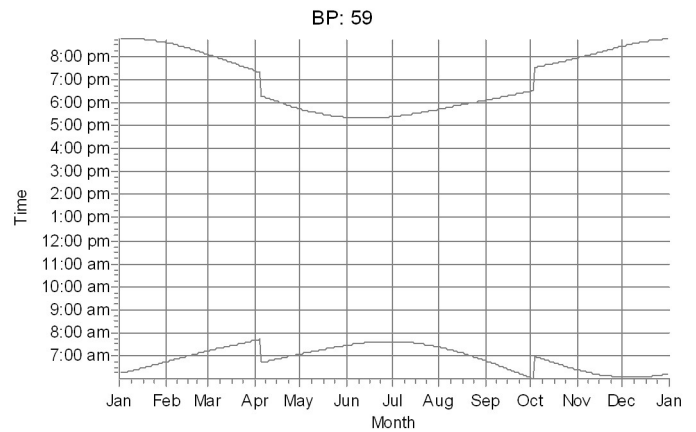
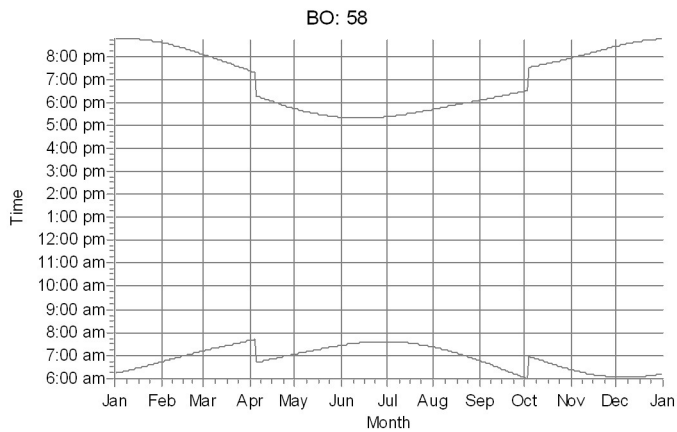


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SHADOW - Calendar, graphical

Calculation: Shadow flicker, 20260330 layout w distance limit 2,152m



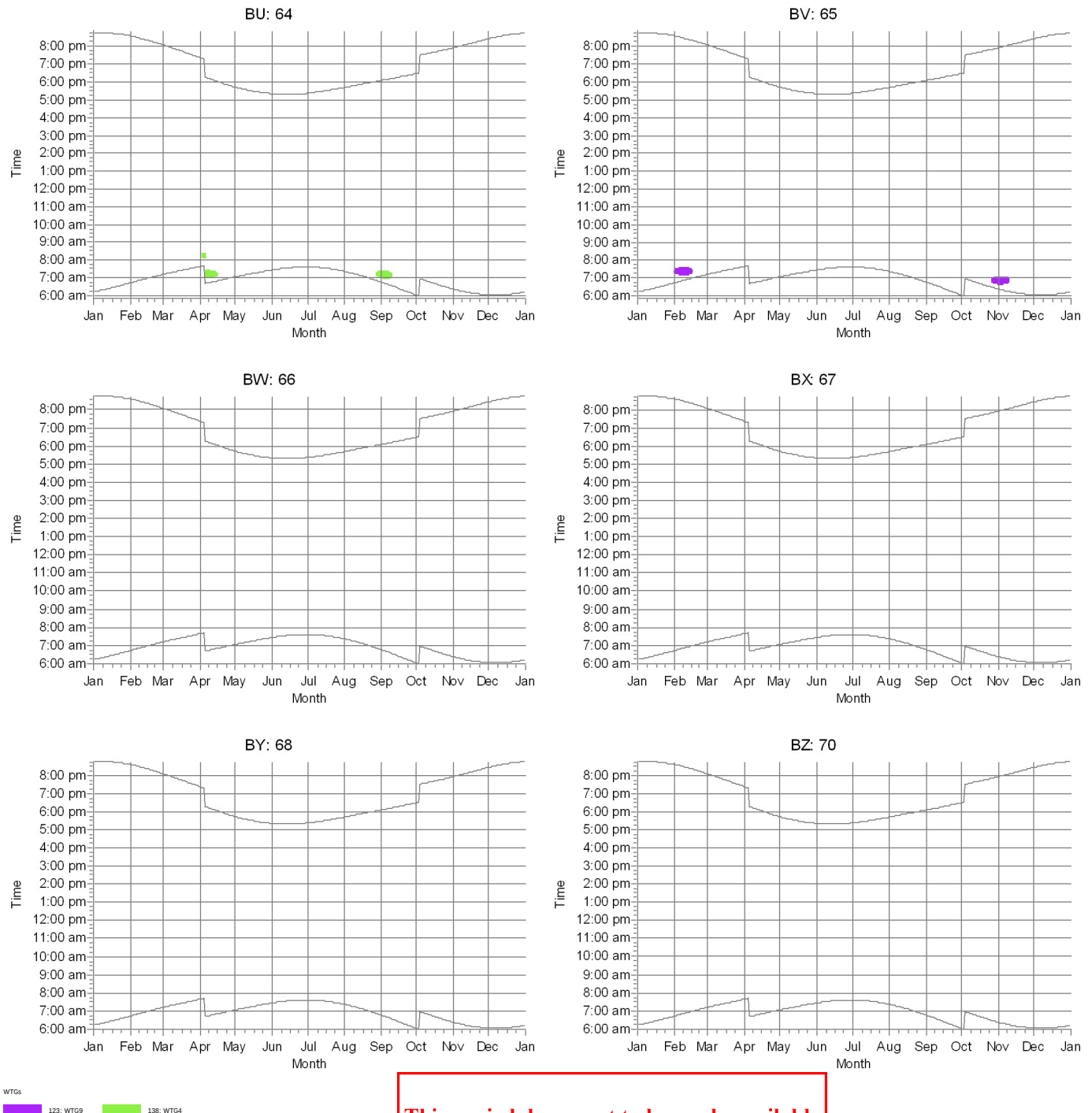
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SHADOW - Calendar, graphical

Calculation: Shadow flicker, 20260330 layout w distance limit 2,152m

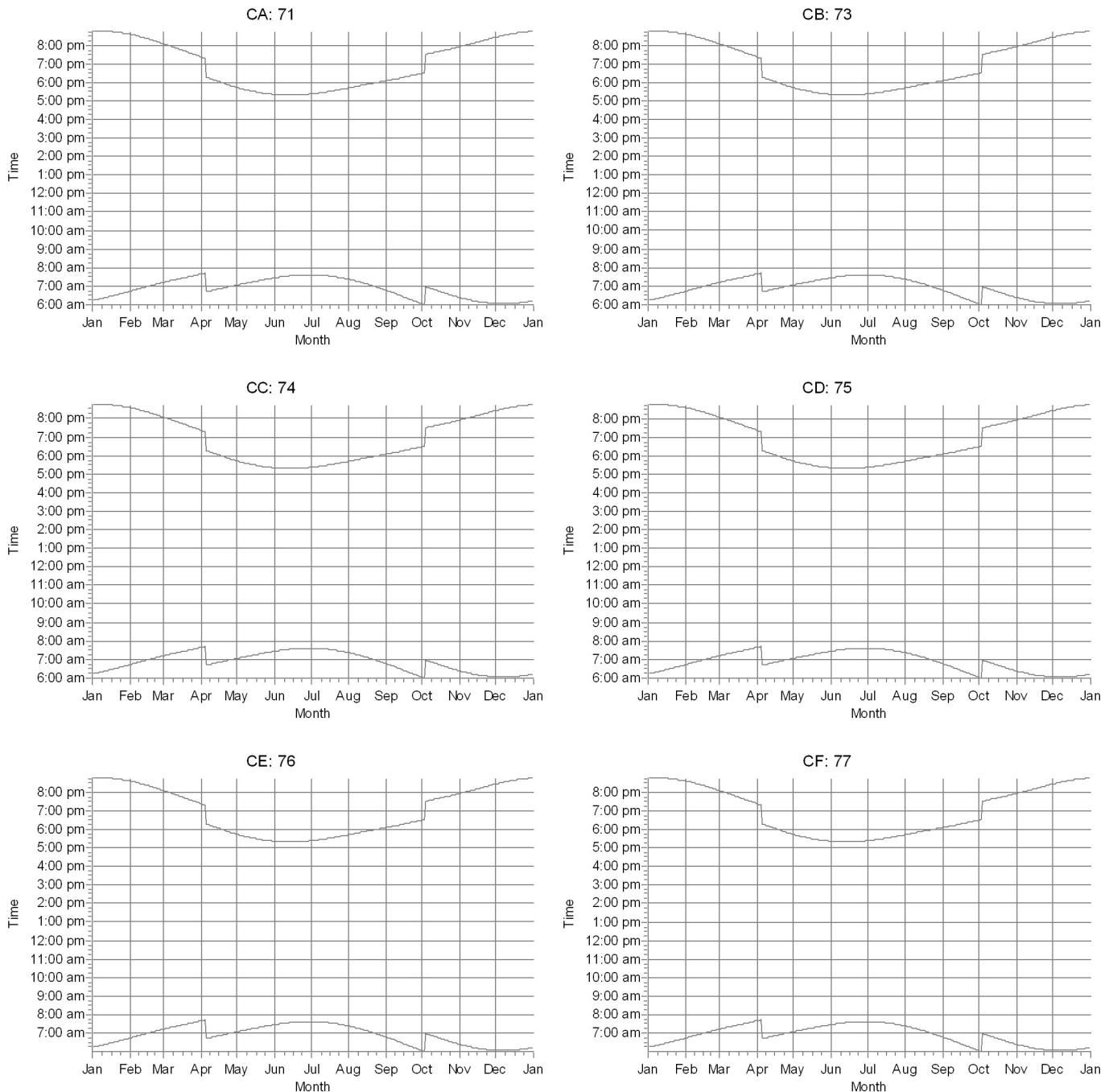


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SHADOW - Calendar, graphical

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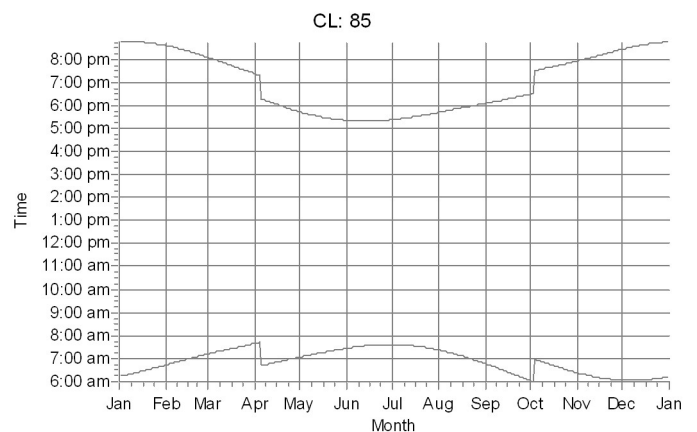
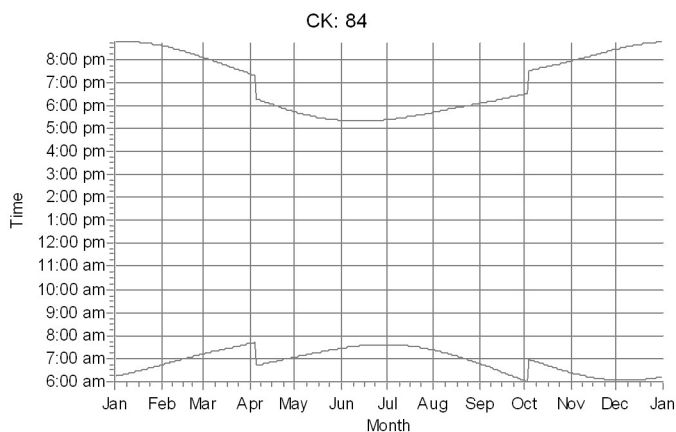
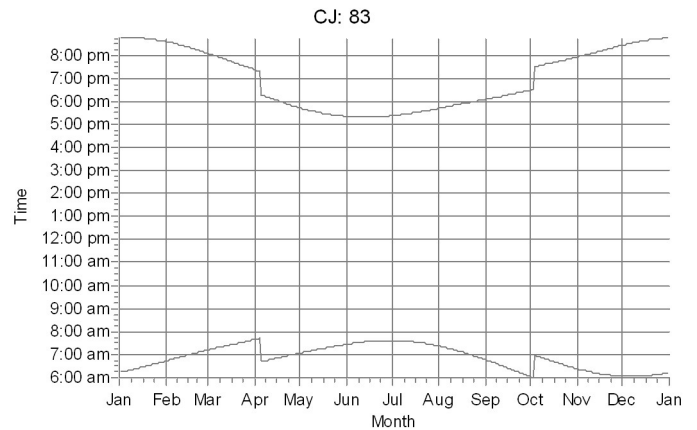
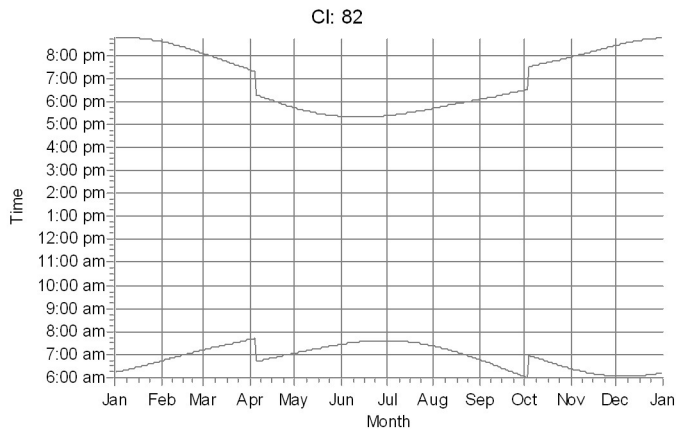
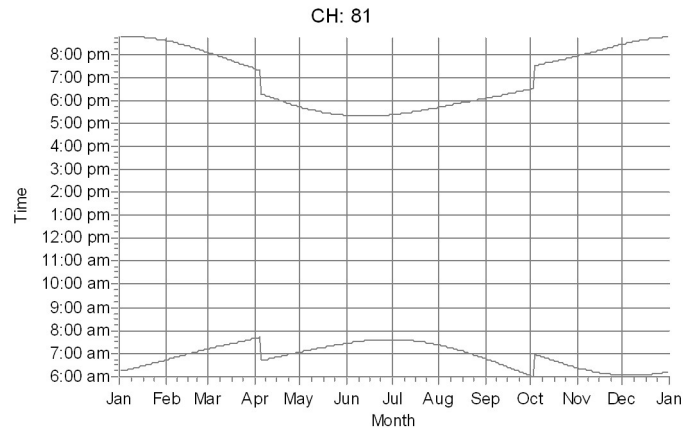
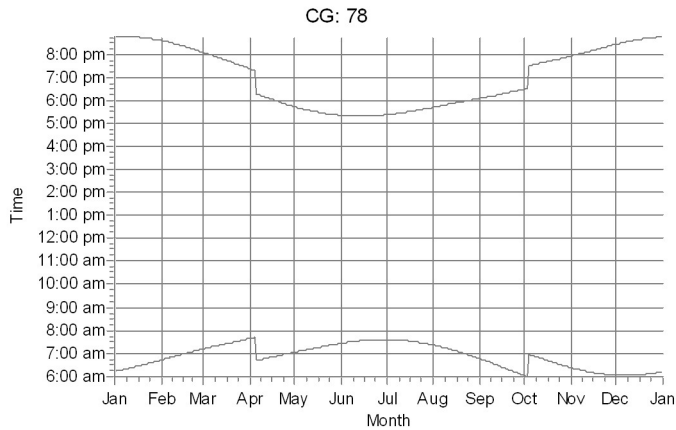
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SHADOW - Calendar, graphical

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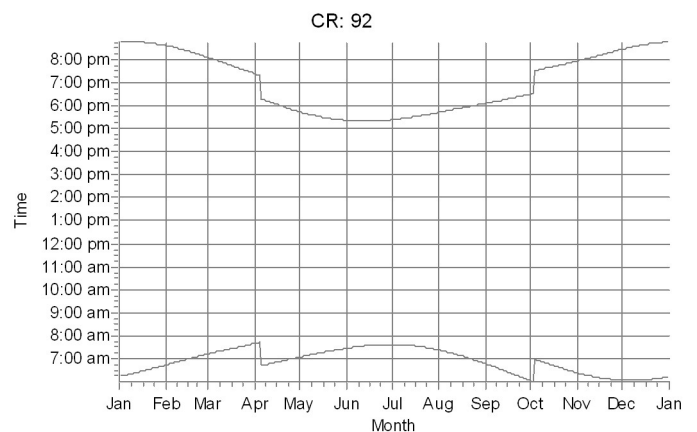
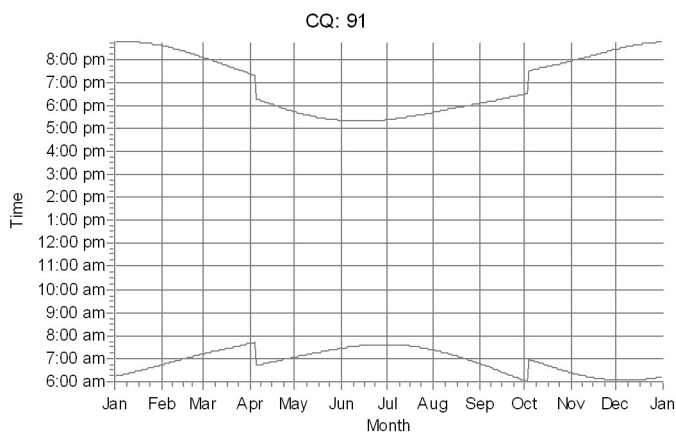
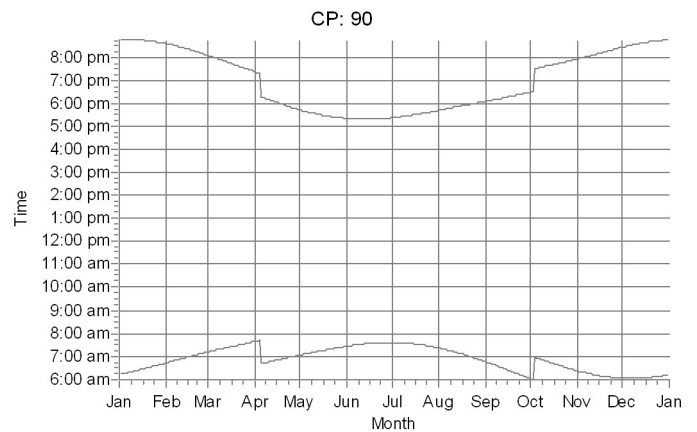
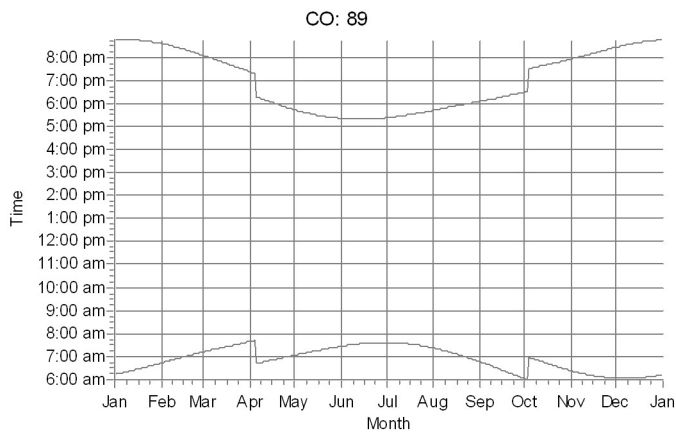
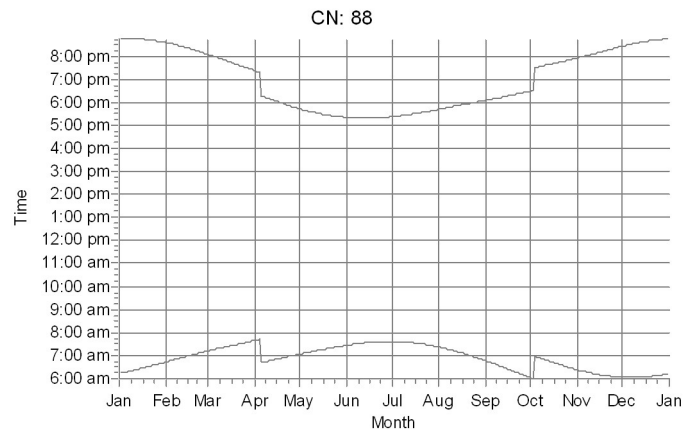
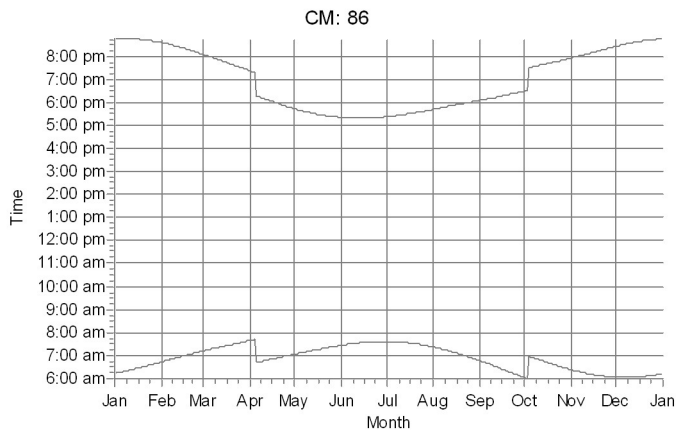
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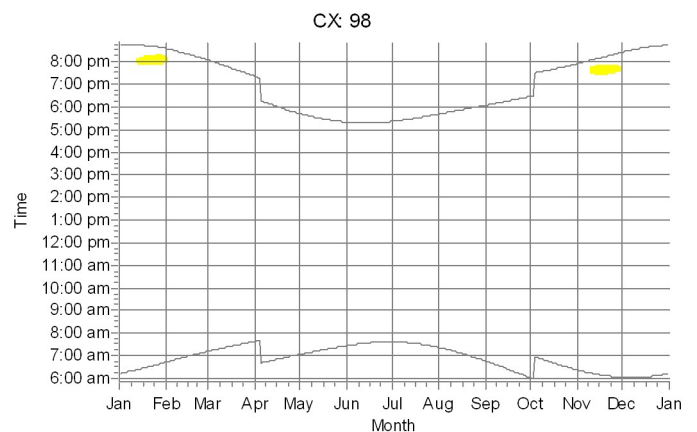
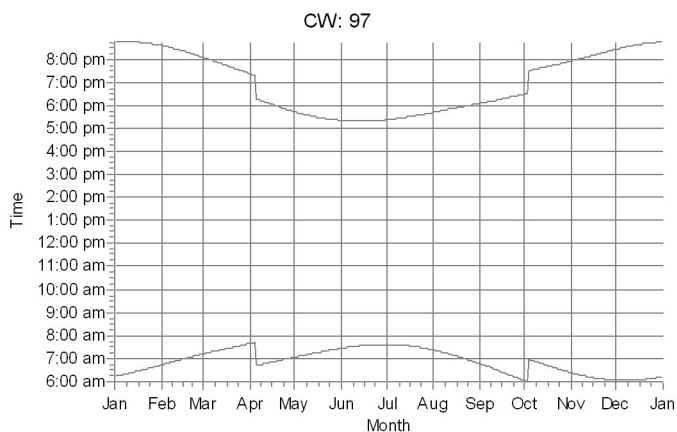
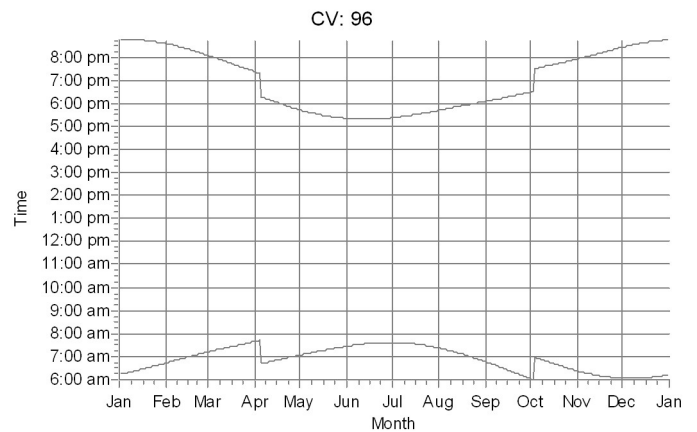
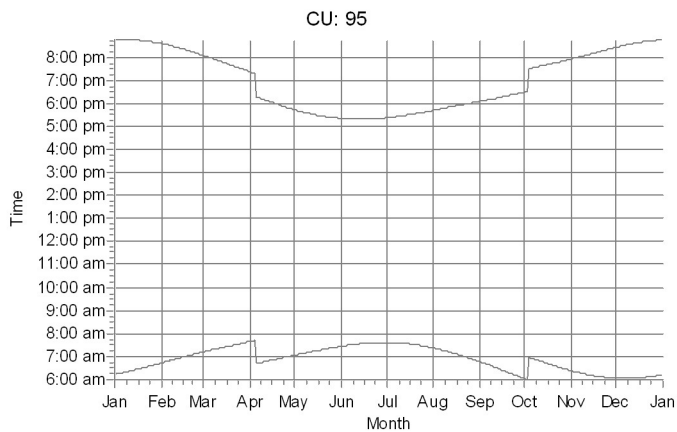
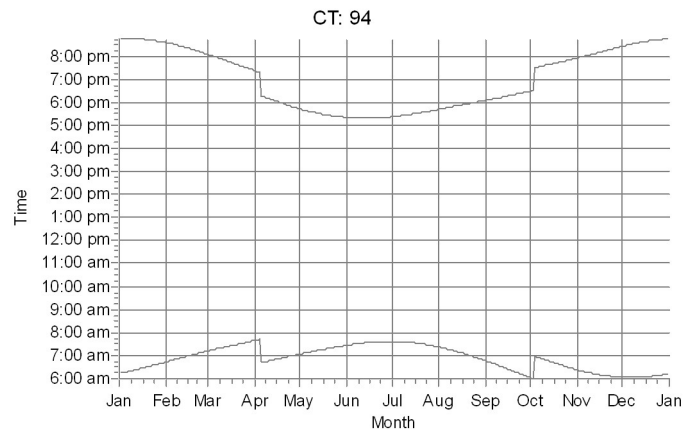
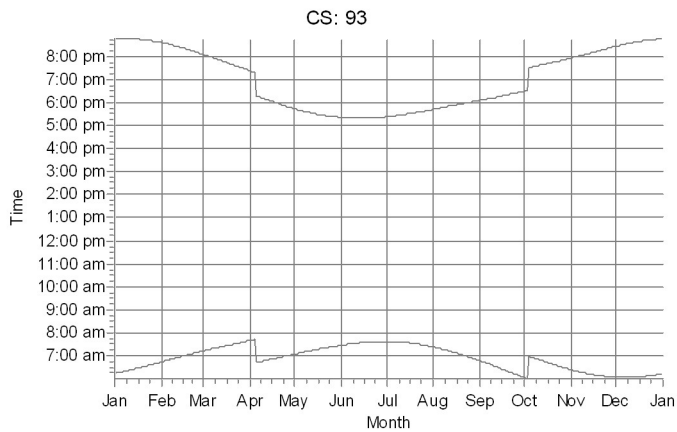
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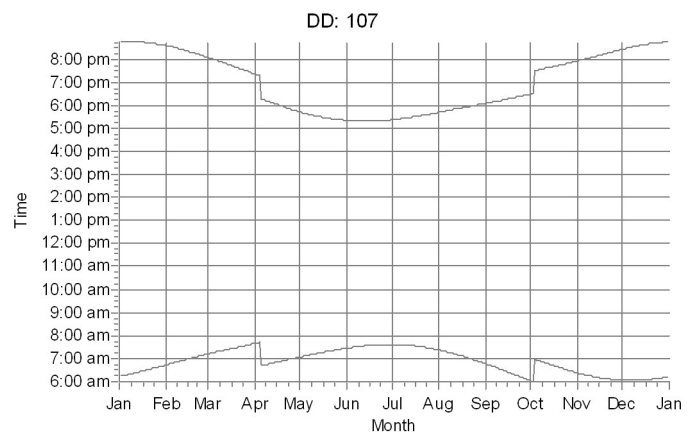
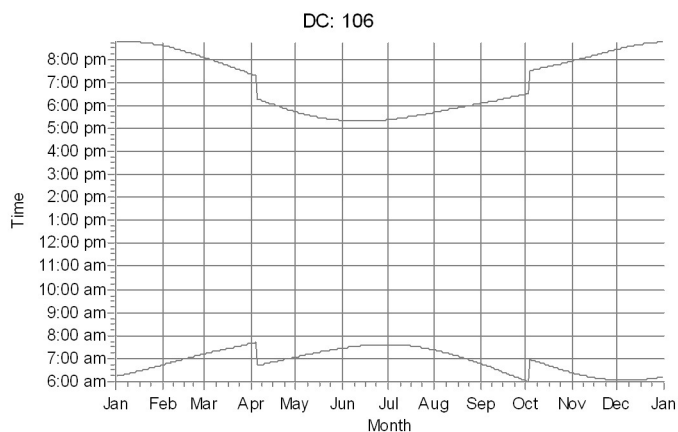
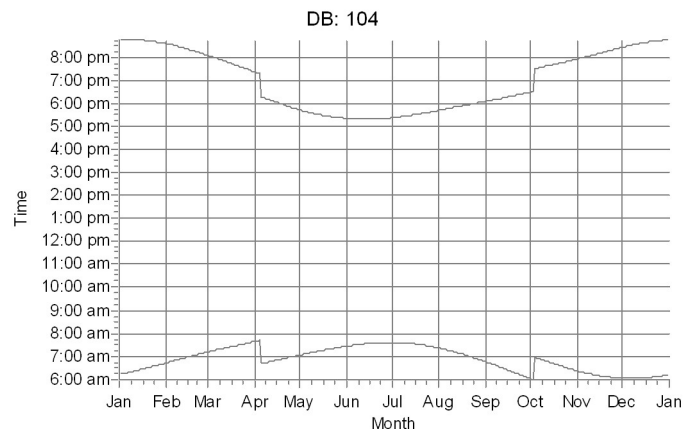
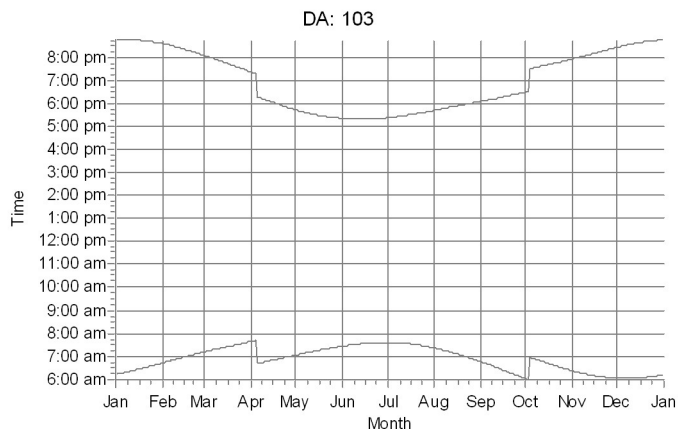
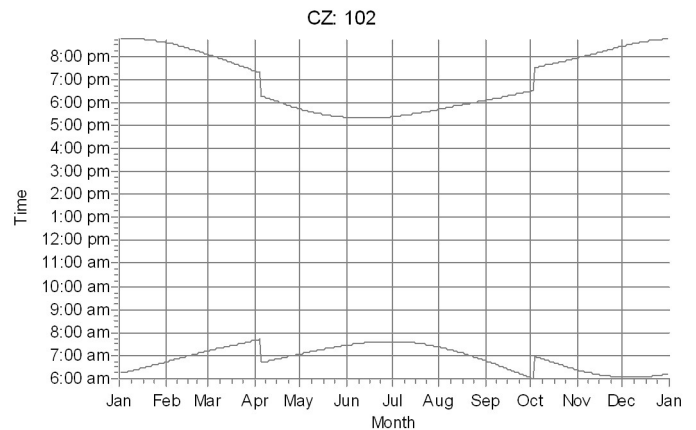
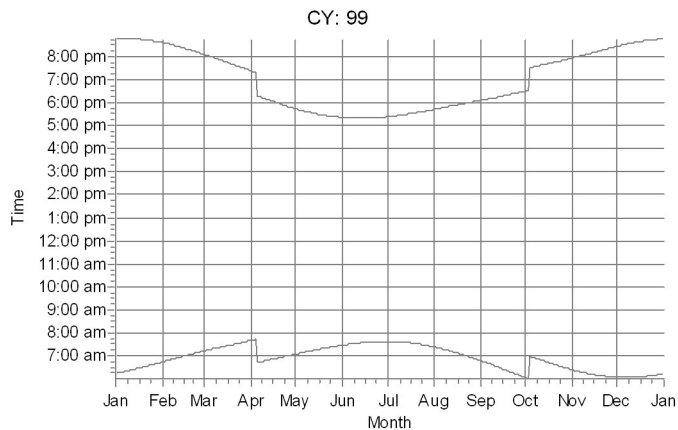
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Calculation: Shadow flicker, 20260330 layout w distance limit 2,152m



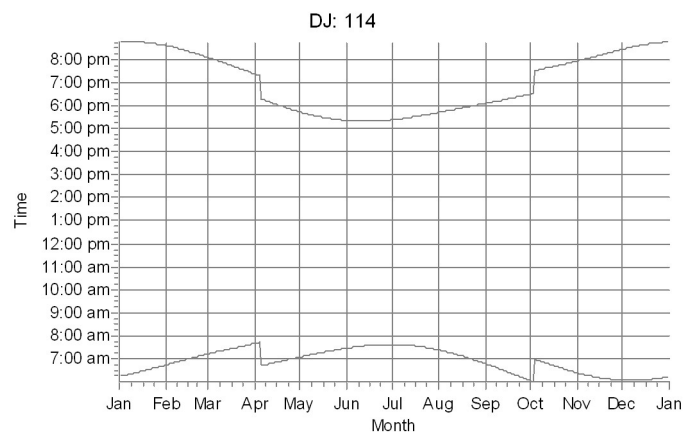
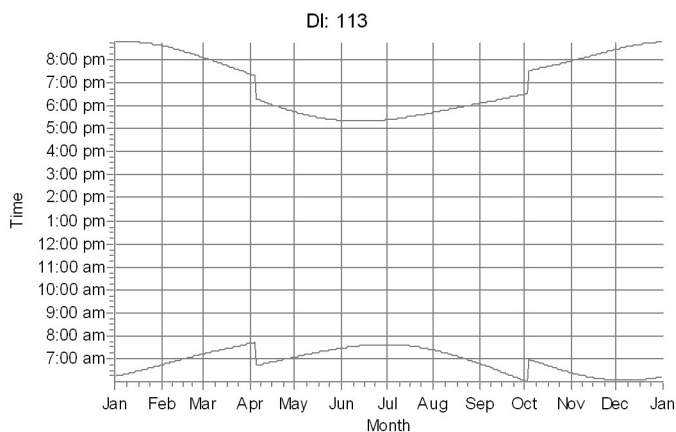
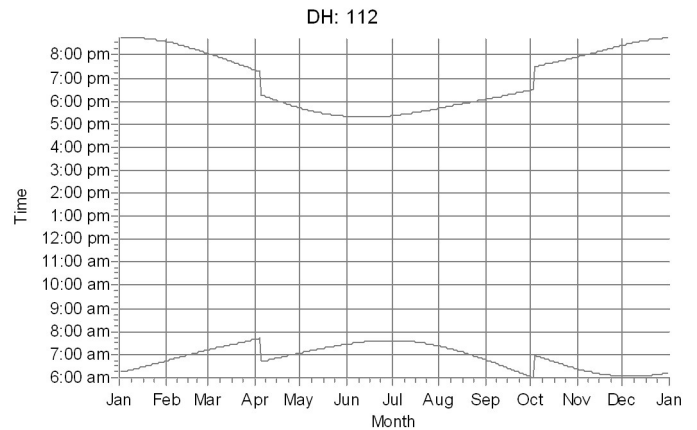
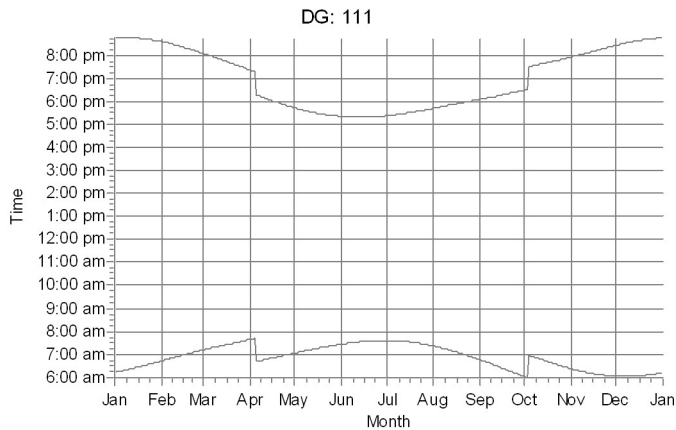
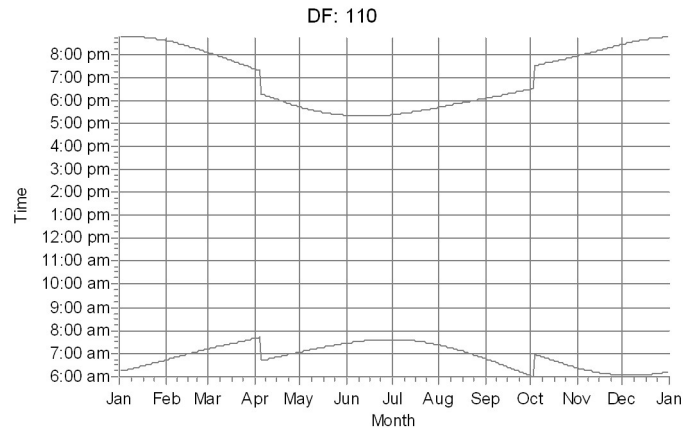
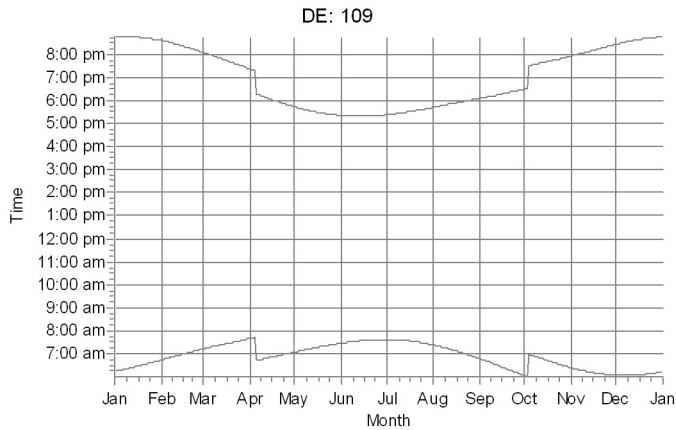
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SHADOW - Calendar, graphical

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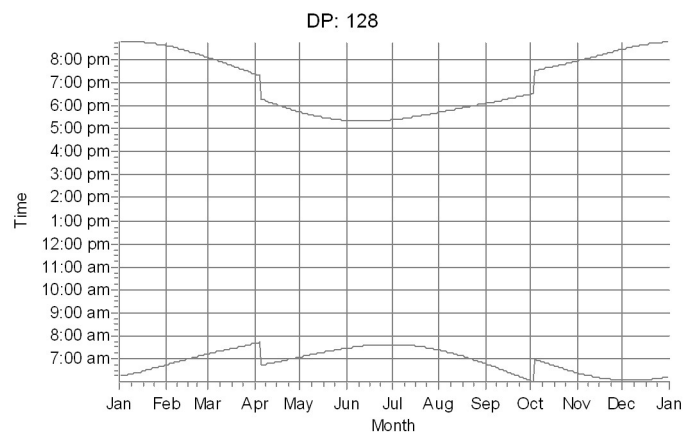
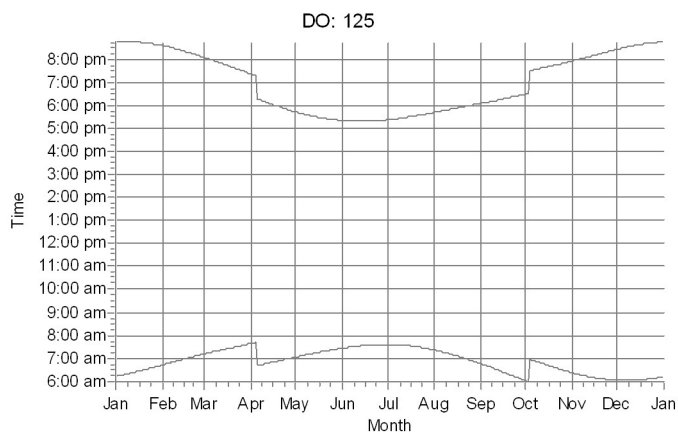
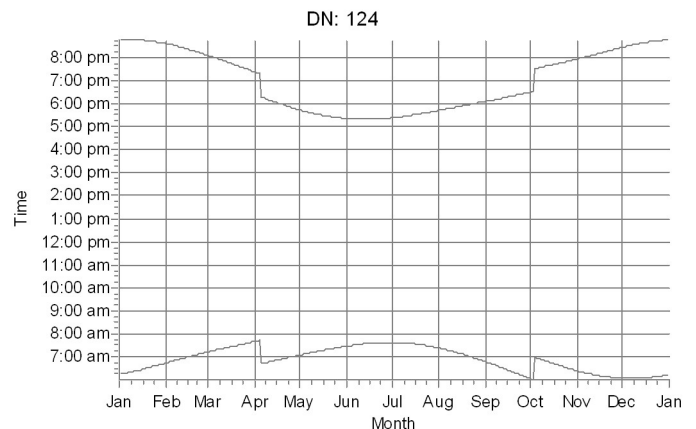
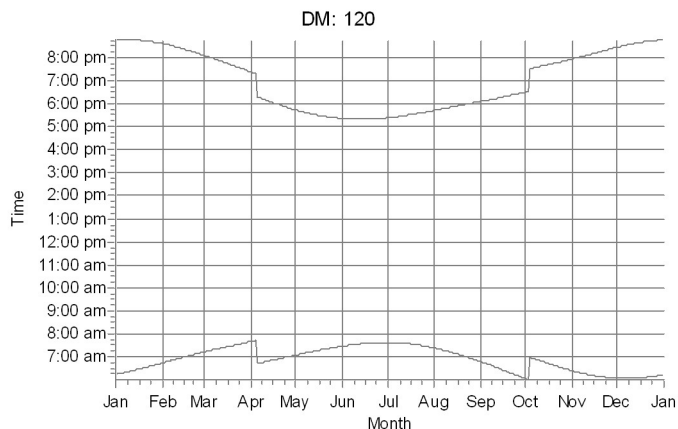
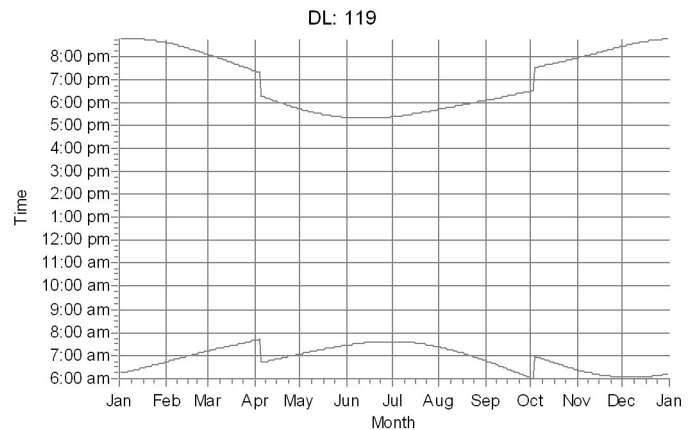
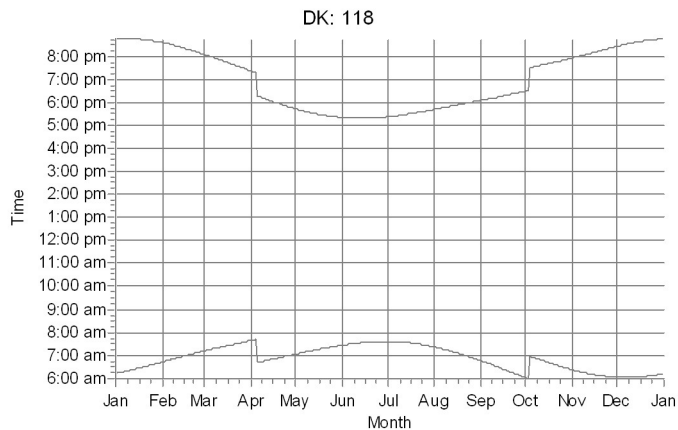
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SHADOW - Calendar, graphical

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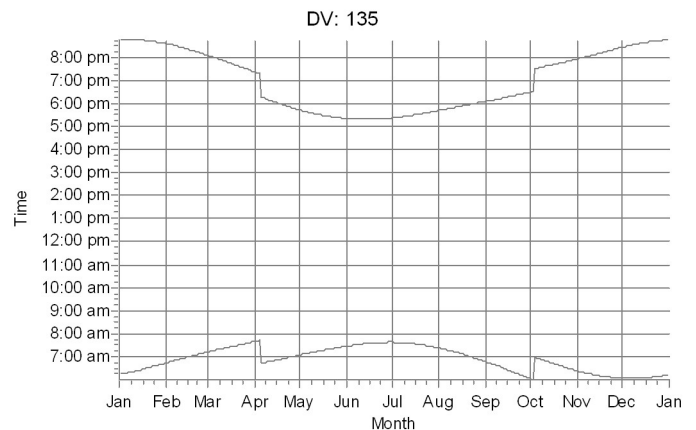
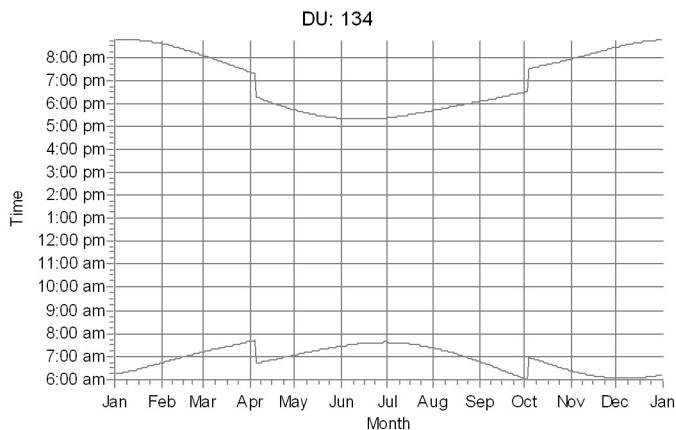
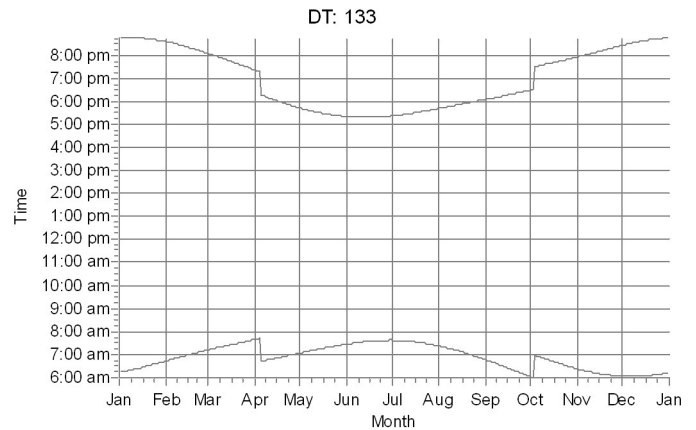
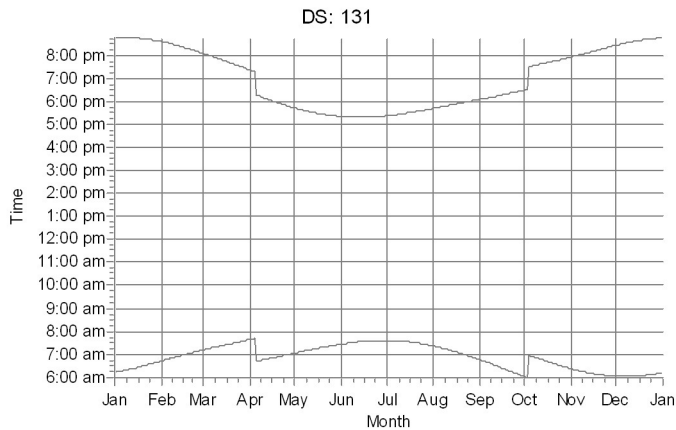
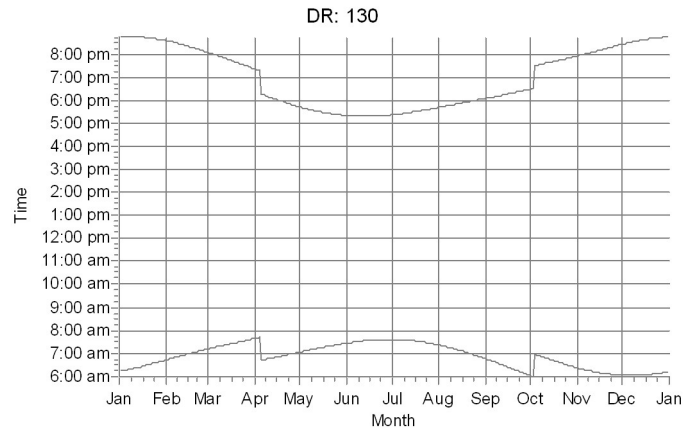
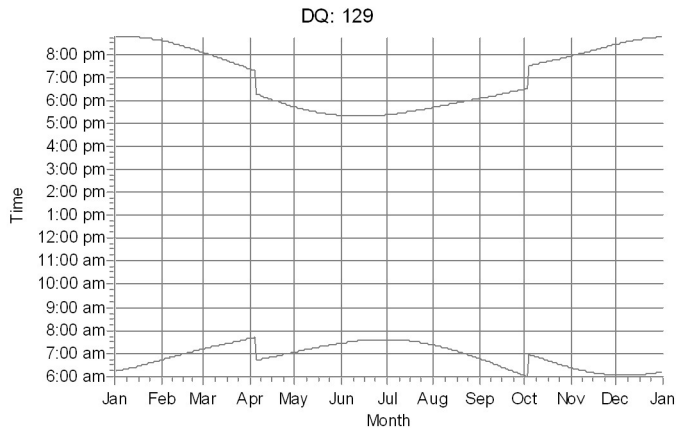
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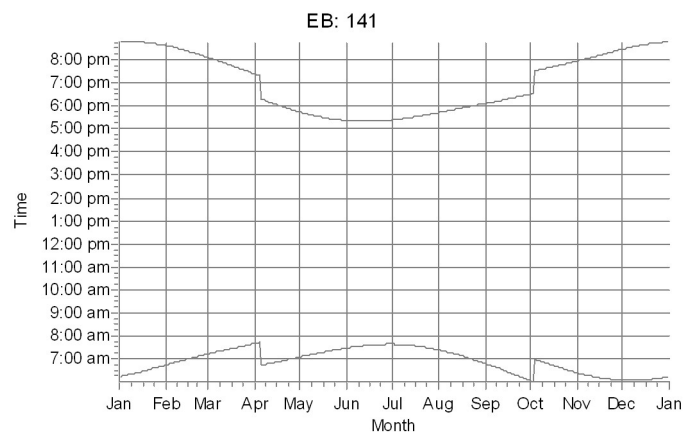
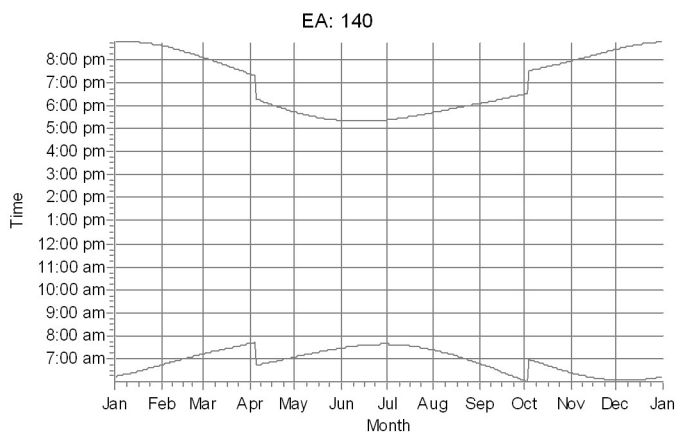
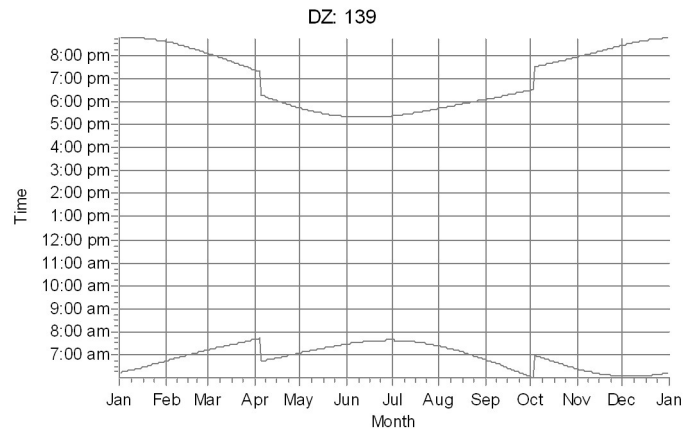
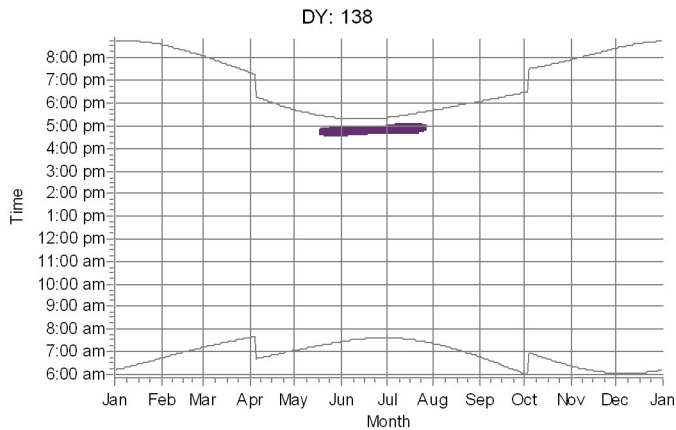
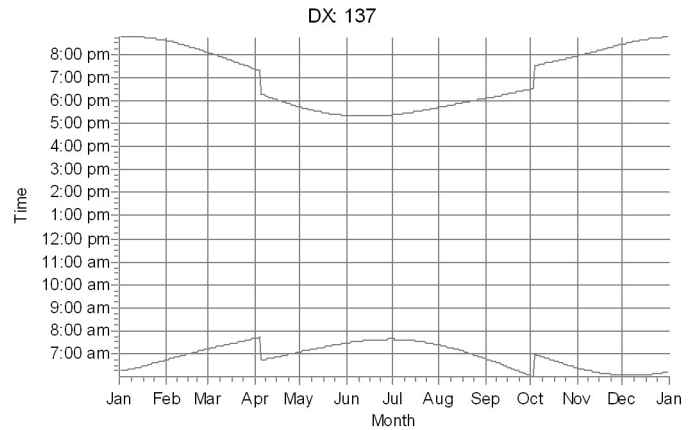
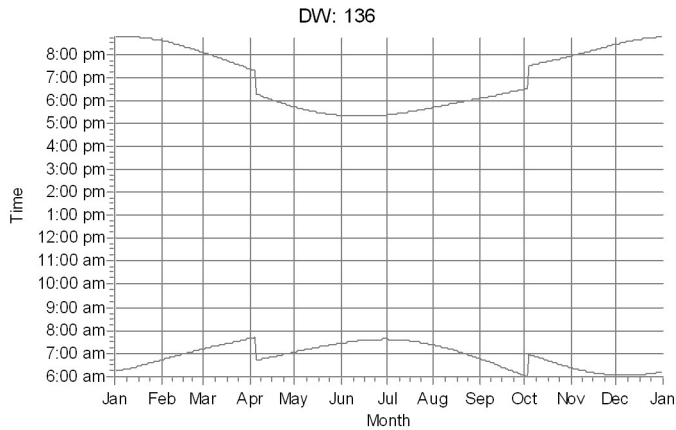
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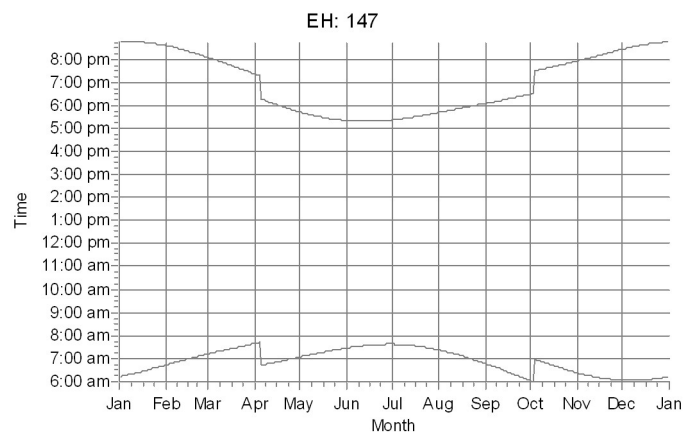
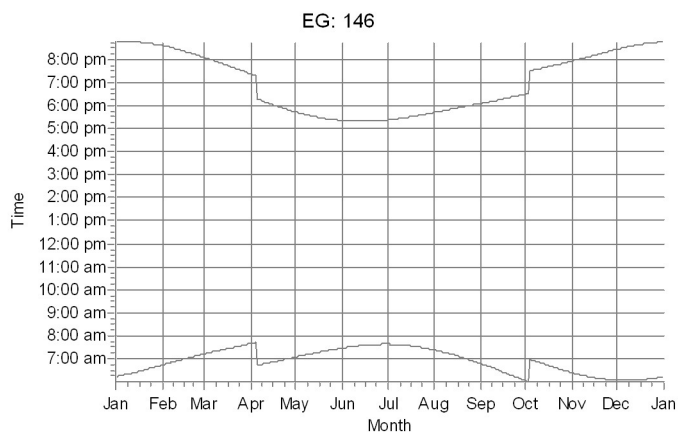
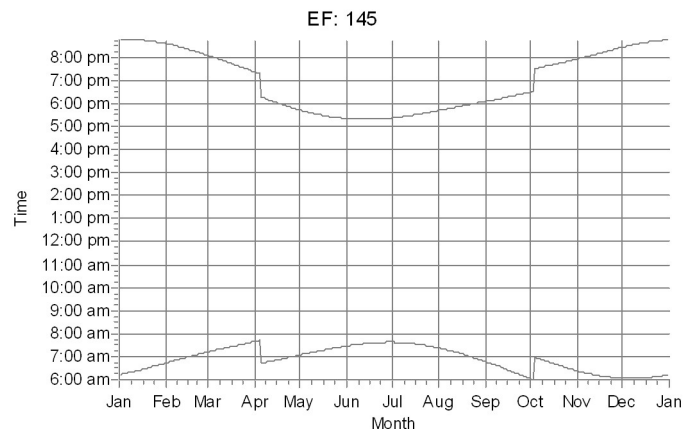
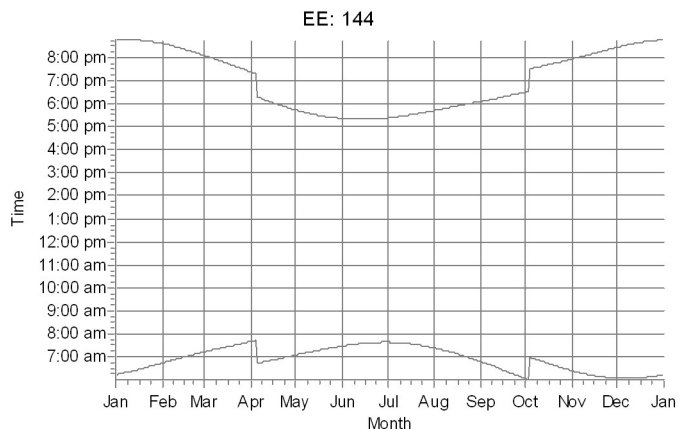
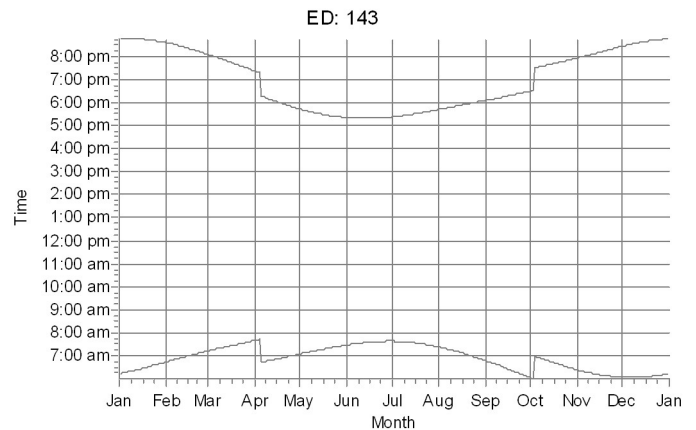
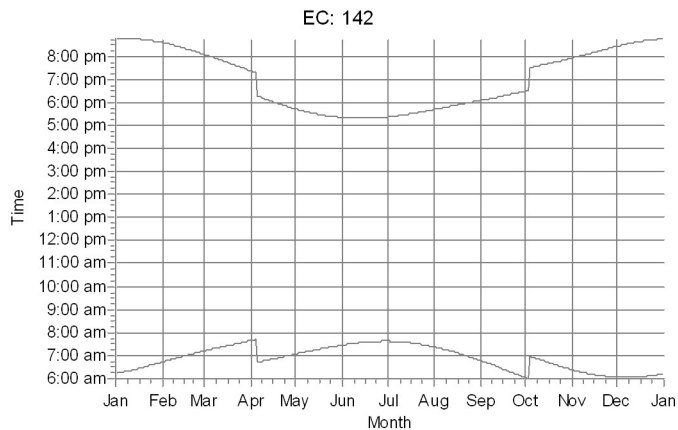
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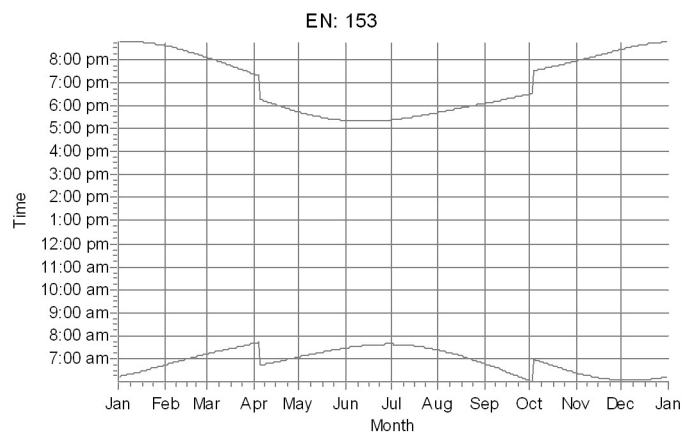
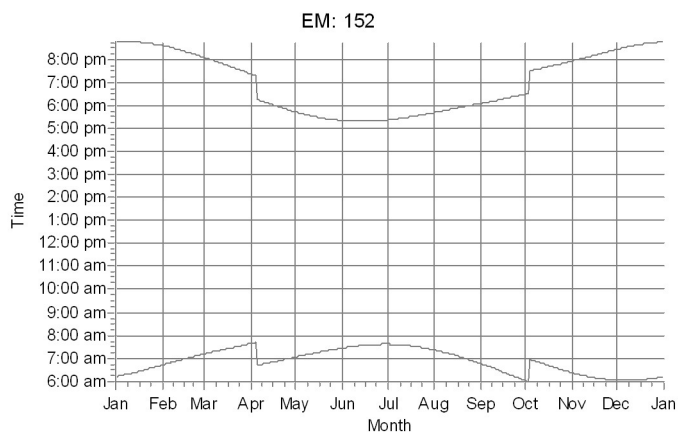
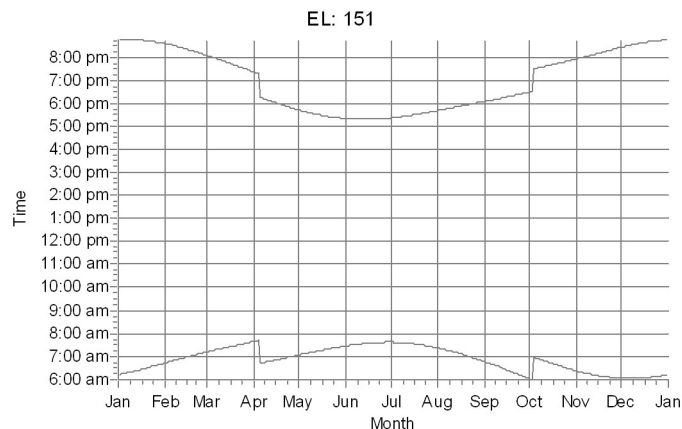
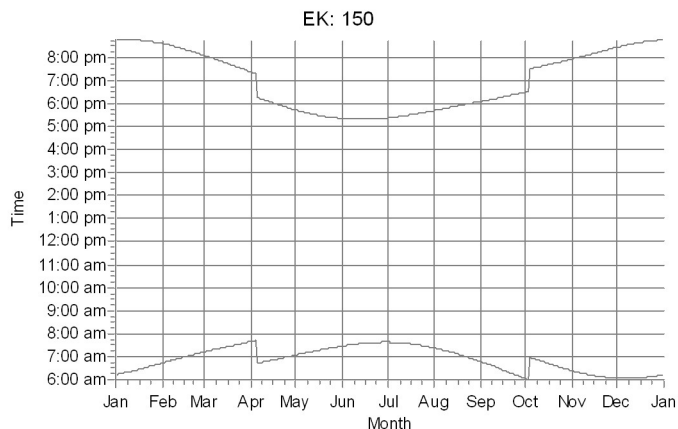
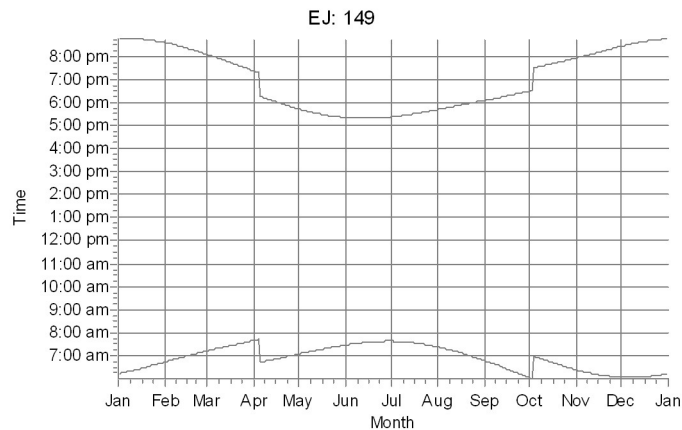
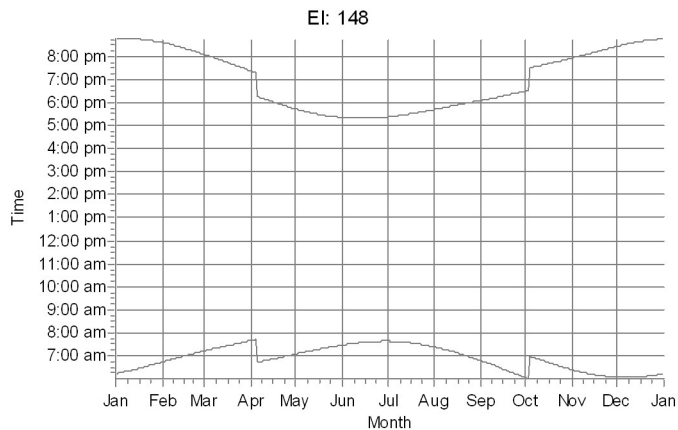
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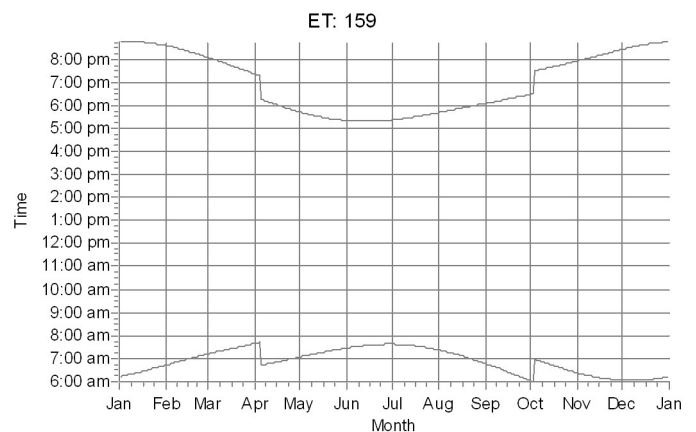
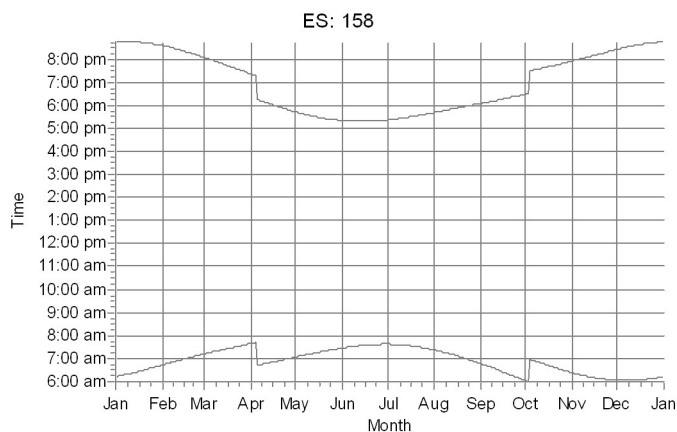
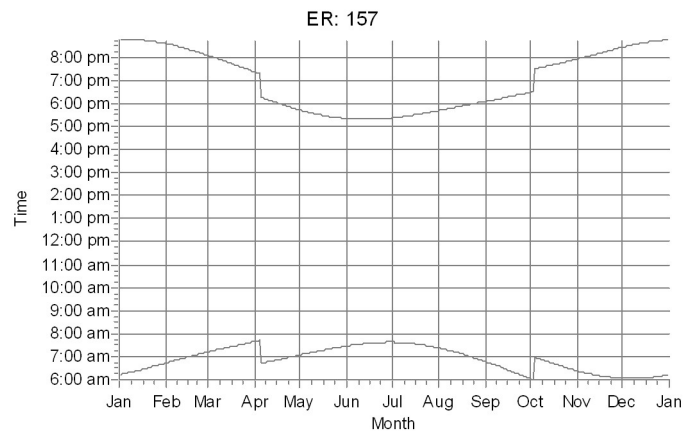
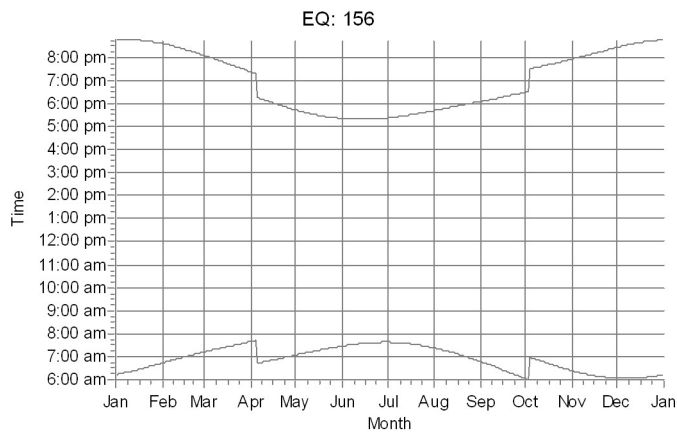
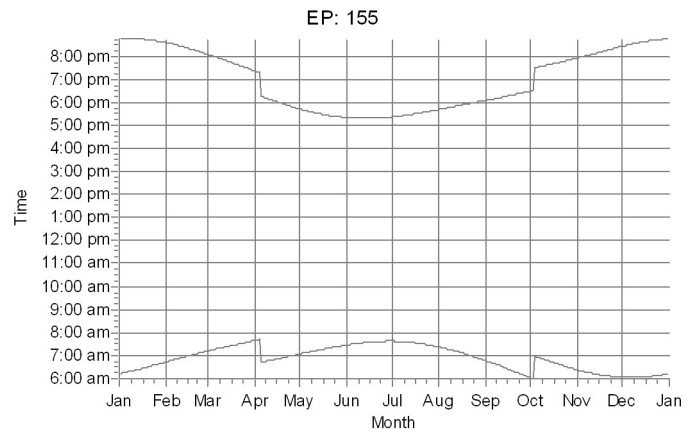
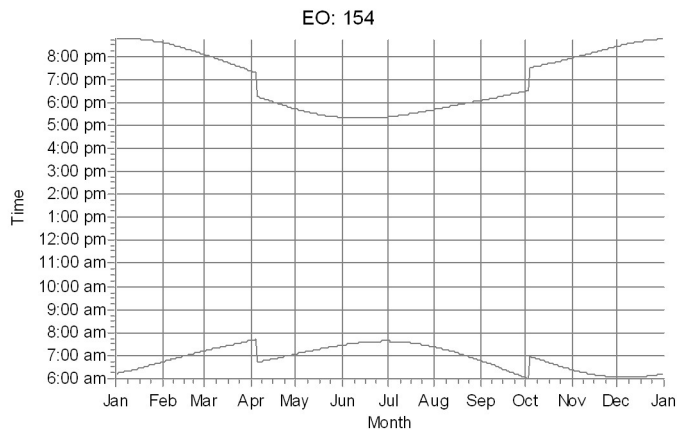
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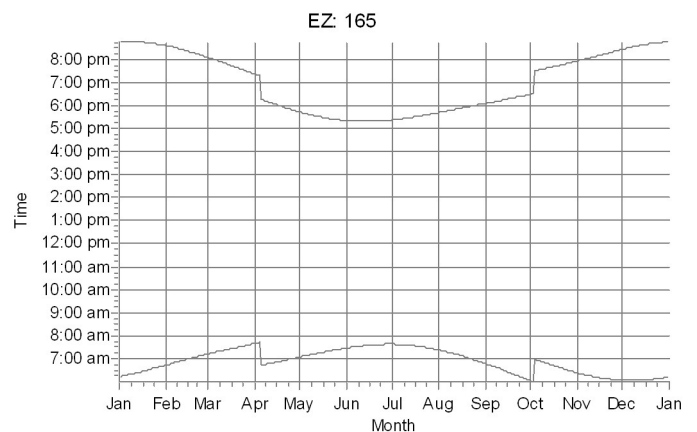
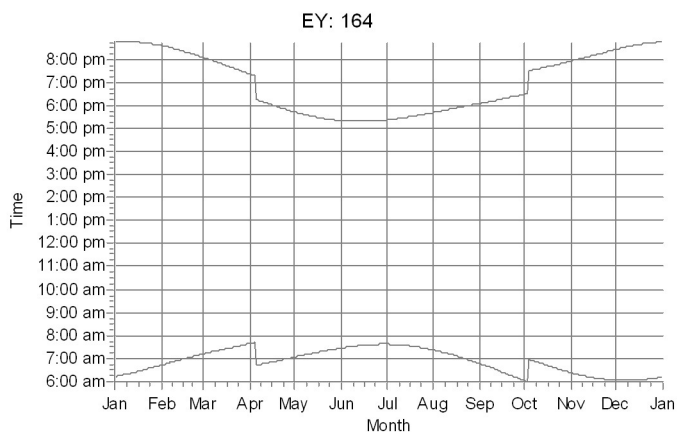
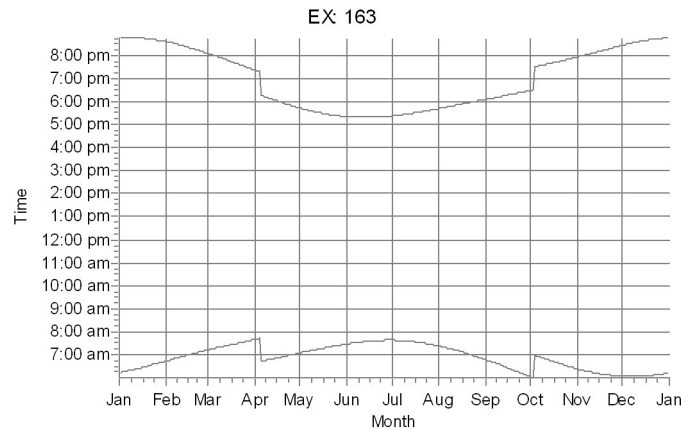
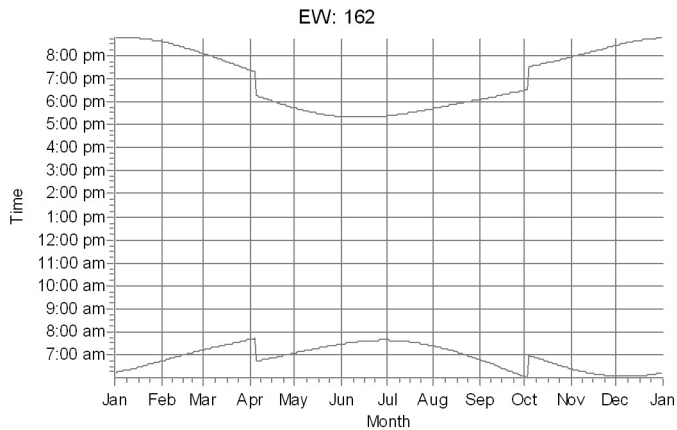
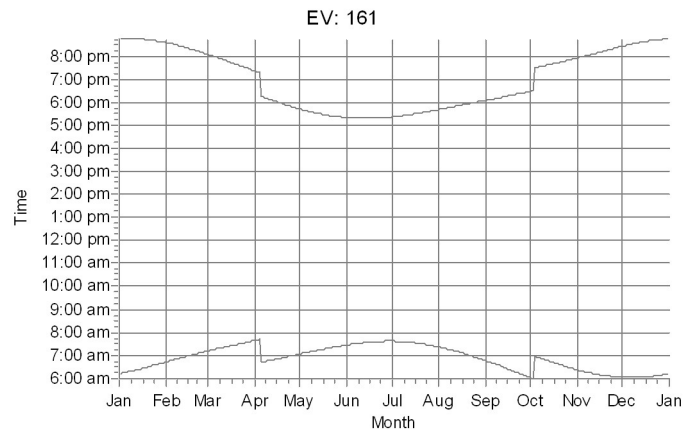
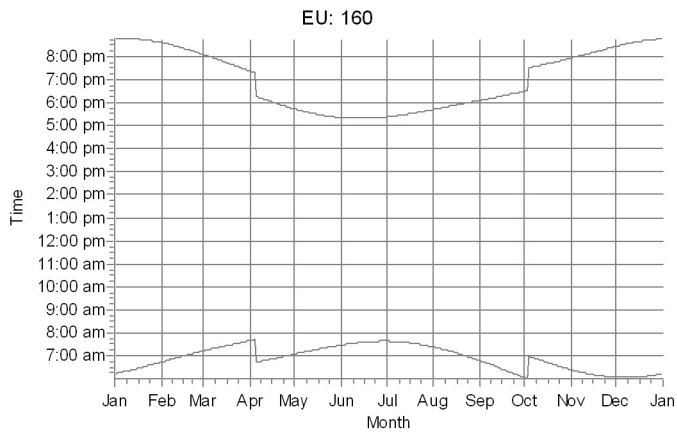
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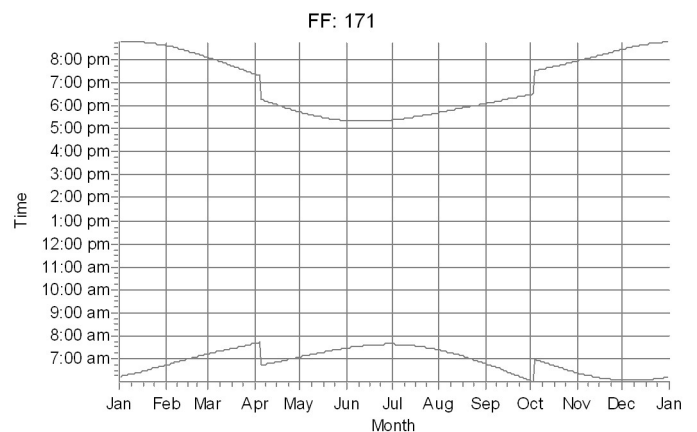
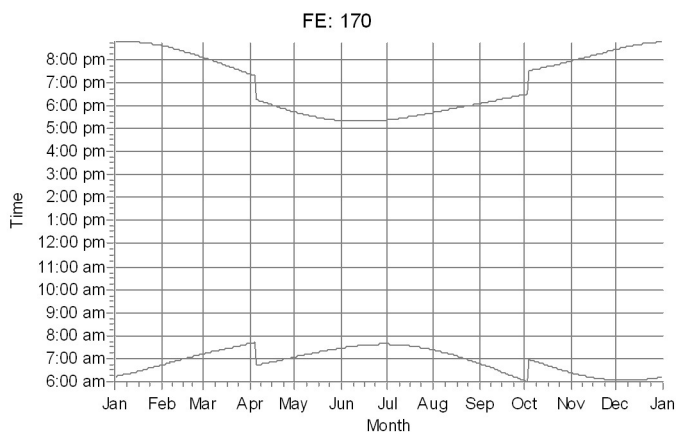
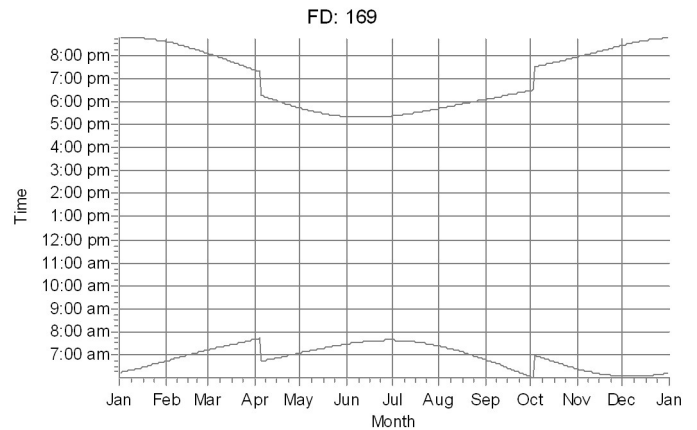
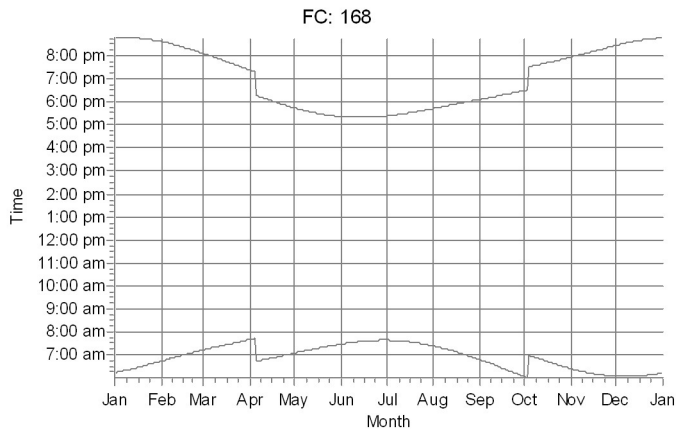
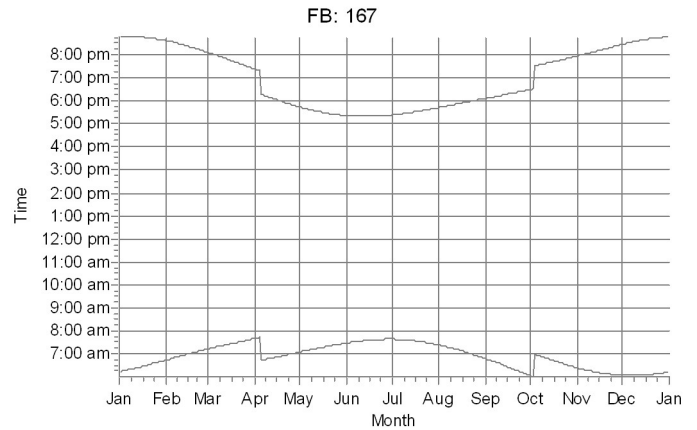
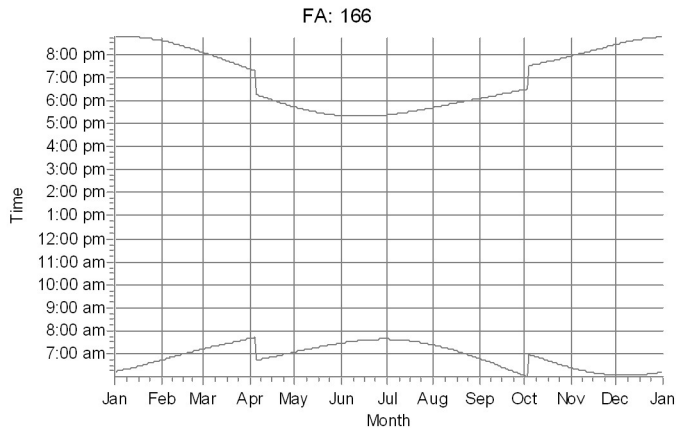
WTGs

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ADVERTISED PLAN

SHADOW - Calendar, graphical

Calculation: Shadow flicker, 20260330 layout w distance limit 2,152m



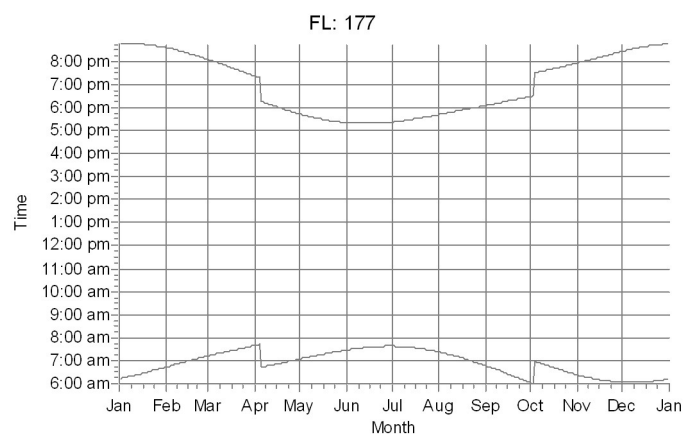
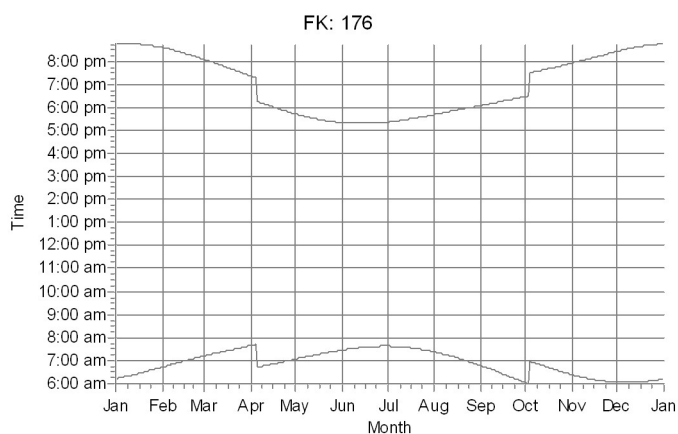
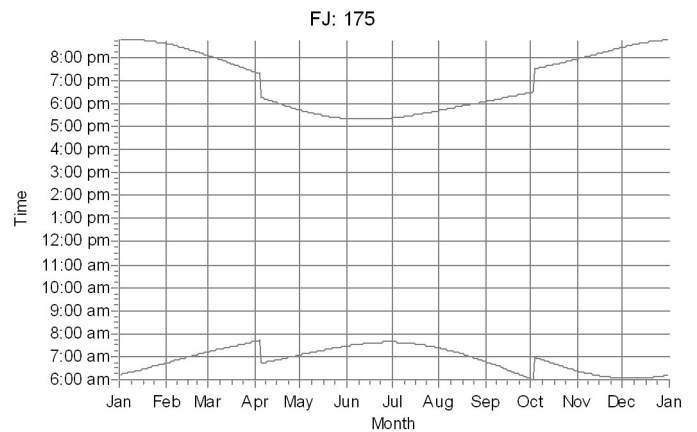
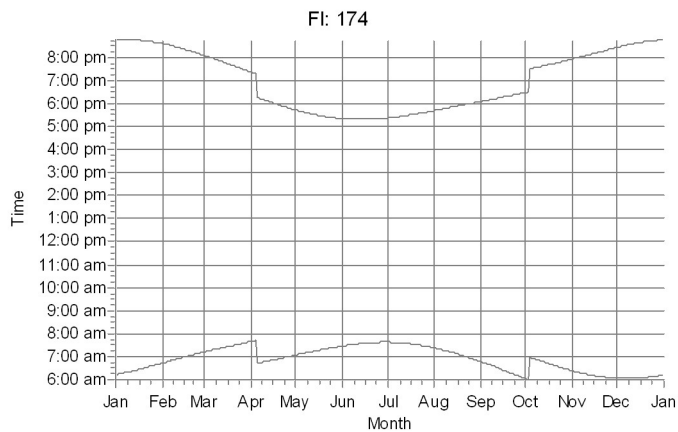
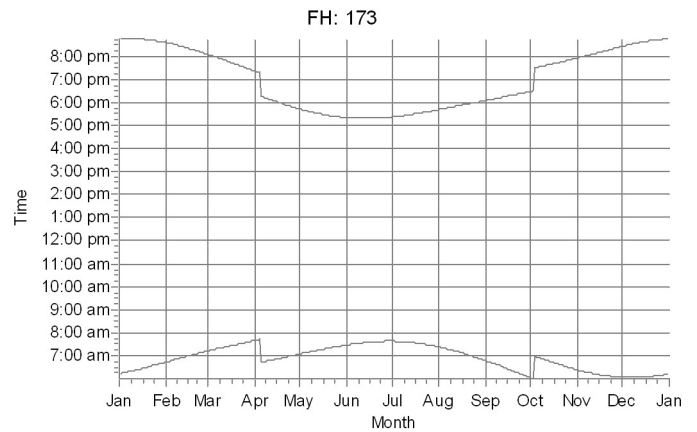
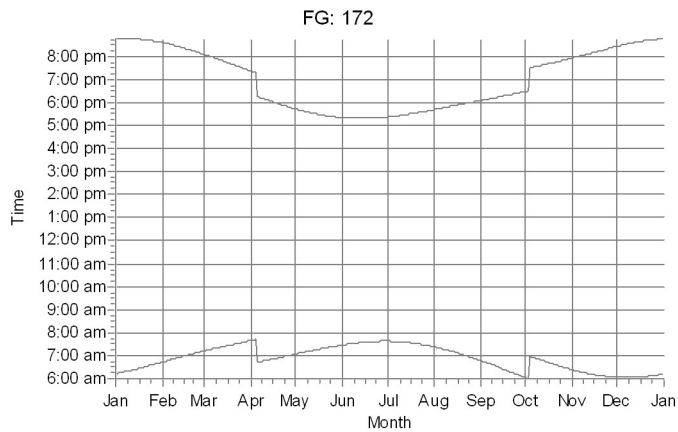
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SHADOW - Calendar, graphical

Calculation: Shadow flicker, 20260330 layout w distance limit 2,152m



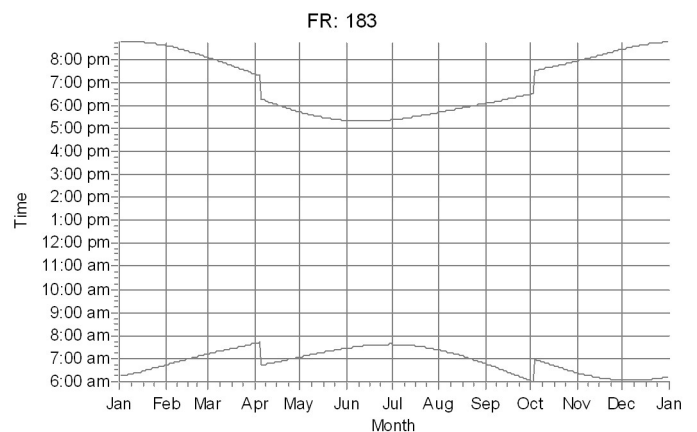
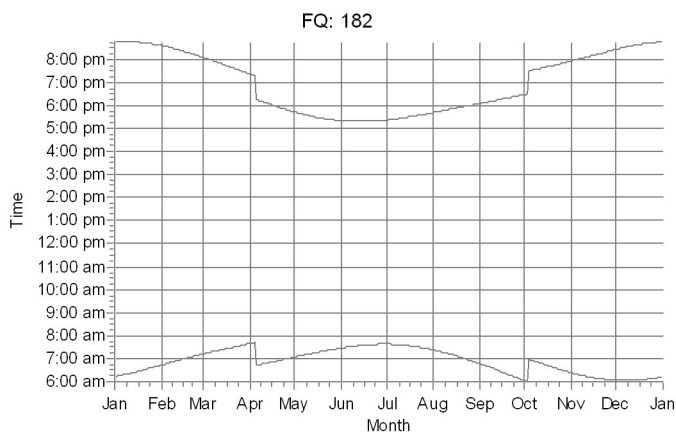
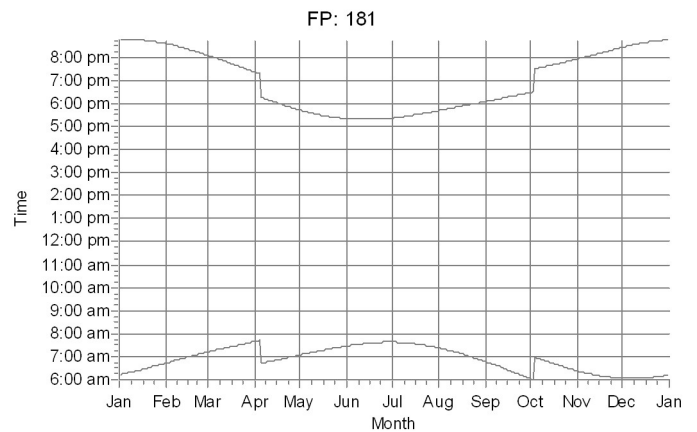
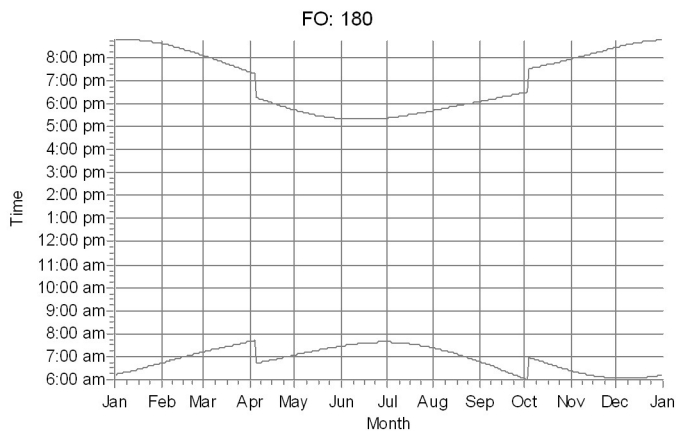
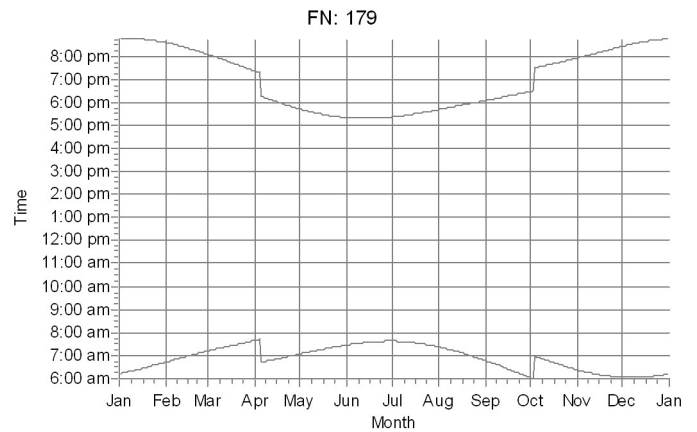
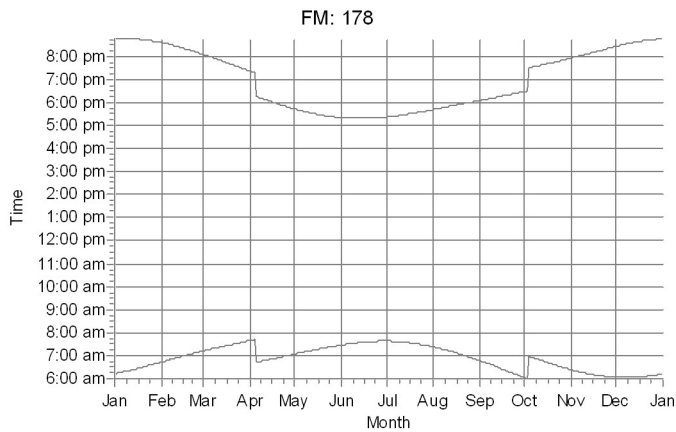
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SHADOW - Calendar, graphical

Calculation: Shadow flicker, 20260330 layout w distance limit 2,152m



WTGs

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Meering West

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AU-3008 VIC Melbourne

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Claire / claire.west@aurecongroup.com

Calculated:

9/04/2026 2:37 pm/4.1.287

SHADOW - Main Result

Calculation: Shadow flicker, 20260330 layout w distance limit 2,152m

Assumptions for shadow calculations

Maximum distance for influence	2,152 m
Minimum sun height over horizon for influence	3 °
Day step for calculation	1 days
Time step for calculation	1 minutes

The calculated times are "worst case" given by the following assumptions:

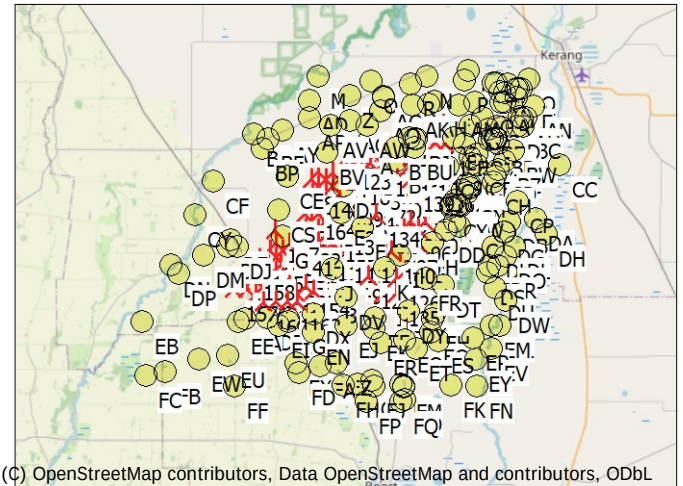
The sun is shining all the day, from sunrise to sunset

The rotor plane is always perpendicular to the line from the WTG to the sun

The WTG is always operating

Line-of-sight calculation has been deactivated. This means that sheltering from obstacles, areas or hills are not taken into account.

All coordinates are in
UTM (south)-WGS84 Zone: 54



Scale 1:750,000

 New WTG

Shadow receptor

ADVERTISED PLAN

WTGs

	Easting	Southing	Z	Row data/Description	WTG type				Shadow data					
					Valid	Manufact.	Type-generator	Power, rated	Rotor diameter	Hub height	Calculation distance	RPM		
			[m]				[kW]		[m]		[m]	[m]	[RPM]	
1	749,208	6,026,239	91.0	WTG75	No	GENERIC	RD172m-8,000	8,000		172.0		194.0	2,152	-
2	750,683	6,026,187	90.0	WTG76	No	GENERIC	RD172m-8,000	8,000		172.0		194.0	2,152	-
3	748,701	6,026,974	94.9	WTG67	No	GENERIC	RD172m-8,000	8,000		172.0		194.0	2,152	-
4	747,772	6,026,284	101.4	WTG74	No	GENERIC	RD172m-8,000	8,000		172.0		194.0	2,152	-
5	743,841	6,026,472	110.0	WTG71	No	GENERIC	RD172m-8,000	8,000		172.0		194.0	2,152	-
6	747,264	6,025,610	109.2	WTG82	No	GENERIC	RD172m-8,000	8,000		172.0		194.0	2,152	-
7	746,632	6,024,974	110.0	WTG89	No	GENERIC	RD172m-8,000	8,000		172.0		194.0	2,152	-
8	745,917	6,024,181	110.0	WTG96	No	GENERIC	RD172m-8,000	8,000		172.0		194.0	2,152	-
9	745,072	6,023,536	110.0	WTG106	No	GENERIC	RD172m-8,000	8,000		172.0		194.0	2,152	-
10	743,614	6,022,159	110.0	WTG125	No	GENERIC	RD172m-8,000	8,000		172.0		194.0	2,152	-
11	742,879	6,021,465	110.0	WTG130	No	GENERIC	RD172m-8,000	8,000		172.0		194.0	2,152	-
12	743,690	6,023,481	110.0	WTG108	No	GENERIC	RD172m-8,000	8,000		172.0		194.0	2,152	-
13	742,281	6,024,975	110.0	WTG88	No	GENERIC	RD172m-8,000	8,000		172.0		194.0	2,152	-
14	740,151	6,027,213	100.0	WTG62	No	GENERIC	RD172m-8,000	8,000		172.0		194.0	2,152	-
15	746,792	6,026,299	110.0	WTG73	No	GENERIC	RD172m-8,000	8,000		172.0		194.0	2,152	-
16	745,971	6,027,055	110.0	WTG65	No	GENERIC	RD172m-8,000	8,000		172.0		194.0	2,152	-
17	745,193	6,027,778	110.0	WTG57	No	GENERIC	RD172m-8,000	8,000		172.0		194.0	2,152	-
18	744,532	6,028,509	110.0	WTG48	No	GENERIC	RD172m-8,000	8,000		172.0		194.0	2,152	-
19	743,820	6,029,231	104.7	WTG40	No	GENERIC	RD172m-8,000	8,000		172.0		194.0	2,152	-
20	743,276	6,029,953	100.0	WTG32	No	GENERIC	RD172m-8,000	8,000		172.0		194.0	2,152	-
21	735,674	6,021,595	110.0	WTG129	No	GENERIC	RD172m-8,000	8,000		172.0		194.0	2,152	-
22	735,181	6,022,400	102.7	WTG120	No	GENERIC	RD172m-8,000	8,000		172.0		194.0	2,152	-
23	734,628	6,023,100	100.0	WTG110	No	GENERIC	RD172m-8,000	8,000		172.0		194.0	2,152	-
24	739,573	6,026,575	100.0	WTG69	No	GENERIC	RD172m-8,000	8,000		172.0		194.0	2,152	-
25	738,756	6,025,838	100.0	WTG77	No	GENERIC	RD172m-8,000	8,000		172.0		194.0	2,152	-
26	738,210	6,025,122	100.0	WTG84	No	GENERIC	RD172m-8,000	8,000		172.0		194.0	2,152	-
27	734,404	6,021,604	106.1	WTG127	No	GENERIC	RD172m-8,000	8,000		172.0		194.0	2,152	-
28	737,920	6,021,004	116.2	WTG134	No	GENERIC	RD172m-8,000	8,000		172.0		194.0	2,152	-
29	737,381	6,021,682	112.4	WTG126	No	GENERIC	RD172m-8,000	8,000		172.0		194.0	2,152	-
30	737,472	6,023,003	110.0	WTG114	No	GENERIC	RD172m-8,000	8,000		172.0		194.0	2,152	-
31	737,996	6,023,737	107.1	WTG101	No	GENERIC	RD172m-8,000	8,000		172.0		194.0	2,152	-
32	738,723	6,024,423	102.1	WTG93	No	GENERIC	RD172m-8,000	8,000		172.0		194.0	2,152	-
33	739,451	6,025,110	101.7	WTG85	No	GENERIC	RD172m-8,000	8,000		172.0		194.0	2,152	-
34	740,178	6,025,797	100.0	WTG78	No	GENERIC	RD172m-8,000	8,000		172.0		194.0	2,152	-
35	738,204	6,026,627	100.0	WTG68	No	GENERIC	RD172m-8,000	8,000		172.0		194.0	2,152	-
36	739,396	6,023,696	108.2	WTG102	No	GENERIC	RD172m-8,000	8,000		172.0		194.0	2,152	-
37	738,683	6,023,008	110.0	WTG113	No	GENERIC	RD172m-8,000	8,000		172.0		194.0	2,152	-
38	737,955	6,022,321	111.0	WTG122	No	GENERIC	RD172m-8,000	8,000		172.0		194.0	2,152	-
39	738,631	6,021,594	113.9	WTG128	No	GENERIC	RD172m-8,000	8,000		172.0		194.0	2,152	-

To be continued on next page...

Project:

Meering West

ADVERTISED PLAN

SHADOW - Main Result

Calculation: Shadow flicker, 20260330 layout w distance limit 2,152m

...continued from previous page

	Easting	Southing	Z	Row data/Description	WTG type					Shadow data		
					Valid	Manufact.	Type-generator	Power, rated	Rotor diameter	Hub height	Calculation distance	RPM
			[m]				[kW]		[m]	[m]	[m]	[RPM]
40	739,370	6,022,281	110.9	WTG123	No	GENERIC	RD172m-8,000	8,000	172.0	194.0	2,152	-
41	740,748	6,022,651	110.0	WTG119	No	GENERIC	RD172m-8,000	8,000	172.0	194.0	2,152	-
42	742,199	6,022,200	110.0	WTG124	No	GENERIC	RD172m-8,000	8,000	172.0	194.0	2,152	-
43	742,240	6,023,621	110.0	WTG104	No	GENERIC	RD172m-8,000	8,000	172.0	194.0	2,152	-
44	741,665	6,024,307	110.0	WTG95	No	GENERIC	RD172m-8,000	8,000	172.0	194.0	2,152	-
45	740,825	6,023,655	110.0	WTG103	No	GENERIC	RD172m-8,000	8,000	172.0	194.0	2,152	-
46	740,137	6,024,344	107.7	WTG94	No	GENERIC	RD172m-8,000	8,000	172.0	194.0	2,152	-
47	739,238	6,020,906	116.0	WTG136	No	GENERIC	RD172m-8,000	8,000	172.0	194.0	2,152	-
48	735,171	6,020,966	110.6	WTG135	No	GENERIC	RD172m-8,000	8,000	172.0	194.0	2,152	-
49	735,045	6,019,572	120.1	WTG148	No	GENERIC	RD172m-8,000	8,000	172.0	194.0	2,152	-
50	734,357	6,020,291	110.9	WTG140	No	GENERIC	RD172m-8,000	8,000	172.0	194.0	2,152	-
51	739,612	6,030,769	94.4	WTG18	No	GENERIC	RD172m-8,000	8,000	172.0	194.0	2,152	-
52	741,022	6,030,636	97.5	WTG19	No	GENERIC	RD172m-8,000	8,000	172.0	194.0	2,152	-
53	743,857	6,030,648	102.5	WTG20	No	GENERIC	RD172m-8,000	8,000	172.0	194.0	2,152	-
54	745,181	6,030,599	108.3	WTG24	No	GENERIC	RD172m-8,000	8,000	172.0	194.0	2,152	-
55	746,600	6,030,424	104.5	WTG25	No	GENERIC	RD172m-8,000	8,000	172.0	194.0	2,152	-
56	748,080	6,030,353	95.2	WTG26	No	GENERIC	RD172m-8,000	8,000	172.0	194.0	2,152	-
57	743,210	6,032,790	99.4	WTG6	No	GENERIC	RD172m-8,000	8,000	172.0	194.0	2,152	-
58	743,169	6,031,376	100.0	WTG13	No	GENERIC	RD172m-8,000	8,000	172.0	194.0	2,152	-
59	745,188	6,032,218	99.9	WTG7	No	GENERIC	RD172m-8,000	8,000	172.0	194.0	2,152	-
60	743,886	6,032,154	100.0	WTG8	No	GENERIC	RD172m-8,000	8,000	172.0	194.0	2,152	-
61	745,854	6,025,639	110.0	WTG79	No	GENERIC	RD172m-8,000	8,000	172.0	194.0	2,152	-
62	747,162	6,027,008	110.0	WTG66	No	GENERIC	RD172m-8,000	8,000	172.0	194.0	2,152	-
63	746,692	6,027,748	110.0	WTG58	No	GENERIC	RD172m-8,000	8,000	172.0	194.0	2,152	-
64	748,029	6,027,627	101.5	WTG59	No	GENERIC	RD172m-8,000	8,000	172.0	194.0	2,152	-
65	748,746	6,028,399	90.0	WTG51	No	GENERIC	RD172m-8,000	8,000	172.0	194.0	2,152	-
66	747,367	6,028,446	107.2	WTG50	No	GENERIC	RD172m-8,000	8,000	172.0	194.0	2,152	-
67	748,008	6,029,111	99.2	WTG43	No	GENERIC	RD172m-8,000	8,000	172.0	194.0	2,152	-
68	747,378	6,029,797	101.8	WTG33	No	GENERIC	RD172m-8,000	8,000	172.0	194.0	2,152	-
69	746,058	6,029,745	109.5	WTG35	No	GENERIC	RD172m-8,000	8,000	172.0	194.0	2,152	-
70	746,584	6,029,128	109.3	WTG42	No	GENERIC	RD172m-8,000	8,000	172.0	194.0	2,152	-
71	745,231	6,029,193	110.0	WTG41	No	GENERIC	RD172m-8,000	8,000	172.0	194.0	2,152	-
72	745,918	6,028,465	110.0	WTG49	No	GENERIC	RD172m-8,000	8,000	172.0	194.0	2,152	-
73	744,434	6,027,095	110.0	WTG64	No	GENERIC	RD172m-8,000	8,000	172.0	194.0	2,152	-
74	743,800	6,027,812	108.6	WTG56	No	GENERIC	RD172m-8,000	8,000	172.0	194.0	2,152	-
75	743,093	6,028,544	100.0	WTG47	No	GENERIC	RD172m-8,000	8,000	172.0	194.0	2,152	-
76	742,995	6,027,202	110.0	WTG63	No	GENERIC	RD172m-8,000	8,000	172.0	194.0	2,152	-
77	742,361	6,027,859	100.8	WTG55	No	GENERIC	RD172m-8,000	8,000	172.0	194.0	2,152	-
78	740,882	6,028,040	100.0	WTG53	No	GENERIC	RD172m-8,000	8,000	172.0	194.0	2,152	-
79	740,259	6,028,627	100.0	WTG44	No	GENERIC	RD172m-8,000	8,000	172.0	194.0	2,152	-
80	738,885	6,030,082	94.9	WTG27	No	GENERIC	RD172m-8,000	8,000	172.0	194.0	2,152	-
81	740,301	6,030,034	100.0	WTG29	No	GENERIC	RD172m-8,000	8,000	172.0	194.0	2,152	-
82	740,987	6,029,314	100.0	WTG39	No	GENERIC	RD172m-8,000	8,000	172.0	194.0	2,152	-
83	744,475	6,029,985	109.8	WTG31	No	GENERIC	RD172m-8,000	8,000	172.0	194.0	2,152	-
84	749,193	6,030,642	90.0	WTG21	No	GENERIC	RD172m-8,000	8,000	172.0	194.0	2,152	-
85	750,056	6,030,049	85.7	WTG28	No	GENERIC	RD172m-8,000	8,000	172.0	194.0	2,152	-
86	750,837	6,030,601	82.0	WTG23	No	GENERIC	RD172m-8,000	8,000	172.0	194.0	2,152	-
87	750,857	6,031,599	80.0	WTG11	No	GENERIC	RD172m-8,000	8,000	172.0	194.0	2,152	-
88	752,448	6,031,728	82.9	WTG10	No	GENERIC	RD172m-8,000	8,000	172.0	194.0	2,152	-
89	748,635	6,025,630	98.8	WTG80	No	GENERIC	RD172m-8,000	8,000	172.0	194.0	2,152	-
90	750,084	6,025,593	90.0	WTG83	No	GENERIC	RD172m-8,000	8,000	172.0	194.0	2,152	-
91	747,920	6,024,825	102.8	WTG90	No	GENERIC	RD172m-8,000	8,000	172.0	194.0	2,152	-
92	747,228	6,024,177	103.0	WTG97	No	GENERIC	RD172m-8,000	8,000	172.0	194.0	2,152	-
93	746,544	6,023,519	107.0	WTG107	No	GENERIC	RD172m-8,000	8,000	172.0	194.0	2,152	-
94	748,690	6,024,155	100.0	WTG98	No	GENERIC	RD172m-8,000	8,000	172.0	194.0	2,152	-
95	749,327	6,023,412	100.0	WTG109	No	GENERIC	RD172m-8,000	8,000	172.0	194.0	2,152	-
96	749,352	6,024,781	98.3	WTG91	No	GENERIC	RD172m-8,000	8,000	172.0	194.0	2,152	-
97	747,864	6,023,561	101.2	WTG105	No	GENERIC	RD172m-8,000	8,000	172.0	194.0	2,152	-
98	743,450	6,020,791	110.0	WTG137	No	GENERIC	RD172m-8,000	8,000	172.0	194.0	2,152	-
99	744,395	6,021,429	110.0	WTG133	No	GENERIC	RD172m-8,000	8,000	172.0	194.0	2,152	-
100	745,633	6,018,553	100.0	WTG159	No	GENERIC	RD172m-8,000	8,000	172.0	194.0	2,152	-
101	746,405	6,019,164	103.0	WTG153	No	GENERIC	RD172m-8,000	8,000	172.0	194.0	2,152	-

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Aurecon Centre Level 8, 850 Collins Street,
Docklands

AU-3008 VIC Melbourne

+64 4 472 9589

Claire / claire.west@aurecongroup.com

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Meering West

ADVERTISED PLAN

SHADOW - Main Result

Calculation: Shadow flicker, 20260330 layout w distance limit 2,152m

...continued from previous page

	Easting	Southing	Z	Row data/Description	WTG type		Type-generator	Power, rated	Rotor diameter	Hub height	Shadow data	
					Valid	Manufact.					Calculation distance	RPM
			[m]					[kW]	[m]	[m]	[m]	[RPM]
102	746,378	6,017,824	100.0	WTG165	No	GENERIC	RD172m-8,000	8,000	172.0	194.0	2,152	-
103	747,391	6,021,445	110.0	WTG132	No	GENERIC	RD172m-8,000	8,000	172.0	194.0	2,152	-
104	750,173	6,028,602	84.2	WTG45	No	GENERIC	RD172m-8,000	8,000	172.0	194.0	2,152	-
105	749,569	6,029,315	87.6	WTG38	No	GENERIC	RD172m-8,000	8,000	172.0	194.0	2,152	-
106	751,810	6,033,823	84.6	WTG3	No	GENERIC	RD172m-8,000	8,000	172.0	194.0	2,152	-
107	752,160	6,035,159	84.8	WTG1	No	GENERIC	RD172m-8,000	8,000	172.0	194.0	2,152	-
108	741,725	6,030,024	100.0	WTG30	No	GENERIC	RD172m-8,000	8,000	172.0	194.0	2,152	-
109	741,668	6,028,371	100.0	WTG52	No	GENERIC	RD172m-8,000	8,000	172.0	194.0	2,152	-
110	750,806	6,029,558	81.1	WTG36	No	GENERIC	RD172m-8,000	8,000	172.0	194.0	2,152	-
111	737,186	6,020,213	118.7	WTG142	No	GENERIC	RD172m-8,000	8,000	172.0	194.0	2,152	-
112	738,648	6,020,173	119.5	WTG143	No	GENERIC	RD172m-8,000	8,000	172.0	194.0	2,152	-
113	735,825	6,023,071	107.5	WTG111	No	GENERIC	RD172m-8,000	8,000	172.0	194.0	2,152	-
114	740,021	6,023,054	110.0	WTG112	No	GENERIC	RD172m-8,000	8,000	172.0	194.0	2,152	-
115	741,610	6,022,921	110.0	WTG115	No	GENERIC	RD172m-8,000	8,000	172.0	194.0	2,152	-
116	742,927	6,022,884	110.0	WTG116	No	GENERIC	RD172m-8,000	8,000	172.0	194.0	2,152	-
117	744,342	6,022,844	110.0	WTG117	No	GENERIC	RD172m-8,000	8,000	172.0	194.0	2,152	-
118	742,377	6,030,638	100.0	WTG22	No	GENERIC	RD172m-8,000	8,000	172.0	194.0	2,152	-
119	740,823	6,025,036	107.2	WTG87	No	GENERIC	RD172m-8,000	8,000	172.0	194.0	2,152	-
120	751,201	6,034,632	90.0	WTG2	No	GENERIC	RD172m-8,000	8,000	172.0	194.0	2,152	-
121	744,705	6,031,482	100.8	WTG12	No	GENERIC	RD172m-8,000	8,000	172.0	194.0	2,152	-
122	745,999	6,031,295	102.6	WTG14	No	GENERIC	RD172m-8,000	8,000	172.0	194.0	2,152	-
123	742,561	6,032,049	98.8	WTG9	No	GENERIC	RD172m-8,000	8,000	172.0	194.0	2,152	-
124	747,906	6,020,621	110.0	WTG138	No	GENERIC	RD172m-8,000	8,000	172.0	194.0	2,152	-
125	744,367	6,020,281	110.0	WTG145	No	GENERIC	RD172m-8,000	8,000	172.0	194.0	2,152	-
126	747,087	6,019,940	110.0	WTG146	No	GENERIC	RD172m-8,000	8,000	172.0	194.0	2,152	-
127	748,476	6,030,918	92.7	WTG15	No	GENERIC	RD172m-8,000	8,000	172.0	194.0	2,152	-
128	750,134	6,030,987	84.1	WTG17	No	GENERIC	RD172m-8,000	8,000	172.0	194.0	2,152	-
129	751,600	6,031,135	80.0	WTG16	No	GENERIC	RD172m-8,000	8,000	172.0	194.0	2,152	-
130	740,819	6,026,545	100.0	WTG70	No	GENERIC	RD172m-8,000	8,000	172.0	194.0	2,152	-
131	741,737	6,025,609	106.7	WTG81	No	GENERIC	RD172m-8,000	8,000	172.0	194.0	2,152	-
132	737,308	6,024,463	108.0	WTG92	No	GENERIC	RD172m-8,000	8,000	172.0	194.0	2,152	-
133	735,771	6,020,252	116.5	WTG141	No	GENERIC	RD172m-8,000	8,000	172.0	194.0	2,152	-
134	745,178	6,026,346	110.0	WTG72	No	GENERIC	RD172m-8,000	8,000	172.0	194.0	2,152	-
135	747,048	6,018,467	100.0	WTG160	No	GENERIC	RD172m-8,000	8,000	172.0	194.0	2,152	-
136	735,211	6,023,861	100.0	WTG99	No	GENERIC	RD172m-8,000	8,000	172.0	194.0	2,152	-
137	735,196	6,025,056	100.0	WTG86	No	GENERIC	RD172m-8,000	8,000	172.0	194.0	2,152	-
138	751,348	6,033,291	86.9	WTG4	No	GENERIC	RD172m-8,000	8,000	172.0	194.0	2,152	-
139	748,762	6,029,775	90.0	WTG34	No	GENERIC	RD172m-8,000	8,000	172.0	194.0	2,152	-
140	746,589	6,022,723	109.0	WTG118	No	GENERIC	RD172m-8,000	8,000	172.0	194.0	2,152	-
141	736,580	6,023,748	110.0	WTG100	No	GENERIC	RD172m-8,000	8,000	172.0	194.0	2,152	-
142	733,115	6,018,762	111.1	WTG158	No	GENERIC	RD172m-8,000	8,000	172.0	194.0	2,152	-
143	733,887	6,019,626	120.0	WTG147	No	GENERIC	RD172m-8,000	8,000	172.0	194.0	2,152	-
144	732,897	6,020,340	120.0	WTG139	No	GENERIC	RD172m-8,000	8,000	172.0	194.0	2,152	-
145	733,574	6,022,332	103.1	WTG121	No	GENERIC	RD172m-8,000	8,000	172.0	194.0	2,152	-
146	739,548	6,027,940	100.0	WTG54	No	GENERIC	RD172m-8,000	8,000	172.0	194.0	2,152	-
147	738,912	6,028,545	100.0	WTG46	No	GENERIC	RD172m-8,000	8,000	172.0	194.0	2,152	-
148	739,572	6,029,354	100.0	WTG37	No	GENERIC	RD172m-8,000	8,000	172.0	194.0	2,152	-
149	734,356	6,018,840	127.0	WTG155	No	GENERIC	RD172m-8,000	8,000	172.0	194.0	2,152	-
150	735,759	6,018,832	120.0	WTG156	No	GENERIC	RD172m-8,000	8,000	172.0	194.0	2,152	-
151	736,483	6,019,524	120.0	WTG149	No	GENERIC	RD172m-8,000	8,000	172.0	194.0	2,152	-
152	737,030	6,018,880	120.0	WTG154	No	GENERIC	RD172m-8,000	8,000	172.0	194.0	2,152	-
153	738,777	6,018,975	120.0	WTG157	No	GENERIC	RD172m-8,000	8,000	172.0	194.0	2,152	-
154	738,101	6,019,520	120.0	WTG150	No	GENERIC	RD172m-8,000	8,000	172.0	194.0	2,152	-
155	732,233	6,019,336	105.6	WTG152	No	GENERIC	RD172m-8,000	8,000	172.0	194.0	2,152	-
156	731,606	6,020,117	100.0	WTG144	No	GENERIC	RD172m-8,000	8,000	172.0	194.0	2,152	-
157	730,832	6,019,377	100.0	WTG151	No	GENERIC	RD172m-8,000	8,000	172.0	194.0	2,152	-
158	732,631	6,021,447	110.0	WTG131	No	GENERIC	RD172m-8,000	8,000	172.0	194.0	2,152	-
159	735,013	6,018,104	126.3	WTG161	No	GENERIC	RD172m-8,000	8,000	172.0	194.0	2,152	-
160	733,777	6,017,996	120.0	WTG163	No	GENERIC	RD172m-8,000	8,000	172.0	194.0	2,152	-
161	736,220	6,018,041	120.0	WTG162	No	GENERIC	RD172m-8,000	8,000	172.0	194.0	2,152	-
162	737,223	6,018,003	116.6	WTG164	No	GENERIC	RD172m-8,000	8,000	172.0	194.0	2,152	-
163	752,216	6,033,148	80.0	WTG5	No	GENERIC	RD172m-8,000	8,000	172.0	194.0	2,152	-
164	738,947	6,027,251	100.0	WTG61	No	GENERIC	RD172m-8,000	8,000	172.0	194.0	2,152	-

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Aurecon Australasia Pty Ltd

Aurecon Centre Level 8, 850 Collins Street,
Docklands

AU-3008 VIC Melbourne

+64 4 472 9589

Claire / claire.west@aurecongroup.com

Calculated:

9/04/2026 2:37 pm/4.1.287

SHADOW - Main Result

Calculation: Shadow flicker, 20260330 layout w distance limit 2,152m

Shadow receptor-Input

No.	Name	Easting	Southing	Z	Width	Height	Elevation a.g.l.	Slope of window	Direction mode
				[m]	[m]	[m]	[m]	[°]	
A 53		744,630	6,033,631	98.1	1.0	1.0	1.0	90.0	"Green house mode"
B 69		747,323	6,031,552	100.0	1.0	1.0	1.0	90.0	"Green house mode"
C 72		752,506	6,030,958	80.0	1.0	1.0	1.0	90.0	"Green house mode"
D 80		742,121	6,029,286	100.0	1.0	1.0	1.0	90.0	"Green house mode"
E 100		741,811	6,026,602	102.4	1.0	1.0	1.0	90.0	"Green house mode"
F 105		743,855	6,025,110	110.0	1.0	1.0	1.0	90.0	"Green house mode"
G 108		735,843	6,024,443	110.0	1.0	1.0	1.0	90.0	"Green house mode"
H 115		750,695	6,023,410	91.2	1.0	1.0	1.0	90.0	"Green house mode"
I 121		747,419	6,022,329	109.2	1.0	1.0	1.0	90.0	"Green house mode"
J 126		740,745	6,021,138	111.9	1.0	1.0	1.0	90.0	"Green house mode"
K 127		745,891	6,021,121	110.0	1.0	1.0	1.0	90.0	"Green house mode"
L 1		754,864	6,040,379	80.0	1.0	1.0	1.0	90.0	"Green house mode"
M 2		739,892	6,040,212	80.0	1.0	1.0	1.0	90.0	"Green house mode"
N 3		750,653	6,039,936	90.0	1.0	1.0	1.0	90.0	"Green house mode"
O 4		745,140	6,039,535	82.0	1.0	1.0	1.0	90.0	"Green house mode"
P 5		754,411	6,039,350	80.0	1.0	1.0	1.0	90.0	"Green house mode"
Q 6		760,795	6,039,284	80.0	1.0	1.0	1.0	90.0	"Green house mode"
R 7		749,065	6,039,125	90.0	1.0	1.0	1.0	90.0	"Green house mode"
S 8		757,544	6,039,096	80.0	1.0	1.0	1.0	90.0	"Green house mode"
T 9		757,317	6,039,046	80.0	1.0	1.0	1.0	90.0	"Green house mode"
U 10		758,647	6,038,877	80.0	1.0	1.0	1.0	90.0	"Green house mode"
V 11		759,742	6,038,439	80.0	1.0	1.0	1.0	90.0	"Green house mode"
W 12		759,527	6,038,423	80.0	1.0	1.0	1.0	90.0	"Green house mode"
X 13		759,949	6,038,404	80.0	1.0	1.0	1.0	90.0	"Green house mode"
Y 14		757,897	6,038,228	80.0	1.0	1.0	1.0	90.0	"Green house mode"
Z 15		742,939	6,038,224	90.0	1.0	1.0	1.0	90.0	"Green house mode"
AA 16		758,344	6,037,992	80.0	1.0	1.0	1.0	90.0	"Green house mode"
AB 17		746,313	6,037,970	90.0	1.0	1.0	1.0	90.0	"Green house mode"
AC 18		746,260	6,037,938	90.0	1.0	1.0	1.0	90.0	"Green house mode"
AD 19		738,905	6,037,906	80.0	1.0	1.0	1.0	90.0	"Green house mode"
AE 20		759,421	6,037,507	80.0	1.0	1.0	1.0	90.0	"Green house mode"
AF 21		751,384	6,037,377	95.0	1.0	1.0	1.0	90.0	"Green house mode"
AG 22		755,364	6,037,191	80.0	1.0	1.0	1.0	90.0	"Green house mode"
AH 23		750,795	6,037,122	95.1	1.0	1.0	1.0	90.0	"Green house mode"
AI 24		757,981	6,037,069	80.0	1.0	1.0	1.0	90.0	"Green house mode"
AJ 25		749,160	6,037,030	90.0	1.0	1.0	1.0	90.0	"Green house mode"
AK 26		749,160	6,037,030	90.0	1.0	1.0	1.0	90.0	"Green house mode"
AL 27		758,274	6,037,021	80.0	1.0	1.0	1.0	90.0	"Green house mode"
AM 28		753,693	6,036,953	80.0	1.0	1.0	1.0	90.0	"Green house mode"
AN 29		761,204	6,036,633	80.0	1.0	1.0	1.0	90.0	"Green house mode"
AO 30		746,035	6,036,493	90.0	1.0	1.0	1.0	90.0	"Green house mode"
AP 31		738,971	6,036,120	80.0	1.0	1.0	1.0	90.0	"Green house mode"
AQ 32		742,879	6,035,707	90.0	1.0	1.0	1.0	90.0	"Green house mode"
AR 33		759,770	6,035,670	80.0	1.0	1.0	1.0	90.0	"Green house mode"
AS 34		756,085	6,035,634	80.0	1.0	1.0	1.0	90.0	"Green house mode"
AT 35		760,436	6,035,556	80.0	1.0	1.0	1.0	90.0	"Green house mode"
AU 36		760,028	6,035,435	80.0	1.0	1.0	1.0	90.0	"Green house mode"
AV 37		740,951	6,035,317	89.7	1.0	1.0	1.0	90.0	"Green house mode"
AW 38		744,623	6,035,219	90.0	1.0	1.0	1.0	90.0	"Green house mode"
AX 39		754,788	6,034,942	80.0	1.0	1.0	1.0	90.0	"Green house mode"
AY 40		736,143	6,034,934	90.0	1.0	1.0	1.0	90.0	"Green house mode"
AZ 41		757,474	6,034,685	80.0	1.0	1.0	1.0	90.0	"Green house mode"
BA 42		759,452	6,034,637	80.0	1.0	1.0	1.0	90.0	"Green house mode"
BB 43		733,238	6,034,636	90.0	1.0	1.0	1.0	90.0	"Green house mode"
BC 44		760,165	6,034,633	80.0	1.0	1.0	1.0	90.0	"Green house mode"
BD 45		757,981	6,034,565	80.0	1.0	1.0	1.0	90.0	"Green house mode"
BE 46		756,615	6,034,554	80.0	1.0	1.0	1.0	90.0	"Green house mode"
BF 47		734,800	6,034,110	90.0	1.0	1.0	1.0	90.0	"Green house mode"
BG 49		748,835	6,033,877	90.0	1.0	1.0	1.0	90.0	"Green house mode"
BH 50		753,173	6,033,720	80.0	1.0	1.0	1.0	90.0	"Green house mode"
BI 51		749,339	6,033,717	90.0	1.0	1.0	1.0	90.0	"Green house mode"
BJ 52		749,380	6,033,710	90.0	1.0	1.0	1.0	90.0	"Green house mode"
BK 54		757,178	6,033,626	80.0	1.0	1.0	1.0	90.0	"Green house mode"

To be continued on next page...

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SHADOW - Main Result

Calculation: Shadow flicker, 20260330 layout w distance limit 2,152m

...continued from previous page

No.	Name	Easting	Southing	Z	Width	Height	Elevation a.g.l.	Slope of window	Direction mode
				[m]	[m]	[m]	[m]	[°]	
BL 55		757,381	6,033,583	80.0	1.0	1.0	1.0	90.0	"Green house mode"
BM 56		757,022	6,033,530	80.0	1.0	1.0	1.0	90.0	"Green house mode"
BN 57		757,291	6,033,517	80.0	1.0	1.0	1.0	90.0	"Green house mode"
BO 58		756,674	6,033,435	80.0	1.0	1.0	1.0	90.0	"Green house mode"
BP 59		734,168	6,033,188	90.0	1.0	1.0	1.0	90.0	"Green house mode"
BQ 60		754,242	6,033,152	80.0	1.0	1.0	1.0	90.0	"Green house mode"
BR 61		757,611	6,033,022	80.0	1.0	1.0	1.0	90.0	"Green house mode"
BS 62		747,361	6,032,873	100.0	1.0	1.0	1.0	90.0	"Green house mode"
BT 63		747,361	6,032,873	100.0	1.0	1.0	1.0	90.0	"Green house mode"
BU 64		749,249	6,032,869	90.0	1.0	1.0	1.0	90.0	"Green house mode"
BV 65		740,497	6,032,640	90.0	1.0	1.0	1.0	90.0	"Green house mode"
BW 66		759,041	6,032,391	80.0	1.0	1.0	1.0	90.0	"Green house mode"
BX 67		755,398	6,032,091	80.0	1.0	1.0	1.0	90.0	"Green house mode"
BY 68		754,678	6,031,694	80.0	1.0	1.0	1.0	90.0	"Green house mode"
BZ 70		758,094	6,031,201	80.0	1.0	1.0	1.0	90.0	"Green house mode"
CA 71		754,952	6,031,068	80.0	1.0	1.0	1.0	90.0	"Green house mode"
CB 73		755,448	6,030,952	80.0	1.0	1.0	1.0	90.0	"Green house mode"
CC 74		763,648	6,030,773	80.0	1.0	1.0	1.0	90.0	"Green house mode"
CD 75		757,504	6,030,451	80.0	1.0	1.0	1.0	90.0	"Green house mode"
CE 76		736,536	6,030,374	90.9	1.0	1.0	1.0	90.0	"Green house mode"
CF 77		729,180	6,030,059	90.0	1.0	1.0	1.0	90.0	"Green house mode"
CG 78		757,170	6,029,835	80.0	1.0	1.0	1.0	90.0	"Green house mode"
CH 81		756,985	6,029,231	80.0	1.0	1.0	1.0	90.0	"Green house mode"
CI 82		754,374	6,029,112	80.0	1.0	1.0	1.0	90.0	"Green house mode"
CJ 83		754,411	6,029,084	80.0	1.0	1.0	1.0	90.0	"Green house mode"
CK 84		754,660	6,029,016	80.0	1.0	1.0	1.0	90.0	"Green house mode"
CL 85		754,645	6,028,798	80.0	1.0	1.0	1.0	90.0	"Green house mode"
CM 86		753,830	6,028,564	80.0	1.0	1.0	1.0	90.0	"Green house mode"
CN 88		754,289	6,028,241	80.0	1.0	1.0	1.0	90.0	"Green house mode"
CO 89		753,065	6,027,536	84.5	1.0	1.0	1.0	90.0	"Green house mode"
CP 90		759,224	6,027,294	84.8	1.0	1.0	1.0	90.0	"Green house mode"
CQ 91		752,849	6,027,166	88.0	1.0	1.0	1.0	90.0	"Green house mode"
CR 92		735,502	6,027,105	100.0	1.0	1.0	1.0	90.0	"Green house mode"
CS 93		735,507	6,027,099	100.0	1.0	1.0	1.0	90.0	"Green house mode"
CT 94		753,541	6,027,090	88.9	1.0	1.0	1.0	90.0	"Green house mode"
CU 95		752,708	6,027,067	88.8	1.0	1.0	1.0	90.0	"Green house mode"
CV 96		753,275	6,027,052	89.8	1.0	1.0	1.0	90.0	"Green house mode"
CW 97		753,637	6,026,910	90.0	1.0	1.0	1.0	90.0	"Green house mode"
CX 98		752,700	6,026,852	81.9	1.0	1.0	1.0	90.0	"Green house mode"
CY 99		727,283	6,026,757	91.3	1.0	1.0	1.0	90.0	"Green house mode"
CZ 102		753,011	6,025,456	80.7	1.0	1.0	1.0	90.0	"Green house mode"
DA 103		761,020	6,025,442	80.0	1.0	1.0	1.0	90.0	"Green house mode"
DB 104		758,457	6,025,354	85.4	1.0	1.0	1.0	90.0	"Green house mode"
DC 106		753,501	6,024,986	90.0	1.0	1.0	1.0	90.0	"Green house mode"
DD 107		752,170	6,024,573	84.2	1.0	1.0	1.0	90.0	"Green house mode"
DE 109		730,796	6,024,221	100.0	1.0	1.0	1.0	90.0	"Green house mode"
DF 110		757,800	6,024,208	83.2	1.0	1.0	1.0	90.0	"Green house mode"
DG 111		757,892	6,024,189	83.0	1.0	1.0	1.0	90.0	"Green house mode"
DH 112		762,055	6,023,985	81.2	1.0	1.0	1.0	90.0	"Green house mode"
DI 113		730,434	6,023,676	100.0	1.0	1.0	1.0	90.0	"Green house mode"
DJ 114		731,402	6,023,591	109.3	1.0	1.0	1.0	90.0	"Green house mode"
DK 118		756,755	6,022,883	84.1	1.0	1.0	1.0	90.0	"Green house mode"
DL 119		758,949	6,022,874	80.5	1.0	1.0	1.0	90.0	"Green house mode"
DM 120		728,028	6,022,848	100.0	1.0	1.0	1.0	90.0	"Green house mode"
DN 124		724,776	6,021,936	100.0	1.0	1.0	1.0	90.0	"Green house mode"
DO 125		757,952	6,021,848	82.7	1.0	1.0	1.0	90.0	"Green house mode"
DP 128		725,446	6,021,000	100.0	1.0	1.0	1.0	90.0	"Green house mode"
DQ 129		756,340	6,020,937	86.5	1.0	1.0	1.0	90.0	"Green house mode"
DR 130		757,202	6,020,857	85.5	1.0	1.0	1.0	90.0	"Green house mode"
DS 131		756,146	6,020,308	87.9	1.0	1.0	1.0	90.0	"Green house mode"
DT 133		751,688	6,019,255	90.0	1.0	1.0	1.0	90.0	"Green house mode"
DU 134		756,840	6,018,787	89.9	1.0	1.0	1.0	90.0	"Green house mode"
DV 135		741,975	6,018,213	110.0	1.0	1.0	1.0	90.0	"Green house mode"

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SHADOW - Main Result

Calculation: Shadow flicker, 20260330 layout w distance limit 2,152m

...continued from previous page

No.	Name	Easting	Southing	Z	Width	Height	Elevation a.g.l.	Slope of window	Direction mode
				[m]	[m]	[m]	[m]	[°]	
DW 136		757,931	6,017,587	90.0	1.0	1.0	1.0	90.0	"Green house mode"
DX 137		738,782	6,016,714	110.0	1.0	1.0	1.0	90.0	"Green house mode"
DY 138		748,142	6,016,668	100.0	1.0	1.0	1.0	90.0	"Green house mode"
DZ 139		734,213	6,016,486	120.0	1.0	1.0	1.0	90.0	"Green house mode"
EA 140		731,971	6,016,422	100.0	1.0	1.0	1.0	90.0	"Green house mode"
EB 141		721,765	6,016,395	100.0	1.0	1.0	1.0	90.0	"Green house mode"
EC 142		750,782	6,016,341	90.0	1.0	1.0	1.0	90.0	"Green house mode"
ED 143		736,264	6,016,293	121.7	1.0	1.0	1.0	90.0	"Green house mode"
EE 144		731,289	6,016,242	100.0	1.0	1.0	1.0	90.0	"Green house mode"
EF 145		744,820	6,016,186	100.0	1.0	1.0	1.0	90.0	"Green house mode"
EG 146		736,295	6,016,113	122.5	1.0	1.0	1.0	90.0	"Green house mode"
EH 147		750,550	6,015,861	90.0	1.0	1.0	1.0	90.0	"Green house mode"
EI 148		735,291	6,015,748	130.0	1.0	1.0	1.0	90.0	"Green house mode"
EJ 149		741,911	6,015,590	100.0	1.0	1.0	1.0	90.0	"Green house mode"
EK 150		744,616	6,015,112	100.0	1.0	1.0	1.0	90.0	"Green house mode"
EL 151		757,208	6,015,108	90.0	1.0	1.0	1.0	90.0	"Green house mode"
EM 152		756,323	6,015,087	90.0	1.0	1.0	1.0	90.0	"Green house mode"
EN 153		738,710	6,014,900	110.0	1.0	1.0	1.0	90.0	"Green house mode"
EO 154		750,304	6,014,516	90.0	1.0	1.0	1.0	90.0	"Green house mode"
EP 155		754,506	6,013,942	90.0	1.0	1.0	1.0	90.0	"Green house mode"
EQ 156		747,737	6,013,864	100.0	1.0	1.0	1.0	90.0	"Green house mode"
ER 157		745,352	6,013,750	100.0	1.0	1.0	1.0	90.0	"Green house mode"
ES 158		751,107	6,013,710	90.0	1.0	1.0	1.0	90.0	"Green house mode"
ET 159		748,867	6,013,050	90.0	1.0	1.0	1.0	90.0	"Green house mode"
EU 160		730,043	6,012,884	100.0	1.0	1.0	1.0	90.0	"Green house mode"
EV 161		756,237	6,012,767	90.0	1.0	1.0	1.0	90.0	"Green house mode"
EW 162		727,237	6,012,608	100.0	1.0	1.0	1.0	90.0	"Green house mode"
EX 163		736,895	6,011,926	101.5	1.0	1.0	1.0	90.0	"Green house mode"
EY 164		754,732	6,011,891	90.0	1.0	1.0	1.0	90.0	"Green house mode"
EZ 165		740,817	6,011,886	110.0	1.0	1.0	1.0	90.0	"Green house mode"
FA 166		739,269	6,011,537	100.0	1.0	1.0	1.0	90.0	"Green house mode"
FB 167		723,829	6,011,502	100.0	1.0	1.0	1.0	90.0	"Green house mode"
FC 168		721,972	6,011,185	100.0	1.0	1.0	1.0	90.0	"Green house mode"
FD 169		737,072	6,010,954	100.0	1.0	1.0	1.0	90.0	"Green house mode"
FE 170		744,457	6,010,042	96.1	1.0	1.0	1.0	90.0	"Green house mode"
FF 171		730,713	6,009,804	100.0	1.0	1.0	1.0	90.0	"Green house mode"
FG 172		742,961	6,009,647	90.0	1.0	1.0	1.0	90.0	"Green house mode"
FH 173		741,554	6,009,598	92.4	1.0	1.0	1.0	90.0	"Green house mode"
FI 174		747,230	6,009,565	90.0	1.0	1.0	1.0	90.0	"Green house mode"
FJ 175		744,494	6,009,428	90.0	1.0	1.0	1.0	90.0	"Green house mode"
FK 176		752,232	6,009,307	90.0	1.0	1.0	1.0	90.0	"Green house mode"
FL 177		747,419	6,009,305	90.0	1.0	1.0	1.0	90.0	"Green house mode"
FM 178		747,527	6,009,195	90.0	1.0	1.0	1.0	90.0	"Green house mode"
FN 179		754,766	6,009,078	90.0	1.0	1.0	1.0	90.0	"Green house mode"
FO 180		747,514	6,008,035	90.0	1.0	1.0	1.0	90.0	"Green house mode"
FP 181		743,671	6,007,927	90.0	1.0	1.0	1.0	90.0	"Green house mode"
FQ 182		747,197	6,007,898	90.0	1.0	1.0	1.0	90.0	"Green house mode"
FR 183		749,985	6,019,909	95.4	1.0	1.0	1.0	90.0	"Green house mode"

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Calculation Results

Shadow receptor

Shadow, worst case

No.	Name	Shadow hours per year [h/year]	Shadow days per year [days/year]	Max shadow hours per day [h/day]
A 53		0:00	0	0:00
B 69		35:55	105	0:30
C 72		50:40	124	0:42
D 80		83:44	216	0:57
E 100		69:05	171	0:41
F 105		18:04	60	0:25
G 108		59:44	107	0:47

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SHADOW - Main Result

Calculation: Shadow flicker, 20260330 layout w distance limit 2,152m

...continued from previous page

Shadow, worst case

No.	Name	Shadow hours per year [h/year]	Shadow days per year [days/year]	Max shadow hours per day [h/day]
H 115		20:47	64	0:29
I 121		35:00	64	0:43
J 126		22:33	66	0:29
K 127		30:15	78	0:46
L 1		0:00	0	0:00
M 2		0:00	0	0:00
N 3		0:00	0	0:00
O 4		0:00	0	0:00
P 5		0:00	0	0:00
Q 6		0:00	0	0:00
R 7		0:00	0	0:00
S 8		0:00	0	0:00
T 9		0:00	0	0:00
U 10		0:00	0	0:00
V 11		0:00	0	0:00
W 12		0:00	0	0:00
X 13		0:00	0	0:00
Y 14		0:00	0	0:00
Z 15		0:00	0	0:00
AA 16		0:00	0	0:00
AB 17		0:00	0	0:00
AC 18		0:00	0	0:00
AD 19		0:00	0	0:00
AE 20		0:00	0	0:00
AF 21		0:00	0	0:00
AG 22		0:00	0	0:00
AH 23		0:00	0	0:00
AI 24		0:00	0	0:00
AJ 25		0:00	0	0:00
AK 26		0:00	0	0:00
AL 27		0:00	0	0:00
AM 28		0:00	0	0:00
AN 29		0:00	0	0:00
AO 30		0:00	0	0:00
AP 31		0:00	0	0:00
AQ 32		0:00	0	0:00
AR 33		0:00	0	0:00
AS 34		0:00	0	0:00
AT 35		0:00	0	0:00
AU 36		0:00	0	0:00
AV 37		0:00	0	0:00
AW 38		0:00	0	0:00
AX 39		0:00	0	0:00
AY 40		0:00	0	0:00
AZ 41		0:00	0	0:00
BA 42		0:00	0	0:00
BB 43		0:00	0	0:00
BC 44		0:00	0	0:00
BD 45		0:00	0	0:00
BE 46		0:00	0	0:00
BF 47		0:00	0	0:00
BG 49		0:00	0	0:00
BH 50		23:38	72	0:29
BI 51		17:53	70	0:21
BJ 52		19:04	72	0:21
BK 54		0:00	0	0:00
BL 55		0:00	0	0:00
BM 56		0:00	0	0:00
BN 57		0:00	0	0:00
BO 58		0:00	0	0:00
BP 59		0:00	0	0:00
BQ 60		6:20	25	0:20

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SHADOW - Main Result

Calculation: Shadow flicker, 20260330 layout w distance limit 2,152m

...continued from previous page

Shadow, worst case

No.	Name	Shadow hours per year [h/year]	Shadow days per year [days/year]	Max shadow hours per day [h/day]
BR 61		0:00	0	0:00
BS 62		0:00	0	0:00
BT 63		0:00	0	0:00
BU 64		5:56	26	0:18
BV 65		7:16	29	0:19
BW 66		0:00	0	0:00
BX 67		0:00	0	0:00
BY 68		0:00	0	0:00
BZ 70		0:00	0	0:00
CA 71		0:00	0	0:00
CB 73		0:00	0	0:00
CC 74		0:00	0	0:00
CD 75		0:00	0	0:00
CE 76		0:00	0	0:00
CF 77		0:00	0	0:00
CG 78		0:00	0	0:00
CH 81		0:00	0	0:00
CI 82		0:00	0	0:00
CJ 83		0:00	0	0:00
CK 84		0:00	0	0:00
CL 85		0:00	0	0:00
CM 86		0:00	0	0:00
CN 88		0:00	0	0:00
CO 89		0:00	0	0:00
CP 90		0:00	0	0:00
CQ 91		0:00	0	0:00
CR 92		0:00	0	0:00
CS 93		0:00	0	0:00
CT 94		0:00	0	0:00
CU 95		0:00	0	0:00
CV 96		0:00	0	0:00
CW 97		0:00	0	0:00
CX 98		10:17	40	0:20
CY 99		0:00	0	0:00
CZ 102		0:00	0	0:00
DA 103		0:00	0	0:00
DB 104		0:00	0	0:00
DC 106		0:00	0	0:00
DD 107		0:00	0	0:00
DE 109		0:00	0	0:00
DF 110		0:00	0	0:00
DG 111		0:00	0	0:00
DH 112		0:00	0	0:00
DI 113		0:00	0	0:00
DJ 114		0:00	0	0:00
DK 118		0:00	0	0:00
DL 119		0:00	0	0:00
DM 120		0:00	0	0:00
DN 124		0:00	0	0:00
DO 125		0:00	0	0:00
DP 128		0:00	0	0:00
DQ 129		0:00	0	0:00
DR 130		0:00	0	0:00
DS 131		0:00	0	0:00
DT 133		0:00	0	0:00
DU 134		0:00	0	0:00
DV 135		0:00	0	0:00
DW 136		0:00	0	0:00
DX 137		0:00	0	0:00
DY 138		18:52	70	0:21
DZ 139		0:00	0	0:00
EA 140		0:00	0	0:00

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To be continued on next page...

SHADOW - Main Result

Calculation: Shadow flicker, 20260330 layout w distance limit 2,152m

...continued from previous page

No.	Name	Shadow, worst case		
		Shadow hours per year [h/year]	Shadow days per year [days/year]	Max shadow hours per day [h/day]
EB 141		0:00	0	0:00
EC 142		0:00	0	0:00
ED 143		0:00	0	0:00
EE 144		0:00	0	0:00
EF 145		0:00	0	0:00
EG 146		0:00	0	0:00
EH 147		0:00	0	0:00
EI 148		0:00	0	0:00
EJ 149		0:00	0	0:00
EK 150		0:00	0	0:00
EL 151		0:00	0	0:00
EM 152		0:00	0	0:00
EN 153		0:00	0	0:00
EO 154		0:00	0	0:00
EP 155		0:00	0	0:00
EQ 156		0:00	0	0:00
ER 157		0:00	0	0:00
ES 158		0:00	0	0:00
ET 159		0:00	0	0:00
EU 160		0:00	0	0:00
EV 161		0:00	0	0:00
EW 162		0:00	0	0:00
EX 163		0:00	0	0:00
EY 164		0:00	0	0:00
EZ 165		0:00	0	0:00
FA 166		0:00	0	0:00
FB 167		0:00	0	0:00
FC 168		0:00	0	0:00
FD 169		0:00	0	0:00
FE 170		0:00	0	0:00
FF 171		0:00	0	0:00
FG 172		0:00	0	0:00
FH 173		0:00	0	0:00
FI 174		0:00	0	0:00
FJ 175		0:00	0	0:00
FK 176		0:00	0	0:00
FL 177		0:00	0	0:00
FM 178		0:00	0	0:00
FN 179		0:00	0	0:00
FO 180		0:00	0	0:00
FP 181		0:00	0	0:00
FQ 182		0:00	0	0:00
FR 183		0:00	0	0:00

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

No.	Name	Worst case [h/year]
1	WTG75	0:00
2	WTG76	10:17
3	WTG67	0:00
4	WTG74	0:00
5	WTG71	6:22
6	WTG82	0:00
7	WTG89	0:00
8	WTG96	0:00
9	WTG106	0:00
10	WTG125	0:00
11	WTG130	0:00
12	WTG108	0:00
13	WTG88	11:12
14	WTG62	9:41

To be continued on next page...

SHADOW - Main Result

Calculation: Shadow flicker, 20260330 layout w distance limit 2,152m

...continued from previous page

No.	Name	Worst case [h/year]
15	WTG73	0:00
16	WTG65	0:00
17	WTG57	0:00
18	WTG48	0:00
19	WTG40	8:59
20	WTG32	32:00
21	WTG129	0:00
22	WTG120	0:00
23	WTG110	0:00
24	WTG69	0:00
25	WTG77	0:00
26	WTG84	0:00
27	WTG127	0:00
28	WTG134	0:00
29	WTG126	0:00
30	WTG114	0:00
31	WTG101	0:00
32	WTG93	0:00
33	WTG85	0:00
34	WTG78	2:14
35	WTG68	0:00
36	WTG102	0:00
37	WTG113	0:00
38	WTG122	0:00
39	WTG128	0:00
40	WTG123	3:40
41	WTG119	0:00
42	WTG124	5:44
43	WTG104	0:00
44	WTG95	0:00
45	WTG103	0:00
46	WTG94	0:00
47	WTG136	13:09
48	WTG135	0:00
49	WTG148	0:00
50	WTG140	0:00
51	WTG18	0:00
52	WTG19	0:00
53	WTG20	0:00
54	WTG24	0:00
55	WTG25	0:00
56	WTG26	0:00
57	WTG6	0:00
58	WTG13	0:00
59	WTG7	0:00
60	WTG8	0:00
61	WTG79	6:52
62	WTG66	0:00
63	WTG58	0:00
64	WTG59	0:00
65	WTG51	0:00
66	WTG50	0:00
67	WTG43	0:00
68	WTG33	0:00
69	WTG35	0:00
70	WTG42	0:00
71	WTG41	0:00
72	WTG49	0:00
73	WTG64	0:00
74	WTG56	0:00
75	WTG47	0:00
76	WTG63	22:39
77	WTG55	0:00
78	WTG53	0:00

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To be continued on next page...

SHADOW - Main Result

Calculation: Shadow flicker, 20260330 layout w distance limit 2,152m

...continued from previous page

No.	Name	Worst case [h/year]
79	WTG44	14:06
80	WTG27	0:00
81	WTG29	8:29
82	WTG39	20:10
83	WTG31	0:00
84	WTG21	17:09
85	WTG28	0:00
86	WTG23	11:35
87	WTG11	9:53
88	WTG10	0:00
89	WTG80	0:00
90	WTG83	0:00
91	WTG90	0:00
92	WTG97	0:00
93	WTG107	0:00
94	WTG98	6:45
95	WTG109	14:02
96	WTG91	0:00
97	WTG105	0:00
98	WTG137	0:00
99	WTG133	11:22
100	WTG159	0:00
101	WTG153	0:00
102	WTG165	18:52
103	WTG132	11:41
104	WTG45	0:00
105	WTG38	0:00
106	WTG3	13:44
107	WTG1	0:00
108	WTG30	0:00
109	WTG52	0:00
110	WTG36	0:00
111	WTG142	0:00
112	WTG143	0:00
113	WTG111	0:00
114	WTG112	0:00
115	WTG115	0:00
116	WTG116	0:00
117	WTG117	0:00
118	WTG22	0:00
119	WTG87	0:00
120	WTG2	13:29
121	WTG12	0:00
122	WTG14	18:19
123	WTG9	7:16
124	WTG138	7:12
125	WTG145	0:00
126	WTG146	0:00
127	WTG15	5:12
128	WTG17	0:00
129	WTG16	29:12
130	WTG70	28:09
131	WTG81	0:00
132	WTG92	12:03
133	WTG141	0:00
134	WTG72	0:00
135	WTG160	0:00
136	WTG99	0:00
137	WTG86	47:41
138	WTG4	23:12
139	WTG34	0:00
140	WTG118	35:00
141	WTG100	0:00
142	WTG158	0:00

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SHADOW - Main Result

Calculation: Shadow flicker, 20260330 layout w distance limit 2,152m

...continued from previous page

No.	Name	Worst case [h/year]
143	WTG147	0:00
144	WTG139	0:00
145	WTG121	0:00
146	WTG54	0:00
147	WTG46	0:00
148	WTG37	0:00
149	WTG155	0:00
150	WTG156	0:00
151	WTG149	0:00
152	WTG154	0:00
153	WTG157	0:00
154	WTG150	0:00
155	WTG152	0:00
156	WTG144	0:00
157	WTG151	0:00
158	WTG131	0:00
159	WTG161	0:00
160	WTG163	0:00
161	WTG162	0:00
162	WTG164	0:00
163	WTG5	6:20
164	WTG61	0:00

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

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Document prepared by

Aurecon Australasia Pty Ltd

ABN 54 005 139 873

Aurecon Centre

Level 8, 850 Collins Street

Docklands, Melbourne VIC 3008

PO Box 23061

Docklands VIC 8012

Australia

T +61 3 9975 3000

F +61 3 9975 3444

E melbourne@aurecongroup.com

W aurecongroup.com

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