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Gemeente Beuningen

Oplegnotitie slagschaduw

Windpark Beuningen



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Oplegnotitie slagschaduw

Windpark Beuningen

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Hoofdstuk 1 Inleiding

Door een recente uitspraak van de Afdeling Bestuursrechtspraak van de Raad van State (ABRvS) kunnen de rechtstreeks geldende milieunormen voor geluid, slagschaduw en externe veiligheid uit het Activiteitenbesluit milieubeheer (Abm) en de Activiteitenregeling milieubeheer (Arm) niet langer gebruikt worden voor windparken, en is het aan het bevoegd gezag om in milieunormen te voorzien.

Hiertoe zijn het bestemmingsplan en de omgevingsvergunning voor Windpark Beuningen voorzien van dergelijke milieunormen.

Voorliggend document betreft een oplegnotitie op het slagschaduw onderzoek, omdat dat rapport is opgesteld toen het Abm en Arm nog van kracht waren voor windparken.

De oplegnotitie bevat aanvullingen en actualisatie en dient gezamenlijk met het slagschaduw onderzoek (SO) en het MER als de milieuonderbouwing voor het onderwerp slagschaduw van windpark Beuningen. Op plekken waar het SO en deze oplegnotitie elkaar tegenspreken dient de oplegnotitie gezien te worden als de juiste versie.

1.1 Procesgeschiedenis

Het bestemmingsplan en de omgevingsvergunning voor Windpark Beuningen zijn gecoördineerd voorbereid. De omgevingsvergunningaanvraag werd ingediend op 10 december 2020. Het ontwerpbestemmingsplan en de ontwerp-omgevingsvergunning hebben van 18 maart tot en met 29 april 2021 ter inzage gelegen, samen met het combiMER. Op 8 juni 2021 bracht de commissie voor de milieueffectrapportage een positief toetsingsadvies uit over het gecombineerd plan- en project-MER voor windpark Beuningen.

Op 30 juni 2021 zijn het Activiteitenbesluit milieubeheer (Abm) en de Activiteitenregeling milieubeheer (Arm) buiten toepassing verklaard.

1.2 Waarom een oplegnotitie?

Het combiMER en bijbehorende onderzoeken zijn een samenhangend geheel dat inzicht geeft in de milieueffecten van het windpark. Daarbij is niet alleen gekeken of aan de toen geldende normen kon worden voldaan, maar ook of er sprake is van een goede ruimtelijke ordening.

Niet voor alle milieuthema's geldt dat de wettelijke kaders buiten toepassing zijn verklaard. Daarom ligt het voor de hand om alleen een actualisatie uit te voeren voor de betreffende onderwerpen geluid, slagschaduw en externe veiligheid.

Het werken met een oplegnotitie heeft als voordeel dat alleen op die punten waar de uitspraak van de ABRvS betrekking op heeft actualisatie plaatsvindt, en het integrale MER op zich kan blijven staan.

1.3 Leeswijzer

Hoofdstuk 2 bevat een onderbouwing van een lokale normgrens voor slagschaduw van Windpark Beuningen zoals vastgelegd in het bestemmingsplan.

Hoofdstuk 3 van deze oplegnotitie beschrijft de aanpassingen aan het slagschaduw-onderzoek t.b.v. de omgevingsvergunning, nu er niet meer verwezen kan worden naar het Activiteitenbesluit en de Activiteitenregeling.

Hoofdstuk 2 Onderbouwing normgrens

2.1 Onderbouwing

Wetenschappelijke literatuur en recente jurisprudentie van de Raad van State bieden een grondslag voor de onderbouwing van een normgrens voor slagschaduw van windturbines. In de uitspraak van de Afdeling Bestuursrechtspraak van de Raad van State (ABRvS) betreffende het inpassingsplan voor windpark De Drentse Monden-Oostermoer (ECLI:NL:RVS:2018:616, overweging 132) is opgenomen: *“Voorts volgt, zo staat in het verweerschrift, uit onderzoek dat in 1999 in Duitsland is verricht, dat omwonenden van windturbines die een netto slagschaduwduur van meer dan 15 uur per jaar ervaren een hogere mate van dagelijkse hinder ervaren in hun leefomgeving. Naar aanleiding van dat onderzoek is in 2000 laboratoriumonderzoek verricht. Volgens dat laboratoriumonderzoek kan in de eerste 20 minuten dat harde slagschaduw optreedt een fysieke reactie worden veroorzaakt, die bij langere blootstelling daarna door het lichaam wordt gecompenseerd. De onderzoekers hebben aanbevolen de slagschaduwduur te beperken om effecten op langere termijn te voorkomen vanwege de energie die deze compensatie kost, zo is in het verweerschrift toegelicht. (...) Volgens de ministers worden, gelet op de conclusies uit deze onderzoeken, met de norm waarbij slagschaduw is beperkt tot maximaal 17 dagen gedurende maximaal 20 minuten per dag binnen een afstand van 12 maal de rotor-diameter, gezondheidsklachten voorkomen en wordt de hinder in voldoende mate beperkt”.*

De genoemde Duitse onderzoeken (Pohl, 1999), (Pohl, 2000) en hun conclusies over het effect van slagschaduwhinder zijn nog steeds relevant voor de beoordeling van slagschaduweffecten. Ten aanzien van eventuele directe gezondheidseffecten in de vorm van (epileptische) beroertes geldt dat in diverse wetenschappelijke studies is aangetoond dat moderne windturbines geen risico geven op dergelijke effecten. Deze kunnen alleen (in zeer zeldzame gevallen) optreden bij flikkerfrequenties van 2.5 Hz of hoger, hetgeen niet voorkomt bij moderne windturbines. Zie bijvoorbeeld (Smedley, Webb, & Wilkins, 2010).

Hoewel er sinds 1999 diverse onderzoeken zijn uitgevoerd naar effecten van slagschaduw van windturbines op hinderbeleving en gezondheidseffecten¹ zijn er geen nieuwe kwantitatieve inzichten die de conclusies uit 1999 en 2000 tegenspreken of veranderen.

Er kan worden aangesloten bij geluidgevoelige objecten omdat het gaat om objecten waar langdurige aanwezigheid van personen aan de orde is, hetgeen voor zowel slagschaduwhinder als geluidshinder relevant is.² Naast gevoelige objecten kan ook naar kantoorpanden worden gekeken, aangezien ook daar sprake is van de langdurige aanwezigheid van personen die hinder kunnen ondervinden van slagschaduw.

¹ Zie bijvoorbeeld (Merlin, Newton, Ellery, Milverton, & Farah, 2013)

² Onder geluidsgevoelige objecten worden gebouwen met een woon-, gezondheids- of onderwijsfunctie verstaan.

2.2 Lokale norm

2.2.1 *Gevoelige objecten*

Een veelgebruikte normgrens voor slagschaduw ter plaatse van gevoelige objecten is 5 uur en 40 minuten per jaar, of afgerond 6 uur per jaar, hetgeen een interpretatie is van de wettelijke norm uit de Activiteitenregeling (maximaal 17 dagen gedurende maximaal 20 minuten). Feitelijk is een grenswaarde van 5 uur en 40 minuten of 6 uur echter aanzienlijk strenger dan die wettelijke norm. Zo oordeelde de Stichting Advisering Bestuursrechtspraak voor Milieu en Ruimtelijke Ordening (StAB) ook in haar deskundigenadvies over Windpark Drentse Monden Oostermoer (d.d. 17 februari 2017, kenmerk StAB -40218), waar getoetst werd aan maximaal 6 uur per jaar: *“de streefwaarde van maximaal 6 uur slagschaduw per jaar voorziet in (veel) geringere aantasting van het woon- en leefklimaat van omwonenden dan de normering in het Activiteitenbesluit milieubeheer. Ten eerste tellen nu ook de dagen mee waarop de slagschaduw minder is dan 20 minuten. Ten tweede worden alle minuten meer dan 20 minuten ook meegeteld.”* Nog recenter heeft de Raad van State haar opstelling in dezen bevestigd in haar uitspraak ten aanzien van Windmolenpark Elzenburg – De Geer (ECLI:NL:RVS:2021:1681, overweging 15).

De gemeente Beuningen hanteert een nóg strengere norm voor slagschaduw op gevoelige objecten. Als planregel wordt opgenomen dat alle slagschaduw op woningen in de omgeving (zoveel als technisch mogelijk) moet worden voorkomen door middel van een stilstandsregeling. In de praktijk betekent dit dat de slagschaduw op omliggende woningen, als gevolg van de tijd die nodig is om de windturbine af te schakelen, gemiddeld per jaar maximaal 30 minuten kan bedragen. Hiermee wordt eventuele hinder van slagschaduw voor omwonenden geminimaliseerd.

2.2.2 *Kantoorpanden*

De gemeente vindt bescherming tegen bewegende slagschaduw van windturbines niet alleen belangrijk voor woningen, maar ook voor panden met een kantoorfunctie; ook daar kan slagschaduw immers voor hinder zorgen. Door de slagschaduw tijdens doordeweekse kantooruren tot maximaal 6 uur per jaar te beperken wordt deze overlast tot een volgens de gemeente aanvaardbaar niveau teruggebracht. Dergelijke beschermingsniveaus zijn, zoals hierboven aangegeven, immers gangbaar en worden toegepast voor woningen bij andere windparken.

Hoofdstuk 3 Actualisatie SO

Indien een deel van het SO niet langer actueel is volgt hieronder een vervangende tekst. Deze paragrafen volgen de nummering uit het SO.

1.1 Inleiding

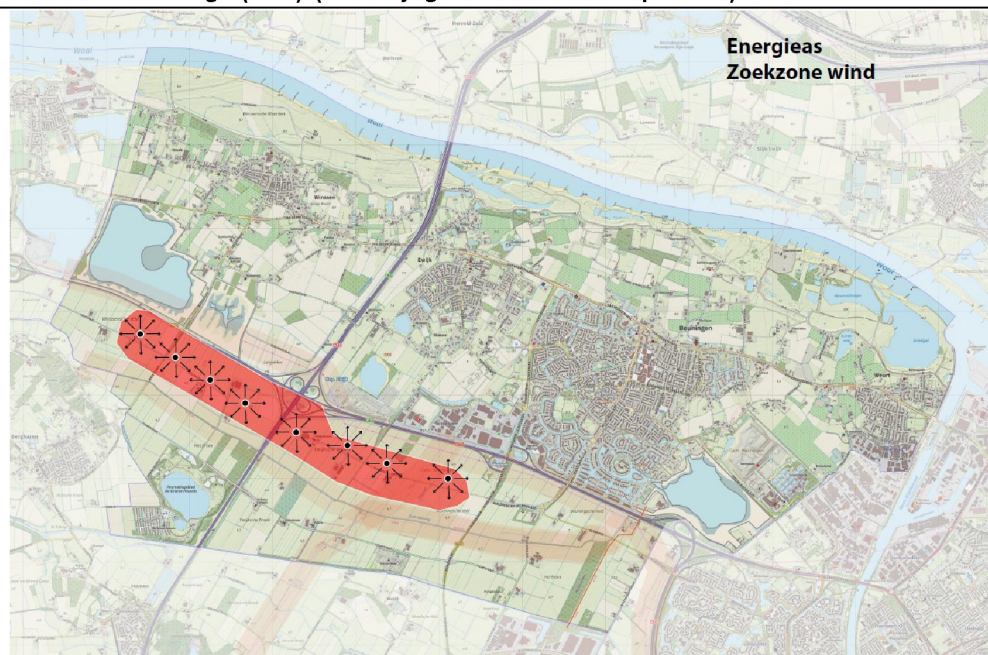
Bosch & van Rijn heeft een slagschaduwonderzoek uitgevoerd naar de slagschaduwduur bij woningen als gevolg van drie alternatieven in het buitengebied van Beuningen (ten zuidoosten en zuidwesten van het knooppunt Ewijk en ten zuiden van bedrijventerrein Schoenaker), ten behoeve van een milieueffectrapportage (MER).

Deze studie volgt de beoordelingscriteria zoals opgenomen in de Notitie Reikwijdte en Detailniveau (NRD) van Windpark Beuningen. Daarnaast wordt de slagschaduwduur als gevolg van de definitieve opstelling ter plaatse van nabijgelegen geluidsgevoelige bestemmingen getoetst aan de norm zoals opgenomen in de planregels van het bestemmingsplan Windpark Beuningen.

Dit document dient ter ondersteuning van zowel het MER als de vergunningaanvraag.

De te onderzoeken alternatieven zijn gesitueerd in de 'zoekzone windenergie' die de gemeenteraad van Beuningen in april 2019 heeft vastgesteld.

Figuur 1 Zoekzone windenergie (rood). (Bron: Bijlage 2b raadsbesluit 9 april 2019).



1.3 Norm

1.3.1 Woningen

Het bestemmingsplan Windpark Beuningen stelt dat de windturbines moeten zijn uitgerust met een automatische stilstandsvoorziening die deze stilzet zodra er bewegende slagschaduw optreedt ter plaatse van gevoelige objecten voor zover de afstand tussen de windturbine en de gevoelige objecten minder dan 12 maal de rotordiameter bedraagt en voorzover zich in de door slagschaduw getroffen uitwendige scheidingsconstructie van gevoelige objecten of woonwagens ramen bevinden. Er geldt dus een norm van 0 uur slagschaduw per gevoelig object per jaar. Waar we in de rest van het rapport gemakshalve spreken over woningen wordt bedoeld op woningen en geluidsgevoelige objecten.

NB. In de praktijk kan, als gevolg van de technisch benodigde stilzettijd, gemiddeld per jaar maximaal 30 minuten slagschaduw optreden ter plaatse van gevoelige objecten.

Hoewel de norm betrekking heeft tot alle geluidsgevoelige objecten worden deze in voorliggende rapportage aangeduid als 'woningen'.

1.3.2 Kantoorpanden

Het bestemmingsplan Windpark Beuningen stelt dat de windturbines moeten zijn uitgerust met een automatische stilstandsvoorziening die de jaarlijkse bewegende slagschaduw op de lichtdoorlatende gevels van panden met een kantoorfunctie binnen een straal van 12 keer de rotordiameter van de windturbine beperkt tot 6 uur, voorzover zich in de door de slagschaduw getroffen gevels ramen bevinden en voorzover deze slagschaduw optreedt gedurende weekdays en tijdens kantooruren (08:30 t/m 17:30).

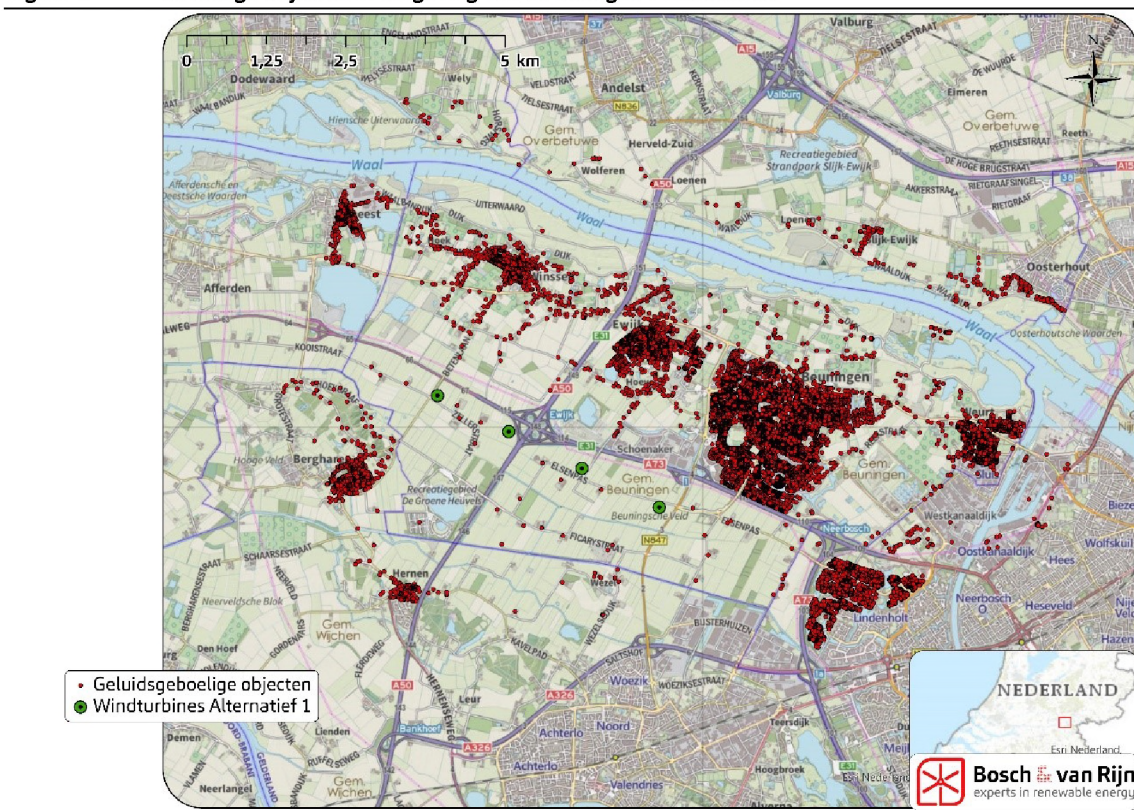
1.4 Stilstandvoorziening

Om normoverschrijding te voorkomen kan een stilstandvoorziening op de windturbine worden aangebracht, zoals vermeld in het Activiteitenbesluit. Deze zorgt ervoor dat bij overschrijding van de slagschaduwnorm, de windturbine wordt uitgeschakeld. De voorziening wordt per schaduwgevoelige woning of kantoorgebouw vooraf ingeregeld, aangezien het gaat om specifieke momenten die van te voren bepaald kunnen worden afhankelijk van de zonnestand. Daarnaast wordt gemeten of er daadwerkelijk voldoende zon (en dus slagschaduw) is op die momenten.

1.5 Onderzochte objecten

In de omgeving van het geplande windpark liggen enkele gevoelige objecten. De bron van de locatie van de woningen (rode stippen in onderstaande afbeelding) is de Basisadministratie Adressen en Gebouwen (BAG, augustus 2020).

Figuur 2 Gevoelige objecten in omgeving van de beoogde windlocaties.



Tevens zijn in de omgeving van het geplande windpark kantoren gelegen waarvoor de lokale slagschaduwnorm geldt. Zie Figuur 3 in Paragraaf 4.8 voor de exacte ligging van deze kantoren.

2.6 Shadow receptors

Op de locatie van de woningen en kantoren is uitgegaan van een verticale schaduw 'receptor' van 5 meter hoog en 8 meter breed, beginnend op 50 cm hoogte. De receptoren zijn in alle richtingen gevoelig voor slagschaduw, en er is geen rekening gehouden met obstakels als bebouwing en begroeiing. Eventueel hoogteverschil van het maaiveld is als verwaarloosbaar beschouwd en de windturbines en de ontvangers zijn op een gelijk denkbeeldig maaiveld gemodelleerd.

3.4 Slagschaduw per windturbine

WindPRO berekent naast hoeveel slagschaduw er jaarlijks naar verwachting optreedt bij elke woning ook hoeveel slagschaduw er door windturbines op woningen wordt veroorzaakt. Dit is niet simpelweg een som van de schaduw per woning, omdat de schaduw bijna altijd meerdere woningen tegelijk zal beslaan. De berekende slagschaduw komt direct overeen met de stilstand die nodig is om alle slagschaduw op woningen te voorkomen.

Tabel 1 Verwachte jaarlijkse slagschaduw per opstelling.

Opstelling	Slagschaduw per jaar (uu:mm)	Derving (%)
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Alternatief 1	321:28	0,97%
Alternatief 2	464:05	0,93%
Alternatief 3	460:22	0,69%

3.5 Stilstand per windturbine

In de NRD van Windpark Beuningen is bepaald dat er tevens inzicht wordt gegeven in de benodigde stilstand – en de daarmee gederfde energieopbrengst – om aan een schaduwduur van maximaal 5:40 uur per jaar per woning te voldoen. Hoewel de gemeente Beuningen haar eigen lokale normen hanteert voor slagschaduw op woningen, dient in het kader van het MER dus ook getoetst te worden aan de vastgestelde ProjectMER beoordelingscriteria.

Hiertoe wordt bij elke woning 5:40u van de totale berekende hoeveelheid slagschaduw afgetrokken (uiteraard met een minimum van 0 uur per jaar).

De overgebleven slagschaduw zou worden voorkomen door middel van stilstand. Deze benodigde stilstand van de windturbines wordt geschat met de volgende berekening:

$$\text{Benodigde stilstand} = (SS_{WT1} + SS_{WTn}) * \frac{\text{normoverschrijdende } SS_{\text{woningen}}}{\text{totale } SS_{\text{woningen}}}$$

Waarbij SS staat voor slagschaduw, en SS_{WTn} voor de som van de slagschaduw van alle windturbines van de betreffende opstelling.

Tabel 2 Verwachte jaarlijkse stilstand die nodig zou zijn om slagschaduw op woningen te beperken tot 5:40 uur.

Opstelling	Stilstand per jaar (uu:mm)	Derving (% van draaiuren)
Alternatief 1	136:34	0,41%
Alternatief 2	231:34	0,46%
Alternatief 3	176:52	0,35%

4.4 Woningen binnen contour

Er bevinden zich gevoelige objecten binnen de 5 uur en 40 minuten en 0 uur slagschaduwcontouren. Onderstaande tabel geeft de aantallen weer. Bijlage A bevat een lijst met adressen en slagschaduwduur voor alle woningen binnen de 5 uur en 40 minuten contour. Bijlage C bevat een lijst met adressen en slagschaduwduur voor alle onderzochte adressen.

Tabel 3 Aantal woningen binnen de slagschaduwcontouren van de onder- en bovengrens.

Opstelling	Aantal woningen binnen 5:40u contour	Aantal woningen binnen 0u contour
Ondergrens	38	3113
Bovengrens	69	3194

4.6 Slagschaduw per windturbine

WindPRO berekent naast hoeveel slagschaduw er jaarlijks naar verwachting optreedt bij elke woning ook hoeveel slagschaduw er door windturbines op woningen wordt veroorzaakt. Dit is niet simpelweg een som van de schaduw per woning, omdat de schaduw bijna altijd meerdere woningen tegelijk zal beslaan. De berekende slagschaduw komt direct overeen met de stilstand die nodig is om alle slagschaduw op woningen te voorkomen.

Tabel 4 Verwachte jaarlijkse slagschaduw per opstelling.

Opstelling	Slagschaduw per jaar (uu:mm)	Derving (%)
Ondergrens	414:43	1,00%
Bovengrens	533:06	1,28%

4.7 Stilstand windturbines

Het bestemmingsplan Windpark Beuningen stelt dat de windturbines moeten zijn uitgerust met een automatische stilstandsvoorziening die deze stilzet zodra er bewegende slagschaduw optreedt op lichtdoorlatende gevels van gevoelige objecten binnen een straal van 12 maal de rotordiameter. Er geldt dus een norm van 0 uur slagschaduw per woning per jaar, wat betekent dat de berekende slagschaduw in Tabel 4 direct overeenkomt met de benodigde stilstand om normoverschrijding te voorkomen.

Om een vergelijking te kunnen maken met de MER alternatieven is daarnaast berekend hoeveel stilstand – en daarmee gederfde energieopbrengst – nodig zou zijn om slagschaduw op woningen te beperken tot 5 uur en 40 minuten per jaar. Hoewel de gemeente Beuningen haar eigen lokale normen hanteert voor slagschaduw op woningen, dient in het kader van het MER immers ook getoetst te worden aan de vastgestelde ProjectMER beoordelingscriteria.

Hiertoe wordt bij elke woning 5:40u van de totale berekende hoeveelheid slagschaduw afgetrokken (uiteraard met een minimum van 0 uur per jaar).

De overgebleven slagschaduw zou worden voorkomen door middel van stilstand. Deze benodigde stilstand van de windturbines wordt geschat met de volgende berekening:

$$\text{Benodigde stilstand} = (SS_{WT1} + SS_{WTn}) * \frac{\text{normoverschrijdende } SS_{\text{woningen}}}{\text{totale } SS_{\text{woningen}}}$$

Waarbij SS staat voor slagschaduw, en SS_{WTn} voor de som van de slagschaduw van alle windturbines van de betreffende opstelling.

Tabel 5 Verwachte jaarlijkse stilstand die nodig zou zijn om slagschaduw op woningen te beperken tot 5:40 uur.

Opstelling	Stilstand per jaar (uu:mm)	Derving (% van draaiuren)
Ondergrens	223:57	0,54%

Bovengrens

292:59

0,71%

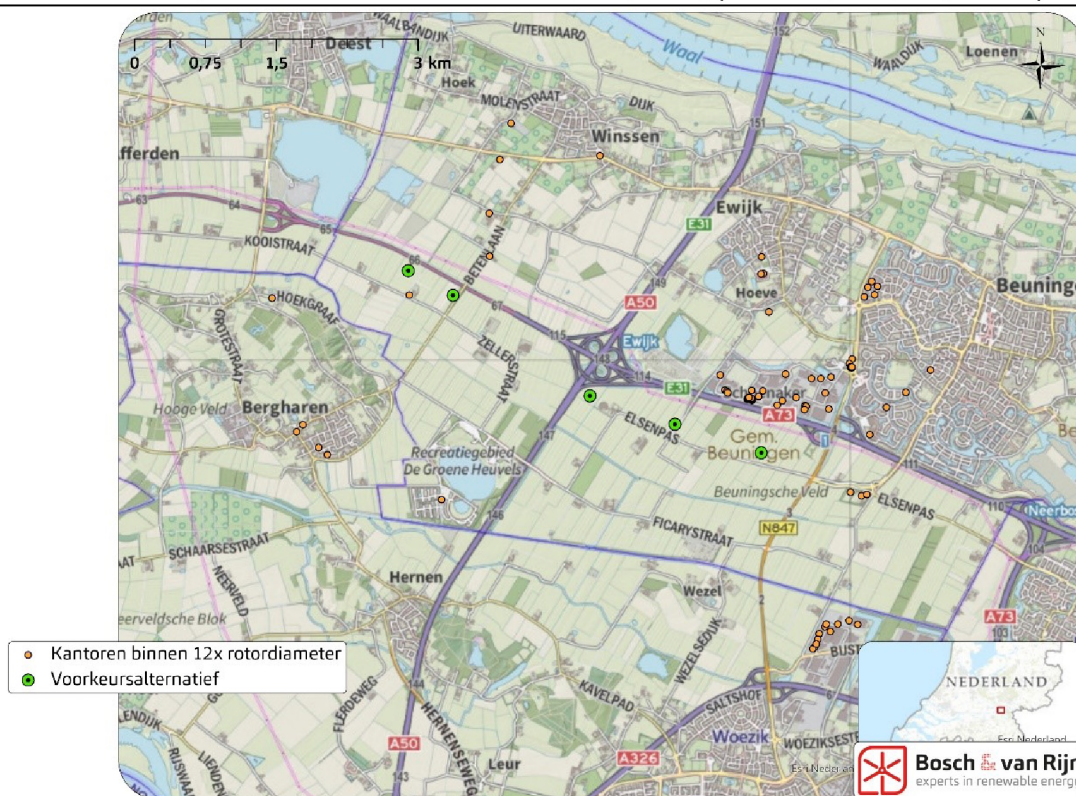
4.8 Slagschaduw en stilstand kantoren

4.8.1 Slagschaduw kantoren

Voor alle kantoorpanden binnen een afstand van 12 maal de rotordiameter is onderzocht hoeveel slagschaduw jaarlijks zal optreden als gevolg van de bovengrens van het VKA, wanneer geen stilstand wordt toegepast. Er is voor gekozen om alleen de bovengrens door te rekenen aangezien deze het meeste slagschaduw zal veroorzaken ter plaatse van de onderzochte kantoren. De resultaten zijn terug te vinden in de uitdraai van het rekenprogramma WindPRO (Bijlage D). Onderstaande figuur toont de ligging van de onderzochte kantoren.

NB. Gebouwen die naast een kantoorfunctie tevens een woonfunctie hebben zijn niet meegenomen in de berekening van de slagschaduw ter plaatse van kantoren. De slagschaduw ter plaatse van deze objecten is immers reeds onderzocht in de uitgevoerde berekeningen van slagschaduw ter plaatse van woningen (Zie Bijlage C) en voor woningen geldt een andere lokale norm dan voor kantoren.

Figuur 3 Kantoorpanden binnen 12x rotordiameter van de opstelling (Bron: BAG, download juni 2021).



Naast gegevens over de jaarlijkse hoeveelheid slagschaduw ter plaatse van kantoren, produceert WindPRO ook zogenoemde slagschaduwkalenders (Zie Bijlage E). Met behulp van deze kalenders is het mogelijk om te berekenen hoeveel van de

veroorzaakte slagschaduw op kantoren kan worden verwacht op doordeweekse dagen en binnen kantooruren.

Uit de berekening volgt dat er 42 kantoren zijn waar als gevolg van de bovengrens een jaarlijkse hoeveelheid slagschaduw wordt verwacht op doordeweekse dagen, binnen kantooruren (08:30-17:30). Onderstaande tabel toont de jaarlijks te verwachten slagschaduwduur ter plaatse van deze kantoren op doordeweekse dagen en binnen kantooruren, wanneer geen stilstand zou worden toegepast. De kantoren zijn aangeduid met dezelfde lettercodes als in de WindPRO uitdraai (Bijlage D) en de slagschaduwkalenders (Bijlage E).

Tabel 6 Jaarlijkse verwachte slagschaduwduur (uu:mm) als gevolg van de bovengrens, op doordeweekse dagen en binnen kantooruren, wanneer er geen stilstand zou worden toegepast.

Kantoor	slagschaduwduur kantoor tijden
D	00:27
E	05:50
F	13:52
G	03:28
H	03:39
I	03:17
J	03:07
K	03:19
L	03:10
M	15:05
N	08:54
O	11:10
P	13:10
Q	12:52
R	12:38
S	12:25
T	13:07
U	12:51
V	12:34
W	12:15
X	17:01
Y	16:47
Z	16:44
AA	09:56
AB	10:27
AC	10:05
AD	10:41
AE	10:30
AK	12:25
AM	00:32
AN	14:36
AO	04:35
AP	05:46
AQ	00:38
AR	05:40
AT	02:17
AU	07:01

BI	01:02
BJ	02:52
BK	05:13
BL	05:54
BM	00:05

4.8.2 Benodigde stilstand

Vervolgens is voor de bovengrens berekend hoeveel stilstand er benodigd is om de slagschaduw te beperken tot maximaal 6 uur per kantoor per jaar op doordeweekse dagen, binnen kantooruren (08:30-17:30). Dit is de benodigde stilstand om te kunnen voldoen aan de lokale norm voor slagschaduw op kantoorpanden.

Hiertoe is voor de bovengrens van het voorkeursalternatief berekend hoeveel van de slagschaduw normoverschrijdend is, door bij elk kantoor 06:00 uur van de totale berekende hoeveelheid slagschaduw af te trekken (uiteeraard met een minimum van 0 uur per jaar).

De overgebleven normoverschrijdende slagschaduw moet worden voorkomen door middel van stilstand.

De benodigde stilstand van de windturbines geschat met de volgende berekening:

$$\text{Benodigde stilstand} = (SS_{WT1} + SS_{WTn}) * \frac{\text{normoverschrijdende } SS_{\text{kantoren}}}{\text{totale } SS_{\text{kantoren}}}$$

Waarbij SS staat voor slagschaduw, en SS_{WTn} voor de som van de slagschaduw op kantoren van alle windturbines van de betreffende opstelling.

Tabel 7 Verwachte jaarlijkse stilstand om normoverschrijding bij kantoorpanden te voorkomen.

Opstelling	Stilstand per jaar (uu:mm)	Derving (% van draaiuren)
Bovengrens	49:26	0,12%

5.1 Conclusie slagschaduwonderzoek CombiMER

In dit onderzoek zijn t.b.v. een ProjectMER drie alternatieven onderzocht. De slagschaduwduur vanwege windturbines ter plaatse van nabijgelegen gevoelige objecten is berekend en gebruikt om de alternatieven te beoordelen op het milieuthema slagschaduw.

Ten aanzien van het ProjectMER beoordelingscriterium van 5 uur en 40 minuten per woning per jaar geldt dat er bij alle drie de alternatieven woningen zijn waarbij deze hoeveelheid wordt overschreden. Indien slagschaduw ter plaatse van deze woningen door middel van stilstand beperkt zou worden tot jaarlijks maximaal 5:40 uur, leidt dit tot opbrengstverlies. Met meteorologische gegevens is berekend dat dit voor Alternatief 1 (alternatief met de minste overschrijding) een verlies oplevert van ongeveer 0,41% van de energieopbrengst terwijl dit voor Alternatief 2 (alternatief met de meeste overschrijding) een opbrengstderving van 0,46% geeft.

Het ProjectMER beoordelingscriterium van 0 uur slagschaduw per woning per jaar is tevens de lokaal geldende norm voor slagschaduw op woningen en overige gevoelige objecten. Om aan de norm van 0 uur slagschaduw te voldoen zal een stilstandvoorziening in de turbines moeten worden aangebracht die de turbine uitschakelt wanneer deze slagschaduw veroorzaakt op woningen, afhankelijk van tijd, datum, windrichting en bewolking. Met meteorologische gegevens is berekend dat dit voor Alternatief 1 (alternatief met de minste overschrijding) een verlies oplevert van ongeveer 0,97% van de energieopbrengst terwijl dit voor Alternatief 2 (alternatief met de meeste overschrijding) een opbrengstderving van 0,93% geeft.

Een dergelijke kleine opbrengstderving brengt rendabele exploitatie van de drie alternatieven niet in gevaar.

5.2 Conclusie Voorkeursalternatief

Tevens is voor het voorkeursalternatief berekend hoeveel slagschaduw er valt op gevoelige objecten en kantoren in de omgeving van het windpark.

Ten aanzien van het ProjectMER beoordelingscriterium van 5 uur en 40 minuten per woning per jaar geldt dat er bij zowel de ondergrens als de bovengrens van het VKA woningen zijn waarbij deze hoeveelheid wordt overschreden. Indien slagschaduw ter plaatse van deze woningen door middel van stilstand beperkt zou worden tot jaarlijks maximaal 5:40 uur, leidt dit tot opbrengstverlies. Met meteorologische gegevens is berekend dat dit voor de bovengrens een verlies oplevert van 0,71 % en voor de ondergrens van 0,54%.

Het ProjectMER beoordelingscriterium van 0 uur slagschaduw per woning per jaar is tevens de lokaal geldende norm voor slagschaduw op woningen en overige gevoelige objecten. Om aan de norm van 0 uur slagschaduw te voldoen zal een stilstandvoorziening in de turbines moeten worden aangebracht die de turbine uitschakelt wanneer deze slagschaduw veroorzaakt op woningen, afhankelijk van tijd, datum, windrichting en bewolking. Met meteorologische gegevens is berekend dat dit voor de bovengrens resulteert in een verlies van 1,28% en voor de ondergrens van 1,00%.

Tenslotte is voor de bovengrens van het VKA berekend hoeveel stilstand benodigd is om te kunnen voldoen aan de lokaal geldende norm voor kantoorpanden. Hieruit volgt dat het beperken van de slagschaduw ter plaatse van kantoorpanden tot maximaal 6 uur per jaar op doordeweekse dagen en tijdens kantooruren, leidt tot een opbrengstverlies van ca. 0,12%.

Voor de onder- en bovengrens van het voorkeursalternatief wordt geconcludeerd dat er geen belangrijke nadelige slagschaduw effecten optreden en dat de haalbaarheid en vergunbaarheid van het windpark niet worden belemmerd.





Hoofdstuk 4 Bijlagen

Bijlage D Uitdraai WindPRO Kantoren

Bijgevoegde WindPRO uitdraai geeft voor de kantoren binnen 12 maal de rotordiameterafstand een waarde voor de verwachte slagschaduwduur per jaar als gevolg van de bovengrens van het VKA.

Bijlage E Slagschaduwkalender kantoren

Bijgevoegde WindPRO slagschaduwkalender toont voor de kantoren binnen 12 maal de rotordiameterafstand op welke momenten gedurende het jaar slagschaduw kan optreden.





Bosch & van Rijn
experts in duurzame energie

Franz-Lisztplantsoen 220
3533 JG Utrecht
www.boschenvanrijn.nl



SHADOW - Main Result

Calculation: VKA bovengrens met kantoren 12RD 210819

Assumptions for shadow calculations

Maximum distance for influence	2,160 m
Minimum sun height over horizon for influence	3 °
Day step for calculation	1 days
Time step for calculation	1 minutes

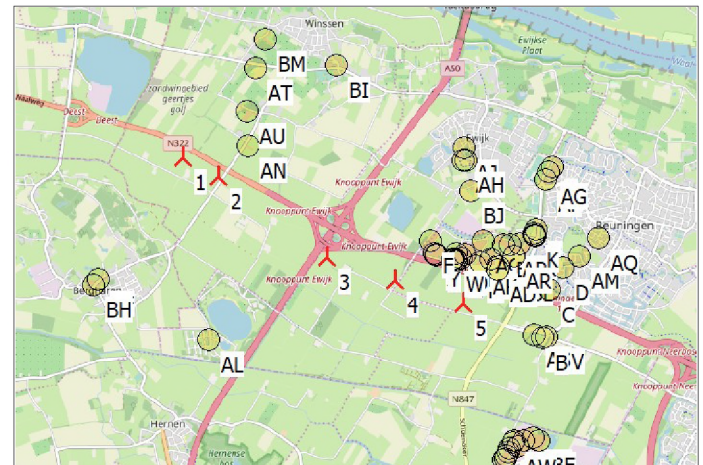
Sunshine probability S (Average daily sunshine hours) [DE BILT]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.48	2.65	3.60	5.24	6.59	6.28	6.20	6.12	4.48	3.32	1.87	1.32

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
385	684	574	504	436	731	797	1,164	1,146	770	577	539	8,307

All coordinates are in
Dutch Stereo-RD/NAP 2008



Scale 1:100,000

 New WTG

Shadow receptor

WTGs

X (east)	Y (north)	Z	Row data/Description
1	1	1	1
1	1	2	2
1	1	3	3
1	1	4	4
1	1	5	5
1	1	6	6
1	1	7	7
1	1	8	8
1	1	9	9
1	1	10	10
1	1	11	11
1	1	12	12
1	1	13	13
1	1	14	14
1	1	15	15
1	1	16	16
1	1	17	17
1	1	18	18
1	1	19	19
1	1	20	20
1	1	21	21
1	1	22	22
1	1	23	23
1	1	24	24
1	1	25	25
1	1	26	26
1	1	27	27
1	1	28	28
1	1	29	29
1	1	30	30
1	1	31	31
1	1	32	32
1	1	33	33
1	1	34	34
1	1	35	35
1	1	36	36
1	1	37	37
1	1	38	38
1	1	39	39
1	1	40	40
1	1	41	41
1	1	42	42
1	1	43	43
1	1	44	44
1	1	45	45
1	1	46	46
1	1	47	47
1	1	48	48
1	1	49	49
1	1	50	50
1	1	51	51
1	1	52	52
1	1	53	53
1	1	54	54
1	1	55	55
1	1	56	56
1	1	57	57
1	1	58	58
1	1	59	59
1	1	60	60
1	1	61	61
1	1	62	62
1	1	63	63
1	1	64	64
1	1	65	65
1	1	66	66
1	1	67	67
1	1	68	68
1	1	69	69
1	1	70	70
1	1	71	71
1	1	72	72
1	1	73	73
1	1	74	74
1	1	75	75
1	1	76	76
1	1	77	77
1	1	78	78
1	1	79	79
1	1	80	80
1	1	81	81
1	1	82	82
1	1	83	83
1	1	84	84
1	1	85	85
1	1	86	86
1	1	87	87
1	1	88	88
1	1	89	89
1	1	90	90
1	1	91	91
1	1	92	92
1	1	93	93
1	1	94	94
1	1	95	95
1	1	96	96
1	1	97	97
1	1	98	98
1	1	99	99
1	1	100	100
1	1	101	101
1	1	102	102
1	1	103	103
1	1	104	104
1	1	105	105
1	1	106	106
1	1	107	107
1	1	108	108
1	1	109	109

[m]

1	175,324	430,942	0.0	LS custom 4600 180.0 !O!	hub: 155.0 m (TOT: 245.0 m)	(61)	Yes
2	175,797	430,681	0.0	LS custom 4600 180.0 !O!	hub: 155.0 m (TOT: 245.0 m)	(62)	Yes
3	177,247	429,618	0.0	LS custom 4600 180.0 !O!	hub: 155.0 m (TOT: 245.0 m)	(63)	Yes
4	178,146	429,318	0.0	LS custom 4600 180.0 !O!	hub: 155.0 m (TOT: 245.0 m)	(64)	Yes
5	179,060	429,016	0.0	LS custom 4600 180.0 !O!	hub: 155.0 m (TOT: 245.0 m)	(65)	Yes

WTG type

Valid	Manufact.	Type-generator	Power, rated [kW]	Rotor diameter [m]	Hub height [m]	RPM [RPM]
Yes		LS custom-4,600	4,600	180.0	155.0	9.3
Yes		LS custom-4,600	4,600	180.0	155.0	9.3
Yes		LS custom-4,600	4,600	180.0	155.0	9.3
Yes		LS custom-4,600	4,600	180.0	155.0	9.3
Yes		LS custom-4,600	4,600	180.0	155.0	9.3

Shadow receptor-Input

No.	X (east)	Y (north)	Z	Width	Height	Elevation a.g.l.	Slope of window	Direction mode	Eye height (ZVI) a.g.l.
			[m]	[m]	[m]	[m]	[°]		[m]
A	180,229	430,826	0.0	8.0	5.0	0.5	90.0	"Green house mode"	5.5
B	180,119	428,561	0.0	8.0	5.0	0.5	90.0	"Green house mode"	5.5
C	180,209	429,208	0.0	8.0	5.0	0.5	90.0	"Green house mode"	5.5
D	180,383	429,498	0.0	8.0	5.0	0.5	90.0	"Green house mode"	5.5
E	179,591	429,802	0.0	8.0	5.0	0.5	90.0	"Green house mode"	5.5
F	178,625	429,839	0.0	8.0	5.0	0.5	90.0	"Green house mode"	5.5
G	180,022	430,009	0.0	8.0	5.0	0.5	90.0	"Green house mode"	5.5
H	179,990	429,961	0.0	8.0	5.0	0.5	90.0	"Green house mode"	5.5
I	180,004	429,916	0.0	8.0	5.0	0.5	90.0	"Green house mode"	5.5
J	180,017	429,912	0.0	8.0	5.0	0.5	90.0	"Green house mode"	5.5
K	180,008	429,925	0.0	8.0	5.0	0.5	90.0	"Green house mode"	5.5
L	180,018	429,922	0.0	8.0	5.0	0.5	90.0	"Green house mode"	5.5
M	179,229	429,519	0.0	8.0	5.0	0.5	90.0	"Green house mode"	5.5
N	179,076	429,673	0.0	8.0	5.0	0.5	90.0	"Green house mode"	5.5
O	179,032	429,613	0.0	8.0	5.0	0.5	90.0	"Green house mode"	5.5
P	178,963	429,571	0.0	8.0	5.0	0.5	90.0	"Green house mode"	5.5
Q	178,965	429,579	0.0	8.0	5.0	0.5	90.0	"Green house mode"	5.5
R	178,961	429,586	0.0	8.0	5.0	0.5	90.0	"Green house mode"	5.5
S	178,954	429,593	0.0	8.0	5.0	0.5	90.0	"Green house mode"	5.5
T	178,911	429,585	0.0	8.0	5.0	0.5	90.0	"Green house mode"	5.5
U	178,915	429,591	0.0	8.0	5.0	0.5	90.0	"Green house mode"	5.5
V	178,920	429,597	0.0	8.0	5.0	0.5	90.0	"Green house mode"	5.5
W	178,930	429,602	0.0	8.0	5.0	0.5	90.0	"Green house mode"	5.5
X	178,673	429,681	0.0	8.0	5.0	0.5	90.0	"Green house mode"	5.5
Y	178,693	429,665	0.0	8.0	5.0	0.5	90.0	"Green house mode"	5.5
Z	178,704	429,652	0.0	8.0	5.0	0.5	90.0	"Green house mode"	5.5
AA	178,959	429,676	0.0	8.0	5.0	0.5	90.0	"Green house mode"	5.5
AB	179,525	429,518	0.0	8.0	5.0	0.5	90.0	"Green house mode"	5.5
AC	179,533	429,506	0.0	8.0	5.0	0.5	90.0	"Green house mode"	5.5

To be continued on next page...

SHADOW - Main Result

Calculation: VKA bovengrens met kantoren 12RD 210819

...continued from previous page

No.	X (east)	Y (north)	Z	Width	Height	Elevation a.g.l.	Slope of window	Direction mode	Eye height (ZVI) a.g.l.
			[m]	[m]	[m]	[m]	[°]		[m]
AD	179,519	429,472	0.0	8.0	5.0	0.5	90.0	"Green house mode"	5.5
AE	179,430	429,602	0.0	8.0	5.0	0.5	90.0	"Green house mode"	5.5
AF	180,149	430,665	0.0	8.0	5.0	0.5	90.0	"Green house mode"	5.5
AG	180,188	430,768	0.0	8.0	5.0	0.5	90.0	"Green house mode"	5.5
AH	179,084	430,913	0.0	8.0	5.0	0.5	90.0	"Green house mode"	5.5
AI	179,057	430,908	0.0	8.0	5.0	0.5	90.0	"Green house mode"	5.5
AJ	179,065	431,087	0.0	8.0	5.0	0.5	90.0	"Green house mode"	5.5
AK	179,282	429,567	0.0	8.0	5.0	0.5	90.0	"Green house mode"	5.5
AL	175,677	428,522	0.0	8.0	5.0	0.5	90.0	"Green house mode"	5.5
AM	180,592	429,657	0.0	8.0	5.0	0.5	90.0	"Green house mode"	5.5
AN	176,185	431,094	0.0	8.0	5.0	0.5	90.0	"Green house mode"	5.5
AO	179,317	429,848	0.0	8.0	5.0	0.5	90.0	"Green house mode"	5.5
AP	179,689	429,801	0.0	8.0	5.0	0.5	90.0	"Green house mode"	5.5
AQ	180,850	429,892	0.0	8.0	5.0	0.5	90.0	"Green house mode"	5.5
AR	179,737	429,650	0.0	8.0	5.0	0.5	90.0	"Green house mode"	5.5
AS	180,005	428,600	0.0	8.0	5.0	0.5	90.0	"Green house mode"	5.5
AT	176,295	432,116	0.0	8.0	5.0	0.5	90.0	"Green house mode"	5.5
AU	176,180	431,549	0.0	8.0	5.0	0.5	90.0	"Green house mode"	5.5
AV	180,177	428,576	0.0	8.0	5.0	0.5	90.0	"Green house mode"	5.5
AW	179,734	427,176	0.0	8.0	5.0	0.5	90.0	"Green house mode"	5.5
AX	179,791	427,126	0.0	8.0	5.0	0.5	90.0	"Green house mode"	5.5
AY	179,671	427,101	0.0	8.0	5.0	0.5	90.0	"Green house mode"	5.5
AZ	179,658	427,045	0.0	8.0	5.0	0.5	90.0	"Green house mode"	5.5
BA	179,625	426,964	0.0	8.0	5.0	0.5	90.0	"Green house mode"	5.5
BB	179,605	426,942	0.0	8.0	5.0	0.5	90.0	"Green house mode"	5.5
BC	179,747	427,203	0.0	8.0	5.0	0.5	90.0	"Green house mode"	5.5
BD	179,641	426,995	0.0	8.0	5.0	0.5	90.0	"Green house mode"	5.5
BE	180,078	427,201	0.0	8.0	5.0	0.5	90.0	"Green house mode"	5.5
BF	174,210	429,315	0.0	8.0	5.0	0.5	90.0	"Green house mode"	5.5
BG	179,987	427,242	0.0	8.0	5.0	0.5	90.0	"Green house mode"	5.5
BH	174,144	429,238	0.0	8.0	5.0	0.5	90.0	"Green house mode"	5.5
BI	177,352	432,159	0.0	8.0	5.0	0.5	90.0	"Green house mode"	5.5
BJ	179,143	430,506	0.0	8.0	5.0	0.5	90.0	"Green house mode"	5.5
BK	179,797	429,820	0.0	8.0	5.0	0.5	90.0	"Green house mode"	5.5
BL	179,776	429,480	0.0	8.0	5.0	0.5	90.0	"Green house mode"	5.5
BM	176,413	432,499	0.0	8.0	5.0	0.5	90.0	"Green house mode"	5.5
BN	179,871	427,203	0.0	8.0	5.0	0.5	90.0	"Green house mode"	5.5

Calculation Results

Shadow receptor

No.	Shadow, worst case		Shadow, expected values	
	Shadow hours per year [h/year]	Shadow days per year [days/year]	Max shadow hours per day [h/day]	Shadow hours per year [h/year]
A	0:00	0	0:00	0:00
B	56:13	110	0:40	12:10
C	28:05	65	0:37	5:33
D	15:16	40	0:31	2:49
E	73:40	122	0:49	9:39
F	158:15	171	1:28	21:28
G	43:59	113	0:34	5:35
H	46:17	118	0:35	5:57
I	41:17	116	0:35	5:31
J	39:05	107	0:35	5:16
K	41:43	121	0:35	5:32
L	39:39	112	0:35	5:19
M	180:02	187	1:24	25:38
N	115:36	163	1:09	16:24
O	144:36	177	1:17	20:20
P	172:01	188	1:21	23:59
Q	167:49	188	1:20	23:26
R	164:42	188	1:19	23:00
S	161:58	187	1:18	22:37
T	171:08	194	1:18	23:56

To be continued on next page...

SHADOW - Main Result

Calculation: VKA bovengrens met kantoren 12RD 210819

...continued from previous page

No.	Shadow, worst case		Max shadow hours per day	Shadow, expected values	
	Shadow hours per year [h/year]	Shadow days per year [days/year]		Shadow hours per year [h/year]	
U	167:43	193	1:17	23:27	
V	164:17	190	1:17	22:55	
W	160:19	189	1:17	22:21	
X	175:43	211	1:07	26:06	
Y	176:15	215	1:05	26:13	
Z	178:29	219	1:05	26:35	
AA	125:19	176	1:09	17:49	
AB	110:42	165	1:04	16:57	
AC	105:10	151	1:04	16:28	
AD	107:52	150	1:08	17:29	
AE	123:32	153	1:05	17:05	
AF	0:00	0	0:00	0:00	
AG	0:00	0	0:00	0:00	
AH	0:00	0	0:00	0:00	
AI	0:00	0	0:00	0:00	
AJ	0:00	0	0:00	0:00	
AK	152:19	178	1:16	21:23	
AL	9:10	44	0:18	2:12	
AM	10:42	35	0:27	1:57	
AN	160:12	209	1:16	26:57	
AO	59:32	123	0:47	8:33	
AP	72:31	126	0:46	9:29	
AQ	7:00	29	0:22	1:16	
AR	63:53	122	0:48	9:30	
AS	65:14	109	0:45	14:04	
AT	28:11	62	0:31	3:13	
AU	70:42	121	0:46	9:50	
AV	44:42	106	0:38	9:45	
AW	0:00	0	0:00	0:00	
AX	0:00	0	0:00	0:00	
AY	0:00	0	0:00	0:00	
AZ	0:00	0	0:00	0:00	
BA	0:00	0	0:00	0:00	
BB	0:00	0	0:00	0:00	
BC	0:00	0	0:00	0:00	
BD	0:00	0	0:00	0:00	
BE	0:00	0	0:00	0:00	
BF	0:00	0	0:00	0:00	
BG	0:00	0	0:00	0:00	
BH	0:00	0	0:00	0:00	
BI	12:32	64	0:22	1:28	
BJ	34:03	92	0:31	4:18	
BK	65:07	128	0:42	8:31	
BL	57:00	104	0:51	10:24	
BM	1:12	12	0:08	0:07	
BN	0:00	0	0:00	0:00	

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

No.	Name	Worst case [h/year]	Expected [h/year]
1	LS custom 4600 180.0 !O! hub: 155.0 m (TOT: 245.0 m) (61)	102:42	16:51
2	LS custom 4600 180.0 !O! hub: 155.0 m (TOT: 245.0 m) (62)	164:45	24:07
3	LS custom 4600 180.0 !O! hub: 155.0 m (TOT: 245.0 m) (63)	56:23	11:03
4	LS custom 4600 180.0 !O! hub: 155.0 m (TOT: 245.0 m) (64)	285:22	49:35
5	LS custom 4600 180.0 !O! hub: 155.0 m (TOT: 245.0 m) (65)	800:50	110:34

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.

Project:

19065LE slagschaduw nieuwbouwwijk

Licensed user:

Bosch & Van Rijn

Franz-Lisztplantsoen 220

NL-3533 JG Utrecht

+31 6 51 71 04 93

Schreurs / leon@boschenvanrijn.nl

Calculated:

19-Aug-21 10:59 AM/3.4.388

SHADOW - Calendar

Calculation: VKA bovengrens met kantoren 12RD 210819 **Shadow receptor:** A - Shadow Receptor: 8.0 × 5.0 Azimuth: 0.0° Slope: 0.0° (10891)
Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) [DE BILT]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1.48 2.65 3.60 5.24 6.59 6.28 6.20 6.12 4.48 3.32 1.87 1.32

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 385 684 574 504 436 731 797 1,164 1,146 770 577 539 8,307

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:45 16:37	08:18 17:24	07:25 18:16	07:15 20:10	06:10 21:00	05:25 21:46	05:22 22:00	05:58 21:28	06:48 20:26	07:37 19:17	07:30 17:11	08:21 16:31
2	08:45 16:38	08:17 17:26	07:23 18:18	07:12 20:11	06:08 21:02	05:24 21:47	05:23 22:00	06:00 21:27	06:50 20:24	07:38 19:15	07:32 17:09	08:23 16:30
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4	08:45 16:40	08:14 17:30	07:19 18:21	07:08 20:15	06:04 21:05	05:23 21:49	05:24 21:59	06:03 21:23	06:53 20:20	07:42 19:10	07:36 17:06	08:25 16:29
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6	08:44 16:42	08:10 17:34	07:14 18:25	07:03 20:18	06:01 21:09	05:21 21:51	05:26 21:58	06:06 21:20	06:56 20:15	07:45 19:06	07:39 17:02	08:28 16:28
7	08:44 16:44	08:09 17:35	07:12 18:27	07:01 20:20	05:59 21:10	05:21 21:52	05:27 21:57	06:08 21:18	06:58 20:13	07:47 19:03	07:41 17:01	08:29 16:28
8	08:43 16:45	08:07 17:37	07:10 18:28	06:59 20:22	05:57 21:12	05:20 21:53	05:28 21:57	06:09 21:16	06:59 20:11	07:48 19:01	07:43 16:59	08:31 16:27
9	08:43 16:46	08:05 17:39	07:07 18:30	06:57 20:23	05:55 21:14	05:20 21:54	05:28 21:56	06:11 21:14	07:01 20:08	07:50 18:59	07:45 16:57	08:32 16:27
10	08:42 16:48	08:03 17:41	07:05 18:32	06:54 20:25	05:54 21:15	05:19 21:55	05:29 21:55	06:12 21:12	07:02 20:06	07:52 18:57	07:47 16:56	08:33 16:27
11	08:42 16:49	08:02 17:43	07:03 18:34	06:52 20:27	05:52 21:17	05:19 21:56	05:31 21:55	06:14 21:11	07:04 20:04	07:54 18:54	07:48 16:54	08:34 16:27
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18	08:36 17:00	07:48 17:56	06:47 18:46	06:37 20:39	05:41 21:28	05:18 21:59	05:39 21:48	06:25 20:57	07:15 19:47	08:06 18:39	08:01 16:44	08:40 16:27
19	08:35 17:01	07:46 17:58	06:45 18:47	06:35 20:40	05:40 21:29	05:18 22:00	05:40 21:47	06:27 20:55	07:17 19:45	08:07 18:37	08:02 16:43	08:41 16:27
20	08:34 17:03	07:44 18:00	06:42 18:49	06:32 20:42	05:38 21:31	05:18 22:00	05:41 21:46	06:28 20:53	07:19 19:43	08:09 18:35	08:04 16:41	08:42 16:28
21	08:33 17:05	07:42 18:01	06:40 18:51	06:30 20:44	05:37 21:32	05:18 22:00	05:43 21:44	06:30 20:50	07:20 19:40	08:11 18:33	08:06 16:40	08:42 16:28
22	08:32 17:07	07:40 18:03	06:38 18:53	06:28 20:45	05:36 21:33	05:18 22:01	05:44 21:43	06:32 20:48	07:22 19:38	08:13 18:31	08:07 16:39	08:43 16:29
23	08:31 17:08	07:38 18:05	06:35 18:54	06:26 20:47	05:34 21:35	05:18 22:01	05:45 21:42	06:33 20:46	07:24 19:36	08:14 18:29	08:09 16:38	08:43 16:29
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31	08:20 17:23	07:17 18:08	06:11 19:08	06:11 20:59	05:26 21:45	05:20 22:01	05:57 21:30	06:46 20:29	07:39 17:13	08:29 16:32	08:21 16:35	08:45 16:35
Potential sun hours	259	278	367	416	485	498	502	454	381	332	266	244
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

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

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

Project:

19065LE slagschaduw nieuwbouwwijk

Licensed user:

Bosch & Van Rijn

Franz-Lisztplantsoen 220

NL-3533 JG Utrecht

+31 6 51 71 04 93

Schreurs / leon@boschenvanrijn.nl

Calculated:

19-Aug-21 10:59 AM/3.4.388

SHADOW - Calendar

Calculation: VKA bovengrens met kantoren 12RD 210819 **Shadow receptor:** B - Shadow Receptor: 8.0 × 5.0 Azimuth: 0.0° Slope: 0.0° (10892)
Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) [DE BILT]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1.48 2.65 3.60 5.24 6.59 6.28 6.20 6.12 4.48 3.32 1.87 1.32

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 385 684 574 504 436 731 797 1,164 1,146 770 577 539 8,307

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:45 16:37 20:45 16:38 30:45 16:39 40:45 16:40 50:44 16:41 60:44 16:42 70:44 16:44 80:43 16:45 90:43 16:46 100:42 16:48 110:42 16:49 120:41 16:51 130:40 16:52 140:40 16:54 150:39 16:55 160:38 16:57 170:37 180:36 190:00 200:35 210:02 220:32 230:17 240:03 250:31 260:27 270:14 280:26 290:15 300:24 310:17 320:20 330:17 340:10 350:08 360:06 370:05 380:05 390:05 400:05 410:05 420:05 430:05 440:05 450:05 460:05 470:05 480:05 490:05 500:05 510:05 520:05 530:05 540:05 550:05 560:05 570:05 580:05 590:05 600:05 610:05 620:05 630:05 640:05 650:05 660:05 670:05 680:05 690:05 700:05 710:05 720:05 730:05 740:05 750:05 760:05 770:05 780:05 790:05 800:05 810:05 820:05 830:05 840:05 850:05 860:05 870:05 880:05 890:05 900:05 910:05 920:05 930:05 940:05 950:05 960:05 970:05 980:05 990:05 1000:05	08:18 17:24 08:17 17:26 08:15 17:28 08:14 17:30 08:12 17:32 08:10 17:34 08:09 17:35 08:07 17:37 08:05 17:39 08:03 17:41 08:01 17:43 08:00 17:45 07:58 17:47 07:56 17:48 07:54 17:50 07:52 17:52 07:50 17:54 07:48 17:56 07:46 17:58 07:44 18:00 07:42 18:01 07:40 18:03 07:38 18:05 07:29 17:10 07:28 17:12 07:27 17:14 07:26 17:15 07:24 17:17 07:23 17:19 08:21 17:21 08:20 17:23	07:25 18:16 07:23 18:18 07:21 18:19 07:19 18:21 07:16 18:23 07:14 18:25 07:12 18:27 07:10 18:28 07:07 18:30 07:05 18:32 07:03 18:34 07:01 18:35 06:58 18:37 06:56 18:39 06:54 18:41 06:52 18:42 06:49 18:44 06:47 18:46 06:45 18:47 06:42 18:49 06:40 18:51 06:38 18:53 06:35 18:54 06:33 18:56 06:31 18:58 06:29 18:59 06:26 19:01 06:24 19:03 06:22 20:05 07:19 20:06 07:17 20:08	07:15 20:10 07:12 20:11 07:10 20:13 07:08 20:15 07:06 20:16 07:03 20:18 07:01 20:20 06:59 20:22 06:57 20:23 06:54 20:25 06:52 20:27 06:50 20:30 06:48 20:32 06:45 20:35 06:43 20:33 06:41 20:35 06:39 20:37 06:37 20:39 06:37 20:40 06:36 20:42 06:35 20:44 06:34 20:47 06:33 20:50 06:32 20:52 06:31 20:55 06:30 20:58 06:29 20:59 06:28 20:59 06:27 20:59 06:26 20:59 06:25 20:59 06:24 20:59 06:23 20:59 06:22 20:59 06:21 20:59 06:20 20:59 06:19 20:59 06:18 20:59 06:17 20:59 06:16 20:59 06:15 20:59 06:14 20:59 06:13 20:59 06:12 20:59 06:11 20:59 06:10 20:59 06:09 20:59 06:08 20:59 06:07 20:59 06:06 20:59 06:05 20:59 06:04 20:59 06:03 20:59 06:02 20:59 06:01 20:59 06:00 20:59 05:59 20:59 05:58 20:59 05:57 20:59 05:56 20:59 05:55 20:59 05:54 20:59 05:53 20:59 05:52 20:59 05:51 20:59 05:50 20:59 05:49 20:59 05:48 20:59 05:47 20:59 05:46 20:59 05:45 20:59 05:44 20:59 05:43 20:59 05:42 20:59 05:41 20:59 05:40 20:59 05:39 20:59 05:38 20:59 05:37 20:59 05:36 20:59 05:35 20:59 05:34 20:59 05:33 20:59 05:32 20:59 05:31 20:59 05:30 20:59 05:29 20:59 05:28 20:59 05:27 20:59 05:26 20:59 05:25 20:59 05:24 20:59 05:23 20:59 05:22 20:59 05:21 20:59 05:20 20:59 05:19 20:59 05:18 20:59 05:17 20:59 05:16 20:59 05:15 20:59 05:14 20:59 05:13 20:59 05:12 20:59 05:11 20:59 05:10 20:59 05:09 20:59 05:08 20:59 05:07 20:59 05:06 20:59 05:05 20:59 05:04 20:59 05:03 20:59 05:02 20:59 05:01 20:59 05:00 20:59 04:59 20:59 04:58 20:59 04:57 20:59 04:56 20:59 04:55 20:59 04:54 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20:59 03:30 20:59 03:29 20:59 03:28 20:59 03:27 20:59 03:26 20:59 03:25 20:59 03:24 20:59 03:23 20:59 03:22 20:59 03:21 20:59 03:20 20:59 03:19 20:59 03:18 20:59 03:17 20:59 03:16 20:59 03:15 20:59 03:14 20:59 03:13 20:59 03:12 20:59 03:11 20:59 03:10 20:59 03:09 20:59 03:08 20:59 03:07 20:59 03:06 20:59 03:05 20:59 03:04 20:59 03:03 20:59 03:02 20:59 03:01 20:59 03:00 20:59 02:59 20:59 02:58 20:59 02:57 20:59 02:56 20:59 02:55 20:59 02:54 20:59 02:53 20:59 02:52 20:59 02:51 20:59 02:50 20:59 02:49 20:59 02:48 20:59 02:47 20:59 02:46 20:59 02:45 20:59 02:44 20:59 02:43 20:59 02:42 20:59 02:41 20:59 02:40 20:59 02:39 20:59 02:38 20:59 02:37 20:59 02:36 20:59 02:35 20:59 02:34 20:59 02:33 20:59 02:32 20:59 02:31 20:59 02:30 20:59 02:29 20:59 02:28 20:59 02:27 20:59 02:26 20:59 02:25 20:59 02:24 20:59 02:23 20:59 02:22 20:59 02:21 20:59 02:20 20:59 02:19 20:59 02:18 20:59 02:17 20:59 02:16 20:59 02:15 20:59 02:14 20:59 02:13 20:59 02:12 20:59 02:11 20:59 02:10 20:59 02:09 20:59 02:08 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20:59 12:44 20:59 12:43 20:59 12:42 20:59 12:41 20:59 12:40 20:59 12:39 20:59 12:38 20:59 12:37 20:59 12:36 20:59 12:35 20:59 12:34 20:59 12:33 20:59 12:32 20:59 12:31 20:59 12:30 20:59 12:29 20:59 12:28 20:59 12:27 20:59 12:26 20:59 12:25 20:59 12:24 20:59 12:23 20:59 12:22 20:59 12:21 20:59 12:20 20:59 12:19 20:59 12:18 20:59 12:17 20:59 12:16 20:59 12:15 20:59 12:14 20:59 12:13 20:59 12:12 20:59 12:11 20:59 12:10 20:59 12:09 20:59 12:08 20:59 12:07 20:59 12:06 20:59 12:05 20:59 12:04 20:59 12:03 20:59 12:02 20:59 12:01 20:59 12:00 20:59 11:59 20:59 11:58 20:59 11:57 20:59 11:56 20:59 11:55 20:59 11:54 20:59 11:53 20:59 11:52 20:59 11:51 20:59 11:50 20:59 11:49 20:59 11:48 20:59 11:47 20:59 11:46 20:59 11:45 20:59 11:44 20:59 11:43 20:59 11:42 20:59 11:41 20:59 11:40 20:59 11:39 20:59 11:38 20:59 11:37 20:59 11:36 20:59 11:35 20:59 11:34 20:59 11:33 20:59 11:32 20:59 11:31 20:59 11:30 20:59 11:29 20:59 11:28 20:59 11:27 20:59 11:26 20:59 11:25 20:59 11:24 20:59 11:23 20:59 11:22 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Table layout: For each day in each month the following matrix apply

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

Project:

19065LE slagschaduw nieuwbouwwijk

Licensed user:

Bosch & Van Rijn

Franz-Lisztplantsoen 220

NL-3533 JG Utrecht

+31 6 51 71 04 93

Schreurs / leon@boschenvanrijn.nl

Calculated:

19-Aug-21 10:59 AM/3.4.388

SHADOW - Calendar

Calculation: VKA bovengrens met kantoren 12RD 210819Shadow receptor: C - Shadow Receptor: 8.0 × 5.0 Azimuth: 0.0° Slope: 0.0° (10893)
Sunshine probability S (Average daily sunshine hours) [DE BILT]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1.48 2.65 3.60 5.24 6.59 6.28 6.20 6.12 4.48 3.32 1.87 1.32

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
385 684 574 504 436 731 797 1,164 1,146 770 577 539 8,307

	January	February	March	April	May	June	July	August	September	October	November	December		
1	08:45 16:37	08:18 17:24	07:25 18:16	07:15 20:10	18:48 (5) 25 19:44 (4)	06:10 21:00	05:25 21:46	05:22 22:00	05:58 21:28	06:48 20:26	07:37 19:17	18:27 (5) 23 18:50 (5)	07:30 17:11	08:21 16:31
2	08:45 16:38	08:17 17:26	07:23 18:18	07:12 20:11	19:30 (4) 16 19:46 (4)	06:08 21:02	05:24 21:47	05:23 22:00	06:00 21:27	06:50 20:24	19:36 (4) 3 19:39 (4)	18:28 (5) 20 18:48 (5)	07:32 17:09	08:23 16:30
3	08:45 16:39	08:15 17:28	07:21 18:19	07:10 20:13	19:30 (4) 18 19:48 (4)	06:06 21:04	05:23 21:48	05:23 21:59	06:01 21:25	06:51 20:22	19:31 (4) 11 19:42 (4)	18:30 (5) 15 18:45 (5)	07:34 17:08	08:24 16:30
4	08:45 16:40	08:14 17:30	07:19 18:21	07:08 20:15	19:29 (4) 20 19:49 (4)	06:04 21:05	05:23 21:49	05:24 21:59	06:03 21:23	06:53 20:20	19:29 (4) 15 19:44 (4)	18:35 (5) 5 18:40 (5)	07:36 17:06	08:25 16:29
5	08:44 16:41	08:12 17:32	07:16 18:23	07:06 20:16	19:29 (4) 21 19:50 (4)	06:03 21:07	05:22 21:50	05:25 21:58	06:05 21:22	06:54 20:17	19:27 (4) 17 19:44 (4)	18:35 (5) 17 18:45 (5)	07:38 17:04	08:27 16:29
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7	08:44 16:44	08:09 17:35	07:12 18:27	07:01 20:20	19:31 (4) 17 19:48 (4)	05:59 21:10	05:21 21:52	05:27 21:57	06:08 21:18	06:58 20:13	19:25 (4) 20 19:45 (4)	18:42 (5) 19 18:45 (4)	07:41 17:01	08:29 16:28
8	08:43 16:45	08:07 17:37	07:10 18:28	06:59 20:22	19:31 (4) 15 19:46 (4)	05:57 21:12	05:20 21:53	05:28 21:57	06:09 21:16	06:59 20:11	19:24 (4) 20 19:44 (4)	18:42 (5) 19 18:45 (4)	07:48 17:01	08:30 16:27
9	08:43 16:46	08:05 17:39	07:07 18:30	06:57 20:23	19:33 (4) 11 19:44 (4)	05:55 21:14	05:20 21:54	05:29 21:56	06:11 21:14	07:01 20:08	19:23 (4) 18 19:41 (4)	18:42 (5) 19 18:45 (4)	07:50 17:02	08:32 16:27
10	08:42 16:48	08:03 17:41	07:05 18:32	06:54 20:25	19:37 (4) 3 19:40 (4)	05:54 21:15	05:19 21:55	05:30 21:55	06:12 21:12	07:03 20:06	19:23 (4) 16 19:39 (4)	18:42 (5) 19 18:45 (4)	07:52 17:04	08:33 16:27
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14	08:40 16:54	07:56 17:48	06:56 18:39	06:45 20:32	19:43 (4) 28 18:13 (5)	05:47 21:22	05:18 21:57	05:34 21:52	06:19 21:05	07:09 19:57	19:34 (4) 30 19:39 (4)	18:33 (5) 19 18:45 (4)	07:59 17:07	08:37 16:27
15	08:39 16:55	07:54 17:50	06:54 18:41	06:43 20:33	19:44 (4) 31 18:15 (5)	05:46 21:23	05:18 21:58	05:35 21:51	06:20 21:03	07:11 19:54	19:35 (4) 29 19:39 (4)	18:33 (5) 19 18:45 (4)	08:00 17:08	08:38 16:27
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22	08:32 17:07	07:40 18:03	06:38 18:53	06:28 20:45	19:51 (4) 37 18:22 (5)	05:36 21:33	05:18 22:01	05:44 21:43	06:32 20:48	07:22 19:38	19:42 (4) 36 19:45 (4)	18:24 (5) 19 18:45 (4)	08:13 17:15	08:43 16:29
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25	08:28 17:12	07:34 18:09	06:31 18:58	06:22 20:50	19:54 (4) 34 18:25 (5)	05:32 21:37	05:19 22:01	05:48 21:39	06:37 20:42	07:27 19:31	19:45 (4) 36 19:48 (4)	18:23 (5) 19 18:45 (4)	08:18 17:18	08:44 16:31
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27	08:26 17:15	07:29 18:12	06:26 19:01	06:18 20:54	19:56 (4) 31 18:27 (5)	05:30 21:40	05:20 22:01	05:51 21:36	06:40 20:38	07:30 19:26	19:47 (4) 34 19:50 (4)	18:23 (5) 19 18:45 (4)	08:22 17:20	08:45 16:32
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Potential sun hours	259	278	367	416	485	498	502	454	381	332	267	244		
Total, worst case			674	165					783	63				
Sun reduction			0.30	0.38					0.35	0.31				
Oper. time red.			0.95	0.95					0.95	0.95				
Wind dir. red.			0.63	0.61					0.62	0.63				
Total reduction			0.18	0.22					0.21	0.18				
Total, real			122	36					164	12				

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

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

Project:

19065LE slagschaduw nieuwbouwwijk

Licensed user:

Bosch & Van Rijn

Franz-Lisztplantsoen 220

NL-3533 JG Utrecht

+31 6 51 71 04 93

Schreurs / leon@boschenvanrijn.nl

Calculated:

19-Aug-21 10:59 AM/3.4.388

SHADOW - Calendar

Calculation: VKA bovengrens met kantoren 12RD 210819 **Shadow receptor:** D - Shadow Receptor: 8.0 × 5.0 Azimuth: 0.0° Slope: 0.0° (10894)
Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) [DE BILT]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1.48 2.65 3.60 5.24 6.59 6.28 6.20 6.12 4.48 3.32 1.87 1.32

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 385 684 574 504 436 731 797 1,164 1,146 770 577 539 8,307

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:45 16:37	08:18 17:24	07:25 18:16	17:17 (5) 20:10	07:15 21:00	06:10 21:46	05:25 22:00	05:22 21:28	05:58 20:26	06:48 19:17	07:37 17:11	07:30 16:31
2	08:45 16:38	08:17 17:26	07:23 18:18	17:16 (5) 20:11	07:12 21:02	06:08 21:47	05:24 22:00	05:23 21:27	06:00 20:24	06:50 19:15	18:03 (5) 17:59 (5)	07:32 17:09
3	08:45 16:39	08:15 17:28	07:21 18:19	17:16 (5) 20:13	07:10 21:04	06:06 21:48	05:23 21:59	05:23 21:25	06:01 20:22	06:51 19:13	07:40 17:57 (5)	07:34 17:08
4	08:45 16:40	08:14 17:30	07:19 18:21	17:16 (5) 20:15	07:08 21:05	06:04 21:49	05:23 21:59	05:24 21:23	06:03 20:20	06:53 19:10	07:42 18:18 (5)	07:36 17:06
5	08:44 16:41	08:12 17:32	07:16 18:23	17:17 (5) 20:16	07:06 21:07	06:03 21:50	05:22 21:58	05:25 21:22	06:05 20:17	06:54 19:08	07:43 17:56 (5)	07:38 17:04
6	08:44 16:42	08:10 17:34	07:14 18:25	17:16 (5) 20:18	07:03 21:09	06:01 21:51	05:21 21:58	05:26 21:20	06:06 20:15	06:56 19:06	07:45 17:54 (5)	07:39 17:02
7	08:44 16:44	08:09 17:35	07:12 18:27	17:17 (5) 20:20	07:01 21:10	05:59 21:52	05:21 21:57	05:27 21:18	06:08 20:13	06:58 19:03	07:47 18:20 (5)	07:41 17:01
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15	08:39 16:55	07:54 17:50	06:54 18:41	06:43 20:33	05:46 21:23	05:18 21:58	05:35 21:51	06:20 21:03	07:11 19:54	08:00 18:46	08:00 18:17 (5)	07:55 16:48
16	08:38 16:57	07:52 17:52	06:52 18:42	06:41 20:35	05:44 21:25	05:18 21:58	05:36 21:50	06:22 21:01	07:12 19:52	08:02 18:44	07:57 18:15 (5)	07:57 16:47
17	08:37 16:58	07:50 17:54	06:49 18:44	06:39 20:37	05:43 21:26	05:18 21:59	05:37 21:49	06:24 20:59	07:14 19:50	08:04 18:41	07:59 18:13 (5)	07:59 16:45
18	08:36 17:00	07:48 17:56	06:47 18:46	06:37 20:39	05:41 21:28	05:18 21:59	05:39 21:48	06:25 20:57	07:15 19:47	08:06 18:39	08:06 18:11 (5)	08:00 16:44
19	08:35 17:02	07:46 17:58	06:45 18:47	06:35 20:40	05:40 21:29	05:18 22:00	05:40 21:47	06:27 20:55	07:17 19:45	08:07 18:37	08:07 17:53 (5)	08:02 16:43
20	08:34 17:03	07:44 18:00	06:42 18:49	06:32 20:42	05:38 21:31	05:18 22:00	05:41 21:45	06:28 20:53	07:19 19:43	08:09 18:35	08:09 18:06 (5)	08:04 16:42
21	08:33 17:05	07:42 18:01	06:40 17:26 (5)	06:30 20:44	05:37 21:32	05:18 22:00	05:43 21:44	06:30 20:50	07:20 19:40	08:11 18:33	08:11 17:58 (5)	08:06 16:40
22	08:32 17:07	07:40 18:03	06:38 17:36 (5)	06:28 20:45	05:36 21:33	05:18 22:01	05:44 21:43	06:32 20:48	07:22 19:38	08:13 18:31	08:13 17:59 (5)	08:07 16:39
23	08:31 17:08	07:38 18:05	06:35 17:22 (5)	06:26 20:47	05:34 21:35	05:18 22:01	05:45 21:42	06:33 20:46	07:24 19:36	08:14 18:29	08:14 17:59 (5)	08:09 16:38
24	08:30 17:10	07:36 18:07	06:33 17:21 (5)	06:24 20:49	05:33 21:36	05:19 22:01	05:47 21:40	06:35 20:44	07:25 19:33	08:16 18:27	08:16 17:59 (5)	08:10 16:37
25	08:28 17:12	07:34 18:09	06:31 17:42 (5)	06:22 20:50	05:32 21:37	05:19 22:01	05:48 21:39	06:37 20:42	07:27 19:31	07:18 17:25	07:18 17:59 (5)	08:12 16:36
26	08:27 17:14	07:32 18:10	06:29 17:18 (5)	06:20 20:52	05:31 21:39	05:19 22:01	05:49 21:38	06:38 20:40	07:28 19:29	07:20 17:23	07:20 17:59 (5)	08:14 16:35
27	08:26 17:15	07:29 18:12	06:26 17:17 (5)	06:18 20:54	05:30 21:40	05:20 22:01	05:51 21:36	06:40 20:38	07:30 19:26	07:21 17:21	07:21 17:59 (5)	08:15 16:34
28	08:24 17:17	07:27 18:14	06:24 17:17 (5)	06:16 20:55	05:29 21:41	05:20 22:01	05:52 21:35	06:41 20:35	07:32 19:24	07:23 17:19	07:23 17:59 (5)	08:17 16:33
29	08:23 17:19		07:22 20:05	06:14 20:57	05:28 21:43	05:21 22:01	05:54 21:33	06:43 20:33	07:33 19:22	07:25 17:17	07:25 17:59 (5)	08:18 16:32
30	08:21 17:21		07:19 20:06	06:12 20:59	05:27 21:44	05:21 22:00	05:55 21:32	06:45 20:31	07:35 19:19	07:27 17:15	07:27 17:59 (5)	08:20 16:32
31	08:20 17:23		07:17 20:08		05:26 21:45		05:57 21:30	06:46 20:29		07:29 17:13		08:45 16:35
Potential sun hours	259	278	367	416	485	498	502	454	381	332	267	244
Total, worst case		165	291								460	
Sun reduction		0.27	0.30								0.31	
Oper. time red.		0.95	0.95								0.95	
Wind dir. red.		0.65	0.65								0.65	
Total reduction		0.16	0.19								0.19	
Total, real		27	55								88	

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

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

Project:

19065LE slagschaduw nieuwbouwwijk

Licensed user:

Bosch & Van Rijn

Franz-Lisztplantsoen 220

NL-3533 JG Utrecht

+31 6 51 71 04 93

Schreurs / leon@boschenvanrijn.nl

Calculated:

19-Aug-21 10:59 AM/3.4.388

SHADOW - Calendar

Calculation: VKA bovengrens met kantoren 12RD 210819Shadow receptor: E - Shadow Receptor: 8.0 × 5.0 Azimuth: 0.0° Slope: 0.0° (10895)
Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) [DE BILT]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1.48 2.65 3.60 5.24 6.59 6.28 6.20 6.12 4.48 3.32 1.87 1.32

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
385 684 574 504 436 731 797 1,164 1,146 770 577 539 8,307

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:45 16:37 48	14:43 (5) 15:31 (5) 15	08:18 15:12 (5) 15:27 (5)	07:25 18:16 26	17:24 (4) 17:50 (4) 20:10	06:10 21:01 21:46	05:25 22:00 21:28	05:58 20:27 19:17	06:48 20:27 19:17	07:37 18:11 (4) 17:11	07:30 18:18 (4) 17:11	08:21 15:18 (5) 16:31
2	08:45 16:38 49	14:43 (5) 15:32 (5) 16	08:17 15:26 16	07:23 18:18 27	17:23 (4) 17:51 (4) 20:11	06:08 21:02 21:47	05:24 22:00 21:27	05:58 20:24 19:15	06:50 20:24 19:15	07:38 18:08 (4) 17:09	07:32 18:22 (4) 16:59	08:23 15:19 (5) 16:30
3	08:45 16:39 49	14:44 (5) 15:33 (5) 17	08:15 15:28 17	07:21 18:19 28	17:23 (4) 17:51 (4) 20:13	06:06 21:04 21:48	05:23 22:00 21:25	06:01 20:22 19:13	06:51 20:22 19:13	07:40 18:05 (4) 17:08	07:34 18:23 (4) 17:08	08:24 15:18 (5) 16:30
4	08:45 16:40 49	14:45 (5) 15:34 (5) 18	08:14 15:30 18	07:19 18:21 28	17:23 (4) 17:51 (4) 20:15	06:04 21:05 21:49	05:23 22:00 21:23	06:03 20:20 19:10	06:53 20:20 19:10	07:42 18:03 (4) 17:06	07:36 18:24 (4) 17:06	08:25 15:19 (5) 16:29
5	08:44 16:41 48	14:45 (5) 15:33 (5) 18	08:12 15:32 18	07:16 18:23 28	17:23 (4) 17:51 (4) 20:17	06:03 21:07 21:50	05:22 22:00 21:22	06:05 20:17 19:08	06:54 20:17 19:08	07:43 18:02 (4) 17:04	07:38 18:25 (4) 17:04	08:27 15:19 (5) 16:29
6	08:44 16:42 48	14:46 (5) 15:34 (5) 19	08:09 15:34 19	07:14 18:25 27	17:23 (4) 17:50 (4) 20:18	06:01 21:09 21:51	05:21 22:00 21:20	06:06 20:15 19:06	06:56 20:15 19:06	07:45 18:00 (4) 17:02	07:39 18:25 (4) 17:02	08:28 15:20 (5) 16:28
7	08:44 16:44 48	14:46 (5) 15:34 (5) 19	08:09 15:34 19	07:14 18:25 27	17:23 (4) 17:50 (4) 20:18	06:01 21:09 21:51	05:21 22:00 21:20	06:06 20:15 19:06	06:56 20:15 19:06	07:45 18:00 (4) 17:02	07:39 18:25 (4) 17:02	08:28 15:20 (5) 16:28
8	08:43 16:45 48	14:46 (5) 15:34 (5) 19	08:07 15:37 19	07:10 18:28 25	17:24 (4) 17:49 (4) 20:22	06:09 21:12 21:53	05:20 22:00 21:27	06:09 20:11 19:01	06:59 20:11 19:01	07:49 18:26 (4) 17:05	07:49 18:26 (4) 17:05	08:29 15:21 (5) 16:27
9	08:43 16:46 48	14:47 (5) 15:35 (5) 19	08:05 15:39 19	07:08 18:30 23	17:24 (4) 17:47 (4) 20:23	06:05 21:14 21:54	05:20 22:00 21:27	06:11 20:08 18:59	07:01 20:08 18:59	07:50 18:26 (4) 17:05	07:50 18:26 (4) 17:05	08:30 15:22 (5) 16:27
10	08:42 16:48 48	14:47 (5) 15:35 (5) 19	08:03 15:41 20	07:05 18:32 20	17:26 (4) 17:46 (4) 20:25	06:04 21:15 21:55	05:19 22:00 21:25	06:12 20:06 18:57	07:03 20:06 18:57	07:52 18:25 (4) 17:06	07:52 18:25 (4) 17:06	08:31 15:22 (5) 16:27
11	08:42 16:49 49	14:47 (5) 15:36 (5) 20	08:02 15:43 20	07:03 18:34 16	17:28 (4) 17:44 (4) 20:27	06:05 21:17 21:56	05:19 22:00 21:25	06:14 20:04 18:55	07:04 20:04 18:55	07:54 18:25 (4) 17:05	07:54 18:25 (4) 17:05	08:32 15:23 (5) 16:27
12	08:41 16:51 49	14:48 (5) 15:37 (5) 20	08:00 15:45 20	07:01 18:35 10	17:31 (4) 17:41 (4) 20:28	06:05 21:18 21:56	05:19 22:00 21:25	06:16 20:01 18:52	07:06 20:01 18:52	07:55 18:24 (4) 17:06	07:55 18:24 (4) 17:06	08:33 15:23 (5) 16:27
13	08:40 16:52 48	14:49 (5) 15:37 (5) 20	07:58 15:47 20	06:58 18:37 20	17:41 (4) 17:47 (4) 20:28	06:06 21:19 21:57	05:18 22:00 21:25	06:17 20:07 18:50	07:07 20:07 18:50	07:57 18:26 (4) 17:05	07:57 18:26 (4) 17:05	08:34 15:24 (5) 16:27
14	08:40 16:54 48	14:49 (5) 15:37 (5) 20	07:56 15:48 20	06:56 18:39 20	17:47 (4) 17:48 (4) 20:28	06:06 21:19 21:57	05:18 22:00 21:25	06:19 20:09 18:50	07:09 20:09 18:50	07:59 18:27 (4) 17:04	07:59 18:27 (4) 17:04	08:35 15:25 (5) 16:27
15	08:39 16:55 47	14:50 (5) 15:37 (5) 21	07:54 15:50 21	06:54 18:41 20	17:48 (4) 17:50 (4) 20:29	06:07 21:20 21:58	05:18 22:00 21:25	06:20 20:08 18:46	07:11 20:08 18:46	08:00 18:28 (4) 17:03	08:00 18:28 (4) 17:03	08:36 15:26 (5) 16:27
16	08:38 16:57 47	14:50 (5) 15:37 (5) 21	07:52 15:52 21	06:52 18:42 20	17:49 (4) 17:52 (4) 20:29	06:08 21:21 21:59	05:18 22:00 21:25	06:22 20:09 18:47	07:12 20:09 18:47	08:02 18:29 (4) 17:02	08:02 18:29 (4) 17:02	08:37 15:27 (5) 16:27
17	08:37 16:58 46	14:51 (5) 15:37 (5) 21	07:50 15:54 21	06:49 18:44 20	17:51 (4) 17:54 (4) 20:30	06:09 21:22 21:59	05:18 22:00 21:25	06:24 20:10 18:48	07:14 20:10 18:48	08:04 18:31 (4) 17:01	08:04 18:31 (4) 17:01	08:38 15:28 (5) 16:27
18	08:36 17:00 46	14:52 (5) 15:38 (5) 21	07:48 15:56 21	06:47 18:46 20	17:52 (4) 17:56 (4) 20:31	06:10 21:23 21:59	05:18 22:00 21:25	06:25 20:11 18:49	07:15 20:11 18:49	08:06 18:32 (4) 17:02	08:06 18:32 (4) 17:02	08:39 15:29 (5) 16:27
19	08:35 17:02 45	14:52 (5) 15:38 (5) 21	07:46 15:58 21	06:45 18:48 20	17:53 (4) 17:58 (4) 20:32	06:11 21:24 21:59	05:18 22:00 21:25	06:27 20:12 18:50	07:17 20:12 18:50	08:07 18:33 (4) 17:03	08:07 18:33 (4) 17:03	08:40 15:30 (5) 16:27
20	08:34 17:03 44	14:53 (5) 15:39 (5) 22	07:44 16:00 22	06:42 18:49 20	17:54 (4) 18:00 (4) 20:33	06:12 21:25 22:00	05:18 22:00 21:25	06:29 20:13 18:51	07:19 20:13 18:51	08:09 18:34 (4) 17:04	08:09 18:34 (4) 17:04	08:41 15:31 (5) 16:27
21	08:33 17:05 43	14:54 (5) 15:39 (5) 22	07:42 16:01 22	06:40 18:51 20	17:55 (4) 18:01 (4) 20:34	06:13 21:26 22:01	05:18 22:00 21:25	06:30 20:14 18:52	07:20 20:14 18:52	08:11 18:35 (4) 17:05	08:11 18:35 (4) 17:05	08:42 15:32 (5) 16:27
22	08:32 17:07 42	14:55 (5) 15:40 (5) 23	07:40 16:03 23	06:38 18:53 20	17:56 (4) 18:03 (4) 20:35	06:14 21:27 22:02	05:18 22:00 21:25	06:32 20:15 18:53	07:22 20:15 18:53	08:13 18:36 (4) 17:06	08:13 18:36 (4) 17:06	08:43 15:33 (5) 16:27
23	08:31 17:08 41	14:55 (5) 15:41 (5) 24	07:38 16:05 24	06:36 18:54 20	17:57 (4) 18:05 (4) 20:36	06:15 21:28 22:03	05:18 22:00 21:25	06:33 20:16 18:54	07:23 20:16 18:54	08:14 18:37 (4) 17:07	08:14 18:37 (4) 17:07	08:44 15:34 (5) 16:27
24	08:30 17:10 40	14:56 (5) 15:42 (5) 25	07:36 16:07 25	06:33 18:56 20	17:58 (4) 18:07 (4) 20:37	06:16 21:29 22:04	05:18 22:00 21:25	06:35 20:17 18:55	07:24 20:17 18:55	08:15 18:38 (4) 17:08	08:15 18:38 (4) 17:08	08:45 15:35 (5) 16:27
25	08:29 17:12 38	14:58 (5) 15:43 (5) 26	07:34 16:09 26	06:31 18:58 20	17:59 (4) 18:08 (4) 20:38	06:17 21:30 22:05	05:18 22:00 21:25	06:37 20:18 18:56	07:27 20:18 18:56	08:16 18:39 (4) 17:09	08:16 18:39 (4) 17:09	08:46 15:36 (5) 16:27
26	08:27 17:14 36	14:59 (5) 15:44 (5) 27	07:32 16:10 27	06:29 19:00 20	17:59 (4) 18:10 (4) 20:39	06:18 21:31 22:06	05:18 22:00 21:25	06:38 20:19 18:57	07:29 20:19 18:57	08:17 18:40 (4) 17:10	08:17 18:40 (4) 17:10	08:47 15:37 (5) 16:27
27	08:26 17:15 35	15:00 (5) 15:45 (5) 28	07:30 16:12 28	06:26 19:01 20	17:59 (4) 18:12 (4) 20:40	06:19 21:32 22:07	05:18 22:00 21:25	06:40 20:20 18:58	07:30 20:20 18:58	08:18 18:41 (4) 17:11	08:18 18:41 (4) 17:11	08:48 15:38 (5) 16:27
28	08:24 17:17 31	15:02 (5) 15:47 (5) 29	07:27 16:14 29	06:24 19:03 20	17:59 (4) 18:14 (4) 20:41	06:20 21:33 22:08	05:18 22:00 21:25	06:41 20:21 18:59	07:32 20:21 18:59	08:19 18:42 (4) 17:12	08:19 18:42 (4) 17:12	08:49 15:39 (5) 16:27
29	08:23 17:19 29	15:03 (5) 15:48 (5) 30	07:22 16:15 30	06:22 19:05 20	17:59 (4) 18:15 (4) 20:42	06:21 21:34 22:09	05:18 22:00 21:25	06:42 20:22 19:00	07:33 20:22 19:00	08:20 18:43 (4) 17:13	08:20 18:43 (4) 17:13	08:50 15:40 (5) 16:27
30	08:21 17:21 25	15:06 (5) 15:51 (5) 31	07:19 16:17 31	06:20 19:07 20	17:59 (4) 18:17 (4) 20:43	06:22 21:35 22:10	05:18 22:00 21:25	06:43 20:23 19:01	07:34 20:23 19:01	08:21 18:44 (4) 17:14	08:21 18:44 (4) 17:14	08:51 15:41 (5) 16:27
31	08:20 17:23 21	15:08 (5) 15:29 (5) 1	07:17 16:18 1	06:17 19:08 20	17:59 (4) 18:18 (4) 20:44	06:23 21:36 22:11	05:18 22:00 21:25	06:44 20:24 19:02	07:35 20:24 19:02	08:22 18:45 (4) 17:15	08:22 18:45 (4) 17:15	08:52 15:42 (5) 16:27
Potential sun hours	259	278	367	416	485	498	502	454	381	332	267	244
Total, worst case	1333	105	286	416	485	498	502	454	381	332	267	244
Sun reduction	0.18	0.27	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30
Oper. time red.	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Wind dir. red.	0.69	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65
Total reduction	0.12	0.17	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19
Total, real	156	17	54	416	485	498	502	454	381	332	267	244

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

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

Project:

19065LE slagschaduw nieuwbouwwijk

Licensed user:

Bosch & Van Rijn

Franz-Lisztplantsoen 220

NL-3533 JG Utrecht

+31 6 51 71 04 93

Schreurs / leon@boschenvanrijn.nl

Calculated:

19-Aug-21 10:59 AM/3.4.388

SHADOW - Calendar

Calculation: VKA bovengrens met kantoren 12RD 210819 **Shadow receptor:** F - Shadow Receptor: 8.0 × 5.0 Azimuth: 0.0° Slope: 0.0° (10896)
Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) [DE BILT]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1.48 2.65 3.60 5.24 6.59 6.28 6.20 6.12 4.48 3.32 1.87 1.32

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 385 684 574 504 436 731 797 1,164 1,146 770 577 539 8,307

	January		February		March		April		May		June	
1	08:45		10:14 (5)	08:19	15:14 (4)	07:25	07:15		06:10		05:25	
	16:37	72	15:45 (4)	17:24	16:16 (4)	18:16	20:10		21:01		21:46	
2	08:45		10:15 (5)	08:17	15:14 (4)	07:23	07:12		06:08		05:24	
	16:38	72	15:46 (4)	17:26	16:16 (4)	18:18	20:11		21:02		21:47	
3	08:45		10:16 (5)	08:15	15:14 (4)	07:21	07:10		06:06		05:23	
	16:39	74	15:48 (4)	17:28	16:16 (4)	18:20	20:13		21:04		21:48	
4	08:45		10:17 (5)	08:14	15:14 (4)	07:19	07:08		06:04		05:23	
	16:40	76	15:50 (4)	17:30	16:16 (4)	18:21	20:15		21:06		21:49	
5	08:45		10:17 (5)	08:12	15:15 (4)	07:16	07:06		06:03		05:22	
	16:41	77	15:51 (4)	17:32	16:17 (4)	18:23	20:17		21:07		21:50	
6	08:44		10:18 (5)	08:10	15:15 (4)	07:14	07:03		06:01		05:21	
	16:42	78	15:52 (4)	17:34	16:17 (4)	18:25	20:18		21:09		21:51	
7	08:44		10:18 (5)	08:09	15:15 (4)	07:12	07:01		05:59		05:21	
	16:44	80	15:53 (4)	17:36	16:17 (4)	18:27	20:20		21:10		21:52	
8	08:43		10:19 (5)	08:07	15:15 (4)	07:10	06:59		05:57		05:20	
	16:45	81	15:55 (4)	17:37	16:16 (4)	18:28	20:22		21:12		21:53	
9	08:43		10:20 (5)	08:05	15:15 (4)	07:08	06:57		05:56		05:20	
	16:46	82	15:56 (4)	17:39	16:16 (4)	18:30	20:23		21:14		21:54	
10	08:42		10:20 (5)	08:03	15:16 (4)	07:05	17:58 (3)	06:54	05:54		05:19	
	16:48	84	15:57 (4)	17:41	16:16 (4)	18:32	18:06 (3)	20:25	21:15		21:55	
11	08:42		10:21 (5)	08:02	15:16 (4)	07:03	17:56 (3)	06:52	05:52		05:19	
	16:49	84	15:58 (4)	17:43	16:15 (4)	18:34	18:08 (3)	20:27	21:17		21:56	
12	08:41		10:22 (5)	08:00	15:18 (4)	07:01	17:54 (3)	06:50	05:50		05:19	
	16:51	85	16:00 (4)	17:45	16:16 (4)	18:35	18:10 (3)	20:28	21:18		21:56	
13	08:40		10:23 (5)	07:58	15:18 (4)	06:59	17:51 (3)	06:48	05:49		05:18	
	16:52	85	16:01 (4)	17:47	16:15 (4)	18:37	18:11 (3)	20:30	21:20		21:57	
14	08:40		10:24 (5)	07:56	15:19 (4)	06:56	17:50 (3)	06:45	05:47		05:18	
	16:54	87	16:03 (4)	17:49	16:15 (4)	18:39	18:13 (3)	20:32	21:22		21:58	
15	08:39		10:24 (5)	07:54	15:20 (4)	06:54	17:49 (3)	06:43	05:46		05:18	
	16:55	88	16:04 (4)	17:50	16:14 (4)	18:41	18:16 (3)	20:34	21:23		21:58	
16	08:38		10:25 (5)	07:52	15:21 (4)	06:52	17:48 (3)	06:41	05:44		05:18	
	16:57	87	16:05 (4)	17:52	16:13 (4)	18:42	18:17 (3)	20:35	21:25		21:59	
17	08:37		10:27 (5)	07:50	15:21 (4)	06:49	17:47 (3)	06:39	05:43		05:18	
	16:58	86	16:06 (4)	17:54	16:11 (4)	18:44	18:18 (3)	20:37	21:26		21:59	
18	08:36		10:28 (5)	07:48	15:23 (4)	06:47	17:47 (3)	06:37	05:41		05:18	
	17:00	86	16:07 (4)	17:56	16:10 (4)	18:46	18:18 (3)	20:39	21:28		21:59	
19	08:35		10:28 (5)	07:46	15:24 (4)	06:45	17:46 (3)	06:35	05:40		05:18	
	17:02	86	16:07 (4)	17:58	16:09 (4)	18:48	18:17 (3)	20:40	21:29		22:00	
20	08:34		10:30 (5)	07:44	15:26 (4)	06:42	17:46 (3)	06:32	05:38		05:18	
	17:03	84	16:08 (4)	18:00	16:08 (4)	18:49	18:17 (3)	20:42	21:31		22:00	
21	08:33		10:31 (5)	07:42	15:28 (4)	06:40	17:47 (3)	06:30	05:37		05:18	
	17:05	83	16:09 (4)	18:01	16:06 (4)	18:51	18:17 (3)	20:44	21:32		22:00	
22	08:32		10:34 (5)	07:40	15:31 (4)	06:38	17:46 (3)	06:28	05:36		05:18	
	17:07	81	16:11 (4)	18:03	16:04 (4)	18:53	18:15 (3)	20:45	21:33		22:01	
23	08:31		10:35 (5)	07:38	15:34 (4)	06:36	17:47 (3)	06:26	05:35		05:18	
	17:08	78	16:11 (4)	18:05	16:02 (4)	18:54	18:15 (3)	20:47	21:35		22:01	
24	08:30		10:38 (5)	07:36	15:37 (4)	06:33	17:48 (3)	06:24	05:33		05:19	
	17:10	73	16:12 (4)	18:07	15:59 (4)	18:56	18:14 (3)	20:49	21:36		22:01	
25	08:28		10:43 (5)	07:34	15:41 (4)	06:31	17:48 (3)	06:22	05:32		05:19	
	17:12	66	16:13 (4)	18:09	15:53 (4)	18:58	18:12 (3)	20:50	21:38		22:01	
26	08:27		15:14 (4)	07:32		06:29	17:49 (3)	06:20	05:31		05:19	
	17:14	59	16:13 (4)	18:11		19:00	18:10 (3)	20:52	21:39		22:01	
27	08:26		15:15 (4)	07:30		06:26	17:51 (3)	06:18	05:30		05:20	
	17:15	59	16:14 (4)	18:12		19:01	18:09 (3)	20:54	21:40		22:01	
28	08:24		15:14 (4)	07:27		06:24	17:54 (3)	06:16	05:29		05:20	
	17:17	60	16:14 (4)	18:14		19:03	18:06 (3)	20:56	21:41		22:01	
29	08:23		15:15 (4)			07:22		06:14	05:28		05:21	
	17:19	60	16:15 (4)			20:05		20:57	21:43		22:01	
30	08:22		15:14 (4)			07:19		06:12	05:27		05:21	
	17:21	61	16:15 (4)			20:06		20:59	21:44		22:00	
31	08:20		15:14 (4)			07:17			05:26			
	17:23	61	16:15 (4)			20:08			21:45			
Potential sun hours	259		278		367		416		485		498	
Total, worst case	2375		1269		447							
Sun reduction	0.18		0.27		0.30							
Oper. time red.	0.95		0.95		0.95							
Wind dir. red.	0.66		0.68		0.63							
Total reduction	0.11		0.17		0.18							
Total, real	261		218		81							

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

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

Project:

19065LE slagschaduw nieuwbouwwijk

Licensed user:

Bosch & Van Rijn

Franz-Lisztplantsoen 220

NL-3533 JG Utrecht

+31 6 51 71 04 93

Schreurs / leon@boschenvanrijn.nl

Calculated:

19-Aug-21 10:59 AM/3.4.388

SHADOW - Calendar

Calculation: VKA bovengrens met kantoren 12RD 210819 **Shadow receptor:** F - Shadow Receptor: 8.0 × 5.0 Azimuth: 0.0° Slope: 0.0° (10896)
Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) [DE BILT]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1.48 2.65 3.60 5.24 6.59 6.28 6.20 6.12 4.48 3.32 1.87 1.32

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 385 684 574 504 436 731 797 1,164 1,146 770 577 539 8,307

	July	August	September	October	November	December
1	05:22	05:58	06:48	07:37	18:32 (3)	07:30
2	05:23	06:00	06:50	07:39	18:50 (3)	07:11
3	05:23	06:02	06:51	07:40	18:48 (3)	07:32
4	05:24	06:03	06:53	07:42	18:35 (3)	07:34
5	05:25	06:05	06:55	07:44	18:45 (3)	07:36
6	05:26	06:06	06:56	07:45	17:06	07:38
7	05:27	06:08	06:58	07:47	17:04	07:39
8	05:28	06:09	06:59	07:49	17:02	07:41
9	05:29	06:11	07:01	07:50	17:01	07:43
10	05:30	06:12	07:03	07:52	16:59	07:45
11	05:31	06:14	07:04	07:54	16:57	07:47
12	05:32	06:16	07:06	07:55	16:56	07:48
13	05:33	06:17	07:07	07:57	16:54	07:50
14	05:34	06:19	07:09	07:59	16:53	07:52
15	05:35	06:20	07:11	08:01	16:51	07:54
16	05:36	06:22	07:12	08:02	16:50	07:55
17	05:38	06:24	07:14	08:04	16:48	07:57
18	05:39	06:25	07:16	08:06	16:47	07:59
19	05:40	06:27	07:17	08:07	16:46	08:01
20	05:41	06:29	07:19	08:09	16:44	08:02
21	05:43	06:30	07:20	08:11	16:43	08:04
22	05:44	06:32	07:22	08:13	16:42	08:06
23	05:45	06:33	07:24	08:14	16:41	08:08
24	05:47	06:35	07:25	08:16	16:40	08:10
25	05:48	06:37	07:27	08:18	16:39	08:12
26	05:50	06:38	07:29	08:20	16:38	08:14
27	05:51	06:40	07:30	08:22	16:37	08:16
28	05:52	06:42	07:32	08:23	16:36	08:18
29	05:54	06:43	07:34	08:25	16:35	08:20
30	05:55	06:45	07:35	08:27	16:34	08:22
31	05:57	06:46	07:37	08:29	16:33	08:24
Potential sun hours	502	454	381	332	267	244
Total, worst case			409	718	2130	2147
Sun reduction			0.35	0.31	0.21	0.17
Oper. time red.			0.95	0.95	0.95	0.95
Wind dir. red.			0.63	0.67	0.67	0.64
Total reduction			0.21	0.20	0.13	0.10
Total, real			86	142	283	218

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

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

Project:

19065LE slagschaduw nieuwbouwwijk

Licensed user:

Bosch & Van Rijn

Franz-Lisztplantsoen 220

NL-3533 JG Utrecht

+31 6 51 71 04 93

Schreurs / leon@boschenvanrijn.nl

Calculated:

19-Aug-21 10:59 AM/3.4.388

SHADOW - Calendar

Calculation: VKA bovengrens met kantoren 12RD 210819**Shadow receptor:** G - Shadow Receptor: 8.0 × 5.0 Azimuth: 0.0° Slope: 0.0° (10897)
Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) [DE BILT]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1.48 2.65 3.60 5.24 6.59 6.28 6.20 6.12 4.48 3.32 1.87 1.32

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 385 684 574 504 436 731 797 1,164 1,146 770 577 539 8,307

	January	February	March	April	May	June	July	August	September	October	November	December	
1	08:45 16:37 23	15:38 (5) 16:01 (5) 17:24	08:18 12 16:09 (5)	07:25 18:16 20	17:26 (4) 20:10 21:00	06:10 18:16 21:46	05:25 22:00 21:28	05:58 21:28 20:26	06:48 19:17 17:11	07:37 19:17 17:11	07:30 17:11 16:31	08:21 15:21 (5) 15:53 (5)	
2	08:45 16:38 25	15:38 (5) 16:03 (5) 17:26	08:17 18:18 20	07:23 18:18 21	17:26 (4) 20:11 21:02	06:08 18:18 21:47	05:23 22:00 21:27	06:00 19:15 17:09	06:50 19:15 17:09	07:38 19:15 17:09	07:32 16:30 16:30	08:23 15:54 (5) 15:54 (5)	32
3	08:45 16:39 26	15:38 (5) 16:04 (5) 17:28	08:15 18:19 20	07:21 18:19 21	17:27 (4) 20:10 21:04	06:06 18:19 21:48	05:23 22:00 21:25	06:01 19:13 17:08	06:51 19:13 17:08	07:40 19:13 17:08	07:34 16:30 16:30	08:24 15:54 (5) 15:54 (5)	31
4	08:45 16:40 27	15:39 (5) 16:06 (5) 17:30	08:14 18:21 20	07:19 18:21 21	17:29 (4) 20:15 21:05	06:04 18:21 21:49	05:23 22:00 21:23	06:03 19:10 17:06	06:53 19:10 17:06	07:42 19:10 17:06	07:36 16:29 16:29	08:25 15:54 (5) 15:54 (5)	30
5	08:44 16:41 28	15:39 (5) 16:07 (5) 17:32	08:12 18:23 20	07:16 18:23 21	17:32 (4) 20:17 21:07	06:03 18:23 21:50	05:22 22:00 21:22	06:05 19:08 17:04	06:54 19:08 17:04	07:43 19:08 17:04	07:38 16:29 16:29	08:27 15:54 (5) 15:54 (5)	29
6	08:44 16:42 29	15:39 (5) 16:08 (5) 17:34	08:10 18:25 20	07:14 18:25 21	17:34 (4) 20:18 21:09	06:01 18:25 21:51	05:26 22:00 21:20	06:06 19:06 17:02	06:56 19:06 17:02	07:45 19:06 17:02	07:39 16:28 16:28	08:28 15:55 (5) 15:55 (5)	28
7	08:44 16:44 30	15:39 (5) 16:09 (5) 17:35	08:09 18:27 20	07:12 18:27 21	17:35 (4) 20:20 21:10	05:59 18:27 21:52	05:27 22:00 21:18	06:08 19:03 17:03	06:58 19:03 17:03	07:47 19:03 17:03	07:41 16:28 16:28	08:29 15:54 (5) 15:54 (5)	27
8	08:43 16:45 31	15:39 (5) 16:09 (5) 17:37	08:07 18:28 20	07:10 18:28 21	17:37 (4) 20:22 21:12	05:57 18:28 21:53	05:28 22:00 21:27	06:09 19:01 17:01	06:59 19:01 17:01	07:48 19:01 17:01	07:40 16:27 16:27	08:31 15:53 (5) 15:53 (5)	26
9	08:43 16:46 32	15:39 (5) 16:10 (5) 17:39	08:05 18:30 20	07:07 18:30 21	17:39 (4) 20:23 21:14	05:55 18:30 21:54	05:29 22:00 21:26	06:11 19:00 17:00	07:50 19:00 17:00	07:45 19:00 17:00	07:45 16:27 16:27	08:32 15:52 (5) 15:52 (5)	25
10	08:42 16:46 33	15:39 (5) 16:11 (5) 17:41	08:03 18:32 20	07:05 18:32 21	17:41 (4) 20:25 21:15	05:54 18:32 21:55	05:30 22:00 21:25	06:12 19:00 17:00	07:52 19:00 17:00	07:47 19:00 17:00	07:47 16:27 16:27	08:33 15:53 (5) 15:53 (5)	24
11	08:42 16:49 34	15:39 (5) 16:12 (5) 17:43	08:02 18:34 20	07:03 18:34 21	17:43 (4) 20:27 21:17	05:52 18:34 21:56	05:31 22:00 21:25	06:14 19:00 17:00	07:54 19:00 17:00	07:48 19:00 17:00	07:48 16:27 16:27	08:34 15:54 (5) 15:54 (5)	23
12	08:41 16:51 35	15:40 (5) 16:13 (5) 17:45	08:00 18:35 20	07:01 18:35 21	17:45 (4) 20:28 21:18	05:50 18:35 21:56	05:32 22:00 21:26	06:16 19:01 17:01	07:55 19:01 17:01	07:55 19:01 17:01	07:55 16:27 16:27	08:35 15:55 (5) 15:55 (5)	22
13	08:40 16:52 36	15:40 (5) 16:13 (5) 17:47	07:58 18:37 20	06:58 18:37 21	17:47 (4) 20:30 21:20	05:49 18:37 21:57	05:33 22:00 21:27	06:17 19:01 17:01	07:57 19:01 17:01	07:57 19:01 17:01	07:57 16:27 16:27	08:36 15:56 (5) 15:56 (5)	21
14	08:40 16:54 37	15:41 (5) 16:13 (5) 17:48	07:56 18:39 20	06:56 18:39 21	17:48 (4) 20:32 21:22	05:47 18:39 21:57	05:34 22:00 21:28	06:19 19:02 17:02	07:59 19:02 17:02	07:59 19:02 17:02	07:59 16:27 16:27	08:37 15:57 (5) 15:57 (5)	20
15	08:39 16:55 38	15:41 (5) 16:14 (5) 17:50	07:54 18:41 20	06:54 18:41 21	17:50 (4) 20:33 21:23	05:46 18:41 21:58	05:35 22:00 21:30	06:20 19:03 17:03	07:11 19:03 17:03	07:11 19:03 17:03	07:11 16:27 16:27	08:38 15:58 (5) 15:58 (5)	19
16	08:38 16:57 39	15:41 (5) 16:14 (5) 17:52	07:52 18:42 20	06:52 18:42 21	17:52 (4) 20:35 21:25	05:44 18:42 21:59	05:36 22:00 21:31	06:22 19:04 17:04	07:12 19:04 17:04	07:12 19:04 17:04	07:12 16:27 16:27	08:39 15:59 (5) 15:59 (5)	18
17	08:37 16:58 40	15:41 (5) 16:15 (5) 17:54	07:50 18:44 20	06:49 18:44 21	17:54 (4) 20:37 21:26	05:43 18:44 21:59	05:37 22:00 21:32	06:24 19:05 17:05	07:14 19:05 17:05	07:14 19:05 17:05	07:14 16:27 16:27	08:40 15:60 (5) 15:60 (5)	17
18	08:36 17:00 41	15:42 (5) 16:15 (5) 17:56	07:48 18:46 20	06:47 18:46 21	17:56 (4) 20:39 21:28	05:41 18:46 21:59	05:39 22:00 21:33	06:25 19:06 17:06	07:15 19:06 17:06	07:15 19:06 17:06	07:15 16:27 16:27	08:41 15:61 (5) 15:61 (5)	16
19	08:35 17:02 42	15:42 (5) 16:15 (5) 17:58	07:46 18:47 20	06:45 18:47 21	17:58 (4) 20:40 21:29	05:40 18:47 21:58	05:40 22:00 21:34	06:27 19:07 17:07	07:17 19:07 17:07	07:17 19:07 17:07	07:17 16:27 16:27	08:42 15:62 (5) 15:62 (5)	15
20	08:34 17:03 43	15:42 (5) 16:15 (5) 18:00	07:44 18:49 20	06:42 18:49 21	18:00 (4) 20:42 21:31	05:38 18:49 21:57	05:41 22:00 21:35	06:28 19:08 17:08	07:18 19:08 17:08	07:18 19:08 17:08	07:18 16:27 16:27	08:43 15:63 (5) 15:63 (5)	14
21	08:33 17:05 44	15:43 (5) 16:15 (5) 18:01	07:42 18:51 20	06:40 18:51 21	18:01 (4) 20:44 21:32	05:37 18:51 21:58	05:43 22:00 21:36	06:30 19:10 17:10	07:20 19:10 17:10	07:20 19:10 17:10	07:20 16:27 16:27	08:44 15:64 (5) 15:64 (5)	13
22	08:32 17:07 45	15:44 (5) 16:16 (5) 18:03	07:40 18:53 20	06:38 18:53 21	18:03 (4) 20:45 21:33	05:36 18:53 21:59	05:44 22:00 21:38	06:32 19:11 17:11	07:22 19:11 17:11	07:22 19:11 17:11	07:22 16:27 16:27	08:45 15:65 (5) 15:65 (5)	12
23	08:31 17:08 46	15:44 (5) 16:15 (5) 18:05	07:38 18:54 20	06:35 18:54 21	18:05 (4) 20:46 21:34	05:35 18:54 21:58	05:45 22:00 21:40	06:33 19:12 17:12	07:24 19:12 17:12	07:24 19:12 17:12	07:24 16:27 16:27	08:46 15:66 (5) 15:66 (5)	11
24	08:30 17:10 47	15:45 (5) 16:15 (5) 18:07	07:36 18:56 20	06:33 18:56 21	18:07 (4) 20:49 21:36	05:33 18:56 21:59	05:47 22:00 21:42	06:35 19:13 17:13	07:25 19:13 17:13	07:25 19:13 17:13	07:25 16:27 16:27	08:47 15:67 (5) 15:67 (5)	10
25	08:29 17:12 48	15:45 (5) 16:14 (5) 18:09	07:34 18:58 20	06:31 18:58 21	18:09 (4) 20:50 21:38	05:32 18:58 21:59	05:48 22:00 21:44	06:37 19:14 17:14	07:27 19:14 17:14	07:27 19:14 17:14	07:27 16:27 16:27	08:48 15:68 (5) 15:68 (5)	9
26	08:27 17:14 49	15:46 (5) 16:15 (5) 18:10	07:32 18:59 20	06:29 18:59 21	18:10 (4) 20:52 21:39	05:31 18:59 21:59	05:49 22:00 21:46	06:38 19:15 17:15	07:29 19:15 17:15	07:29 19:15 17:15	07:29 16:27 16:27	08:49 15:69 (5) 15:69 (5)	8
27	08:26 17:15 50	15:48 (5) 16:15 (5) 18:12	07:29 19:01 20	06:26 19:01 21	18:12 (4) 20:54 21:40	05:30 19:01 21:59	05:51 22:00 21:48	06:40 19:16 17:16	07:30 19:16 17:16	07:30 19:16 17:16	07:30 16:27 16:27	08:50 15:70 (5) 15:70 (5)	7
28	08:24 17:17 51	15:48 (5) 16:14 (5) 18:14	07:27 19:03 20	06:24 19:03 21	18:14 (4) 20:55 21:41	05:29 19:03 21:58	05:52 22:00 21:49	06:41 19:17 17:17	07:32 19:17 17:17	07:32 19:17 17:17	07:32 16:27 16:27	08:51 15:71 (5) 15:71 (5)	6
29	08:23 17:19 52	15:49 (5) 16:12 (5) 18:15	07:25 19:05 20	06:22 19:05 21	18:15 (4) 20:57 21:43	05:28 19:05 21:58	05:54 22:00 21:50	06:43 19:18 17:18	07:33 19:18 17:18	07:33 19:18 17:18	07:33 16:27 16:27	08:52 15:72 (5) 15:72 (5)	5
30	08:21 17:21 53	15:52 (5) 16:12 (5) 18:17	07:23 19:07 20	06:20 19:07 21	18:17 (4) 20:59 21:44	05:27 19:07 21:58	05:55 22:00 21:51	06:45 19:19 17:19	07:35 19:19 17:19	07:35 19:19 17:19	07:35 16:27 16:27	08:53 15:73 (5) 15:73 (5)	4
31	08:20 17:23 54	15:53 (5) 16:10 (5) 18:18	07:21 19:08 20	06:18 19:08 21	18:18 (4) 20:59 21:45	05:26 19:08 21:58	05:57 22:00 21:52	06:46 19:20 17:20	07:36 19:20 17:20	07:36 19:20 17:20	07:36 16:27 16:27	08:54 15:74 (5) 15:74 (5)	3
Potential sun hours	259	278	367	416	485	498	502	454	381	332	267	244	721
Total, worst case	907	133	72								195	611	721
Sun reduction	0.18	0.27	0.30								0.31	0.21	0.17
Oper. time red.	0.95	0.95	0.95								0.95	0.95	0.95
Wind dir. red.	0.67	0.65	0.65								0.65	0.67	0.67
Total reduction	0.11	0.17	0.19								0.19	0.13	0.11
Total, real	103	22	14								37	82	77

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

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

Project:

19065LE slagschaduw nieuwbouwwijk

Licensed user:

Bosch & Van Rijn

Franz-Lisztplantsoen 220

NL-3533 JG Utrecht

+31 6 51 71 04 93

Schreurs / leon@boschenvanrijn.nl

Calculated:

19-Aug-21 10:59 AM/3.4.388

SHADOW - Calendar

Calculation: VKA bovengrens met kantoren 12RD 210819Shadow receptor: H - Shadow Receptor: 8.0 × 5.0 Azimuth: 0.0° Slope: 0.0° (10898)
Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) [DE BILT]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1.48 2.65 3.60 5.24 6.59 6.28 6.20 6.12 4.48 3.32 1.87 1.32

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
385 684 574 504 436 731 797 1,164 1,146 770 577 539 8,307

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:45 16:37 22	15:39 (5) 16:01 (5) 17:24	08:18 21 16:14 (5) 18:16	07:25 18:16 22	17:28 (4) 20:10 21:00	05:25 21:46 22:00	05:22 21:46 22:00	05:58 21:28 20:26	06:48 21:28 20:26	07:37 19:17 17:11	07:30 17:11 16:31	08:21 15:23 (5) 15:54 (5)
2	08:45 16:38 23	15:40 (5) 16:03 (5) 17:26	08:17 17 16:12 (5) 18:18	07:23 21 16:12 (5) 18:18	17:27 (4) 20:11 21:02	05:24 21:47 22:00	05:23 21:47 22:00	06:00 20:24 19:15	06:50 20:24 19:15	07:38 17:09 16:30	07:32 17:09 16:30	08:23 15:55 (5) 15:24 (5)
3	08:45 16:39 24	15:40 (5) 16:04 (5) 18:15	08:15 13 16:10 (5) 18:19	07:21 20 16:10 (5) 18:19	17:28 (4) 20:13 21:04	05:23 21:48 21:59	05:23 21:48 21:59	06:01 21:25 20:22	06:51 20:22 19:13	07:40 17:08 16:30	07:34 17:08 16:30	08:24 15:55 (5) 15:24 (5)
4	08:45 16:40 25	15:41 (5) 16:06 (5) 18:14	08:14 1 16:03 (5) 18:21	07:19 18 16:04 (5) 18:21	17:29 (4) 20:15 21:05	05:23 21:49 21:59	05:24 21:49 21:59	06:03 21:23 20:20	06:53 20:20 19:10	07:42 17:06 16:30	07:36 17:06 16:30	08:25 15:55 (5) 15:25 (5)
5	08:44 16:41 26	15:40 (5) 16:07 (5) 18:12	08:12 16 16:07 (5) 18:32	07:16 16 16:07 (5) 18:32	17:30 (4) 20:17 21:07	05:22 21:50 21:59	05:25 21:50 21:59	06:05 21:22 20:17	06:54 20:17 19:08	07:43 17:04 16:30	07:38 17:04 16:30	08:27 15:55 (5) 15:25 (5)
6	08:44 16:42 27	15:41 (5) 16:08 (5) 18:10	08:10 12 16:08 (5) 18:34	07:14 12 16:08 (5) 18:34	17:31 (4) 20:18 21:09	05:21 21:51 21:58	05:26 21:51 21:58	06:06 21:20 20:15	06:56 20:15 19:06	07:45 17:02 16:30	07:39 17:02 16:30	08:28 15:55 (5) 15:27 (5)
7	08:44 16:44 28	15:40 (5) 16:09 (5) 18:09	08:09 4 16:09 (5) 18:35	07:12 4 16:09 (5) 18:35	17:35 (4) 20:20 21:10	05:59 21:52 21:57	05:27 21:52 21:57	06:08 21:18 20:13	06:58 20:13 19:03	07:47 17:01 16:30	07:41 17:01 16:30	08:29 15:55 (5) 15:27 (5)
8	08:43 16:45 30	15:40 (5) 16:10 (5) 18:07	08:07 18 16:10 (5) 18:37	07:10 18 16:10 (5) 18:37	17:39 (4) 20:22 21:12	06:59 21:53 21:57	05:57 21:53 21:57	06:09 21:16 20:11	06:59 20:11 19:01	07:48 17:01 16:30	07:48 17:01 16:30	08:31 15:55 (5) 15:28 (5)
9	08:43 16:46 31	15:41 (5) 16:11 (5) 18:03	08:05 18 16:11 (5) 18:37	07:07 18 16:11 (5) 18:37	17:40 (4) 20:23 21:14	06:57 21:54 21:56	05:29 21:54 21:56	06:11 21:14 20:08	07:50 18:59 17:52	07:45 17:52 16:30	07:50 17:52 16:30	08:32 15:55 (5) 15:30 (5)
10	08:42 16:48 31	15:41 (5) 16:12 (5) 18:03	08:03 20 16:12 (5) 18:37	07:05 20 16:12 (5) 18:37	17:41 (4) 20:25 21:15	06:54 21:55 21:55	05:30 21:55 21:55	06:12 21:12 20:06	07:03 18:57 17:54	07:52 18:57 17:54	07:52 18:57 17:54	08:33 15:55 (5) 15:30 (5)
11	08:42 16:49 32	15:42 (5) 16:13 (5) 18:02	08:02 23 16:13 (5) 18:38	07:03 23 16:13 (5) 18:38	17:42 (4) 20:27 21:17	06:52 21:56 21:55	05:31 21:56 21:55	06:14 21:11 20:04	07:04 18:54 17:54	07:54 18:54 17:54	07:54 18:54 17:54	08:34 15:55 (5) 15:31 (5)
12	08:41 16:51 33	15:41 (5) 16:14 (5) 18:00	08:00 21 16:14 (5) 18:35	07:01 21 16:14 (5) 18:35	17:43 (4) 20:28 21:18	06:50 21:56 21:54	05:32 21:54 21:54	06:16 21:09 20:01	07:06 18:52 17:52	07:55 18:52 17:52	07:55 18:52 17:52	08:35 15:55 (5) 15:32 (5)
13	08:40 16:52 34	15:41 (5) 16:15 (5) 17:48	07:58 19 16:15 (5) 18:39	06:58 19 16:15 (5) 18:39	17:44 (4) 20:30 21:20	06:48 21:57 21:53	05:33 21:57 21:53	06:17 21:07 20:59	07:57 18:50 17:57	07:57 18:50 17:57	07:57 18:50 17:57	08:36 15:55 (5) 15:33 (5)
14	08:40 16:54 35	15:41 (5) 16:16 (5) 17:48	07:56 20 16:16 (5) 18:40	06:56 20 16:16 (5) 18:40	17:45 (4) 20:32 21:22	06:45 21:57 21:52	05:34 21:52 21:52	06:19 21:05 20:57	07:59 18:48 17:57	07:59 18:48 17:57	07:59 18:48 17:57	08:37 15:55 (5) 15:33 (5)
15	08:39 16:55 36	15:42 (5) 16:17 (5) 17:50	07:54 21 16:17 (5) 18:41	06:54 21 16:17 (5) 18:41	17:46 (4) 20:33 21:23	06:43 21:58 21:53	05:35 21:53 21:53	06:20 21:03 20:54	07:11 18:46 17:54	07:55 18:46 17:54	07:55 18:46 17:54	08:38 15:55 (5) 15:33 (5)
16	08:39 16:57 37	15:42 (5) 16:18 (5) 17:52	07:52 22 16:18 (5) 18:42	06:52 22 16:18 (5) 18:42	17:47 (4) 20:35 21:25	06:41 21:59 21:50	05:36 21:50 21:50	06:22 21:01 20:52	07:12 18:44 17:54	07:57 18:44 17:54	07:57 18:44 17:54	08:39 15:55 (5) 15:33 (5)
17	08:37 16:58 38	15:42 (5) 16:19 (5) 17:54	07:50 23 16:19 (5) 18:44	06:49 23 16:19 (5) 18:44	17:48 (4) 20:37 21:26	06:39 21:59 21:49	05:37 21:49 21:49	06:24 20:59 20:50	07:14 18:41 17:54	08:04 18:41 17:54	08:04 18:41 17:54	08:40 15:55 (5) 15:35 (5)
18	08:36 17:00 39	15:42 (5) 16:20 (5) 17:56	07:48 24 16:20 (5) 18:46	06:47 24 16:20 (5) 18:46	17:49 (4) 20:39 21:28	06:37 21:59 21:48	05:39 21:48 21:48	06:25 20:57 20:47	07:15 18:39 17:57	08:06 18:39 17:57	08:06 18:39 17:57	08:41 15:55 (5) 15:36 (5)
19	08:35 17:02 40	15:42 (5) 16:21 (5) 17:58	07:46 25 16:21 (5) 18:48	06:45 25 16:21 (5) 18:48	17:50 (4) 20:40 21:29	06:35 21:50 22:00	05:40 21:47 21:47	06:27 20:55 19:45	07:17 18:37 17:57	08:07 18:37 17:57	08:07 18:37 17:57	08:42 15:55 (5) 15:36 (5)
20	08:34 17:03 41	15:42 (5) 16:22 (5) 18:00	07:44 26 16:22 (5) 18:53	06:42 26 16:22 (5) 18:53	17:51 (4) 20:42 21:31	06:32 21:50 22:00	05:41 21:46 21:46	06:28 20:53 19:43	07:19 18:35 17:57	08:09 18:35 17:57	08:09 18:35 17:57	08:43 15:55 (5) 15:37 (5)
21	08:33 17:05 42	15:43 (5) 16:23 (5) 18:01	07:42 27 16:23 (5) 18:51	06:40 27 16:23 (5) 18:51	17:52 (4) 20:44 21:32	06:30 21:44 22:00	05:43 21:44 21:44	06:30 20:50 19:40	07:20 18:33 17:57	08:11 18:33 17:57	08:11 18:33 17:57	08:44 15:55 (5) 15:38 (5)
22	08:32 17:07 43	15:44 (5) 16:24 (5) 18:03	07:40 28 16:24 (5) 18:54	06:38 28 16:24 (5) 18:54	17:53 (4) 20:45 21:33	06:28 21:43 22:01	05:44 21:43 21:43	06:32 20:48 19:38	07:22 18:31 17:57	08:13 18:31 17:57	08:13 18:31 17:57	08:45 15:55 (5) 15:39 (5)
23	08:31 17:08 44	15:44 (5) 16:25 (5) 18:05	07:38 29 16:25 (5) 18:54	06:35 29 16:25 (5) 18:54	17:54 (4) 20:46 21:35	06:26 21:42 22:01	05:45 21:42 21:42	06:33 20:46 19:36	07:24 18:29 17:57	08:14 18:29 17:57	08:14 18:29 17:57	08:46 15:55 (5) 15:40 (5)
24	08:30 17:10 45	15:44 (5) 16:26 (5) 18:07	07:36 30 16:26 (5) 18:56	06:33 30 16:26 (5) 18:56	17:55 (4) 20:47 21:36	06:24 21:41 22:01	05:47 21:40 21:40	06:35 20:44 19:33	07:25 18:27 17:57	08:16 18:27 17:57	08:16 18:27 17:57	08:47 15:55 (5) 15:41 (5)
25	08:28 17:12 46	15:45 (5) 16:27 (5) 18:09	07:34 31 16:27 (5) 18:58	06:31 31 16:27 (5) 18:58	17:56 (4) 20:48 21:37	06:22 21:40 22:01	05:48 21:39 21:39	06:37 20:42 19:31	07:27 18:25 17:57	08:18 18:25 17:57	08:18 18:25 17:57	08:48 15:55 (5) 15:42 (5)
26	08:27 17:14 47	15:46 (5) 16:28 (5) 18:10	07:32 32 16:28 (5) 18:59	06:29 32 16:28 (5) 18:59	17:57 (4) 20:49 21:38	06:20 21:39 22:01	05:49 21:38 21:38	06:38 20:40 19:29	07:29 18:23 17:57	08:20 18:23 17:57	08:20 18:23 17:57	08:49 15:55 (5) 15:43 (5)
27	08:26 17:15 48	15:47 (5) 16:29 (5) 18:12	07:29 33 16:29 (5) 18:59	06:26 33 16:29 (5) 18:59	17:58 (4) 20:50 21:40	06:18 21:37 22:01	05:50 21:36 21:36	06:40 20:38 19:26	07:30 18:21 17:57	08:21 18:21 17:57	08:21 18:21 17:57	08:50 15:55 (5) 15:44 (5)
28	08:24 17:17 49	15:47 (5) 16:30 (5) 18:14	07:27 34 16:30 (5) 18:59	06:24 34 16:30 (5) 18:59	17:59 (4) 20:51 21:41	06:16 21:36 22:01	05:52 21:35 21:35	06:41 20:35 19:24	07:32 18:20 17:57	08:22 18:20 17:57	08:22 18:20 17:57	08:51 15:55 (5) 15:45 (5)
29	08:23 17:19 50	15:48 (5) 16:31 (5) 18:15	07:25 35 16:31 (5) 18:59	06:22 35 16:31 (5) 18:59	18:00 (4) 20:52 21:42	06:14 21:35 22:01	05:54 21:33 21:33	06:43 20:33 19:22	07:33 18:17 17:57	08:23 18:17 17:57	08:23 18:17 17:57	08:52 15:55 (5) 15:46 (5)
30	08:21 17:21 51	15:50 (5) 16:32 (5) 18:19	07:19 36 16:32 (5) 18:59	06:19 36 16:32 (5) 18:59	18:01 (4) 20:53 21:43	06:12 21:34 22:01	05:55 21:32 21:32	06:45 20:31 19:19	07:35 18:15 17:57	08:24 18:15 17:57	08:24 18:15 17:57	08:53 15:55 (5) 15:47 (5)
31	08:20 17:23 52	15:51 (5) 16:33 (5) 18:21	07:17 37 16:33 (5) 18:59	06:17 37 16:33 (5) 18:59	18:02 (4) 20:54 21:44	06:10 21:33 22:01	05:57 21:30 21:30	06:46 20:29 19:17	07:36 18:13 17:57	08:25 18:13 17:57	08:25 18:13 17:57	08:54 15:55 (5) 15:48 (5)
Potential sun hours	259	278	367	416	485	498	502	454	381	332	267	244
Total, worst case	944	144	113	416	485	498	502	454	381	332	267	244
Sun reduction	0.18	0.27	0.30	0.18	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27
Oper. time red.	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Wind dir. red.	0.67	0.66	0.65	0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.67
Total reduction	0.11	0.17	0.19	0.11	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17
Total, real	107	24	21	107	107	107	107	107	107	107	107	107

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

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

Project:

19065LE slagschaduw nieuwbouwwijk

Licensed user:

Bosch & Van Rijn

Franz-Lisztplantsoen 220

NL-3533 JG Utrecht

+31 6 51 71 04 93

Schreurs / leon@boschenvanrijn.nl

Calculated:

19-Aug-21 10:59 AM/3.4.388

SHADOW - Calendar

Calculation: VKA bovengrens met kantoren 12RD 210819Shadow receptor: I - Shadow Receptor: 8.0 × 5.0 Azimuth: 0.0° Slope: 0.0° (10899)
Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) [DE BILT]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1.48 2.65 3.60 5.24 6.59 6.28 6.20 6.12 4.48 3.32 1.87 1.32

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
385 684 574 504 436 731 797 1,164 1,146 770 577 539 8,307

	[January	[February	[March	[April	[May	[June	[July	[August	[September	[October	[November	[December												
1	08:45	15:51 (5)	08:18	15:55 (5)	07:25	17:32 (4)	07:15	06:10	05:25	05:22	05:58	06:48	07:37	07:30	08:21	15:31 (5)								
2	16:37	10	16:01 (5)	17:24	29	16:24 (5)	18:16	18	17:50 (4)	20:10	21:00	21:46	22:00	21:28	20:26	19:17	17:11	16:31	26	15:57 (5)				
3	08:45	15:51 (5)	08:17	15:56 (5)	07:23	17:31 (4)	07:12	06:08	05:24	05:23	06:00	06:50	07:38	07:32	08:23	15:32 (5)								
4	16:38	12	16:03 (5)	17:26	28	16:24 (5)	18:18	20	17:51 (4)	20:11	21:02	21:47	22:00	21:27	20:24	19:15	17:09	16:30	25	15:57 (5)				
5	08:45	15:51 (5)	08:15	15:57 (5)	07:21	17:31 (4)	07:10	06:06	05:23	05:23	06:01	06:51	07:40	07:34	08:24	15:33 (5)								
6	16:39	13	16:04 (5)	17:28	25	16:22 (5)	18:19	22	17:53 (4)	20:13	21:04	21:48	21:59	21:25	20:22	19:13	17:08	16:30	23	15:56 (5)				
7	08:45	15:51 (5)	08:14	15:58 (5)	07:19	17:32 (4)	07:08	06:04	05:23	05:24	06:03	06:53	07:42	07:36	08:25	15:34 (5)								
8	16:40	15	16:06 (5)	17:30	23	16:21 (5)	18:21	21	17:53 (4)	20:15	21:05	21:49	21:59	21:23	20:20	19:10	17:06	9	15:45 (5)	16:29	22	15:56 (5)		
9	08:44	15:50 (5)	08:12	16:01 (5)	07:16	17:32 (4)	07:06	06:03	05:22	05:25	06:05	06:54	07:43	07:38	08:27	15:35 (5)								
10	16:41	17	16:07 (5)	17:32	19	16:20 (5)	18:23	21	17:53 (4)	20:17	21:07	21:50	21:59	21:22	20:17	19:08	10	18:24 (4)	07:38	15	15:48 (5)	16:29	20	15:55 (5)
11	08:44	15:51 (5)	08:10	16:04 (5)	07:14	17:32 (4)	07:03	06:01	05:21	05:26	06:06	06:56	07:45	07:39	08:28	15:37 (5)								
12	16:42	17	16:08 (5)	17:34	14	16:18 (5)	18:25	19	17:51 (4)	20:18	21:09	21:51	21:58	21:20	20:15	19:06	14	18:25 (4)	07:02	19	15:50 (5)	16:28	18	15:55 (5)
13	08:44	15:50 (5)	08:09	16:07 (5)	07:12	17:34 (4)	07:01	05:59	05:21	05:27	06:08	06:58	07:47	07:41	08:30	15:37 (5)								
14	16:44	19	16:09 (5)	17:35	8	16:15 (5)	18:27	16	17:50 (4)	20:20	21:10	21:52	21:57	21:18	20:13	19:03	17	18:26 (4)	07:01	23	15:52 (5)	16:28	17	15:54 (5)
15	08:43	15:49 (5)	08:07	16:07	07:10	17:36 (4)	06:59	05:57	05:20	05:28	06:09	06:59	07:48	07:42	08:31	15:38 (5)								
16	16:45	21	16:10 (5)	17:37	18:28	12	17:48 (4)	20:22	21:12	21:53	21:57	21:16	20:11	19:01	19	18:27 (4)	16:59	25	15:53 (5)	16:27	15	15:53 (5)		
17	08:43	15:50 (5)	08:05	16:07	07:07	17:38 (4)	06:57	05:55	05:20	05:29	06:11	07:01	07:50	07:44	08:32	15:39 (5)								
18	16:46	23	16:13 (5)	17:39	18:30	6	17:44 (4)	20:23	21:14	21:54	21:56	21:14	20:08	18:59	21	18:28 (4)	16:57	27	15:54 (5)	16:27	14	15:53 (5)		
19	08:42	15:49 (5)	08:03	16:03	07:05	17:39	06:54	05:54	05:19	05:30	06:12	07:03	07:52	07:46	08:33	15:41 (5)								
20	16:48	25	16:14 (5)	17:41	18:32	20:25	21:15	21:55	21:55	21:12	20:06	18:57	22	18:27 (4)	16:56	29	15:55 (5)	16:27	12	15:53 (5)				
21	08:42	15:49 (5)	08:02	16:02	07:03	17:42	06:52	05:52	05:19	05:31	06:14	07:04	07:54	07:48	08:34	15:42 (5)								
22	16:49	26	16:15 (5)	17:43	18:34	20:27	21:17	21:55	21:55	21:11	20:04	18:54	22	18:27 (4)	16:54	30	15:56 (5)	16:27	11	15:53 (5)				
23	08:41	15:50 (5)	08:00	16:01	07:01	17:43	06:50	05:50	05:19	05:32	06:16	07:06	07:55	07:49	08:35	15:43 (5)								
24	16:51	27	16:17 (5)	17:45	18:35	20:28	21:18	21:56	21:54	21:09	20:01	18:52	19	18:24 (4)	16:53	32	15:56 (5)	16:27	9	15:52 (5)				
25	08:40	15:50 (5)	07:58	16:06	06:58	17:46	06:48	05:49	05:18	05:33	06:17	07:07	07:57	07:51	08:36	15:44 (5)								
26	16:52	29	16:19 (5)	17:47	18:37	20:30	21:20	21:57	21:53	21:07	19:59	18:50	17	18:22 (4)	16:51	33	15:57 (5)	16:27	8	15:52 (5)				
27	08:40	15:49 (5)	07:56	16:06	06:56	17:48	06:45	05:47	05:18	05:34	06:19	07:09	07:59	07:53	08:37	15:46 (5)								
28	16:54	31	16:20 (5)	17:48	18:39	20:32	21:22	21:57	21:52	21:05	19:57	18:48	14	18:19 (4)	16:50	33	15:57 (5)	16:27	6	15:52 (5)				
29	08:39	15:49 (5)	07:54	16:04	06:54	17:49	06:43	05:46	05:18	05:35	06:20	07:11	08:00	07:55	08:38	15:47 (5)								
30	16:55	32	16:21 (5)	17:50	18:41	20:33	21:23	21:58	21:51	21:03	19:54	18:46	11	18:17 (4)	16:48	34	15:58 (5)	16:27	5	15:52 (5)				
31	08:38	15:49 (5)	07:52	16:05	06:52	17:51	06:41	05:44	05:18	05:36	06:22	07:12	08:02	07:57	08:39	15:48 (5)								
32	16:57	32	16:21 (5)	17:52	18:42	20:35	21:25	21:59	21:50	21:01	19:52	18:44	9	18:15 (4)	16:47	34	15:58 (5)	16:27	4	15:52 (5)				
33	08:37	15:49 (5)	07:50	16:04	06:49	17:53	06:39	05:43	05:18	05:37	06:24	07:14	08:04	07:59	08:39	15:49 (5)								
34	16:58	33	16:22 (5)	17:54	18:44	20:37	21:26	21:59	21:49	20:59	19:50	18:41	5	18:13 (4)	16:45	35	15:59 (5)	16:27	2	15:52 (5)				
35	08:36	15:50 (5)	07:48	16:07	06:47	17:54	06:37	05:41	05:18	05:39	06:25	07:15	08:06	07:51	08:40	15:50 (5)								
36	17:00	33	16:23 (5)	17:56	18:46	20:39	21:28	21:59	21:48	20:57	19:47	18:39	1	18:11 (4)	16:44	35	15:59 (5)	16:27						
37	08:35	15:49 (5)	07:46	16:05	06:45	17:55	06:35	05:40	05:18	05:40	06:27	07:17	08:07	08:02	08:41	15:52 (5)								
38	17:02	34	16:23 (5)	17:58	18:47	20:40	21:29	22:00	21:47	20:55	19:45	18:37		16:43	35	16:00 (5)	16:28							
39	08:34	15:49 (5)	07:44	16:04	06:42	17:56	06:32	05:38	05:18	05:41	06:28	07:19	08:09	08:04	15:25 (5)	16:28								
40	17:03	34	16:23 (5)	18:00	18:49	20:42	21:31	22:00	21:46	20:53	19:43	18:35		16:42	35	16:00 (5)	16:28							
41	08:33	15:50 (5)	07:42	16:03	06:40	17:57	06:30	05:37	05:18	05:43	06:30	07:20	08:11	08:06	15:25 (5)	16:28								
42	17:05	34	16:24 (5)	18:01	18:51	20:44	21:32	22:00	21:44	20:50	19:40	18:33		16:40	34	15:59 (5)	16:28							
43	08:32	15:50 (5)	07:40	16:06	06:38	17:58	06:28	05:36	05:18	05:44	06:32	07:22	08:13	08:07	15:25 (5)	16:28								
44	17:07	35	16:25 (5)	18:03	18:53	20:45	21:33	22:01	21:43	20:48	19:38	18:31		16:39	35	16:00 (5)	16:29							
45	08:31	15:50 (5)	07:38	16:05	06:35	17:59	06:26	05:34	05:18	05:45	06:33	07:24	08:14	08:09	15:26 (5)	16:29								
46	17:08	35	16:25 (5)	18:05	18:54	20:47	21:35	22:01	21:42	20:46	19:36	18:29		16:38	34	16:00 (5)	16:29							
47	08:30	15:50 (5)	07:36	16:03	06:33	17:59	06:24	05:33	05:19	05:47	06:35	07:25	08:16	08:11	15:27 (5)	16:29								
48	17:10	35	16:25 (5)	18:07	18:56	20:49	21:36	22:01	21:40	20:44	19:33	18:27		16:37	33	16:00 (5)	16:30							
49	08:28	15:50 (5)	07:34	16:01	06:31	17:58	06:22	05:32	05:19	05:48	06:37	07:27	08:18	08:12	15:27 (5)	16:30								
50	17:12	35	16:25 (5)	18:09	18:58	20:50	21:38	22:01	21:39	20:42	19:31	18:25		16:36	32	15:59 (5)	16:30							
51	08:27	15:51 (5)	07:32	16:02	06:29	17:59	06:20	05:31	05:19	05:49	06:38	07:29	08:20	08:14	15:27 (5)	16:30								
52	17:14	34	16:25 (5)	18:10	18:59	20:52	21:39	22:01	21:38	20:40	19:29	18:23		16:35	33	16:00 (5)	16:31							
53	08:26	15:52 (5)	07:29	16:03	06:26	17:59	06:18	05:30	05:20	05:51	06:40	07:30	08:21	08:15	15:28 (5)	16:31								
54	17:15	34	16:26 (5)	18:12	19:01	20:54	21:40	22:01	21:36	20:38	19:26	18:21		16:34	32	16:00 (5)	16:32							
55	08:24	15:52 (5)	07:27	16:04	06:24	17:59	06:16	05:29	05:20	05:52	06:41	07:32	08:23	08:17	15:30 (5)	16:32								
56	17:17	33	16:25 (5)	18:14	19:03	20:55	21:41	22:01	21:35	20:35	19:24	18:19		16:33	30	16:00 (5)	16:33							
57	08:23	15:52 (5)	07:22	16:05	06:22	17:59	06:14	05:28	05:21	05:54	06:43	07:33	08:25	08:18	15:30 (5)	16:33								
58	17:19	33	16:25 (5)	18:05	18:54	20:57	21:43	22:01	21:33	20:33	19:22	18:17		16:32	29	15:59 (5)	16:34</							

Project:

19065LE slagschaduw nieuwbouwwijk

Licensed user:

Bosch & Van Rijn

Franz-Lisztplantsoen 220

NL-3533 JG Utrecht

+31 6 51 71 04 93

Schreurs / leon@boschenvanrijn.nl

Calculated:

19-Aug-21 10:59 AM/3.4.388

SHADOW - Calendar

Calculation: VKA bovengrens met kantoren 12RD 210819Shadow receptor: J - Shadow Receptor: 8.0 × 5.0 Azimuth: 0.0° Slope: 0.0° (10900)
Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) [DE BILT]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1.48 2.65 3.60 5.24 6.59 6.28 6.20 6.12 4.48 3.32 1.87 1.32

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
385 684 574 504 436 731 797 1,164 1,146 770 577 539 8,307

January		February		March		April		May		June		July		August		September		October		November		December	
1	08:45	15:56 (5)	08:18	15:57 (5)	07:25	17:33 (4)	07:15	06:10	05:25	05:22	05:58	06:48	07:37			07:30		08:21	15:34 (5)			08:21	15:34 (5)
2	08:45	15:55 (5)	08:17	15:56 (5)	07:23	17:32 (4)	07:12	06:08	05:24	05:23	06:00	06:50	07:38			07:32		16:31	15:57 (5)			16:31	15:57 (5)
3	08:45	15:55 (5)	08:15	15:58 (5)	07:21	17:32 (4)	07:10	06:06	05:23	05:23	06:01	06:51	07:40			07:34		15:40 (5)	15:36 (5)			15:40 (5)	15:36 (5)
4	08:45	15:55 (5)	08:14	16:00 (5)	07:19	17:32 (4)	07:08	06:04	05:23	05:24	06:03	06:53	07:42			18:18 (4)	07:36	15:36 (5)	15:38 (5)			15:36 (5)	15:38 (5)
5	08:44	15:54 (5)	08:12	16:02 (5)	07:16	17:33 (4)	07:06	06:03	05:22	05:25	06:05	06:54	07:43			18:14 (4)	07:38	15:33 (5)	15:38 (5)			15:33 (5)	15:38 (5)
6	08:44	15:54 (5)	08:10	16:04 (5)	07:14	17:33 (4)	07:03	06:01	05:21	05:26	06:06	06:56	07:45			18:11 (4)	07:39	15:32 (5)	15:38 (5)			15:32 (5)	15:38 (5)
7	08:44	15:53 (5)	08:09	16:07 (5)	07:12	17:34 (4)	07:01	05:59	05:21	05:27	06:08	06:58	07:47			18:09 (4)	07:41	15:30 (5)	15:41 (5)			15:30 (5)	15:41 (5)
8	08:43	15:53 (5)	08:07	16:19 (5)	07:10	17:36 (4)	06:59	05:57	05:20	05:28	06:09	06:59	07:48			18:08 (4)	07:43	15:29 (5)	15:42 (5)			15:29 (5)	15:42 (5)
9	08:43	15:53 (5)	08:05	16:10 (5)	07:07	17:49 (4)	07:00	05:55	05:20	05:29	06:11	07:01	07:50			18:08 (4)	07:45	15:28 (5)	15:43 (5)			15:28 (5)	15:43 (5)
10	08:42	15:52 (5)	08:03	16:13 (5)	07:05	17:46 (4)	06:57	05:54	05:19	05:30	06:12	07:03	07:52			18:06 (4)	07:47	15:28 (5)	15:45 (5)			15:28 (5)	15:45 (5)
11	08:42	15:52 (5)	08:02	16:14 (5)	07:03	17:46 (4)	06:56	05:54	05:19	05:30	06:12	07:03	07:52			18:06 (4)	07:47	15:28 (5)	15:45 (5)			15:28 (5)	15:45 (5)
12	08:41	15:52 (5)	08:00	16:15 (5)	07:01	17:47 (4)	06:55	05:53	05:18	05:29	06:11	07:01	07:50			18:06 (4)	07:47	15:28 (5)	15:45 (5)			15:28 (5)	15:45 (5)
13	08:40	15:52 (5)	07:58	16:17 (5)	06:58	17:48 (4)	06:54	05:52	05:17	05:28	06:12	07:03	07:52			18:06 (4)	07:47	15:28 (5)	15:45 (5)			15:28 (5)	15:45 (5)
14	08:40	15:52 (5)	07:56	16:18 (5)	06:56	17:49 (4)	06:53	05:51	05:16	05:27	06:13	07:04	07:53			18:06 (4)	07:47	15:28 (5)	15:45 (5)			15:28 (5)	15:45 (5)
15	08:39	15:52 (5)	07:54	16:19 (5)	06:54	17:50 (4)	06:52	05:50	05:15	05:26	06:14	07:05	07:54			18:06 (4)	07:47	15:28 (5)	15:45 (5)			15:28 (5)	15:45 (5)
16	08:38	15:52 (5)	07:52	16:20 (5)	06:52	17:51 (4)	06:51	05:49	05:14	05:25	06:15	07:06	07:55			18:06 (4)	07:47	15:28 (5)	15:45 (5)			15:28 (5)	15:45 (5)
17	08:37	15:52 (5)	07:50	16:21 (5)	06:49	17:52 (4)	06:50	05:48	05:13	05:24	06:16	07:07	07:54			18:06 (4)	07:47	15:28 (5)	15:45 (5)			15:28 (5)	15:45 (5)
18	08:36	15:52 (5)	07:48	16:22 (5)	06:47	17:53 (4)	06:49	05:47	05:12	05:23	06:17	07:08	07:55			18:06 (4)	07:47	15:28 (5)	15:45 (5)			15:28 (5)	15:45 (5)
19	08:35	15:51 (5)	07:46	16:23 (5)	06:45	17:54 (4)	06:48	05:46	05:11	05:22	06:18	07:09	07:56			18:06 (4)	07:47	15:28 (5)	15:45 (5)			15:28 (5)	15:45 (5)
20	08:34	15:51 (5)	07:44	16:24 (5)	06:42	17:55 (4)	06:47	05:45	05:10	05:21	06:19	07:10	07:57			18:06 (4)	07:47	15:28 (5)	15:45 (5)			15:28 (5)	15:45 (5)
21	08:33	15:52 (5)	07:42	16:25 (5)	06:40	17:56 (4)	06:46	05:44	05:09	05:20	06:20	07:11	07:58			18:06 (4)	07:47	15:28 (5)	15:45 (5)			15:28 (5)	15:45 (5)
22	08:32	15:52 (5)	07:40	16:26 (5)	06:38	17:57 (4)	06:45	05:43	05:08	05:19	06:21	07:12	07:59			18:06 (4)	07:47	15:28 (5)	15:45 (5)			15:28 (5)	15:45 (5)
23	08:31	15:52 (5)	07:38	16:27 (5)	06:35	17:58 (4)	06:44	05:42	05:07	05:18	06:22	07:13	08:00			18:06 (4)	07:47	15:28 (5)	15:45 (5)			15:28 (5)	15:45 (5)
24	08:30	15:52 (5)	07:36	16:28 (5)	06:33	17:59 (4)	06:43	05:41	05:06	05:17	06:23	07:14	08:01			18:06 (4)	07:47	15:28 (5)	15:45 (5)			15:28 (5)	15:45 (5)
25	08:28	15:52 (5)	07:34	16:29 (5)	06:31	18:00 (4)	06:42	05:40	05:05	05:16	06:24	07:15	08:02			18:06 (4)	07:47	15:28 (5)	15:45 (5)			15:28 (5)	15:45 (5)
26	08:27	15:53 (5)	07:32	16:30 (5)	06:29	18:01 (4)	06:41	05:39	05:04	05:15	06:25	07:16	08:03			18:06 (4)	07:47	15:28 (5)	15:45 (5)			15:28 (5)	15:45 (5)
27	08:26	15:54 (5)	07:29	16:31 (5)	06:26	18:02 (4)	06:40	05:38	05:03	05:14	06:26	07:17	08:04			18:06 (4)	07:47	15:28 (5)	15:45 (5)			15:28 (5)	15:45 (5)
28	08:24	15:54 (5)	07:27	16:32 (5)	06:24	18:03 (4)	06:39	05:37	05:02	05:13	06:27	07:18	08:05			18:06 (4)	07:47	15:28 (5)	15:45 (5)			15:28 (5)	15:45 (5)
29	08:23	15:54 (5)	07:25	16:33 (5)	06:22	18:04 (4)	06:38	05:36	05:01	05:12	06:28	07:19	08:06			18:06 (4)	07:47	15:28 (5)	15:45 (5)			15:28 (5)	15:45 (5)
30	08:21	15:55 (5)	07:23	16:34 (5)	06:20	18:05 (4)	06:37	05:35	05:00	05:11	06:29	07:20	08:07			18:06 (4)	07:47	15:28 (5)	15:45 (5)			15:28 (5)	15:45 (5)
31	08:20	15:55 (5)	07:21	16:35 (5)	06:18	18:06 (4)	06:36	05:34	05:00	05:10	06:30	07:21	08:08			18:06 (4)	07:47	15:28 (5)	15:45 (5)			15:28 (5)	15:45 (5)
17:23	32	16:27 (5)		16:27 (5)	06:17	18:07 (4)	06:35	05:33	05:00	05:10	06:31	07:22	08:09			18:06 (4)	07:47	15:28 (5)	15:45 (5)			15:28 (5)	15:45 (5)
Potential sun hours	259		278		367	416	485	498	502	454	381	332	267			199	813	169				169	
Total, worst case	803		204		157											0.31	0.21	0.17				0.17	
Sun reduction	0.18		0.27		0.30											0.95	0.95	0.95				0.95	
Oper. time red.	0.95		0.95		0.95											0.66	0.66	0.66				0.66	
Wind dir. red.	0.66		0.66		0.64											0.19	0.13	0.11				0.11	
Total reduction	0.11		0.17		0.19											0.38	0.108	0.18				0.18	
Total, real	90		34		29																		

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

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

Project:

19065LE slagschaduw nieuwbouwwijk

Licensed user:

Bosch & Van Rijn

Franz-Lisztplantsoen 220

NL-3533 JG Utrecht

+31 6 51 71 04 93

Schreurs / leon@boschenvanrijn.nl

Calculated:

19-Aug-21 10:59 AM/3.4.388

SHADOW - Calendar

Calculation: VKA bovengrens met kantoren 12RD 210819**Shadow receptor:** K - Shadow Receptor: 8.0 × 5.0 Azimuth: 0.0° Slope: 0.0° (10901)
Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) [DE BILT]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1.48 2.65 3.60 5.24 6.59 6.28 6.20 6.12 4.48 3.32 1.87 1.32

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 385 684 574 504 436 731 797 1,164 1,146 770 577 539 8,307

	[January	[February	[March	[April	[May	[June	[July	[August	[September	[October	[November	[December
1	08:45 15:50 (5) 16:01 (5) 2 08:45 15:50 (5) 16:03 (5) 3 08:45 15:50 (5) 16:04 (5) 4 08:45 15:50 (5) 16:06 (5) 5 08:44 15:49 (5) 16:07 (5) 6 08:44 15:50 (5) 16:08 (5) 7 08:44 15:49 (5) 16:10 (5) 8 08:43 15:48 (5) 16:11 (5) 9 08:43 15:48 (5) 16:13 (5) 10 08:42 15:47 (5) 16:14 (5) 11 08:42 15:46 (5) 16:15 (5) 12 08:41 15:45 (5) 16:16 (5) 13 08:40 15:44 (5) 16:17 (5) 14 08:40 15:43 (5) 16:18 (5) 15 08:39 15:42 (5) 16:19 (5) 16 08:38 15:41 (5) 16:20 (5) 17 08:37 15:40 (5) 16:21 (5) 18 08:36 15:39 (5) 16:22 (5) 19 08:35 15:38 (5) 16:23 (5) 20 08:34 15:37 (5) 16:24 (5) 21 08:33 15:36 (5) 16:25 (5) 22 08:32 15:35 (5) 16:26 (5) 23 08:31 15:34 (5) 16:27 (5) 24 08:30 15:33 (5) 16:28 (5) 25 08:29 15:32 (5) 16:29 (5) 26 08:28 15:31 (5) 16:30 (5) 27 08:27 15:30 (5) 16:31 (5) 28 08:26 15:29 (5) 16:32 (5) 29 08:25 15:28 (5) 16:33 (5) 30 08:24 15:27 (5) 16:34 (5) 31 08:23 15:26 (5) 16:35 (5)	08:18 15:55 (5) 16:24 (5) 07:25 18:16 07:23 18:18 07:21 18:15 07:16 18:12 07:13 18:08 07:14 18:03 07:15 18:00 07:16 18:00 07:17 18:00 07:18 18:00 07:19 18:00 07:20 18:00 07:21 18:00 07:22 18:00 07:23 18:00 07:24 18:00 07:25 18:00 07:26 18:00 07:27 18:00 07:28 18:00 07:29 18:00 07:30 18:00 07:31 18:00 07:32 18:00 07:33 18:00 07:34 18:00 07:35 18:00 07:36 18:00 07:37 18:00 07:38 18:00 07:39 18:00 07:40 18:00 07:41 18:00 07:42 18:00 07:43 18:00 07:44 18:00 07:45 18:00 07:46 18:00 07:47 18:00 07:48 18:00 07:49 18:00 07:50 18:00 07:51 18:00 07:52 18:00 07:53 18:00 07:54 18:00 07:55 18:00 07:56 18:00 07:57 18:00 07:58 18:00 07:59 18:00 08:00 18:00 08:01 18:00 08:02 18:00 08:03 18:00 08:04 18:00 08:05 18:00 08:06 18:00 08:07 18:00 08:08 18:00 08:09 18:00 08:10 18:00 08:11 18:00 08:12 18:00 08:13 18:00 08:14 18:00 08:15 18:00 08:16 18:00 08:17 18:00 08:18 18:00 08:19 18:00 08:20 18:00 08:21 18:00 08:22 18:00 08:23 18:00 08:24 18:00 08:25 18:00 08:26 18:00 08:27 18:00 08:28 18:00 08:29 18:00 08:30 18:00 08:31 18:00 08:32 18:00 08:33 18:00 08:34 18:00 08:35 18:00 08:36 18:00 08:37 18:00 08:38 18:00 08:39 18:00 08:40 18:00 08:41 18:00 08:42 18:00 08:43 18:00 08:44 18:00 08:45 18:00 08:46 18:00 08:47 18:00 08:48 18:00 08:49 18:00 08:50 18:00 08:51 18:00 08:52 18:00 08:53 18:00 08:54 18:00 08:55 18:00 08:56 18:00 08:57 18:00 08:58 18:00 08:59 18:00 09:00 18:00 09:01 18:00 09:02 18:00 09:03 18:00 09:04 18:00 09:05 18:00 09:06 18:00 09:07 18:00 09:08 18:00 09:09 18:00 09:10 18:00 09:11 18:00 09:12 18:00 09:13 18:00 09:14 18:00 09:15 18:00 09:16 18:00 09:17 18:00 09:18 18:00 09:19 18:00 09:20 18:00 09:21 18:00 09:22 18:00 09:23 18:00 09:24 18:00 09:25 18:00 09:26 18:00 09:27 18:00 09:28 18:00 09:29 18:00 09:30 18:00 09:31 18:00 09:32 18:00 09:33 18:00 09:34 18:00 09:35 18:00 09:36 18:00 09:37 18:00 09:38 18:00 09:39 18:00 09:40 18:00 09:41 18:00 09:42 18:00 09:43 18:00 09:44 18:00 09:45 18:00 09:46 18:00 09:47 18:00 09:48 18:00 09:49 18:00 09:50 18:00 09:51 18:00 09:52 18:00 09:53 18:00 09:54 18:00 09:55 18:00 09:56 18:00 09:57 18:00 09:58 18:00 09:59 18:00 10:00 18:00 10:01 18:00 10:02 18:00 10:03 18:00 10:04 18:00 10:05 18:00 10:06 18:00 10:07 18:00 10:08 18:00 10:09 18:00 10:10 18:00 10:11 18:00 10:12 18:00 10:13 18:00 10:14 18:00 10:15 18:00 10:16 18:00 10:17 18:00 10:18 18:00 10:19 18:00 10:20 18:00 10:21 18:00 10:22 18:00 10:23 18:00 10:24 18:00 10:25 18:00 10:26 18:00 10:27 18:00 10:28 18:00 10:29 18:00 10:30 18:00 10:31 18:00 10:32 18:00 10:33 18:00 10:34 18:00 10:35 18:00 10:36 18:00 10:37 18:00 10:38 18:00 10:39 18:00 10:40 18:00 10:41 18:00 10:42 18:00 10:43 18:00 10:44 18:00 10:45 18:00 10:46 18:00 10:47 18:00 10:48 18:00 10:49 18:00 10:50 18:00 10:51 18:00 10:52 18:00 10:53 18:00 10:54 18:00 10:55 18:00 10:56 18:00 10:57 18:00 10:58 18:00 10:59 18:00 11:00 18:00 11:01 18:00 11:02 18:00 11:03 18:00 11:04 18:00 11:05 18:00 11:06 18:00 11:07 18:00 11:08 18:00 11:09 18:00 11:10 18:00 11:11 18:00 11:12 18:00 11:13 18:00 11:14 18:00 11:15 18:00 11:16 18:00 11:17 18:00 11:18 18:00 11:19 18:00 11:20 18:00 11:21 18:00 11:22 18:00 11:23 18:00 11:24 18:00 11:25 18:00 11:26 18:00 11:27 18:00 11:28 18:00 11:29 18:00 11:30 18:00 11:31 18:00 11:32 18:00 11:33 18:00 11:34 18:00 11:35 18:00 11:36 18:00 11:37 18:00 11:38 18:00 11:39 18:00 11:40 18:00 11:41 18:00 11:42 18:00 11:43 18:00 11:44 18:00 11:45 18:00 11:46 18:00 11:47 18:00 11:48 18:00 11:49 18:00 11:50 18:00 11:51 18:00 11:52 18:00 11:53 18:00 11:54 18:00 11:55 18:00 11:56 18:00 11:57 18:00 11:58 18:00 11:59 18:00 12:00 18:00 12:01 18:00 12:02 18:00 12:03 18:00 12:04 18:00 12:05 18:00 12:06 18:00 12:07 18:00 12:08 18:00 12:09 18:00 12:10 18:00 12:11 18:00 12:12 18:00 12:13 18:00 12:14 18:00 12:15 18:00 12:16 18:00 12:17 18:00 12:18 18:00 12:19 18:00 12:20 18:00 12:21 18:00 12:22 18:00 12:23 18:00 12:24 18:00 12:25 18:00 12:26 18:00 12:27 18:00 12:28 18:00 12:29 18:00 12:30 18:00 12:31 18:00 12:32 18:00 12:33 18:00 12:34 18:00 12:35 18:00 12:36 18:00 12:37 18:00 12:38 18:00 12:39 18:00 12:40 18:00 12:41 18:00 12:42 18:00 12:43 18:00 12:44 18:00 12:45 18:00 12:46 18:00 12:47 18:00 12:48 18:00 12:49 18:00 12:50 18:00 12:51 18:00 12:52 18:00 12:53 18:00 12:54 18:00 12:55 18:00 12:56 18:00 12:57 18:00 12:58 18:00 12:59 18:00 13:00 18:00 13:01 18:00 13:02 18:00 13:03 18:00 13:04 18:00 13:05 18:00 13:06 18:00 13:07 18:00 13:08 18:00 13:09 18:00 13:10 18:00 13:11 18:00 13:12 18:00 13:13 18:00 13:14 18:00 13:15 18:00 13:16 18:00 13:17 18:00 13:18 18:00 13:19 18:00 13:20 18:00 13:21 18:00 13:22 18:00 13:23 18:00 13:24 18:00 13:25 18:00 13:26 18:00 13:27 18:00 13:28 18:00 13:29 18:00 13:30 18:00 13:31 18:00 13:32 18:00 13:33 18:00 13:34 18:00 13:35 18:00 13:36 18:00 13:37 18:00 13:38 18:00 13:39 18:00 13:40 18:00 13:41 18:00 13:42 18:00 13:43 18:00 13:44 18:00 13:45 18:00 13:46 18:00 13:47 18:00 13:48 18:00 13:49 18:00 13:50 18:00 13:51 18:00 13:52 18:00 13:53 18:00 13:54 18:00 13:55 18:00 13:56 18:00 13:57 18:00 13:58 18:00 13:59 18:00 14:00 18:00 14:01 18:00 14:02 18:00 14:03 18:00 14:04 18:00 14:05 18:00 14:06 18:00 14:07 18:00 14:08 18:00 14:09 18:00 14:10 18:00 14:11 18:00 14:12 18:00 14:13 18:00 14:14 18:00 14:15 18:00 14:16 18:00 14:17 18:00 14:18 18:00 14:19 18:00 14:20 18:00 14:21 18:00 14:22 18:00 14:23 18:00 14:24 18:00 14:25 18:00 14:26 18:00 14:27 18:00 14:28 18:00 14:29 18:00 14:30 18:00 14:31 18:00 14:32 18:00 14:33 18:00 14:34 18:00 14:35 18:00 14:36 18:00 14:37 18:00 14:38 18:00 14:39 18:00 14:40 18:00 14:41 18:00 14:42 18:00 14:43 18:00 14:44 18:00 14:45 18:00 14:46 18:00 14:47 18:00 14:48 18:00 14:49 18:00 14:50 18:00 14:51 18:00 14:52 18:00 14:53 18:00 14:54 18:00 14:55 18:00 14:56 18:00 14:57 18:00 14:58 18:00 14:59 18:00 15:00 18:00 15:01 18:00 15:02 18:00 15:03 18:00 15:04 18:00 15:05 18:00 15:06 18:00 15:07 18:00 15:08 18:00 15:09 18:00 15:10 18:00 15:11 18:00 15:12 18:00 15:13 18:00 15:14 18:00 15:15 18:00 15:16 18:00 15:17 18:00 15:18 18:00 15:19 18:00 15:20 18:00 15:21 18:00 15:22 18:00 15:23 18:00 15:24 18:00 15:25 18:00 15:26 18:00 15:27 18:00 15:28 18:00 15:29 18:00 15:30 18:00 15:31 18:00 15:32 18:00 15:33 18:00 15:34 18:00 15:35 18:00 15:36 18:00 15:37 18:00 15:38 18:00 15:39 18:00 15:40 18:00 15:41 18:00 15:42 18:00 15:43 18:00 15:44 18:00 15:45 18:00 15:46 18:00 15:47 18:00 15:48 18:00 15:49 18:00 15:50 18:00 15:51 18:00 15:52 18:00 15:53 18:00 15:54 18:00 15:55 18:00 15:56 18:00 15:57 18:00 15:58 18:00 15:59 18:00 16:00 18:00 16:01 18:00 16:02 18:00 16:03 18:00 16:04 18:00 16:05 18:00 16:06 18:00 16:07 18:00 16:08 18:00 16:09 18:00 16:10 18:00 16:11 18:00 16:12 18:00 16:13 18:00 16:14 18:00 16:15 18:00 16:16 18:00 16:17 18:00 16:18 18:00 16:19 18:00 16:20 18:00 16:21 18:00 16:22 18:00 16:23 18:00 16:24 18:00 16:25 18:00 16:26 18:00 16:27 18:00 16:28 18:00 16:29 18:00 16:30 18:00 16:31 18:00 16:32 18:00 16:33 18:00 16:34 18:00 16:35 18:00 16:36 18:00 16:37 18:00 16:38 18:00 16:39 18:00 16:40 18:00 16:41 18:00 16:42 18:00 16:43 18:00 16:44 18:00 16:45 18:00 16:46 18:00 16:47 18:00 16:48 18:00 16:49 18:00 16:50 18:00 16:51 18:00 16:52 18:00 16:53 18:00 16:54 18:00 16:55 18:00 16:56 18:00 16:57 18:00 16:58 18:00 16:59 18:00 17:00 18:00 17:01 18:00 17:02 18:00 17:03 18:00 17:04 18:00 17:05 18:00 17:06 18:00 17:07 18:00 17:08 18:00 17:09 18:00 17:10 18:00 17:11 18:00 17:12 18:00 17:13 18:00 17:14 18:00 17:15 18:00 17:16 18:00 17:17 18:00 17:18 18:00 17:19 18:00 17:20 18:00 17:21 18:00 17:22 18:00 17:23 18:00 17:24 18:00 17:25 18:00 17:26 18:00 17:27 18:00 17:28 18:00 17:29 18:00 17:30 18:00 17:31 18:00 17:32 18:00 17:33 18:00 17:34 18:00 17:35 18:00 17:36 18:00 17:37 18:00 17:38 18:00 17:39 18:00 17:40 18:00 17:41 18:00 17:42 18:00 17:43 18:00 17:44 18:00 17:45 18:00 17:46 18:00 17:47 18:00 17:48 18:00 17:49 18:00 17:50 18:00 17:51 18:00 17:52 18:00 17:53 18:00 17:54 18:00 17:55 18:00 17:56 18:00 17:57 18:00 17:58 18:00 17:59 18:00 18:00 18:00 18:01 18:00 18:02 18:00 18:03 18:00 18:04 18:00 18:05 18:00 18:06 18:00 18:07 18:00 18:08 18:00 18:09 18:00 18:10 18:00 18:11 18:00 18:12 18:00 18:13 18:00 18:14 18:00 18:15 18:00 18:16 18:00 18:17 18:00 18:18 18:00 18:19 18:00 18:20 18:00 18:21 18:00 18:22 18:00 18:23 18:00 18:24 18:00 18:25 18:00 18:26 18:00 18:27 18:00 18:28 18:00 18:29 18:00 18:30 18:00 18:31 18:00 18:32 18:00 18:33 18:00 18:34 18:00 18:35 18:00 18:36 18:00 18:37 18:00 18:38 18:00 18:39 18:00 18:40 18:00 18:41 18:00 18:42 18:00 18:43 18:00 18:44 18:00 18:45 18:00 18:46 18:00 18:47 18:00 18:48 18:00 18:49 18:00 18:50 18:00 18:51 18:00 18:52 18:00 18:53 18:00 18:54 18:00 18:55 18:00 18:56 18:00 18:57 18:00 18:58 18:00 18:59 18:00 19:00 18:00 19:01 18:00 19:02 18:00 19:03 18:00 19:04 18:00 19:05 18:00 19:06 18:00 19:07 18:00 19:08 18:00 19:09 18:00 19:10 18:00 19:11 18:00 19:12 18:00 19:13 18:00 19:14 18:00 19:15 18:00 19:16 18:00 19:17 18:00 19:18 18:00 19:19 18:00 19:20 18:00 19:21 18:00 19:22 18:00 19:23 18:00 19:24 18:00 19:25 18:00 19:26 18:00 19:27 18:00 19:28 18:00 19:29 18:00 19:30 18:00 19:31 18:00 19:32 18:00 19:33 18:00 19:34 18:00 19:35 18:00 19:36										

Project:

19065LE slagschaduw nieuwbouwwijk

Licensed user:

Bosch & Van Rijn

Franz-Lisztplantsoen 220

NL-3533 JG Utrecht

+31 6 51 71 04 93

Schreurs / leon@boschenvanrijn.nl

Calculated:

19-Aug-21 10:59 AM/3.4.388

SHADOW - Calendar

Calculation: VKA bovengrens met kantoren 12RD 210819Shadow receptor: L - Shadow Receptor: 8.0 × 5.0 Azimuth: 0.0° Slope: 0.0° (10902)
Sunshine probability S (Average daily sunshine hours) [DE BILT]

Assumptions for shadow calculations

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1.48 2.65 3.60 5.24 6.59 6.28 6.20 6.12 4.48 3.32 1.87 1.32

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
385 684 574 504 436 731 797 1,164 1,146 770 577 539 8,307

	January		February		March		April		May		June		July		August		September		October		November		December	
1	08:45	15:53 (5)	08:18	15:56 (5)	07:25	17:32 (4)	07:15	06:10	05:25	05:22	05:58	06:48	07:37			07:30		08:21	15:33 (5)					
2	08:45	15:53 (5)	08:17	15:56 (5)	07:23	17:31 (4)	07:12	06:08	05:24	05:23	06:00	06:50	07:38			07:32		08:23	15:34 (5)					
3	08:45	15:53 (5)	08:15	15:58 (5)	07:21	17:31 (4)	07:10	06:06	05:23	05:23	06:01	06:51	07:40			07:34		08:24	15:34 (5)					
4	08:45	15:53 (5)	08:14	15:59 (5)	07:19	17:32 (4)	07:08	06:04	05:23	05:24	06:03	06:53	07:42			07:36		15:37 (5)	08:25					
5	08:44	15:52 (5)	08:12	16:02 (5)	07:16	17:32 (4)	07:06	06:03	05:22	05:25	06:05	06:54	07:43			07:38		15:34 (5)	08:27					
6	08:44	15:52 (5)	08:10	16:05 (5)	07:14	17:32 (4)	07:03	06:01	05:21	05:26	06:06	06:56	07:45			07:40		15:32 (5)	08:28					
7	08:44	16:08 (5)	17:34	16:19 (5)	08:25	18:17 (5)	07:01	05:59	05:21	05:28	06:10	07:00	07:50			07:42		15:30 (5)	08:29					
8	08:44	16:09 (5)	17:35	16:16 (5)	08:27	18:18 (5)	07:02	05:58	05:22	05:29	06:11	07:01	07:51			07:43		15:31 (5)	08:30					
9	08:43	16:08 (5)	17:37	16:15 (5)	08:26	18:17 (5)	07:01	05:57	05:21	05:28	06:10	07:00	07:50			07:43		15:30 (5)	08:31					
10	08:42	16:13 (5)	17:39	16:16 (5)	08:29	18:20 (5)	07:02	05:56	05:22	05:29	06:11	07:01	07:51			07:44		15:29 (5)	08:32					
11	08:42	16:14 (5)	17:41	16:17 (5)	08:31	18:21 (5)	07:03	05:57	05:23	05:30	06:12	07:03	07:52			07:45		15:28 (5)	08:33					
12	08:42	16:15 (5)	17:43	16:18 (5)	08:32	18:22 (5)	07:04	05:58	05:24	05:31	06:13	07:04	07:53			07:46		15:27 (5)	08:34					
13	08:41	16:16 (5)	17:45	16:19 (5)	08:34	18:23 (5)	07:05	05:59	05:25	05:32	06:14	07:05	07:54			07:47		15:26 (5)	08:35					
14	08:40	16:21 (5)	17:48	16:24 (5)	08:39	18:28 (5)	07:10	06:04	05:30	05:37	06:16	07:06	07:55			07:48		15:25 (5)	08:36					
15	08:39	16:22 (5)	17:50	16:25 (5)	08:41	18:29 (5)	07:11	06:05	05:31	05:38	06:17	07:07	07:57			07:49		15:24 (5)	08:37					
16	08:38	16:23 (5)	17:52	16:26 (5)	08:42	18:30 (5)	07:12	06:06	05:32	05:39	06:18	07:08	07:58			07:50		15:23 (5)	08:38					
17	08:37	16:24 (5)	17:54	16:27 (5)	08:43	18:31 (5)	07:13	06:07	05:33	05:40	06:19	07:09	07:59			07:51		15:22 (5)	08:39					
18	08:36	16:25 (5)	17:56	16:28 (5)	08:44	18:32 (5)	07:14	06:08	05:34	05:41	06:20	07:10	08:00			07:52		15:21 (5)	08:40					
19	08:35	16:26 (5)	17:58	16:29 (5)	08:45	18:33 (5)	07:15	06:09	05:35	05:42	06:21	07:11	08:01			07:53		15:20 (5)	08:41					
20	08:34	16:27 (5)	18:00	16:30 (5)	08:46	18:34 (5)	07:16	06:10	05:36	05:43	06:22	07:12	08:02			07:54		15:19 (5)	08:42					
21	08:33	16:28 (5)	18:02	16:31 (5)	08:47	18:35 (5)	07:17	06:11	05:37	05:44	06:23	07:13	08:03			07:55		15:18 (5)	08:43					
22	08:32	16:29 (5)	18:04	16:32 (5)	08:48	18:36 (5)	07:18	06:12	05:38	05:45	06:24	07:14	08:04			07:56		15:17 (5)	08:44					
23	08:31	16:30 (5)	18:06	16:33 (5)	08:49	18:37 (5)	07:19	06:13	05:39	05:46	06:25	07:15	08:05			07:57		15:16 (5)	08:45					
24	08:30	16:31 (5)	18:08	16:34 (5)	08:50	18:38 (5)	07:20	06:14	05:40	05:47	06:26	07:16	08:06			07:58		15:15 (5)	08:46					
25	08:29	16:32 (5)	18:10	16:35 (5)	08:51	18:39 (5)	07:21	06:15	05:41	05:48	06:27	07:17	08:07			07:59		15:14 (5)	08:47					
26	08:28	16:33 (5)	18:12	16:36 (5)	08:52	18:40 (5)	07:22	06:16	05:42	05:49	06:28	07:18	08:08			08:00		15:13 (5)	08:48					
27	08:27	16:34 (5)	18:14	16:37 (5)	08:53	18:41 (5)	07:23	06:17	05:43	05:50	06:29	07:19	08:09			08:01		15:12 (5)	08:49					
28	08:26	16:35 (5)	18:16	16:38 (5)	08:54	18:42 (5)	07:24	06:18	05:44	05:51	06:30	07:20	08:10			08:02		15:11 (5)	08:50					
29	08:25	16:36 (5)	18:18	16:39 (5)	08:55	18:43 (5)	07:25	06:19	05:45	05:52	06:31	07:21	08:11			08:03		15:10 (5)	08:51					
30	08:24	16:37 (5)	18:20	16:40 (5)	08:56	18:44 (5)	07:26	06:20	05:46	05:53	06:32	07:22	08:12			08:04		15:09 (5)	08:52					
31	08:23	16:38 (5)	18:22	16:41 (5)	08:57	18:45 (5)	07:27	06:21	05:47	05:54	06:33	07:23	08:13			08:05		15:08 (5)	08:53					
Potential sun hours	259		278		367		416		485		498		502		454		381		332		267		244	
Total, worst case	826		194		147														199		795		218	
Sun reduction	0.18		0.27		0.30														0.31		0.21		0.17	
Oper. time red.	0.95		0.95		0.95														0.95		0.95		0.95	
Wind dir. red.	0.67		0.66		0.64														0.64		0.67		0.67	
Total reduction	0.11		0.17		0.19														0.19		0.13		0.11	
Total, real	92		33		27														38		106		23	

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

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

Project:

19065LE slagschaduw nieuwbouwwijk

Licensed user:

Bosch & Van Rijn

Franz-Lisztplantsoen 220

NL-3533 JG Utrecht

+31 6 51 71 04 93

Schreurs / leon@boschenvanrijn.nl

Calculated:

19-Aug-21 10:59 AM/3.4.388

SHADOW - Calendar

Calculation: VKA bovengrens met kantoren 12RD 210819Shadow receptor: M - Shadow Receptor: 8.0 × 5.0 Azimuth: 0.0° Slope: 0.0° (10903)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [DE BILT]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.48	2.65	3.60	5.24	6.59	6.28	6.20	6.12	4.48	3.32	1.87	1.32

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
385	684	574	504	436	731	797	1,164	1,146	770	577	539	8,307

January		February		March		April		May		June	
1	08:45	13:16 (5)	08:18	13:28 (5)	07:25	07:15	18:44 (4)	06:10	05:25		
	16:37	81 14:37 (5)	17:24	14:47 (5)	18:16	20:10	26 19:44 (3)	21:01	21:46		
2	08:45	13:16 (5)	08:17	13:29 (5)	07:23	07:12	19:29 (3)	06:08	05:24		
	16:38	82 14:38 (5)	17:26	14:46 (5)	18:18	20:11	17 19:46 (3)	21:02	21:47		
3	08:45	13:17 (5)	08:15	13:29 (5)	07:21	07:10	19:29 (3)	06:06	05:23		
	16:39	81 14:38 (5)	17:28	14:45 (5)	18:20	20:13	19 19:48 (3)	21:04	21:48		
4	08:45	13:18 (5)	08:14	13:30 (5)	07:19	07:08	19:28 (3)	06:04	05:23		
	16:40	81 14:39 (5)	17:30	14:45 (5)	18:21	20:15	21 19:49 (3)	21:05	21:49		
5	08:44	13:17 (5)	08:12	13:32 (5)	07:16	07:06	19:28 (3)	06:03	05:22		
	16:41	82 14:39 (5)	17:32	14:45 (5)	18:23	20:17	21 19:49 (3)	21:07	21:50		
6	08:44	13:18 (5)	08:10	13:32 (5)	07:14	07:03	19:28 (3)	06:01	05:21		
	16:42	82 14:40 (5)	17:34	14:44 (5)	18:25	20:18	20 19:48 (3)	21:09	21:51		
7	08:44	13:18 (5)	08:09	13:33 (5)	07:12	07:01	19:29 (3)	05:59	05:21		
	16:44	82 14:40 (5)	17:36	14:44 (5)	18:27	20:20	19 19:48 (3)	21:10	21:52		
8	08:43	13:18 (5)	08:07	13:34 (5)	07:10	17:54 (4)	06:59	19:30 (3)	05:57	05:20	
	16:45	83 14:41 (5)	17:37	14:43 (5)	18:28	17:59 (4)	20:22	16 19:46 (3)	21:12	21:53	
9	08:43	13:19 (5)	08:05	13:36 (5)	07:08	17:49 (4)	06:57	19:31 (3)	05:56	05:20	
	16:46	83 14:42 (5)	17:39	14:42 (5)	18:30	18:04 (4)	20:23	13 19:44 (3)	21:14	21:54	
10	08:42	13:19 (5)	08:03	13:37 (5)	07:05	17:45 (4)	06:54	19:34 (3)	05:54	05:19	
	16:48	83 14:42 (5)	17:41	14:40 (5)	18:32	18:06 (4)	20:25	7 19:41 (3)	21:15	21:55	
11	08:42	13:19 (5)	08:02	13:38 (5)	07:03	17:43 (4)	06:52		05:52	05:19	
	16:49	83 14:42 (5)	17:43	14:39 (5)	18:34	18:08 (4)	20:27		21:17	21:56	
12	08:41	13:20 (5)	08:00	13:40 (5)	07:01	17:41 (4)	06:50		05:50	05:19	
	16:51	83 14:43 (5)	17:45	14:38 (5)	18:35	18:10 (4)	20:28		21:18	21:56	
13	08:40	13:20 (5)	07:58	13:43 (5)	06:58	17:39 (4)	06:48		05:49	05:18	
	16:52	84 14:44 (5)	17:47	14:37 (5)	18:37	18:10 (4)	20:30		21:20	21:57	
14	08:40	13:21 (5)	07:56	13:45 (5)	06:56	17:38 (4)	06:45		05:47	05:18	
	16:54	83 14:44 (5)	17:49	14:36 (5)	18:39	18:12 (4)	20:32		21:22	21:57	
15	08:39	13:21 (5)	07:54	13:48 (5)	06:54	17:37 (4)	06:43		05:46	05:18	
	16:55	84 14:45 (5)	17:50	14:33 (5)	18:41	18:13 (4)	20:34		21:23	21:58	
16	08:38	13:21 (5)	07:52	13:50 (5)	06:52	17:36 (4)	06:41		05:44	05:18	
	16:57	84 14:45 (5)	17:52	14:30 (5)	18:42	18:12 (4)	20:35		21:25	21:59	
17	08:37	13:22 (5)	07:50	13:54 (5)	06:49	17:35 (4)	06:39		05:43	05:18	
	16:58	83 14:45 (5)	17:54	14:27 (5)	18:44	18:13 (4)	20:37		21:26	21:59	
18	08:36	13:22 (5)	07:48	14:00 (5)	06:47	17:35 (4)	06:37		05:41	05:18	
	17:00	84 14:46 (5)	17:56	14:22 (5)	18:46	18:13 (4)	20:39		21:28	21:59	
19	08:35	13:22 (5)	07:46		06:45	17:34 (4)	06:35		05:40	05:18	
	17:02	83 14:45 (5)	17:58		18:48	18:13 (4)	20:40		21:29	22:00	
20	08:34	13:22 (5)	07:44		06:42	17:34 (4)	06:32		05:38	05:18	
	17:03	84 14:46 (5)	18:00		18:49	18:13 (4)	20:42		21:31	22:00	
21	08:33	13:23 (5)	07:42		06:40	17:34 (4)	06:30		05:37	05:18	
	17:05	83 14:46 (5)	18:01		18:51	18:13 (4)	20:44		21:32	22:00	
22	08:32	13:23 (5)	07:40		06:38	17:33 (4)	06:28		05:36	05:18	
	17:07	84 14:47 (5)	18:03		18:53	18:12 (4)	20:45		21:33	22:01	
23	08:31	13:23 (5)	07:38		06:36	17:33 (4)	06:26		05:35	05:18	
	17:08	83 14:46 (5)	18:05		18:54	18:11 (4)	20:47		21:35	22:01	
24	08:30	13:24 (5)	07:36		06:33	17:34 (4)	06:24		05:33	05:19	
	17:10	83 14:47 (5)	18:07		18:56	18:11 (4)	20:49		21:36	22:01	
25	08:28	13:25 (5)	07:34		06:31	17:34 (4)	06:22		05:32	05:19	
	17:12	82 14:47 (5)	18:09		18:58	18:09 (4)	20:50		21:38	22:01	
26	08:27	13:25 (5)	07:32		06:29	17:35 (4)	06:20		05:31	05:19	
	17:14	82 14:47 (5)	18:11		19:00	18:08 (4)	20:52		21:39	22:01	
27	08:26	13:26 (5)	07:30		06:26	17:36 (4)	06:18		05:30	05:20	
	17:15	81 14:47 (5)	18:12		19:01	18:07 (4)	20:54		21:40	22:01	
28	08:24	13:26 (5)	07:27		06:24	17:37 (4)	06:16		05:29	05:20	
	17:17	81 14:47 (5)	18:14		19:03	18:38 (3)	20:55		21:41	22:01	
29	08:23	13:26 (5)			07:22	18:38 (4)	06:14		05:28	05:21	
	17:19	80 14:46 (5)			20:05	19:39 (3)	20:57		21:43	22:01	
30	08:21	13:27 (5)			07:19	18:40 (4)	06:12		05:27	05:21	
	17:21	80 14:47 (5)			20:06	19:41 (3)	20:59		21:44	22:00	
31	08:20	13:27 (5)			07:17	18:42 (4)			05:26		
	17:23	79 14:46 (5)			20:08	19:43 (3)			21:45		
Potential sun hours	259		278		367		416		485		498
Total, worst case	2553		1085		761		179				
Sun reduction	0.18		0.27		0.30		0.38				
Oper. time red.	0.95		0.95		0.95		0.95				
Wind dir. red.	0.68		0.68		0.63		0.61				
Total reduction	0.12		0.17		0.18		0.22				
Total, real	295		189		138		40				

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

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

19065LE slagschaduw nieuwbouwwijk

Licensed user:

Bosch & Van Rijn

Franz-Lisztplantsoen 220

NL-3533 JG Utrecht

+31 6 51 71 04 93

Schreurs / leon@boschenvanrijn.nl

Calculated:

19-Aug-21 10:59 AM/3.4.388

SHADOW - Calendar

Calculation: VKA bovengrens met kantoren 12RD 210819 **Shadow receptor:** M - Shadow Receptor: 8.0 × 5.0 Azimuth: 0.0° Slope: 0.0° (10903)
Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) [DE BILT]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1.48 2.65 3.60 5.24 6.59 6.28 6.20 6.12 4.48 3.32 1.87 1.32

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 385 684 574 504 436 731 797 1,164 1,146 770 577 539 8,307

	July	August	September	October	November	December
1	05:22	05:58	06:48	07:37	18:20 (4)	07:30
	22:00	21:28	20:27	19:17	18:49 (4)	17:11
2	05:23	06:00	06:50	19:33 (3)	07:38	18:21 (4)
	22:00	21:27	20:24	19:40 (3)	19:15	18:48 (4)
3	05:23	06:01	06:51	19:29 (3)	07:40	18:22 (4)
	21:59	21:25	20:22	19:42 (3)	19:13	18:45 (4)
4	05:24	06:03	06:53	19:28 (3)	07:42	18:24 (4)
	21:59	21:23	20:20	19:43 (3)	19:10	18:43 (4)
5	05:25	06:05	06:54	19:25 (3)	07:43	18:28 (4)
	21:59	21:22	20:17	19:44 (3)	19:08	18:39 (4)
6	05:26	06:06	06:56	19:25 (3)	07:45	17:02
	21:58	21:20	20:15	19:45 (3)	19:06	17:02
7	05:27	06:08	06:58	19:23 (3)	07:47	17:01
	21:57	21:18	20:13	19:44 (3)	19:04	17:01
8	05:28	06:09	06:59	19:23 (3)	07:49	17:01
	21:57	21:16	20:11	19:44 (3)	19:01	16:59
9	05:29	06:11	07:01	19:22 (3)	07:50	17:01
	21:56	21:14	20:08	19:41 (3)	18:59	16:57
10	05:30	06:12	07:03	19:22 (3)	07:52	17:02
	21:55	21:13	20:06	19:39 (3)	18:57	16:56
11	05:31	06:14	07:04	18:38 (4)	07:54	17:02
	21:55	21:11	20:04	19:37 (3)	18:55	16:54
12	05:32	06:16	07:06	18:34 (4)	07:55	17:02
	21:54	21:09	20:01	19:34 (3)	18:52	16:53
13	05:33	06:17	07:07	18:31 (4)	07:57	17:02
	21:53	21:07	19:59	19:32 (3)	18:50	16:51
14	05:34	06:19	07:09	18:28 (4)	07:59	17:03
	21:52	21:05	19:57	19:30 (3)	18:48	16:50
15	05:35	06:20	07:11	18:27 (4)	08:00	17:04
	21:51	21:03	19:54	19:28 (3)	18:46	16:48
16	05:36	06:22	07:12	18:24 (4)	08:02	17:05
	21:50	21:01	19:52	18:56 (4)	18:44	16:47
17	05:37	06:24	07:14	18:23 (4)	08:04	17:06
	21:49	20:59	19:50	18:57 (4)	18:41	16:45
18	05:39	06:25	07:16	18:22 (4)	08:06	17:07
	21:48	20:57	19:47	18:57 (4)	18:39	16:44
19	05:40	06:27	07:17	18:21 (4)	08:07	17:08
	21:47	20:55	19:45	18:57 (4)	18:37	16:43
20	05:41	06:29	07:19	18:20 (4)	08:09	17:09
	21:46	20:53	19:43	18:58 (4)	18:35	16:42
21	05:43	06:30	07:20	18:19 (4)	08:11	17:10
	21:44	20:50	19:40	18:57 (4)	18:33	16:40
22	05:44	06:32	07:22	18:18 (4)	08:13	17:11
	21:43	20:48	19:38	18:57 (4)	18:31	16:39
23	05:45	06:33	07:24	18:18 (4)	08:14	17:12
	21:42	20:46	19:36	18:57 (4)	18:29	16:38
24	05:47	06:35	07:25	18:17 (4)	08:16	17:13
	21:40	20:44	19:33	18:56 (4)	18:27	16:37
25	05:48	06:37	07:27	18:18 (4)	07:18	17:14
	21:39	20:42	19:31	18:56 (4)	17:25	16:35
26	05:50	06:38	07:29	18:18 (4)	07:20	17:15
	21:38	20:40	19:29	18:56 (4)	17:23	16:35
27	05:51	06:40	07:30	18:17 (4)	07:21	17:16
	21:36	20:38	19:26	18:54 (4)	17:21	16:34
28	05:52	06:41	07:32	18:18 (4)	07:23	17:17
	21:35	20:35	19:24	18:54 (4)	17:19	16:33
29	05:54	06:43	07:34	18:19 (4)	07:25	17:18
	21:33	20:33	19:22	18:53 (4)	17:17	16:33
30	05:55	06:45	07:35	18:19 (4)	07:27	17:19
	21:32	20:31	19:20	18:51 (4)	17:15	16:32
31	05:57	06:46		07:29	13:08 (5)	16:35
	21:30	20:29		17:13	14:09 (5)	16:35
Potential sun hours	502	454	381	332	267	244
Total, worst case			846	496	2372	2510
Sun reduction			0.35	0.31	0.21	0.17
Oper. time red.			0.95	0.95	0.95	0.95
Wind dir. red.			0.62	0.67	0.68	0.68
Total reduction			0.21	0.20	0.14	0.11
Total, real			178	99	326	274

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

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

Project:

19065LE slagschaduw nieuwbouwwijk

Licensed user:

Bosch & Van Rijn

Franz-Lisztplantsoen 220

NL-3533 JG Utrecht

+31 6 51 71 04 93

Schreurs / leon@boschenvanrijn.nl

Calculated:

19-Aug-21 10:59 AM/3.4.388

SHADOW - Calendar

Calculation: VKA bovengrens met kantoren 12RD 210819 **Shadow receptor:** N - Shadow Receptor: 8.0 × 5.0 Azimuth: 0.0° Slope: 0.0° (10904)
Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) [DE BILT]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1.48 2.65 3.60 5.24 6.59 6.28 6.20 6.12 4.48 3.32 1.87 1.32

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 385 684 574 504 436 731 797 1,164 1,146 770 577 539 8,307

January		February		March		April		May		June	
1	08:45	12:12 (5)	08:18	07:25	17:03 (4)	07:15	19:15 (3)	06:10	05:25		
	16:37	68 13:20 (5)	17:24	18:16	40 17:43 (4)	20:10	19	19:34 (3)	21:01	21:46	
2	08:45	12:13 (5)	08:17	07:23	17:02 (4)	07:12		19:16 (3)	06:08	05:24	
	16:38	68 13:21 (5)	17:26	18:18	41 17:43 (4)	20:11	17	19:33 (3)	21:02	21:47	
3	08:45	12:14 (5)	08:15	07:21	17:01 (4)	07:10		19:18 (3)	06:06	05:23	
	16:39	67 13:21 (5)	17:28	18:20	42 17:43 (4)	20:13	13	19:31 (3)	21:04	21:48	
4	08:45	12:15 (5)	08:14	07:19	17:01 (4)	07:08		19:21 (3)	06:04	05:23	
	16:40	67 13:22 (5)	17:30	18:21	43 17:44 (4)	20:15	5	19:26 (3)	21:06	21:49	
5	08:44	12:15 (5)	08:12	07:16	17:01 (4)	07:06			06:03	05:22	
	16:41	67 13:22 (5)	17:32	18:23	43 17:44 (4)	20:17			21:07	21:50	
6	08:44	12:16 (5)	08:10	07:14	17:00 (4)	07:03			06:01	05:21	
	16:42	66 13:22 (5)	17:34	18:25	43 17:43 (4)	20:18			21:09	21:51	
7	08:44	12:16 (5)	08:09	07:12	17:00 (4)	07:01			05:59	05:21	
	16:44	66 13:22 (5)	17:36	18:27	43 17:43 (4)	20:20			21:10	21:52	
8	08:43	12:17 (5)	08:07	07:10	17:00 (4)	06:59			05:57	05:20	
	16:45	66 13:23 (5)	17:37	18:28	43 17:43 (4)	20:22			21:12	21:53	
9	08:43	12:18 (5)	08:05	07:08	17:01 (4)	06:57			05:56	05:20	
	16:46	65 13:23 (5)	17:39	18:30	42 17:43 (4)	20:23			21:14	21:54	
10	08:42	12:18 (5)	08:03	07:05	17:00 (4)	06:54			05:54	05:19	
	16:48	65 13:23 (5)	17:41	18:32	42 17:42 (4)	20:25			21:15	21:55	
11	08:42	12:19 (5)	08:02	07:03	17:01 (4)	06:52			05:52	05:19	
	16:49	63 13:22 (5)	17:43	18:34	40 17:41 (4)	20:27			21:17	21:56	
12	08:41	12:20 (5)	08:00	07:01	17:02 (4)	06:50			05:50	05:19	
	16:51	63 13:23 (5)	17:45	18:35	39 17:41 (4)	20:28			21:18	21:56	
13	08:40	12:21 (5)	07:58	06:58	17:02 (4)	06:48			05:49	05:18	
	16:52	62 13:23 (5)	17:47	18:37	37 17:39 (4)	20:30			21:20	21:57	
14	08:40	12:22 (5)	07:56	06:56	17:03 (4)	06:45			05:47	05:18	
	16:54	61 13:23 (5)	17:49	18:39	35 17:38 (4)	20:32			21:22	21:58	
15	08:39	12:22 (5)	07:54	06:54	17:04 (4)	06:43			05:46	05:18	
	16:55	61 13:23 (5)	17:50	18:41	33 17:37 (4)	20:34			21:23	21:58	
16	08:38	12:23 (5)	07:52	06:52	17:05 (4)	06:41			05:44	05:18	
	16:57	60 13:23 (5)	17:52	18:42	29 17:34 (4)	20:35			21:25	21:59	
17	08:37	12:24 (5)	07:50	06:49	17:07 (4)	06:39			05:43	05:18	
	16:58	58 13:22 (5)	17:54	18:44	26 17:33 (4)	20:37			21:26	21:59	
18	08:36	12:26 (5)	07:48	06:47	17:10 (4)	06:37			05:41	05:18	
	17:00	56 13:22 (5)	17:56	18:46	20 17:30 (4)	20:39			21:28	21:59	
19	08:35	12:26 (5)	07:46	06:45	17:12 (4)	06:35			05:40	05:18	
	17:02	55 13:21 (5)	17:58	18:48	14 17:26 (4)	20:40			21:29	22:00	
20	08:34	12:27 (5)	07:44	06:42		06:32			05:38	05:18	
	17:03	54 13:21 (5)	18:00	18:49		20:42			21:31	22:00	
21	08:33	12:29 (5)	07:42	17:16 (4)	06:40	18:23 (3)	06:30		05:37	05:18	
	17:05	51 13:20 (5)	18:01	18:51	3 18:26 (3)	20:44			21:32	22:00	
22	08:32	12:30 (5)	07:40	17:13 (4)	06:38	18:20 (3)	06:28		05:36	05:18	
	17:07	50 13:20 (5)	18:03	18:53	7 18:27 (3)	20:45			21:33	22:01	
23	08:31	12:31 (5)	07:38	17:11 (4)	06:36	18:18 (3)	06:26		05:35	05:18	
	17:08	47 13:18 (5)	18:05	18:54	11 18:29 (3)	20:47			21:35	22:01	
24	08:30	12:33 (5)	07:36	17:09 (4)	06:33	18:17 (3)	06:24		05:33	05:19	
	17:10	44 13:17 (5)	18:07	18:56	14 18:31 (3)	20:49			21:36	22:01	
25	08:28	12:35 (5)	07:34	17:07 (4)	06:31	18:15 (3)	06:22		05:32	05:19	
	17:12	42 13:17 (5)	18:09	18:58	17 18:32 (3)	20:50			21:38	22:01	
26	08:27	12:37 (5)	07:32	17:06 (4)	06:29	18:15 (3)	06:20		05:31	05:19	
	17:14	37 13:14 (5)	18:11	17:40 (4)	19:00	18:34 (3)	20:52		21:39	22:01	
27	08:26	12:40 (5)	07:30	17:05 (4)	06:26	18:15 (3)	06:18		05:30	05:20	
	17:15	33 13:13 (5)	18:12	17:41 (4)	19:01	18:36 (3)	20:54		21:40	22:01	
28	08:24	12:42 (5)	07:27	17:04 (4)	06:24	18:15 (3)	06:16		05:29	05:20	
	17:17	28 13:10 (5)	18:14	17:42 (4)	19:03	18:38 (3)	20:56		21:41	22:01	
29	08:23	12:46 (5)		07:22	19:14 (3)	06:14			05:28	05:21	
	17:19	20 13:06 (5)		20:05	23 19:37 (3)	20:57			21:43	22:01	
30	08:21			07:19	19:14 (3)	06:12			05:27	05:21	
	17:21			20:06	23 19:37 (3)	20:59			21:44	22:00	
31	08:20			07:17	19:15 (3)				05:26		
	17:23			20:08	21 19:36 (3)				21:45		
Potential sun hours	259		278		367		416		485		498
Total, worst case	1610		230		877		54				
Sun reduction	0.18		0.27		0.30		0.38				
Oper. time red.	0.95		0.95		0.95		0.95				
Wind dir. red.	0.68		0.65		0.65		0.62				
Total reduction	0.11		0.17		0.19		0.22				
Total, real	184		38		165		12				

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

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

Project:

19065LE slagschaduw nieuwbouwwijk

Licensed user:

Bosch & Van Rijn

Franz-Lisztplantsoen 220

NL-3533 JG Utrecht

+31 6 51 71 04 93

Schreurs / leon@boschenvanrijn.nl

Calculated:

19-Aug-21 10:59 AM/3.4.388

SHADOW - Calendar

Calculation: VKA bovengrens met kantoren 12RD 210819 **Shadow receptor:** N - Shadow Receptor: 8.0 × 5.0 Azimuth: 0.0° Slope: 0.0° (10904)
Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) [DE BILT]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1.48 2.65 3.60 5.24 6.59 6.28 6.20 6.12 4.48 3.32 1.87 1.32

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 385 684 574 504 436 731 797 1,164 1,146 770 577 539 8,307

	July	August	September	October	November	December
1	05:22	05:58	06:48	07:37	17:41 (4)	07:30
	22:00	21:28	20:27	19:17	18:19 (4)	17:11
2	05:23	06:00	06:50	07:38	17:40 (4)	07:32
	22:00	21:27	20:24	19:15	18:20 (4)	17:09
3	05:23	06:01	06:51	07:40	17:38 (4)	07:34
	21:59	21:25	20:22	19:13	18:19 (4)	17:08
4	05:24	06:03	06:53	07:42	17:38 (4)	07:36
	21:59	21:23	20:20	19:10	18:20 (4)	17:06
5	05:25	06:05	06:54	07:43	17:37 (4)	07:38
	21:59	21:22	20:17	19:08	18:20 (4)	17:04
6	05:26	06:06	06:56	07:45	17:36 (4)	07:39
	21:58	21:20	20:15	19:06	18:19 (4)	17:02
7	05:27	06:08	06:58	07:47	17:36 (4)	07:41
	21:57	21:18	20:13	19:04	18:19 (4)	17:01
8	05:28	06:09	06:59	19:16 (3)	07:49	17:36 (4)
	21:57	21:16	20:11	19:21 (3)	19:01	18:19 (4)
9	05:29	06:11	07:01	19:12 (3)	07:50	17:36 (4)
	21:56	21:14	20:08	19:24 (3)	18:59	18:19 (4)
10	05:30	06:12	07:03	19:10 (3)	07:52	17:35 (4)
	21:55	21:13	20:06	19:26 (3)	18:57	18:18 (4)
11	05:31	06:14	07:04	19:08 (3)	07:54	17:36 (4)
	21:55	21:11	20:04	19:27 (3)	18:55	18:17 (4)
12	05:32	06:16	07:06	19:06 (3)	07:55	17:36 (4)
	21:54	21:09	20:01	19:27 (3)	18:52	18:17 (4)
13	05:33	06:17	07:07	19:06 (3)	07:57	17:37 (4)
	21:53	21:07	19:59	19:28 (3)	18:50	18:16 (4)
14	05:34	06:19	07:09	19:04 (3)	07:59	17:36 (4)
	21:52	21:05	19:57	19:27 (3)	18:48	18:14 (4)
15	05:35	06:20	07:11	19:04 (3)	08:00	17:37 (4)
	21:51	21:03	19:54	19:28 (3)	18:46	18:13 (4)
16	05:36	06:22	07:12	19:03 (3)	08:02	17:38 (4)
	21:50	21:01	19:52	19:25 (3)	18:44	18:12 (4)
17	05:37	06:24	07:14	19:03 (3)	08:04	17:40 (4)
	21:49	20:59	19:50	19:23 (3)	18:41	18:11 (4)
18	05:39	06:25	07:16	19:04 (3)	08:06	17:41 (4)
	21:48	20:57	19:47	19:21 (3)	18:39	18:09 (4)
19	05:40	06:27	07:17	19:03 (3)	08:07	17:43 (4)
	21:47	20:55	19:45	19:18 (3)	18:37	18:07 (4)
20	05:41	06:29	07:19	19:04 (3)	08:09	17:44 (4)
	21:46	20:53	19:43	19:16 (3)	18:35	18:03 (4)
21	05:43	06:30	07:20	19:05 (3)	08:11	17:48 (4)
	21:44	20:51	19:40	19:13 (3)	18:33	18:00 (4)
22	05:44	06:32	07:22	19:07 (3)	08:13	18:07
	21:43	20:48	19:38	19:11 (3)	18:31	16:39
23	05:45	06:33	07:24	18:29	08:09	16:38
	21:42	20:46	19:36	17:57 (4)	08:16	16:37
24	05:47	06:35	07:25	18:08 (4)	18:27	16:37
	21:40	20:44	19:33	17:53 (4)	07:18	16:36
25	05:48	06:37	07:27	18:12 (4)	17:25	16:36
	21:39	20:42	19:31	17:51 (4)	07:20	16:35
26	05:50	06:38	07:29	18:15 (4)	17:23	16:35
	21:38	20:40	19:29	17:47 (4)	07:22	16:34
27	05:51	06:40	07:30	18:15 (4)	17:21	16:34
	21:36	20:38	19:26	17:46 (4)	07:23	16:33
28	05:52	06:42	07:32	18:17 (4)	17:19	16:33
	21:35	20:35	19:24	17:44 (4)	07:25	16:33
29	05:54	06:43	07:34	18:18 (4)	17:17	16:33
	21:33	20:33	19:22	17:42 (4)	07:27	16:32
30	05:55	06:45	07:35	18:18 (4)	17:15	16:32
	21:32	20:31	19:20	17:13	07:29	16:35
31	05:57	06:46		17:13	16:35	16:35
	21:30	20:29		332	267	244
Potential sun hours	502	454	381			
Total, worst case			423	762	881	2099
Sun reduction			0.35	0.31	0.21	0.17
Oper. time red.			0.95	0.95	0.95	0.95
Wind dir. red.			0.64	0.65	0.68	0.68
Total reduction			0.21	0.19	0.14	0.11
Total, real			91	147	120	227

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

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

Project:

19065LE slagschaduw nieuwbouwwijk

Licensed user:

Bosch & Van Rijn

Franz-Lisztplantsoen 220

NL-3533 JG Utrecht

+31 6 51 71 04 93

Schreurs / leon@boschenvanrijn.nl

Calculated:

19-Aug-21 10:59 AM/3.4.388

SHADOW - Calendar

Calculation: VKA bovengrens met kantoren 12RD 210819 **Shadow receptor:** O - Shadow Receptor: 8.0 × 5.0 Azimuth: 0.0° Slope: 0.0° (10905)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [DE BILT]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.48	2.65	3.60	5.24	6.59	6.28	6.20	6.12	4.48	3.32	1.87	1.32

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
385	684	574	504	436	731	797	1,164	1,146	770	577	539	8,307

	January		February		March		April		May		June	
1	08:45	11:51 (5)	08:18	12:18 (5)	07:25	17:13 (4)	07:15	19:18 (3)	06:10	05:25		
	16:37	76	13:07 (5)	17:24	43	13:01 (5)	18:16	17:46 (4)	20:10	24	19:42 (3)	21:01
2	08:45	11:51 (5)	08:17	12:20 (5)	07:23	17:11 (4)	07:12	19:18 (3)	06:08	05:24		
	16:38	76	13:07 (5)	17:26	39	12:59 (5)	18:18	17:47 (4)	20:11	24	19:42 (3)	21:02
3	08:45	11:52 (5)	08:15	12:23 (5)	07:21	17:10 (4)	07:10	19:19 (3)	06:06	05:23		
	16:39	76	13:08 (5)	17:28	33	12:56 (5)	18:20	17:48 (4)	20:13	22	19:41 (3)	21:04
4	08:45	11:53 (5)	08:14	12:26 (5)	07:19	17:09 (4)	07:08	19:20 (3)	06:04	05:23		
	16:40	76	13:09 (5)	17:30	26	12:52 (5)	18:21	17:49 (4)	20:15	20	19:40 (3)	21:06
5	08:44	11:53 (5)	08:12	12:33 (5)	07:16	17:08 (4)	07:06	19:20 (3)	06:03	05:22		
	16:41	76	13:09 (5)	17:32	13	12:46 (5)	18:23	17:50 (4)	20:17	18	19:38 (3)	21:07
6	08:44	11:54 (5)	08:10		07:14	17:07 (4)	07:03	19:22 (3)	06:01	05:21		
	16:42	76	13:10 (5)	17:34		18:25	43	17:50 (4)	20:18	14	19:36 (3)	21:09
7	08:44	11:54 (5)	08:09		07:12	17:06 (4)	07:01	19:24 (3)	05:59	05:21		
	16:44	75	13:09 (5)	17:36		18:27	44	17:50 (4)	20:20	10	19:34 (3)	21:10
8	08:43	11:55 (5)	08:07		07:10	17:06 (4)	06:59		05:57	05:20		
	16:45	75	13:10 (5)	17:37		18:28	45	17:51 (4)	20:22		21:12	21:53
9	08:43	11:55 (5)	08:05		07:08	17:06 (4)	06:57		05:56	05:20		
	16:46	75	13:10 (5)	17:39		18:30	45	17:51 (4)	20:23		21:14	21:54
10	08:42	11:56 (5)	08:03		07:05	17:05 (4)	06:54		05:54	05:19		
	16:48	74	13:10 (5)	17:41		18:32	45	17:50 (4)	20:25		21:15	21:55
11	08:42	11:56 (5)	08:02		07:03	17:05 (4)	06:52		05:52	05:19		
	16:49	74	13:10 (5)	17:43		18:34	45	17:50 (4)	20:27		21:17	21:56
12	08:41	11:57 (5)	08:00		07:01	17:05 (4)	06:50		05:50	05:19		
	16:51	74	13:11 (5)	17:45		18:35	45	17:50 (4)	20:28		21:18	21:56
13	08:40	11:58 (5)	07:58		06:58	17:04 (4)	06:48		05:49	05:18		
	16:52	73	13:11 (5)	17:47		18:37	45	17:49 (4)	20:30		21:20	21:57
14	08:40	11:58 (5)	07:56		06:56	17:04 (4)	06:45		05:47	05:18		
	16:54	73	13:11 (5)	17:49		18:39	45	17:49 (4)	20:32		21:22	21:58
15	08:39	11:59 (5)	07:54		06:54	17:05 (4)	06:43		05:46	05:18		
	16:55	72	13:11 (5)	17:50		18:41	44	17:49 (4)	20:34		21:23	21:58
16	08:38	12:00 (5)	07:52		06:52	17:05 (4)	06:41		05:44	05:18		
	16:57	71	13:11 (5)	17:52		18:42	42	17:47 (4)	20:35		21:25	21:59
17	08:37	12:00 (5)	07:50		06:49	17:05 (4)	06:39		05:43	05:18		
	16:58	71	13:11 (5)	17:54		18:44	42	17:47 (4)	20:37		21:26	21:59
18	08:36	12:01 (5)	07:48		06:47	17:06 (4)	06:37		05:41	05:18		
	17:00	70	13:11 (5)	17:56		18:46	40	17:46 (4)	20:39		21:28	21:59
19	08:35	12:01 (5)	07:46		06:45	17:06 (4)	06:35		05:40	05:18		
	17:02	70	13:11 (5)	17:58		18:48	38	17:44 (4)	20:40		21:29	22:00
20	08:34	12:02 (5)	07:44		06:42	17:08 (4)	06:32		05:38	05:18		
	17:03	69	13:11 (5)	18:00		18:49	35	17:43 (4)	20:42		21:31	22:00
21	08:33	12:03 (5)	07:42		06:40	17:09 (4)	06:30		05:37	05:18		
	17:05	68	13:11 (5)	18:01		18:51	33	17:42 (4)	20:44		21:32	22:00
22	08:32	12:04 (5)	07:40		06:38	17:10 (4)	06:28		05:36	05:18		
	17:07	67	13:11 (5)	18:03		18:53	29	17:39 (4)	20:45		21:33	22:01
23	08:31	12:05 (5)	07:38		06:36	17:13 (4)	06:26		05:35	05:18		
	17:08	65	13:10 (5)	18:05		18:54	24	17:37 (4)	20:47		21:35	22:01
24	08:30	12:06 (5)	07:36		06:33	17:15 (4)	06:24		05:33	05:19		
	17:10	63	13:09 (5)	18:07		18:56	24	18:31 (3)	20:49		21:36	22:01
25	08:28	12:07 (5)	07:34	17:23 (4)	06:31	17:19 (4)	06:22		05:32	05:19		
	17:12	62	13:09 (5)	18:09	13	17:36 (4)	18:58	18:32 (3)	20:50		21:38	22:01
26	08:27	12:08 (5)	07:32	17:19 (4)	06:29	17:19 (4)	06:20		05:31	05:19		
	17:14	60	13:08 (5)	18:11	21	17:40 (4)	19:00	18:34 (3)	20:52		21:39	22:01
27	08:26	12:10 (5)	07:30	17:17 (4)	06:26	17:17 (4)	06:18		05:30	05:20		
	17:15	58	13:08 (5)	18:12	25	17:42 (4)	19:01	18:36 (3)	20:54		21:40	22:01
28	08:24	12:11 (5)	07:27	17:15 (4)	06:24	18:21 (3)	06:16		05:29	05:20		
	17:17	55	13:06 (5)	18:14	29	17:44 (4)	19:03	18:38 (3)	20:56		21:41	22:01
29	08:23	12:12 (5)			07:22	19:19 (3)	06:14		05:28	05:21		
	17:19	53	13:05 (5)		20:05	19:39 (3)	20:57		21:43	22:01		
30	08:21	12:14 (5)			07:19	19:19 (3)	06:12		05:27	05:21		
	17:21	50	13:04 (5)		20:06	19:41 (3)	20:59		21:44	22:00		
31	08:20	12:15 (5)			07:17	19:19 (3)			05:26			
	17:23	47	13:02 (5)		20:08	19:43 (3)			21:45			
Potential sun hours	259		278		367		416		485		498	
Total, worst case	2120		242		1068		132					
Sun reduction	0.18		0.27		0.30		0.38					
Oper. time red.	0.95		0.95		0.95		0.95					
Wind dir. red.	0.67		0.66		0.64		0.62					
Total reduction	0.11		0.17		0.19		0.22					
Total, real	239		41		199		29					

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

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

19065LE slagschaduw nieuwbouwwijk

Licensed user:

Bosch & Van Rijn

Franz-Lisztplantsoen 220

NL-3533 JG Utrecht

+31 6 51 71 04 93

Schreurs / leon@boschenvanrijn.nl

Calculated:

19-Aug-21 10:59 AM/3.4.388

SHADOW - Calendar

Calculation: VKA bovengrens met kantoren 12RD 210819 **Shadow receptor:** O - Shadow Receptor: 8.0 × 5.0 Azimuth: 0.0° Slope: 0.0° (10905)
Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) [DE BILT]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1.48 2.65 3.60 5.24 6.59 6.28 6.20 6.12 4.48 3.32 1.87 1.32

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 385 684 574 504 436 731 797 1,164 1,146 770 577 539 8,307

	July	August	September	October	November	December
1	05:22	05:58	06:48	07:37	17:44 (4)	07:30
	22:00	21:28	20:27	19:17	18:29 (4)	17:11
2	05:23	06:00	06:50	07:38	17:44 (4)	07:32
	22:00	21:27	20:24	19:15	18:29 (4)	17:09
3	05:23	06:01	06:51	07:40	17:42 (4)	07:34
	21:59	21:25	20:22	19:13	18:28 (4)	17:08
4	05:24	06:03	06:53	07:42	17:43 (4)	07:36
	21:59	21:23	20:20	19:10	18:28 (4)	17:06
5	05:25	06:05	06:54	19:20 (3)	07:43	17:43 (4)
	21:59	21:22	20:17	19:30 (3)	19:08	18:28 (4)
6	05:26	06:06	06:56	19:18 (3)	07:45	17:42 (4)
	21:58	21:20	20:15	19:32 (3)	19:06	18:26 (4)
7	05:27	06:08	06:58	19:15 (3)	07:47	17:42 (4)
	21:57	21:18	20:13	19:33 (3)	19:04	18:26 (4)
8	05:28	06:09	06:59	19:14 (3)	07:49	17:43 (4)
	21:57	21:16	20:11	19:34 (3)	19:01	18:25 (4)
9	05:29	06:11	07:01	19:12 (3)	07:50	17:44 (4)
	21:56	21:14	20:08	19:34 (3)	18:59	18:24 (4)
10	05:30	06:12	07:03	19:12 (3)	07:52	17:44 (4)
	21:55	21:13	20:06	19:35 (3)	18:57	18:23 (4)
11	05:31	06:14	07:04	19:11 (3)	07:54	17:45 (4)
	21:55	21:11	20:04	19:35 (3)	18:55	18:21 (4)
12	05:32	06:16	07:06	19:10 (3)	07:55	17:46 (4)
	21:54	21:09	20:01	19:34 (3)	18:52	18:20 (4)
13	05:33	06:17	07:07	19:10 (3)	07:57	17:47 (4)
	21:53	21:07	19:59	19:32 (3)	18:50	18:18 (4)
14	05:34	06:19	07:09	19:10 (3)	07:59	17:48 (4)
	21:52	21:05	19:57	19:30 (3)	18:48	18:16 (4)
15	05:35	06:20	07:11	19:10 (3)	08:00	17:50 (4)
	21:51	21:03	19:54	19:28 (3)	18:46	18:13 (4)
16	05:36	06:22	07:12	19:10 (3)	08:02	17:52 (4)
	21:50	21:01	19:52	19:25 (3)	18:44	18:11 (4)
17	05:37	06:24	07:14	19:11 (3)	08:04	17:57 (4)
	21:49	20:59	19:50	19:23 (3)	18:41	18:06 (4)
18	05:39	06:25	07:16	18:09 (4)	08:06	18:01
	21:48	20:57	19:47	19:21 (3)	18:39	16:44
19	05:40	06:27	07:17	18:03 (4)	08:07	18:02
	21:47	20:55	19:45	19:18 (3)	18:37	16:43
20	05:41	06:29	07:19	18:00 (4)	08:09	18:04
	21:46	20:53	19:43	18:23 (4)	18:35	16:42
21	05:43	06:30	07:20	17:56 (4)	08:11	18:06
	21:44	20:51	19:40	18:24 (4)	18:33	16:40
22	05:44	06:32	07:22	17:54 (4)	08:13	18:07
	21:43	20:48	19:38	18:26 (4)	18:31	16:39
23	05:45	06:33	07:24	17:53 (4)	08:14	18:09
	21:42	20:46	19:36	18:27 (4)	18:29	16:38
24	05:47	06:35	07:25	17:50 (4)	08:16	18:11
	21:40	20:44	19:33	18:27 (4)	18:27	16:37
25	05:48	06:37	07:27	17:49 (4)	07:18	18:12
	21:39	20:42	19:31	18:28 (4)	17:25	16:36
26	05:50	06:38	07:29	17:48 (4)	07:20	18:14
	21:38	20:40	19:29	18:29 (4)	17:23	16:35
27	05:51	06:40	07:30	17:46 (4)	07:22	18:15
	21:36	20:38	19:26	18:29 (4)	17:21	16:34
28	05:52	06:42	07:32	17:46 (4)	07:23	18:17
	21:35	20:35	19:24	18:29 (4)	17:19	16:33
29	05:54	06:43	07:34	17:45 (4)	07:25	18:18
	21:33	20:33	19:22	18:30 (4)	17:17	16:33
30	05:55	06:45	07:35	17:44 (4)	07:27	18:20
	21:32	20:31	19:20	18:29 (4)	17:15	16:32
31	05:57	06:46		07:29		
	21:30	20:29		17:13		16:35
Potential sun hours	502	454	381	332	267	244
Total, worst case			690	615	1452	2357
Sun reduction			0.35	0.31	0.21	0.17
Oper. time red.			0.95	0.95	0.95	0.95
Wind dir. red.			0.64	0.65	0.67	0.67
Total reduction			0.21	0.19	0.13	0.11
Total, real			148	118	195	252

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

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

Project:

19065LE slagschaduw nieuwbouwwijk

Licensed user:

Bosch & Van Rijn

Franz-Lisztplantsoen 220

NL-3533 JG Utrecht

+31 6 51 71 04 93

Schreurs / leon@boschenvanrijn.nl

Calculated:

19-Aug-21 10:59 AM/3.4.388

SHADOW - Calendar

Calculation: VKA bovengrens met kantoren 12RD 210819 **Shadow receptor:** P - Shadow Receptor: 8.0 × 5.0 Azimuth: 0.0° Slope: 0.0° (10906)
Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) [DE BILT]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1.48 2.65 3.60 5.24 6.59 6.28 6.20 6.12 4.48 3.32 1.87 1.32

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 385 684 574 504 436 731 797 1,164 1,146 770 577 539 8,307

	January		February		March		April		May		June	
1	08:45		11:18 (5)	08:18	11:38 (5)	07:25	17:19 (4)	07:15	19:21 (3)	06:10	05:25	
	16:37	81	12:39 (5)	17:24	12:41 (5)	18:16	17:44 (4)	20:10	19:44 (3)	21:01	21:46	
2	08:45		11:19 (5)	08:17	11:39 (5)	07:23	17:16 (4)	07:12	19:21 (3)	06:08	05:24	
	16:38	80	12:39 (5)	17:26	12:39 (5)	18:18	17:45 (4)	20:11	19:46 (3)	21:02	21:47	
3	08:45		11:20 (5)	08:15	11:40 (5)	07:21	17:14 (4)	07:10	19:21 (3)	06:06	05:23	
	16:39	80	12:40 (5)	17:28	12:38 (5)	18:20	17:47 (4)	20:13	19:46 (3)	21:04	21:48	
4	08:45		11:21 (5)	08:14	11:41 (5)	07:19	17:12 (4)	07:08	19:21 (3)	06:04	05:23	
	16:40	80	12:41 (5)	17:30	12:36 (5)	18:21	17:49 (4)	20:15	19:46 (3)	21:06	21:49	
5	08:44		11:20 (5)	08:12	11:44 (5)	07:16	17:11 (4)	07:06	19:21 (3)	06:03	05:22	
	16:41	81	12:41 (5)	17:32	12:35 (5)	18:23	17:50 (4)	20:17	19:45 (3)	21:07	21:50	
6	08:44		11:21 (5)	08:10	11:45 (5)	07:14	17:09 (4)	07:03	19:21 (3)	06:01	05:21	
	16:42	81	12:42 (5)	17:34	12:33 (5)	18:25	17:51 (4)	20:18	19:44 (3)	21:09	21:51	
7	08:44		11:21 (5)	08:09	11:47 (5)	07:12	17:08 (4)	07:01	19:22 (3)	05:59	05:21	
	16:44	81	12:42 (5)	17:36	12:31 (5)	18:27	17:52 (4)	20:20	19:43 (3)	21:10	21:52	
8	08:43		11:22 (5)	08:07	11:50 (5)	07:10	17:08 (4)	06:59	19:23 (3)	05:57	05:20	
	16:45	81	12:43 (5)	17:37	12:28 (5)	18:28	17:53 (4)	20:22	19:42 (3)	21:12	21:53	
9	08:43		11:23 (5)	08:05	11:53 (5)	07:08	17:07 (4)	06:57	19:24 (3)	05:56	05:20	
	16:46	80	12:43 (5)	17:39	12:24 (5)	18:30	17:53 (4)	20:23	19:39 (3)	21:14	21:54	
10	08:42		11:23 (5)	08:03	11:58 (5)	07:05	17:05 (4)	06:54	19:26 (3)	05:54	05:19	
	16:48	80	12:43 (5)	17:41	12:18 (5)	18:32	17:53 (4)	20:25	19:37 (3)	21:15	21:55	
11	08:42		11:23 (5)	08:02		07:03	17:05 (4)	06:52		05:52	05:19	
	16:49	80	12:43 (5)	17:43		18:34	17:54 (4)	20:27		21:17	21:56	
12	08:41		11:24 (5)	08:00		07:01	17:05 (4)	06:50		05:50	05:19	
	16:51	80	12:44 (5)	17:45		18:35	17:54 (4)	20:28		21:18	21:56	
13	08:40		11:25 (5)	07:58		06:58	17:04 (4)	06:48		05:49	05:18	
	16:52	79	12:44 (5)	17:47		18:37	17:53 (4)	20:30		21:20	21:57	
14	08:40		11:25 (5)	07:56		06:56	17:04 (4)	06:45		05:47	05:18	
	16:54	79	12:44 (5)	17:49		18:39	17:53 (4)	20:32		21:22	21:58	
15	08:39		11:26 (5)	07:54		06:54	17:04 (4)	06:43		05:46	05:18	
	16:55	79	12:45 (5)	17:50		18:41	17:54 (4)	20:34		21:23	21:58	
16	08:38		11:26 (5)	07:52		06:52	17:03 (4)	06:41		05:44	05:18	
	16:57	79	12:45 (5)	17:52		18:42	17:52 (4)	20:35		21:25	21:59	
17	08:37		11:27 (5)	07:50		06:49	17:03 (4)	06:39		05:43	05:18	
	16:58	78	12:45 (5)	17:54		18:44	17:52 (4)	20:37		21:26	21:59	
18	08:36		11:27 (5)	07:48		06:47	17:04 (4)	06:37		05:41	05:18	
	17:00	78	12:45 (5)	17:56		18:46	17:52 (4)	20:39		21:28	21:59	
19	08:35		11:27 (5)	07:46		06:45	17:03 (4)	06:35		05:40	05:18	
	17:02	78	12:45 (5)	17:58		18:48	17:51 (4)	20:40		21:29	22:00	
20	08:34		11:28 (5)	07:44		06:42	17:04 (4)	06:32		05:38	05:18	
	17:03	77	12:45 (5)	18:00		18:49	17:50 (4)	20:42		21:31	22:00	
21	08:33		11:29 (5)	07:42		06:40	17:05 (4)	06:30		05:37	05:18	
	17:05	76	12:45 (5)	18:01		18:51	17:50 (4)	20:44		21:32	22:00	
22	08:32		11:30 (5)	07:40		06:38	17:05 (4)	06:28		05:36	05:18	
	17:07	75	12:45 (5)	18:03		18:53	17:48 (4)	20:45		21:33	22:01	
23	08:31		11:30 (5)	07:38		06:36	17:06 (4)	06:26		05:35	05:18	
	17:08	74	12:44 (5)	18:05		18:54	17:47 (4)	20:47		21:35	22:01	
24	08:30		11:31 (5)	07:36		06:33	17:07 (4)	06:24		05:33	05:19	
	17:10	74	12:45 (5)	18:07		18:56	17:46 (4)	20:49		21:36	22:01	
25	08:28		11:32 (5)	07:34		06:31	17:07 (4)	06:22		05:32	05:19	
	17:12	73	12:45 (5)	18:09		18:58	17:44 (4)	20:50		21:38	22:01	
26	08:27		11:32 (5)	07:32		06:29	17:09 (4)	06:20		05:31	05:19	
	17:14	72	12:44 (5)	18:11		19:00	18:34 (3)	20:52		21:39	22:01	
27	08:26		11:33 (5)	07:30	17:26 (4)	06:26	17:11 (4)	06:18		05:30	05:20	
	17:15	71	12:44 (5)	18:12	17:36 (4)	19:01	18:36 (3)	20:54		21:40	22:01	
28	08:24		11:34 (5)	07:27	17:22 (4)	06:24	17:14 (4)	06:16		05:29	05:20	
	17:17	69	12:43 (5)	18:14	17:41 (4)	19:03	18:38 (3)	20:56		21:41	22:01	
29	08:23		11:34 (5)			07:22	18:16 (4)	06:14		05:28	05:21	
	17:19	68	12:42 (5)			20:05	19:39 (3)	20:57		21:43	22:01	
30	08:21		11:36 (5)			07:19	18:21 (4)	06:12		05:27	05:21	
	17:21	66	12:42 (5)			20:06	19:41 (3)	20:59		21:44	22:00	
31	08:20		11:36 (5)			07:17	19:23 (3)			05:26		
	17:23	65	12:41 (5)			20:08	19:43 (3)			21:45		
Potential sun hours	259		278			367	416			485	498	
Total, worst case	2375		497			1264			211			
Sun reduction	0.18		0.27			0.30			0.38			
Oper. time red.	0.95		0.95			0.95			0.95			
Wind dir. red.	0.65		0.65			0.64			0.62			
Total reduction	0.11		0.16			0.18			0.22			
Total, real	258		81			234			47			

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

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

Project:

19065LE slagschaduw nieuwbouwwijk

Licensed user:

Bosch & Van Rijn

Franz-Lisztplantsoen 220

NL-3533 JG Utrecht

+31 6 51 71 04 93

Schreurs / leon@boschenvanrijn.nl

Calculated:

19-Aug-21 10:59 AM/3.4.388

SHADOW - Calendar

Calculation: VKA bovengrens met kantoren 12RD 210819 **Shadow receptor:** P - Shadow Receptor: 8.0 × 5.0 Azimuth: 0.0° Slope: 0.0° (10906)
Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) [DE BILT]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1.48 2.65 3.60 5.24 6.59 6.28 6.20 6.12 4.48 3.32 1.87 1.32

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 385 684 574 504 436 731 797 1,164 1,146 770 577 539 8,307

	July	August	September	October	November	December
1	05:22	05:58	06:48	07:37	17:44 (4)	07:30
	22:00	21:28	20:27	19:17	18:33 (4)	17:11
2	05:23	06:00	06:50	19:25 (3)	07:38	11:26 (5)
	22:00	21:27	20:24	19:36 (3)	19:15	11:49 (5)
3	05:23	06:01	06:51	19:22 (3)	07:40	11:22 (5)
	21:59	21:25	20:22	19:37 (3)	19:13	11:54 (5)
4	05:24	06:03	06:53	19:21 (3)	07:42	11:19 (5)
	21:59	21:23	20:20	19:39 (3)	19:10	11:58 (5)
5	05:25	06:05	06:54	19:18 (3)	07:44	11:17 (5)
	21:59	21:22	20:17	19:39 (3)	19:08	11:51 (5)
6	05:26	06:06	06:56	19:18 (3)	07:45	12:03 (5)
	21:58	21:20	20:15	19:40 (3)	19:06	11:13 (5)
7	05:27	06:08	06:58	19:16 (3)	07:47	11:35 (5)
	21:57	21:18	20:13	19:40 (3)	19:04	11:12 (5)
8	05:28	06:09	06:59	19:16 (3)	07:49	12:07 (5)
	21:57	21:16	20:11	19:40 (3)	19:01	11:11 (5)
9	05:29	06:11	07:01	19:14 (3)	07:50	12:09 (5)
	21:56	21:14	20:08	19:40 (3)	18:59	11:10 (5)
10	05:30	06:12	07:03	19:14 (3)	07:52	12:10 (5)
	21:55	21:13	20:06	19:39 (3)	18:57	11:09 (5)
11	05:31	06:14	07:04	19:15 (3)	07:54	12:12 (5)
	21:55	21:11	20:04	19:37 (3)	18:55	11:08 (5)
12	05:32	06:16	07:06	19:14 (3)	07:55	12:13 (5)
	21:54	21:09	20:01	19:34 (3)	18:52	11:07 (5)
13	05:33	06:17	07:07	18:14 (4)	07:57	12:14 (5)
	21:53	21:07	19:59	19:32 (3)	18:50	11:06 (5)
14	05:34	06:19	07:09	18:07 (4)	07:59	12:15 (5)
	21:52	21:05	19:57	19:30 (3)	18:48	11:05 (5)
15	05:35	06:20	07:11	18:04 (4)	08:00	12:16 (5)
	21:51	21:03	19:54	19:28 (3)	18:46	11:05 (5)
16	05:36	06:22	07:12	18:00 (4)	08:02	12:17 (5)
	21:50	21:01	19:52	19:25 (3)	18:44	11:05 (5)
17	05:37	06:24	07:14	17:58 (4)	08:04	12:18 (5)
	21:49	20:59	19:50	19:23 (3)	18:41	11:05 (5)
18	05:39	06:25	07:16	17:56 (4)	08:06	12:19 (5)
	21:48	20:57	19:47	18:32 (4)	18:39	11:05 (5)
19	05:40	06:27	07:17	17:54 (4)	08:07	12:20 (5)
	21:47	20:55	19:45	18:32 (4)	18:37	11:04 (5)
20	05:41	06:29	07:19	17:52 (4)	08:09	12:21 (5)
	21:46	20:53	19:43	18:33 (4)	18:35	11:04 (5)
21	05:43	06:30	07:20	17:50 (4)	08:11	12:22 (5)
	21:44	20:51	19:40	18:33 (4)	18:33	11:04 (5)
22	05:44	06:32	07:22	17:49 (4)	08:13	12:23 (5)
	21:43	20:48	19:38	18:34 (4)	18:31	11:04 (5)
23	05:45	06:33	07:24	17:49 (4)	08:14	12:24 (5)
	21:42	20:46	19:36	18:35 (4)	18:29	11:04 (5)
24	05:47	06:35	07:25	17:47 (4)	08:16	12:25 (5)
	21:40	20:44	19:33	18:34 (4)	18:27	11:04 (5)
25	05:48	06:37	07:27	17:46 (4)	07:18	12:26 (5)
	21:39	20:42	19:31	18:35 (4)	17:25	11:05 (5)
26	05:50	06:38	07:29	17:46 (4)	07:20	12:27 (5)
	21:38	20:40	19:29	18:35 (4)	17:23	11:05 (5)
27	05:51	06:40	07:30	17:45 (4)	07:22	12:28 (5)
	21:36	20:38	19:26	18:34 (4)	17:21	11:05 (5)
28	05:52	06:42	07:32	17:45 (4)	07:23	12:29 (5)
	21:35	20:35	19:24	18:34 (4)	17:19	11:05 (5)
29	05:54	06:43	07:34	17:44 (4)	07:25	12:30 (5)
	21:33	20:33	19:22	18:34 (4)	17:17	11:05 (5)
30	05:55	06:45	07:35	17:43 (4)	07:27	12:31 (5)
	21:32	20:31	19:20	18:33 (4)	17:15	11:05 (5)
31	05:57	06:46		07:29		12:32 (5)
	21:30	20:29		17:13		11:19 (5)
Potential sun hours	502	454	381	332	267	244
Total, worst case			982	536	1966	2490
Sun reduction			0.35	0.31	0.21	0.17
Oper. time red.			0.95	0.95	0.95	0.95
Wind dir. red.			0.63	0.64	0.65	0.65
Total reduction			0.21	0.19	0.13	0.10
Total, real			209	101	254	256

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

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

Project:

19065LE slagschaduw nieuwbouwwijk

Licensed user:

Bosch & Van Rijn

Franz-Lisztplantsoen 220

NL-3533 JG Utrecht

+31 6 51 71 04 93

Schreurs / leon@boschenvanrijn.nl

Calculated:

19-Aug-21 10:59 AM/3.4.388

SHADOW - Calendar

Calculation: VKA bovengrens met kantoren 12RD 210819 Shadow receptor: Q - Shadow Receptor: 8.0 × 5.0 Azimuth: 0.0° Slope: 0.0° (10907)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [DE BILT]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec

1.48 2.65 3.60 5.24 6.59 6.28 6.20 6.12 4.48 3.32 1.87 1.32

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
385	684	574	504	436	731	797	1,164	1,146	770	577	539	8,307

	January		February		March		April		May		June	
1	08:45		11:20 (5)	08:18	11:41 (5)	07:25	17:16 (4)	07:15	19:21 (3)	06:10	05:25	
	16:37	80	12:40 (5)	17:24	12:40 (5)	18:16	17:44 (4)	20:10	19:44 (3)	21:01	21:46	
2	08:45		11:21 (5)	08:17	11:42 (5)	07:23	17:13 (4)	07:12	19:20 (3)	06:08	05:24	
	16:38	79	12:40 (5)	17:26	12:39 (5)	18:18	17:45 (4)	20:11	19:46 (3)	21:02	21:47	
3	08:45		11:22 (5)	08:15	11:43 (5)	07:21	17:11 (4)	07:10	19:20 (3)	06:06	05:23	
	16:39	79	12:41 (5)	17:28	12:37 (5)	18:20	17:47 (4)	20:13	19:46 (3)	21:04	21:48	
4	08:45		11:22 (5)	08:14	11:44 (5)	07:19	17:10 (4)	07:08	19:21 (3)	06:04	05:23	
	16:40	80	12:42 (5)	17:30	12:35 (5)	18:21	17:49 (4)	20:15	19:45 (3)	21:06	21:49	
5	08:44		11:22 (5)	08:12	11:47 (5)	07:16	17:09 (4)	07:06	19:20 (3)	06:03	05:22	
	16:41	80	12:42 (5)	17:32	12:34 (5)	18:23	17:50 (4)	20:17	19:44 (3)	21:07	21:50	
6	08:44		11:23 (5)	08:10	11:49 (5)	07:14	17:07 (4)	07:03	19:21 (3)	06:01	05:21	
	16:42	80	12:43 (5)	17:34	12:32 (5)	18:25	17:50 (4)	20:18	19:43 (3)	21:09	21:51	
7	08:44		11:23 (5)	08:09	11:52 (5)	07:12	17:06 (4)	07:01	19:22 (3)	05:59	05:21	
	16:44	80	12:43 (5)	17:36	12:29 (5)	18:27	17:51 (4)	20:20	19:42 (3)	21:10	21:52	
8	08:43		11:24 (5)	08:07	11:55 (5)	07:10	17:06 (4)	06:59	19:23 (3)	05:57	05:20	
	16:45	80	12:44 (5)	17:37	12:26 (5)	18:28	17:52 (4)	20:22	19:40 (3)	21:12	21:53	
9	08:43		11:24 (5)	08:05	11:59 (5)	07:08	17:05 (4)	06:57	19:24 (3)	05:56	05:20	
	16:46	80	12:44 (5)	17:39	12:20 (5)	18:30	17:52 (4)	20:23	19:38 (3)	21:14	21:54	
10	08:42		11:25 (5)	08:03		07:05	17:04 (4)	06:54	19:27 (3)	05:54	05:19	
	16:48	79	12:44 (5)	17:41		18:32	17:52 (4)	20:25	19:34 (3)	21:15	21:55	
11	08:42		11:25 (5)	08:02		07:03	17:04 (4)	06:52		05:52	05:19	
	16:49	79	12:44 (5)	17:43		18:34	17:52 (4)	20:27		21:17	21:56	
12	08:41		11:26 (5)	08:00		07:01	17:03 (4)	06:50		05:50	05:19	
	16:51	79	12:45 (5)	17:45		18:35	17:53 (4)	20:28		21:18	21:56	
13	08:40		11:27 (5)	07:58		06:58	17:02 (4)	06:48		05:49	05:18	
	16:52	78	12:45 (5)	17:47		18:37	17:52 (4)	20:30		21:20	21:57	
14	08:40		11:27 (5)	07:56		06:56	17:02 (4)	06:45		05:47	05:18	
	16:54	78	12:45 (5)	17:49		18:39	17:52 (4)	20:32		21:22	21:58	
15	08:39		11:28 (5)	07:54		06:54	17:03 (4)	06:43		05:46	05:18	
	16:55	77	12:45 (5)	17:50		18:41	17:52 (4)	20:34		21:23	21:58	
16	08:38		11:28 (5)	07:52		06:52	17:02 (4)	06:41		05:44	05:18	
	16:57	77	12:45 (5)	17:52		18:42	17:51 (4)	20:35		21:25	21:59	
17	08:37		11:29 (5)	07:50		06:49	17:02 (4)	06:39		05:43	05:18	
	16:58	77	12:46 (5)	17:54		18:44	17:51 (4)	20:37		21:26	21:59	
18	08:36		11:29 (5)	07:48		06:47	17:03 (4)	06:37		05:41	05:18	
	17:00	77	12:46 (5)	17:56		18:46	17:50 (4)	20:39		21:28	21:59	
19	08:35		11:29 (5)	07:46		06:45	17:02 (4)	06:35		05:40	05:18	
	17:02	76	12:45 (5)	17:58		18:48	17:49 (4)	20:40		21:29	22:00	
20	08:34		11:30 (5)	07:44		06:42	17:03 (4)	06:32		05:38	05:18	
	17:03	75	12:45 (5)	18:00		18:49	17:48 (4)	20:42		21:31	22:00	
21	08:33		11:31 (5)	07:42		06:40	17:04 (4)	06:30		05:37	05:18	
	17:05	74	12:45 (5)	18:01		18:51	17:47 (4)	20:44		21:32	22:00	
22	08:32		11:32 (5)	07:40		06:38	17:04 (4)	06:28		05:36	05:18	
	17:07	74	12:46 (5)	18:03		18:53	17:46 (4)	20:45		21:33	22:01	
23	08:31		11:32 (5)	07:38		06:36	17:05 (4)	06:26		05:35	05:18	
	17:08	73	12:45 (5)	18:05		18:54	17:44 (4)	20:47		21:35	22:01	
24	08:30		11:33 (5)	07:36		06:33	17:07 (4)	06:24		05:33	05:19	
	17:10	72	12:45 (5)	18:07		18:56	17:43 (4)	20:49		21:36	22:01	
25	08:28		11:34 (5)	07:34		06:31	17:08 (4)	06:22		05:32	05:19	
	17:12	71	12:45 (5)	18:09		18:58	17:41 (4)	20:50		21:38	22:01	
26	08:27		11:34 (5)	07:32	17:27 (4)	06:29	17:10 (4)	06:20		05:31	05:19	
	17:14	70	12:44 (5)	18:11	17:33 (4)	19:00	18:34 (3)	20:52		21:39	22:01	
27	08:26		11:36 (5)	07:30	17:21 (4)	06:26	17:12 (4)	06:18		05:30	05:20	
	17:15	68	12:44 (5)	18:12	17:39 (4)	19:01	18:36 (3)	20:54		21:40	22:01	
28	08:24		11:36 (5)	07:27	17:18 (4)	06:24	17:15 (4)	06:16		05:29	05:20	
	17:17	67	12:43 (5)	18:14	17:42 (4)	19:03	18:38 (3)	20:56		21:41	22:01	
29	08:23		11:36 (5)			07:22	18:19 (4)	06:14		05:28	05:21	
	17:19	66	12:42 (5)			20:05	19:39 (3)	20:57		21:43	22:01	
30	08:21		11:38 (5)			07:19	19:22 (3)	06:12		05:27	05:21	
	17:21	64	12:42 (5)			20:06	19:41 (3)	20:59		21:44	22:00	
31	08:20		11:39 (5)			07:17	19:22 (3)			05:26		
	17:23	62	12:41 (5)			20:08	19:43 (3)			21:45		
Potential sun hours	259		278			367	416			485	498	
Total, worst case	2331		448			1248			203			
Sun reduction	0.18		0.27			0.30			0.38			
Oper. time red.	0.95		0.95			0.95			0.95			
Wind dir. red.	0.65		0.65			0.64			0.62			
Total reduction	0.11		0.16			0.19			0.22			
Total, real	254		74			231			45			

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

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

Project:

19065LE slagschaduw nieuwbouwwijk

Licensed user:

Bosch & Van Rijn

Franz-Lisztplantsoen 220

NL-3533 JG Utrecht

+31 6 51 71 04 93

Schreurs / leon@boschenvanrijn.nl

Calculated:

19-Aug-21 10:59 AM/3.4.388

SHADOW - Calendar

Calculation: VKA bovengrens met kantoren 12RD 210819 **Shadow receptor:** Q - Shadow Receptor: 8.0 × 5.0 Azimuth: 0.0° Slope: 0.0° (10907)
Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) [DE BILT]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1.48 2.65 3.60 5.24 6.59 6.28 6.20 6.12 4.48 3.32 1.87 1.32

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 385 684 574 504 436 731 797 1,164 1,146 770 577 539 8,307

	July	August	September	October	November	December
1	05:22	05:58	06:48	07:37	17:42 (4)	07:30
	22:00	21:28	20:27	19:17	18:32 (4)	17:11
2	05:23	06:00	06:50	19:26 (3)	07:38	17:42 (4)
	22:00	21:27	20:24	19:33 (3)	19:15	18:31 (4)
3	05:23	06:01	06:51	19:22 (3)	07:40	17:42 (4)
	21:59	21:25	20:22	19:36 (3)	19:13	18:30 (4)
4	05:24	06:03	06:53	19:20 (3)	07:42	17:42 (4)
	21:59	21:23	20:20	19:37 (3)	19:10	18:30 (4)
5	05:25	06:05	06:54	19:18 (3)	07:44	17:42 (4)
	21:59	21:22	20:17	19:38 (3)	19:08	18:29 (4)
6	05:26	06:06	06:56	19:17 (3)	07:45	17:42 (4)
	21:58	21:20	20:15	19:39 (3)	19:06	18:27 (4)
7	05:27	06:08	06:58	19:15 (3)	07:47	17:43 (4)
	21:57	21:18	20:13	19:39 (3)	19:04	18:27 (4)
8	05:28	06:09	06:59	19:15 (3)	07:49	17:44 (4)
	21:57	21:16	20:11	19:39 (3)	19:01	18:26 (4)
9	05:29	06:11	07:01	19:14 (3)	07:50	17:45 (4)
	21:56	21:14	20:08	19:39 (3)	18:59	18:24 (4)
10	05:30	06:12	07:03	19:14 (3)	07:52	17:45 (4)
	21:55	21:13	20:06	19:39 (3)	18:57	18:22 (4)
11	05:31	06:14	07:04	19:14 (3)	07:54	17:46 (4)
	21:55	21:11	20:04	19:37 (3)	18:55	18:20 (4)
12	05:32	06:16	07:06	19:13 (3)	07:55	17:48 (4)
	21:54	21:09	20:01	19:34 (3)	18:52	18:19 (4)
13	05:33	06:17	07:07	19:14 (3)	07:57	17:50 (4)
	21:53	21:07	19:59	19:32 (3)	18:50	18:16 (4)
14	05:34	06:19	07:09	18:11 (4)	07:59	17:51 (4)
	21:52	21:05	19:57	19:30 (3)	18:48	18:13 (4)
15	05:35	06:20	07:11	18:05 (4)	08:00	17:55 (4)
	21:51	21:03	19:54	19:28 (3)	18:46	18:09 (4)
16	05:36	06:22	07:12	18:01 (4)	08:02	17:57
	21:50	21:01	19:52	19:25 (3)	18:44	16:47
17	05:37	06:24	07:14	17:59 (4)	08:04	17:59
	21:49	20:59	19:50	19:23 (3)	18:41	16:45
18	05:39	06:25	07:16	17:57 (4)	08:06	16:45
	21:48	20:57	19:47	18:29 (4)	18:39	16:44
19	05:40	06:27	07:17	17:54 (4)	08:07	16:44
	21:47	20:55	19:45	18:29 (4)	18:37	16:43
20	05:41	06:29	07:19	17:52 (4)	08:09	16:43
	21:46	20:53	19:43	18:31 (4)	18:35	16:42
21	05:43	06:30	07:20	17:50 (4)	08:11	16:42
	21:44	20:51	19:40	18:31 (4)	18:33	16:40
22	05:44	06:32	07:22	17:49 (4)	08:13	16:40
	21:43	20:48	19:38	18:32 (4)	18:31	16:39
23	05:45	06:33	07:24	17:48 (4)	08:14	16:38
	21:42	20:46	19:36	18:33 (4)	18:29	16:38
24	05:47	06:35	07:25	17:46 (4)	08:16	16:37
	21:40	20:44	19:33	18:32 (4)	18:27	16:37
25	05:48	06:37	07:27	17:46 (4)	07:18	16:36
	21:39	20:42	19:31	18:33 (4)	17:25	16:36
26	05:50	06:38	07:29	17:45 (4)	07:20	16:36
	21:38	20:40	19:29	18:33 (4)	17:23	16:35
27	05:51	06:40	07:30	17:44 (4)	07:22	16:35
	21:36	20:38	19:26	18:32 (4)	17:21	16:34
28	05:52	06:42	07:32	17:43 (4)	07:23	16:34
	21:35	20:35	19:24	18:33 (4)	17:19	16:33
29	05:54	06:43	07:34	17:43 (4)	07:25	16:33
	21:33	20:33	19:22	18:33 (4)	17:17	16:33
30	05:55	06:45	07:35	17:42 (4)	07:27	16:32
	21:32	20:31	19:20	18:32 (4)	17:15	16:32
31	05:57	06:46		07:29		16:32
	21:30	20:29		17:13		16:35
Potential sun hours	502	454	381	332	267	244
Total, worst case			937	576	1862	2464
Sun reduction			0.35	0.31	0.21	0.17
Oper. time red.			0.95	0.95	0.95	0.95
Wind dir. red.			0.64	0.64	0.65	0.65
Total reduction			0.21	0.19	0.13	0.10
Total, real			200	109	241	254

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

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

Project:

19065LE slagschaduw nieuwbouwwijk

Licensed user:

Bosch & Van Rijn

Franz-Lisztplantsoen 220

NL-3533 JG Utrecht

+31 6 51 71 04 93

Schreurs / leon@boschenvanrijn.nl

Calculated:

19-Aug-21 10:59 AM/3.4.388

SHADOW - Calendar

Calculation: VKA bovengrens met kantoren 12RD 210819 **Shadow receptor:** R - Shadow Receptor: 8.0 × 5.0 Azimuth: 0.0° Slope: 0.0° (10908)
Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) [DE BILT]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1.48 2.65 3.60 5.24 6.59 6.28 6.20 6.12 4.48 3.32 1.87 1.32

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 385 684 574 504 436 731 797 1,164 1,146 770 577 539 8,307

	January		February		March		April		May		June	
1	08:45		11:19 (5)	08:18	11:41 (5)	07:25	17:12 (4)	07:15	19:20 (3)	06:10	05:25	
	16:37	79	12:38 (5)	17:24	12:38 (5)	18:16	17:44 (4)	20:10	19:44 (3)	21:01	21:46	
2	08:45		11:20 (5)	08:17	11:42 (5)	07:23	17:10 (4)	07:12	19:20 (3)	06:08	05:24	
	16:38	79	12:39 (5)	17:26	12:36 (5)	18:18	17:45 (4)	20:11	19:45 (3)	21:02	21:47	
3	08:45		11:21 (5)	08:15	11:43 (5)	07:21	17:09 (4)	07:10	19:20 (3)	06:06	05:23	
	16:39	78	12:39 (5)	17:28	12:34 (5)	18:20	17:47 (4)	20:13	19:45 (3)	21:04	21:48	
4	08:45		11:22 (5)	08:14	11:45 (5)	07:19	17:08 (4)	07:08	19:20 (3)	06:04	05:23	
	16:40	78	12:40 (5)	17:30	12:33 (5)	18:21	17:48 (4)	20:15	19:44 (3)	21:06	21:49	
5	08:44		11:22 (5)	08:12	11:48 (5)	07:16	17:07 (4)	07:06	19:20 (3)	06:03	05:22	
	16:41	78	12:40 (5)	17:32	12:31 (5)	18:23	17:49 (4)	20:17	19:43 (3)	21:07	21:50	
6	08:44		11:22 (5)	08:10	11:50 (5)	07:14	17:05 (4)	07:03	19:21 (3)	06:01	05:21	
	16:42	79	12:41 (5)	17:34	12:29 (5)	18:25	17:49 (4)	20:18	19:42 (3)	21:09	21:51	
7	08:44		11:22 (5)	08:09	11:53 (5)	07:12	17:04 (4)	07:01	19:22 (3)	05:59	05:21	
	16:44	79	12:41 (5)	17:36	12:25 (5)	18:27	17:50 (4)	20:20	19:41 (3)	21:10	21:52	
8	08:43		11:24 (5)	08:07	11:57 (5)	07:10	17:04 (4)	06:59	19:23 (3)	05:57	05:20	
	16:45	78	12:42 (5)	17:37	12:20 (5)	18:28	17:51 (4)	20:22	19:39 (3)	21:12	21:53	
9	08:43		11:24 (5)	08:05	12:05 (5)	07:08	17:03 (4)	06:57	19:24 (3)	05:56	05:20	
	16:46	78	12:42 (5)	17:39	12:10 (5)	18:30	17:51 (4)	20:23	19:36 (3)	21:14	21:54	
10	08:42		11:24 (5)	08:03		07:05	17:02 (4)	06:54		05:54	05:19	
	16:48	78	12:42 (5)	17:41		18:32	17:51 (4)	20:25		21:15	21:55	
11	08:42		11:24 (5)	08:02		07:03	17:02 (4)	06:52		05:52	05:19	
	16:49	78	12:42 (5)	17:43		18:34	17:51 (4)	20:27		21:17	21:56	
12	08:41		11:26 (5)	08:00		07:01	17:02 (4)	06:50		05:50	05:19	
	16:51	77	12:43 (5)	17:45		18:35	17:51 (4)	20:28		21:18	21:56	
13	08:40		11:26 (5)	07:58		06:58	17:01 (4)	06:48		05:49	05:18	
	16:52	77	12:43 (5)	17:47		18:37	17:50 (4)	20:30		21:20	21:57	
14	08:40		11:26 (5)	07:56		06:56	17:01 (4)	06:45		05:47	05:18	
	16:54	77	12:43 (5)	17:49		18:39	17:50 (4)	20:32		21:22	21:58	
15	08:39		11:27 (5)	07:54		06:54	17:01 (4)	06:43		05:46	05:18	
	16:55	76	12:43 (5)	17:50		18:41	17:50 (4)	20:34		21:23	21:58	
16	08:38		11:27 (5)	07:52		06:52	17:00 (4)	06:41		05:44	05:18	
	16:57	77	12:44 (5)	17:52		18:42	17:49 (4)	20:35		21:25	21:59	
17	08:37		11:28 (5)	07:50		06:49	17:01 (4)	06:39		05:43	05:18	
	16:58	76	12:44 (5)	17:54		18:44	17:49 (4)	20:37		21:26	21:59	
18	08:36		11:29 (5)	07:48		06:47	17:01 (4)	06:37		05:41	05:18	
	17:00	75	12:44 (5)	17:56		18:46	17:48 (4)	20:39		21:28	21:59	
19	08:35		11:28 (5)	07:46		06:45	17:01 (4)	06:35		05:40	05:18	
	17:02	75	12:43 (5)	17:58		18:48	17:47 (4)	20:40		21:29	22:00	
20	08:34		11:29 (5)	07:44		06:42	17:02 (4)	06:32		05:38	05:18	
	17:03	74	12:43 (5)	18:00		18:49	17:46 (4)	20:42		21:31	22:00	
21	08:33		11:30 (5)	07:42		06:40	17:03 (4)	06:30		05:37	05:18	
	17:05	74	12:44 (5)	18:01		18:51	17:45 (4)	20:44		21:32	22:00	
22	08:32		11:31 (5)	07:40		06:38	17:03 (4)	06:28		05:36	05:18	
	17:07	73	12:44 (5)	18:03		18:53	17:43 (4)	20:45		21:33	22:01	
23	08:31		11:31 (5)	07:38		06:36	17:05 (4)	06:26		05:35	05:18	
	17:08	72	12:43 (5)	18:05		18:54	17:42 (4)	20:47		21:35	22:01	
24	08:30		11:32 (5)	07:36		06:33	17:06 (4)	06:24		05:33	05:19	
	17:10	71	12:43 (5)	18:07		18:56	17:41 (4)	20:49		21:36	22:01	
25	08:28		11:34 (5)	07:34		06:31	17:07 (4)	06:22		05:32	05:19	
	17:12	69	12:43 (5)	18:09		18:58	18:32 (3)	20:50		21:38	22:01	
26	08:27		11:34 (5)	07:32	17:20 (4)	06:29	17:10 (4)	06:20		05:31	05:19	
	17:14	68	12:42 (5)	18:11	17:36 (4)	19:00	18:34 (3)	20:52		21:39	22:01	
27	08:26		11:35 (5)	07:30	17:17 (4)	06:26	17:12 (4)	06:18		05:30	05:20	
	17:15	67	12:42 (5)	18:12	17:40 (4)	19:01	18:36 (3)	20:54		21:40	22:01	
28	08:24		11:36 (5)	07:27	17:14 (4)	06:24	17:16 (4)	06:16		05:29	05:20	
	17:17	65	12:41 (5)	18:14	17:42 (4)	19:03	18:38 (3)	20:56		21:41	22:01	
29	08:23		11:37 (5)			07:22	19:22 (3)	06:14		05:28	05:21	
	17:19	64	12:41 (5)			20:05	19:39 (3)	20:57		21:43	22:01	
30	08:21		11:38 (5)			07:19	19:21 (3)	06:12		05:27	05:21	
	17:21	62	12:40 (5)			20:06	19:41 (3)	20:59		21:44	22:00	
31	08:20		11:39 (5)			07:17	19:21 (3)			05:26		
	17:23	59	12:38 (5)			20:08	19:43 (3)			21:45		
Potential sun hours	259		278			367	416		485	498		
Total, worst case	2290		419			1237		189				
Sun reduction	0.18		0.27			0.30		0.38				
Oper. time red.	0.95		0.95			0.95		0.95				
Wind dir. red.	0.65		0.65			0.64		0.62				
Total reduction	0.11		0.16			0.19		0.22				
Total, real	249		69			230		42				

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

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

Project:

19065LE slagschaduw nieuwbouwwijk

Licensed user:

Bosch & Van Rijn

Franz-Lisztplantsoen 220

NL-3533 JG Utrecht

+31 6 51 71 04 93

Schreurs / leon@boschenvanrijn.nl

Calculated:

19-Aug-21 10:59 AM/3.4.388

SHADOW - Calendar

Calculation: VKA bovengrens met kantoren 12RD 210819 **Shadow receptor:** R - Shadow Receptor: 8.0 × 5.0 Azimuth: 0.0° Slope: 0.0° (10908)
Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) [DE BILT]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1.48 2.65 3.60 5.24 6.59 6.28 6.20 6.12 4.48 3.32 1.87 1.32

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 385 684 574 504 436 731 797 1,164 1,146 770 577 539 8,307

	July	August	September	October	November	December
1	05:22	05:58	06:48	07:37	17:40 (4)	07:30
	22:00	21:28	20:27	19:17	18:30 (4)	17:11
2	05:23	06:00	06:50	19:28 (3)	07:38	17:40 (4)
	22:00	21:27	20:24	19:30 (3)	19:15	18:30 (4)
3	05:23	06:01	06:51	19:22 (3)	07:40	17:40 (4)
	21:59	21:25	20:22	19:34 (3)	19:13	18:29 (4)
4	05:24	06:03	06:53	19:20 (3)	07:42	17:40 (4)
	21:59	21:23	20:20	19:36 (3)	19:10	18:28 (4)
5	05:25	06:05	06:54	19:18 (3)	07:44	17:40 (4)
	21:59	21:22	20:18	19:37 (3)	19:08	18:28 (4)
6	05:26	06:06	06:56	19:17 (3)	07:45	17:40 (4)
	21:58	21:20	20:15	19:38 (3)	19:06	18:26 (4)
7	05:27	06:08	06:58	19:15 (3)	07:47	17:40 (4)
	21:57	21:18	20:13	19:38 (3)	19:04	18:25 (4)
8	05:28	06:09	06:59	19:14 (3)	07:49	17:41 (4)
	21:57	21:16	20:11	19:38 (3)	19:01	18:25 (4)
9	05:29	06:11	07:01	19:13 (3)	07:50	17:42 (4)
	21:56	21:14	20:08	19:38 (3)	18:59	18:24 (4)
10	05:30	06:12	07:03	19:13 (3)	07:52	17:42 (4)
	21:55	21:13	20:06	19:38 (3)	18:57	18:21 (4)
11	05:31	06:14	07:04	19:13 (3)	07:54	17:43 (4)
	21:55	21:11	20:04	19:37 (3)	18:55	18:20 (4)
12	05:32	06:16	07:06	19:12 (3)	07:55	17:45 (4)
	21:54	21:09	20:01	19:34 (3)	18:52	18:18 (4)
13	05:33	06:17	07:07	19:13 (3)	07:57	17:46 (4)
	21:53	21:07	19:59	19:32 (3)	18:50	18:16 (4)
14	05:34	06:19	07:09	19:12 (3)	07:59	17:47 (4)
	21:52	21:05	19:57	19:30 (3)	18:48	18:13 (4)
15	05:35	06:20	07:11	18:07 (4)	08:00	17:50 (4)
	21:51	21:03	19:54	19:28 (3)	18:46	18:11 (4)
16	05:36	06:22	07:12	18:01 (4)	08:02	17:54 (4)
	21:50	21:01	19:52	19:25 (3)	18:44	18:07 (4)
17	05:37	06:24	07:14	17:59 (4)	08:04	17:59 (4)
	21:49	20:59	19:50	19:23 (3)	18:41	16:45
18	05:39	06:25	07:16	17:56 (4)	08:06	16:45
	21:48	20:57	19:47	19:21 (3)	18:39	16:44
19	05:40	06:27	07:17	17:53 (4)	08:07	16:44
	21:47	20:55	19:45	18:27 (4)	18:37	16:43
20	05:41	06:29	07:19	17:52 (4)	08:09	16:43
	21:46	20:53	19:43	18:28 (4)	18:35	16:42
21	05:43	06:30	07:20	17:49 (4)	08:11	16:40
	21:44	20:51	19:40	18:28 (4)	18:33	16:40
22	05:44	06:32	07:22	17:48 (4)	08:13	16:40
	21:43	20:48	19:38	18:29 (4)	18:31	16:39
23	05:45	06:33	07:24	17:47 (4)	08:14	16:38
	21:42	20:46	19:36	18:30 (4)	18:29	16:38
24	05:47	06:35	07:25	17:45 (4)	08:16	16:37
	21:40	20:44	19:33	18:30 (4)	18:27	16:37
25	05:48	06:37	07:27	17:44 (4)	07:18	16:36
	21:39	20:42	19:31	18:31 (4)	17:25	16:36
26	05:50	06:38	07:29	17:44 (4)	07:20	16:35
	21:38	20:40	19:29	18:31 (4)	17:23	16:35
27	05:51	06:40	07:30	17:42 (4)	07:22	16:35
	21:36	20:38	19:26	18:31 (4)	17:21	16:34
28	05:52	06:42	07:32	17:42 (4)	07:23	16:34
	21:35	20:35	19:24	18:31 (4)	17:19	16:33
29	05:54	06:43	07:34	17:42 (4)	07:25	16:33
	21:33	20:33	19:22	18:31 (4)	17:17	16:33
30	05:55	06:45	07:35	17:40 (4)	07:27	16:32
	21:32	20:31	19:20	18:30 (4)	17:15	16:32
31	05:57	06:46		07:29		16:32
	21:30	20:29		17:13		16:31
Potential sun hours	502	454	381	332	267	244
Total, worst case			902	621	1790	2434
Sun reduction			0.35	0.31	0.21	0.17
Oper. time red.			0.95	0.95	0.95	0.95
Wind dir. red.			0.64	0.65	0.65	0.65
Total reduction			0.21	0.19	0.13	0.10
Total, real			192	118	231	250

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

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

Project:

19065LE slagschaduw nieuwbouwwijk

Licensed user:

Bosch & Van Rijn

Franz-Lisztplantsoen 220

NL-3533 JG Utrecht

+31 6 51 71 04 93

Schreurs / leon@boschenvanrijn.nl

Calculated:

19-Aug-21 10:59 AM/3.4.388

SHADOW - Calendar

Calculation: VKA bovengrens met kantoren 12RD 210819 **Shadow receptor:** S - Shadow Receptor: 8.0 × 5.0 Azimuth: 0.0° Slope: 0.0° (10909)
Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) [DE BILT]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1.48 2.65 3.60 5.24 6.59 6.28 6.20 6.12 4.48 3.32 1.87 1.32

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 385 684 574 504 436 731 797 1,164 1,146 770 577 539 8,307

	January		February		March		April		May		June	
1	08:45		11:17 (5)	08:18	11:40 (5)	07:25	17:09 (4)	07:15	19:19 (3)	06:10	05:25	
	16:37	78	12:35 (5)	17:24	12:34 (5)	18:16	17:44 (4)	20:10	19:44 (3)	21:01	21:46	
2	08:45		11:18 (5)	08:17	11:41 (5)	07:23	17:07 (4)	07:12	19:19 (3)	06:08	05:24	
	16:38	78	12:36 (5)	17:26	12:32 (5)	18:18	17:44 (4)	20:11	19:44 (3)	21:02	21:47	
3	08:45		11:19 (5)	08:15	11:42 (5)	07:21	17:06 (4)	07:10	19:19 (3)	06:06	05:23	
	16:39	78	12:37 (5)	17:28	12:30 (5)	18:20	17:46 (4)	20:13	19:44 (3)	21:04	21:48	
4	08:45		11:20 (5)	08:14	11:44 (5)	07:19	17:05 (4)	07:08	19:19 (3)	06:04	05:23	
	16:40	77	12:37 (5)	17:30	12:28 (5)	18:21	17:47 (4)	20:15	19:43 (3)	21:06	21:49	
5	08:44		11:20 (5)	08:12	11:47 (5)	07:16	17:04 (4)	07:06	19:19 (3)	06:03	05:22	
	16:41	77	12:37 (5)	17:32	12:27 (5)	18:23	17:48 (4)	20:17	19:42 (3)	21:07	21:50	
6	08:44		11:21 (5)	08:10	11:50 (5)	07:14	17:02 (4)	07:03	19:20 (3)	06:01	05:21	
	16:42	77	12:38 (5)	17:34	12:24 (5)	18:25	17:48 (4)	20:18	19:41 (3)	21:09	21:51	
7	08:44		11:21 (5)	08:09	11:53 (5)	07:12	17:01 (4)	07:01	19:21 (3)	05:59	05:21	
	16:44	77	12:38 (5)	17:36	12:20 (5)	18:27	17:49 (4)	20:20	19:40 (3)	21:10	21:52	
8	08:43		11:22 (5)	08:07	11:59 (5)	07:10	17:01 (4)	06:59	19:23 (3)	05:57	05:20	
	16:45	77	12:39 (5)	17:37	12:12 (5)	18:28	17:49 (4)	20:22	19:38 (3)	21:12	21:53	
9	08:43		11:22 (5)	08:05		07:08	17:01 (4)	06:57	19:25 (3)	05:56	05:20	
	16:46	77	12:39 (5)	17:39		18:30	17:50 (4)	20:23	19:34 (3)	21:14	21:54	
10	08:42		11:22 (5)	08:03		07:05	16:59 (4)	06:54		05:54	05:19	
	16:48	77	12:39 (5)	17:41		18:32	17:49 (4)	20:25		21:15	21:55	
11	08:42		11:22 (5)	08:02		07:03	16:59 (4)	06:52		05:52	05:19	
	16:49	77	12:39 (5)	17:43		18:34	17:49 (4)	20:27		21:17	21:56	
12	08:41		11:24 (5)	08:00		07:01	16:59 (4)	06:50		05:50	05:19	
	16:51	76	12:40 (5)	17:45		18:35	17:49 (4)	20:28		21:18	21:56	
13	08:40		11:24 (5)	07:58		06:58	16:59 (4)	06:48		05:49	05:18	
	16:52	76	12:40 (5)	17:47		18:37	17:48 (4)	20:30		21:20	21:57	
14	08:40		11:25 (5)	07:56		06:56	16:59 (4)	06:45		05:47	05:18	
	16:54	75	12:40 (5)	17:49		18:39	17:48 (4)	20:32		21:22	21:58	
15	08:39		11:25 (5)	07:54		06:54	16:59 (4)	06:43		05:46	05:18	
	16:55	75	12:40 (5)	17:50		18:41	17:48 (4)	20:34		21:23	21:58	
16	08:38		11:26 (5)	07:52		06:52	16:59 (4)	06:41		05:44	05:18	
	16:57	75	12:41 (5)	17:52		18:42	17:47 (4)	20:35		21:25	21:59	
17	08:37		11:26 (5)	07:50		06:49	16:59 (4)	06:39		05:43	05:18	
	16:58	75	12:41 (5)	17:54		18:44	17:46 (4)	20:37		21:26	21:59	
18	08:36		11:27 (5)	07:48		06:47	17:00 (4)	06:37		05:41	05:18	
	17:00	74	12:41 (5)	17:56		18:46	17:46 (4)	20:39		21:28	21:59	
19	08:35		11:27 (5)	07:46		06:45	17:00 (4)	06:35		05:40	05:18	
	17:02	73	12:40 (5)	17:58		18:48	17:44 (4)	20:40		21:29	22:00	
20	08:34		11:28 (5)	07:44		06:42	17:01 (4)	06:32		05:38	05:18	
	17:03	72	12:40 (5)	18:00		18:49	17:43 (4)	20:42		21:31	22:00	
21	08:33		11:29 (5)	07:42		06:40	17:02 (4)	06:30		05:37	05:18	
	17:05	71	12:40 (5)	18:01		18:51	17:42 (4)	20:44		21:32	22:00	
22	08:32		11:29 (5)	07:40		06:38	17:02 (4)	06:28		05:36	05:18	
	17:07	71	12:40 (5)	18:03		18:53	17:40 (4)	20:45		21:33	22:01	
23	08:31		11:30 (5)	07:38		06:36	17:04 (4)	06:26		05:35	05:18	
	17:08	70	12:40 (5)	18:05		18:54	17:39 (4)	20:47		21:35	22:01	
24	08:30		11:31 (5)	07:36		06:33	17:06 (4)	06:24		05:33	05:19	
	17:10	69	12:40 (5)	18:07		18:56	17:38 (4)	20:49		21:36	22:01	
25	08:28		11:32 (5)	07:34	17:18 (4)	06:31	17:07 (4)	06:22		05:32	05:19	
	17:12	68	12:40 (5)	18:09	17:34 (4)	18:58	18:32 (3)	20:50		21:38	22:01	
26	08:27		11:32 (5)	07:32	17:15 (4)	06:29	17:09 (4)	06:20		05:31	05:19	
	17:14	67	12:39 (5)	18:11	17:37 (4)	19:00	18:34 (3)	20:52		21:39	22:01	
27	08:26		11:34 (5)	07:30	17:12 (4)	06:26	17:13 (4)	06:18		05:30	05:20	
	17:15	65	12:39 (5)	18:12	17:40 (4)	19:01	18:36 (3)	20:54		21:40	22:01	
28	08:24		11:34 (5)	07:27	17:11 (4)	06:24	18:23 (3)	06:16		05:29	05:20	
	17:17	63	12:37 (5)	18:14	17:42 (4)	19:03	18:38 (3)	20:56		21:41	22:01	
29	08:23		11:36 (5)			07:22	19:21 (3)	06:14		05:28	05:21	
	17:19	61	12:37 (5)			20:05	19:39 (3)	20:57		21:43	22:01	
30	08:21		11:37 (5)			07:19	19:20 (3)	06:12		05:27	05:21	
	17:21	59	12:36 (5)			20:06	19:41 (3)	20:59		21:44	22:00	
31	08:20		11:38 (5)			07:17	19:20 (3)			05:26		
	17:23	57	12:35 (5)			20:08	19:43 (3)			21:45		
Potential sun hours	259		278			367	416		485		498	
Total, worst case	2242		408			1226		186				
Sun reduction	0.18		0.27			0.30		0.38				
Oper. time red.	0.95		0.95			0.95		0.95				
Wind dir. red.	0.64		0.64			0.64		0.62				
Total reduction	0.11		0.16			0.19		0.22				
Total, real	242		67			228		41				

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

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

SHADOW - Calendar

Calculation: VKA bovengrens met kantoren 12RD 210819**Shadow receptor:** S - Shadow Receptor: 8.0 × 5.0 Azimuth: 0.0° Slope: 0.0° (10909)
Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) [DE BILT]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1.48 2.65 3.60 5.24 6.59 6.28 6.20 6.12 4.48 3.32 1.87 1.32

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 385 684 574 504 436 731 797 1,164 1,146 770 577 539 8,307

	July	August	September	October	November	December
1	05:22	05:58	06:48	07:37	17:38 (4)	07:30
	22:00	21:28	20:27	19:17	18:28 (4)	17:11
2	05:23	06:00	06:50	07:38	17:38 (4)	07:32
	22:00	21:27	20:24	19:15	18:28 (4)	17:09
3	05:23	06:01	06:51	19:23 (3)	07:40	17:37 (4)
	21:59	21:25	20:22	9 19:32 (3)	19:13	50 18:27 (4)
4	05:24	06:03	06:53	19:20 (3)	07:42	17:37 (4)
	21:59	21:23	20:20	15 19:35 (3)	19:10	50 18:27 (4)
5	05:25	06:05	06:54	19:17 (3)	07:44	17:38 (4)
	21:59	21:22	20:18	19 19:36 (3)	19:08	48 18:26 (4)
6	05:26	06:06	06:56	19:16 (3)	07:45	17:37 (4)
	21:58	21:20	20:15	21 19:37 (3)	19:06	48 18:25 (4)
7	05:27	06:08	06:58	19:14 (3)	07:47	17:38 (4)
	21:57	21:18	20:13	23 19:37 (3)	19:04	46 18:24 (4)
8	05:28	06:09	06:59	19:14 (3)	07:49	17:38 (4)
	21:57	21:16	20:11	24 19:38 (3)	19:01	45 18:23 (4)
9	05:29	06:11	07:01	19:12 (3)	07:50	17:39 (4)
	21:56	21:14	20:08	25 19:37 (3)	18:59	44 18:23 (4)
10	05:30	06:12	07:03	19:12 (3)	07:52	17:39 (4)
	21:55	21:13	20:06	25 19:37 (3)	18:57	42 18:21 (4)
11	05:31	06:14	07:04	19:12 (3)	07:54	17:40 (4)
	21:55	21:11	20:04	25 19:37 (3)	18:55	39 18:19 (4)
12	05:32	06:16	07:06	19:11 (3)	07:55	17:41 (4)
	21:54	21:09	20:01	23 19:34 (3)	18:52	37 18:18 (4)
13	05:33	06:17	07:07	19:12 (3)	07:57	17:43 (4)
	21:53	21:07	19:59	20 19:32 (3)	18:50	33 18:16 (4)
14	05:34	06:19	07:09	19:11 (3)	07:59	17:43 (4)
	21:52	21:05	19:57	19 19:30 (3)	18:48	30 18:13 (4)
15	05:35	06:20	07:11	19:12 (3)	08:00	17:46 (4)
	21:51	21:03	19:54	16 19:28 (3)	18:46	25 18:11 (4)
16	05:36	06:22	07:12	18:02 (4)	08:02	17:48 (4)
	21:50	21:01	19:52	28 19:25 (3)	18:44	20 18:08 (4)
17	05:37	06:24	07:14	17:58 (4)	08:04	17:53 (4)
	21:49	20:59	19:50	31 19:23 (3)	18:41	11 18:04 (4)
18	05:39	06:25	07:16	17:56 (4)	08:06	18:01
	21:48	20:57	19:47	32 19:21 (3)	18:39	16:44
19	05:40	06:27	07:17	17:53 (4)	08:07	18:02
	21:47	20:55	19:45	31 18:24 (4)	18:37	16:43
20	05:41	06:29	07:19	17:51 (4)	08:09	18:04
	21:46	20:53	19:43	34 18:25 (4)	18:35	16:42
21	05:43	06:30	07:20	17:48 (4)	08:11	18:06
	21:44	20:51	19:40	38 18:26 (4)	18:33	16:40
22	05:44	06:32	07:22	17:47 (4)	08:13	18:07
	21:43	20:48	19:38	40 18:27 (4)	18:31	16:39
23	05:45	06:33	07:24	17:46 (4)	08:14	18:09
	21:42	20:46	19:36	42 18:28 (4)	18:29	16:38
24	05:47	06:35	07:25	17:44 (4)	08:16	18:11
	21:40	20:44	19:33	44 18:28 (4)	18:27	16:37
25	05:48	06:37	07:27	17:43 (4)	07:18	18:12
	21:39	20:42	19:31	45 18:28 (4)	17:25	16:36
26	05:50	06:38	07:29	17:42 (4)	07:20	18:14
	21:38	20:40	19:29	47 18:29 (4)	17:23	16:35
27	05:51	06:40	07:30	17:40 (4)	07:22	18:15
	21:36	20:38	19:26	48 18:28 (4)	17:21	16:34
28	05:52	06:42	07:32	17:40 (4)	07:23	18:17
	21:35	20:35	19:24	49 18:29 (4)	17:19	16:33
29	05:54	06:43	07:34	17:40 (4)	07:25	18:18
	21:33	20:33	19:22	49 18:29 (4)	17:17	16:33
30	05:55	06:45	07:35	17:38 (4)	07:27	18:20
	21:32	20:31	19:20	50 18:28 (4)	17:15	16:32
31	05:57	06:46			07:29	
	21:30	20:29			17:13	
Potential sun hours	502	454	381	332	267	244
Total, worst case			872	668	1711	2405
Sun reduction			0.35	0.31	0.21	0.17
Oper. time red.			0.95	0.95	0.95	0.95
Wind dir. red.			0.64	0.65	0.64	0.64
Total reduction			0.21	0.19	0.13	0.10
Total, real			186	127	220	246

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

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

Project:

19065LE slagschaduw nieuwbouwwijk

Licensed user:

Bosch & Van Rijn

Franz-Lisztplantsoen 220

NL-3533 JG Utrecht

+31 6 51 71 04 93

Schreurs / leon@boschenvanrijn.nl

Calculated:

19-Aug-21 10:59 AM/3.4.388

SHADOW - Calendar

Calculation: VKA bovengrens met kantoren 12RD 210819 **Shadow receptor:** T - Shadow Receptor: 8.0 × 5.0 Azimuth: 0.0° Slope: 0.0° (10910)
Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) [DE BILT]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1.48 2.65 3.60 5.24 6.59 6.28 6.20 6.12 4.48 3.32 1.87 1.32

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 385 684 574 504 436 731 797 1,164 1,146 770 577 539 8,307

	January		February		March		April		May		June	
1	08:45		11:00 (5)	08:18	11:20 (5)	07:25	17:05 (4)	07:15	19:19 (3)	06:10	05:25	
	16:37	77	12:17 (5)	17:24	12:18 (5)	18:16	17:42 (4)	20:10	19:44 (3)	21:01	21:46	
2	08:45		11:01 (5)	08:17	11:21 (5)	07:23	17:03 (4)	07:12	19:19 (3)	06:08	05:24	
	16:38	77	12:18 (5)	17:26	12:17 (5)	18:18	17:43 (4)	20:11	19:45 (3)	21:02	21:47	
3	08:45		11:01 (5)	08:15	11:22 (5)	07:21	17:02 (4)	07:10	19:19 (3)	06:06	05:23	
	16:39	78	12:19 (5)	17:28	12:15 (5)	18:20	17:44 (4)	20:13	19:45 (3)	21:04	21:48	
4	08:45		11:02 (5)	08:14	11:23 (5)	07:19	17:01 (4)	07:08	19:19 (3)	06:04	05:23	
	16:40	77	12:19 (5)	17:30	12:14 (5)	18:21	17:45 (4)	20:15	19:45 (3)	21:06	21:49	
5	08:44		11:02 (5)	08:12	11:26 (5)	07:16	17:00 (4)	07:06	19:19 (3)	06:03	05:22	
	16:41	77	12:19 (5)	17:32	12:13 (5)	18:23	17:46 (4)	20:17	19:43 (3)	21:07	21:50	
6	08:44		11:03 (5)	08:10	11:27 (5)	07:14	16:58 (4)	07:03	19:20 (3)	06:01	05:21	
	16:42	77	12:20 (5)	17:34	12:10 (5)	18:25	17:46 (4)	20:18	19:42 (3)	21:09	21:51	
7	08:44		11:03 (5)	08:09	11:30 (5)	07:12	16:58 (4)	07:01	19:20 (3)	05:59	05:21	
	16:44	77	12:20 (5)	17:36	12:08 (5)	18:27	17:47 (4)	20:20	19:41 (3)	21:10	21:52	
8	08:43		11:04 (5)	08:07	11:32 (5)	07:10	16:57 (4)	06:59	19:22 (3)	05:57	05:20	
	16:45	77	12:21 (5)	17:37	12:04 (5)	18:28	17:48 (4)	20:22	19:40 (3)	21:12	21:53	
9	08:43		11:04 (5)	08:05	11:36 (5)	07:08	16:57 (4)	06:57	19:23 (3)	05:56	05:20	
	16:46	77	12:21 (5)	17:39	11:59 (5)	18:30	17:48 (4)	20:23	19:37 (3)	21:14	21:54	
10	08:42		11:04 (5)	08:03	11:43 (5)	07:05	16:56 (4)	06:54	19:25 (3)	05:54	05:19	
	16:48	77	12:21 (5)	17:41	11:51 (5)	18:32	17:47 (4)	20:25	19:35 (3)	21:15	21:55	
11	08:42		11:04 (5)	08:02		07:03	16:55 (4)	06:52		05:52	05:19	
	16:49	77	12:21 (5)	17:43		18:34	17:48 (4)	20:27		21:17	21:56	
12	08:41		11:06 (5)	08:00		07:01	16:55 (4)	06:50		05:50	05:19	
	16:51	76	12:22 (5)	17:45		18:35	17:48 (4)	20:28		21:18	21:56	
13	08:40		11:06 (5)	07:58		06:58	16:55 (4)	06:48		05:49	05:18	
	16:52	77	12:23 (5)	17:47		18:37	17:47 (4)	20:30		21:20	21:57	
14	08:40		11:07 (5)	07:56		06:56	16:55 (4)	06:45		05:47	05:18	
	16:54	76	12:23 (5)	17:49		18:39	17:47 (4)	20:32		21:22	21:58	
15	08:39		11:07 (5)	07:54		06:54	16:55 (4)	06:43		05:46	05:18	
	16:55	76	12:23 (5)	17:50		18:41	17:47 (4)	20:34		21:23	21:58	
16	08:38		11:08 (5)	07:52		06:52	16:54 (4)	06:41		05:44	05:18	
	16:57	75	12:23 (5)	17:52		18:42	17:46 (4)	20:35		21:25	21:59	
17	08:37		11:08 (5)	07:50		06:49	16:55 (4)	06:39		05:43	05:18	
	16:58	75	12:23 (5)	17:54		18:44	17:45 (4)	20:37		21:26	21:59	
18	08:36		11:09 (5)	07:48		06:47	16:56 (4)	06:37		05:41	05:18	
	17:00	75	12:24 (5)	17:56		18:46	17:45 (4)	20:39		21:28	21:59	
19	08:35		11:09 (5)	07:46		06:45	16:55 (4)	06:35		05:40	05:18	
	17:02	74	12:23 (5)	17:58		18:48	17:43 (4)	20:40		21:29	22:00	
20	08:34		11:09 (5)	07:44		06:42	16:56 (4)	06:32		05:38	05:18	
	17:03	74	12:23 (5)	18:00		18:49	17:43 (4)	20:42		21:31	22:00	
21	08:33		11:10 (5)	07:42		06:40	16:57 (4)	06:30		05:37	05:18	
	17:05	73	12:23 (5)	18:01		18:51	17:42 (4)	20:44		21:32	22:00	
22	08:32		11:11 (5)	07:40		06:38	16:57 (4)	06:28		05:36	05:18	
	17:07	72	12:23 (5)	18:03		18:53	17:40 (4)	20:45		21:33	22:01	
23	08:31		11:11 (5)	07:38		06:36	16:59 (4)	06:26		05:35	05:18	
	17:08	72	12:23 (5)	18:05		18:54	17:39 (4)	20:47		21:35	22:01	
24	08:30		11:12 (5)	07:36		06:33	17:00 (4)	06:24		05:33	05:19	
	17:10	71	12:23 (5)	18:07	17:20 (4)	18:56	17:37 (4)	20:49		21:36	22:01	
25	08:28		11:13 (5)	07:34		06:31	17:01 (4)	06:22		05:32	05:19	
	17:12	70	12:23 (5)	18:09	17:33 (4)	18:58	18:32 (3)	20:50		21:38	22:01	
26	08:27		11:13 (5)	07:32		06:29	17:04 (4)	06:20		05:31	05:19	
	17:14	69	12:22 (5)	18:11	17:36 (4)	19:00	18:34 (3)	20:52		21:39	22:01	
27	08:26		11:15 (5)	07:30		06:26	17:06 (4)	06:18		05:30	05:20	
	17:15	67	12:22 (5)	18:12	17:38 (4)	19:01	18:36 (3)	20:54		21:40	22:01	
28	08:24		11:15 (5)	07:27		06:24	17:09 (4)	06:16		05:29	05:20	
	17:17	66	12:21 (5)	18:14	17:40 (4)	19:03	18:38 (3)	20:56		21:41	22:01	
29	08:23		11:17 (5)			07:22	18:14 (4)	06:14		05:28	05:21	
	17:19	64	12:21 (5)			20:05	19:39 (3)	20:57		21:43	22:01	
30	08:21		11:17 (5)			07:19	19:21 (3)	06:12		05:27	05:21	
	17:21	63	12:20 (5)			20:06	19:41 (3)	20:59		21:44	22:00	
31	08:20		11:18 (5)			07:17	19:21 (3)			05:26		
	17:23	61	12:19 (5)			20:08	19:43 (3)			21:45		
Potential sun hours	259		278			367	416			485	498	
Total, worst case	2274		523			1338			212			
Sun reduction	0.18		0.27			0.30			0.38			
Oper. time red.	0.95		0.95			0.95			0.95			
Wind dir. red.	0.63		0.64			0.65			0.62			
Total reduction	0.11		0.16			0.19			0.22			
Total, real	241		84			249			47			

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

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

Project:

19065LE slagschaduw nieuwbouwwijk

Licensed user:

Bosch & Van Rijn

Franz-Lisztplantsoen 220

NL-3533 JG Utrecht

+31 6 51 71 04 93

Schreurs / leon@boschenvanrijn.nl

Calculated:

19-Aug-21 10:59 AM/3.4.388

SHADOW - Calendar

Calculation: VKA bovengrens met kantoren 12RD 210819 **Shadow receptor:** T - Shadow Receptor: 8.0 × 5.0 Azimuth: 0.0° Slope: 0.0° (10910)
Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) [DE BILT]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1.48 2.65 3.60 5.24 6.59 6.28 6.20 6.12 4.48 3.32 1.87 1.32

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 385 684 574 504 436 731 797 1,164 1,146 770 577 539 8,307

	July	August	September	October	November	December
1	05:22	05:58	06:48	07:37	17:34 (4)	07:30
	22:00	21:28	20:27	19:17	18:27 (4)	17:11
2	05:23	06:00	06:50	19:24 (3)	07:38	11:23 (5)
	22:00	21:27	20:24	19:34 (3)	19:15	11:05 (5)
3	05:23	06:01	06:51	19:21 (3)	07:40	11:30 (5)
	21:59	21:25	20:22	19:35 (3)	19:13	11:01 (5)
4	05:24	06:03	06:53	19:19 (3)	07:42	11:34 (5)
	21:59	21:23	20:20	19:37 (3)	19:10	11:01 (5)
5	05:25	06:05	06:54	19:17 (3)	07:44	11:38 (5)
	21:59	21:22	20:18	19:37 (3)	19:08	11:05 (5)
6	05:26	06:06	06:56	19:16 (3)	07:45	11:40 (5)
	21:58	21:20	20:15	19:39 (3)	19:06	11:40 (5)
7	05:27	06:08	06:58	19:14 (3)	07:47	11:43 (5)
	21:57	21:18	20:13	19:38 (3)	19:04	11:43 (5)
8	05:28	06:09	06:59	19:14 (3)	07:49	11:45 (5)
	21:57	21:16	20:11	19:39 (3)	19:01	11:45 (5)
9	05:29	06:11	07:01	19:12 (3)	07:50	11:48 (5)
	21:56	21:14	20:08	19:38 (3)	18:59	11:51 (5)
10	05:30	06:12	07:03	19:12 (3)	07:52	11:48 (5)
	21:55	21:13	20:06	19:38 (3)	18:57	11:50 (5)
11	05:31	06:14	07:04	19:12 (3)	07:54	11:49 (5)
	21:55	21:11	20:04	19:37 (3)	18:55	11:50 (5)
12	05:32	06:16	07:06	19:12 (3)	07:55	11:51 (5)
	21:54	21:09	20:01	19:34 (3)	18:52	11:51 (5)
13	05:33	06:17	07:07	19:12 (3)	07:57	11:52 (5)
	21:53	21:07	19:59	19:32 (3)	18:50	11:52 (5)
14	05:34	06:19	07:09	19:12 (3)	07:59	11:53 (5)
	21:52	21:05	19:57	19:30 (3)	18:48	11:53 (5)
15	05:35	06:20	07:11	17:59 (4)	08:00	11:53 (5)
	21:51	21:03	19:54	19:28 (3)	18:46	11:54 (5)
16	05:36	06:22	07:12	17:55 (4)	08:02	11:54 (5)
	21:50	21:01	19:52	19:25 (3)	18:44	11:55 (5)
17	05:38	06:24	07:14	17:52 (4)	08:04	11:55 (5)
	21:49	20:59	19:50	19:23 (3)	18:41	11:56 (5)
18	05:39	06:25	07:16	17:50 (4)	08:06	11:56 (5)
	21:48	20:57	19:47	19:21 (3)	18:39	11:57 (5)
19	05:40	06:27	07:17	17:47 (4)	08:07	11:57 (5)
	21:47	20:55	19:45	18:23 (4)	18:37	11:58 (5)
20	05:41	06:29	07:19	17:46 (4)	08:09	11:58 (5)
	21:46	20:53	19:43	18:25 (4)	18:35	11:59 (5)
21	05:43	06:30	07:20	17:43 (4)	08:11	12:00 (5)
	21:44	20:51	19:40	18:25 (4)	18:33	12:01 (5)
22	05:44	06:32	07:22	17:42 (4)	08:13	12:01 (5)
	21:43	20:48	19:38	18:26 (4)	18:31	12:02 (5)
23	05:45	06:33	07:24	17:41 (4)	08:14	12:02 (5)
	21:42	20:46	19:36	18:27 (4)	18:29	12:03 (5)
24	05:47	06:35	07:25	17:39 (4)	08:16	12:03 (5)
	21:40	20:44	19:33	18:27 (4)	18:27	12:04 (5)
25	05:48	06:37	07:27	17:38 (4)	07:18	12:04 (5)
	21:39	20:42	19:31	18:27 (4)	17:25	12:05 (5)
26	05:50	06:38	07:29	17:38 (4)	07:20	12:05 (5)
	21:38	20:40	19:29	18:28 (4)	17:23	12:06 (5)
27	05:51	06:40	07:30	17:36 (4)	07:22	12:06 (5)
	21:36	20:38	19:26	18:27 (4)	17:21	12:07 (5)
28	05:52	06:42	07:32	17:36 (4)	07:23	12:07 (5)
	21:35	20:35	19:24	18:28 (4)	17:19	12:08 (5)
29	05:54	06:43	07:34	17:36 (4)	07:25	12:08 (5)
	21:33	20:33	19:22	18:28 (4)	17:17	12:09 (5)
30	05:55	06:45	07:35	17:34 (4)	07:27	12:09 (5)
	21:32	20:31	19:20	18:27 (4)	17:15	12:10 (5)
31	05:57	06:46			07:29	12:10 (5)
	21:30	20:29			17:13	12:11 (5)
Potential sun hours	502	454	381	332	267	244
Total, worst case			972	711	1848	2390
Sun reduction			0.35	0.31	0.21	0.17
Oper. time red.			0.95	0.95	0.95	0.95
Wind dir. red.			0.64	0.65	0.63	0.63
Total reduction			0.21	0.19	0.13	0.10
Total, real			207	136	233	240

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

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

Project:

19065LE slagschaduw nieuwbouwwijk

Licensed user:

Bosch & Van Rijn

Franz-Lisztplantsoen 220

NL-3533 JG Utrecht

+31 6 51 71 04 93

Schreurs / leon@boschenvanrijn.nl

Calculated:

19-Aug-21 10:59 AM/3.4.388

SHADOW - Calendar

Calculation: VKA bovengrens met kantoren 12RD 210819 **Shadow receptor:** U - Shadow Receptor: 8.0 × 5.0 Azimuth: 0.0° Slope: 0.0° (10911)
Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) [DE BILT]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1.48 2.65 3.60 5.24 6.59 6.28 6.20 6.12 4.48 3.32 1.87 1.32

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 385 684 574 504 436 731 797 1,164 1,146 770 577 539 8,307

	January		February		March		April		May		June	
1	08:45	11:02 (5)	08:18	11:23 (5)	07:25	17:04 (4)	07:15	19:19 (3)	06:10	05:25		
	16:37	77	12:19 (5)	17:24	56	12:19 (5)	18:16	17:42 (4)	20:10	25	19:44 (3)	21:01
2	08:45		11:03 (5)	08:17		11:24 (5)	07:23	17:02 (4)	07:12		19:19 (3)	06:08
	16:38	77	12:20 (5)	17:26	54	12:18 (5)	18:18	17:43 (4)	20:11	25	19:44 (3)	21:02
3	08:45		11:04 (5)	08:15		11:25 (5)	07:21	17:01 (4)	07:10		19:19 (3)	06:06
	16:39	76	12:20 (5)	17:28	51	12:16 (5)	18:20	17:44 (4)	20:13	25	19:44 (3)	21:04
4	08:45		11:04 (5)	08:14		11:27 (5)	07:19	17:00 (4)	07:08		19:19 (3)	06:04
	16:40	77	12:21 (5)	17:30	47	12:14 (5)	18:21	17:45 (4)	20:15	25	19:44 (3)	21:06
5	08:44		11:04 (5)	08:12		11:29 (5)	07:16	16:59 (4)	07:06		19:18 (3)	06:03
	16:41	77	12:21 (5)	17:32	44	12:13 (5)	18:23	17:46 (4)	20:17	24	19:42 (3)	21:07
6	08:44		11:05 (5)	08:10		11:31 (5)	07:14	16:57 (4)	07:03		19:19 (3)	06:01
	16:42	77	12:22 (5)	17:34	39	12:10 (5)	18:25	17:46 (4)	20:18	23	19:42 (3)	21:09
7	08:44		11:05 (5)	08:09		11:34 (5)	07:12	16:57 (4)	07:01		19:20 (3)	05:59
	16:44	77	12:22 (5)	17:36	33	12:07 (5)	18:27	17:46 (4)	20:20	20	19:40 (3)	21:10
8	08:43		11:06 (5)	08:07		11:37 (5)	07:10	16:56 (4)	06:59		19:22 (3)	05:57
	16:45	77	12:23 (5)	17:37	26	12:03 (5)	18:28	17:47 (4)	20:22	17	19:39 (3)	21:12
9	08:43		11:06 (5)	08:05		11:43 (5)	07:08	16:56 (4)	06:57		19:23 (3)	05:56
	16:46	77	12:23 (5)	17:39	12	11:55 (5)	18:30	17:47 (4)	20:23	13	19:36 (3)	21:14
10	08:42		11:07 (5)	08:03		07:05	16:55 (4)	16:55 (4)	06:54		19:26 (3)	05:54
	16:48	76	12:23 (5)	17:41		18:32	52	17:47 (4)	20:25	7	19:33 (3)	21:15
11	08:42		11:07 (5)	08:02		07:03	16:55 (4)	16:55 (4)	06:52		19:26 (3)	05:52
	16:49	76	12:23 (5)	17:43		18:34	52	17:47 (4)	20:27		19:33 (3)	21:17
12	08:41		11:08 (5)	08:00		07:01	16:55 (4)	16:55 (4)	06:50		19:26 (3)	05:50
	16:51	76	12:24 (5)	17:45		18:35	52	17:47 (4)	20:28		19:33 (3)	21:18
13	08:40		11:09 (5)	07:58		06:58	16:54 (4)	16:54 (4)	06:48		19:26 (3)	05:49
	16:52	75	12:24 (5)	17:47		18:37	52	17:46 (4)	20:30		19:33 (3)	21:20
14	08:40		11:09 (5)	07:56		06:56	16:54 (4)	16:54 (4)	06:45		19:26 (3)	05:47
	16:54	75	12:24 (5)	17:49		18:39	52	17:46 (4)	20:32		19:33 (3)	21:22
15	08:39		11:10 (5)	07:54		06:54	16:55 (4)	16:55 (4)	06:43		19:26 (3)	05:46
	16:55	75	12:25 (5)	17:50		18:41	51	17:46 (4)	20:34		19:33 (3)	21:23
16	08:38		11:10 (5)	07:52		06:52	16:54 (4)	16:54 (4)	06:41		19:26 (3)	05:44
	16:57	75	12:25 (5)	17:52		18:42	50	17:44 (4)	20:35		19:33 (3)	21:25
17	08:37		11:11 (5)	07:50		06:49	16:55 (4)	16:55 (4)	06:39		19:26 (3)	05:43
	16:58	74	12:25 (5)	17:54		18:44	49	17:44 (4)	20:37		19:33 (3)	21:26
18	08:36		11:11 (5)	07:48		06:47	16:55 (4)	16:55 (4)	06:37		19:26 (3)	05:41
	17:00	74	12:25 (5)	17:56		18:46	49	17:44 (4)	20:39		19:33 (3)	21:28
19	08:35		11:11 (5)	07:46		06:45	16:55 (4)	16:55 (4)	06:35		19:26 (3)	05:40
	17:02	73	12:24 (5)	17:58		18:48	47	17:42 (4)	20:40		19:33 (3)	21:29
20	08:34		11:12 (5)	07:44		06:42	16:56 (4)	16:56 (4)	06:32		19:26 (3)	05:38
	17:03	73	12:25 (5)	18:00		18:49	45	17:41 (4)	20:42		19:33 (3)	21:31
21	08:33		11:13 (5)	07:42		06:40	16:57 (4)	16:57 (4)	06:30		19:26 (3)	05:37
	17:05	72	12:25 (5)	18:01		18:51	43	17:40 (4)	20:44		19:33 (3)	21:32
22	08:32		11:14 (5)	07:40		06:38	16:58 (4)	16:58 (4)	06:28		19:26 (3)	05:36
	17:07	71	12:25 (5)	18:03		18:53	40	17:38 (4)	20:45		19:33 (3)	21:33
23	08:31		11:14 (5)	07:38		06:36	16:59 (4)	16:59 (4)	06:26		19:26 (3)	05:35
	17:08	70	12:24 (5)	18:05		18:54	38	17:37 (4)	20:47		19:33 (3)	21:35
24	08:30		11:15 (5)	07:36		06:33	17:01 (4)	17:01 (4)	06:24		19:26 (3)	05:33
	17:10	69	12:24 (5)	18:07	15	17:31 (4)	18:56	17:35 (4)	20:49		19:33 (3)	21:36
25	08:28		11:16 (5)	07:34		17:11 (4)	06:31	17:02 (4)	06:22		19:26 (3)	05:32
	17:12	68	12:24 (5)	18:09	23	17:34 (4)	18:58	18:32 (3)	20:50		19:33 (3)	21:38
26	08:27		11:16 (5)	07:32		17:09 (4)	06:29	17:04 (4)	06:20		19:26 (3)	05:31
	17:14	67	12:23 (5)	18:11	27	17:36 (4)	19:00	18:34 (3)	20:52		19:33 (3)	21:39
27	08:26		11:18 (5)	07:30		17:07 (4)	06:26	17:07 (4)	06:18		19:26 (3)	05:30
	17:15	65	12:23 (5)	18:12	31	17:38 (4)	19:01	18:36 (3)	20:54		19:33 (3)	21:40
28	08:24		11:18 (5)	07:27		17:05 (4)	06:24	17:12 (4)	06:16		19:26 (3)	05:29
	17:17	64	12:22 (5)	18:14	35	17:40 (4)	19:03	18:38 (3)	20:56		19:33 (3)	21:41
29	08:23		11:20 (5)			07:22	19:21 (3)	19:21 (3)	06:14		19:26 (3)	05:28
	17:19	62	12:22 (5)			20:05	18	19:39 (3)	20:57		19:33 (3)	21:43
30	08:21		11:20 (5)			07:19	19:20 (3)	19:20 (3)	06:12		19:26 (3)	05:27
	17:21	61	12:21 (5)			20:06	21	19:41 (3)	20:59		19:33 (3)	21:44
31	08:20		11:21 (5)			07:17	19:20 (3)	19:20 (3)			19:26 (3)	05:26
	17:23	59	12:20 (5)			20:08	23	19:43 (3)			19:33 (3)	21:45
Potential sun hours	259		278			367		416			485	498
Total, worst case	2242		493			1310		204				
Sun reduction	0.18		0.27			0.30		0.38				
Oper. time red.	0.95		0.95			0.95		0.95				
Wind dir. red.	0.63		0.64			0.65		0.62				
Total reduction	0.11		0.16			0.19		0.22				
Total, real	238		79			244		45				

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

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

Project:

19065LE slagschaduw nieuwbouwwijk

Licensed user:

Bosch & Van Rijn

Franz-Lisztplantsoen 220

NL-3533 JG Utrecht

+31 6 51 71 04 93

Schreurs / leon@boschenvanrijn.nl

Calculated:

19-Aug-21 10:59 AM/3.4.388

SHADOW - Calendar

Calculation: VKA bovengrens met kantoren 12RD 210819 **Shadow receptor:** U - Shadow Receptor: 8.0 × 5.0 Azimuth: 0.0° Slope: 0.0° (10911)
Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) [DE BILT]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1.48 2.65 3.60 5.24 6.59 6.28 6.20 6.12 4.48 3.32 1.87 1.32

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 385 684 574 504 436 731 797 1,164 1,146 770 577 539 8,307

	July	August	September	October	November	December
1	05:22	05:58	06:48	07:37	17:34 (4)	07:30
2	22:00	21:28	20:27	19:17	18:26 (4)	17:11
3	05:23	06:00	06:50	19:25 (3)	17:34 (4)	07:32
4	22:00	21:27	20:24	19:32 (3)	18:26 (4)	17:09
5	05:23	06:01	06:51	19:21 (3)	17:33 (4)	07:34
6	21:59	21:25	20:22	19:34 (3)	18:25 (4)	17:08
7	05:24	06:03	06:53	19:19 (3)	17:33 (4)	07:36
8	21:59	21:23	20:20	19:36 (3)	18:24 (4)	17:06
9	05:25	06:05	06:54	19:16 (3)	17:33 (4)	07:38
10	21:59	21:22	20:18	19:36 (3)	18:24 (4)	17:04
11	05:26	06:06	06:56	19:15 (3)	17:32 (4)	07:39
12	21:58	21:20	20:15	19:38 (3)	18:23 (4)	17:02
13	05:27	06:08	06:58	19:14 (3)	17:33 (4)	07:41
14	21:57	21:18	20:13	19:37 (3)	18:22 (4)	17:01
15	05:28	06:09	06:59	19:13 (3)	17:34 (4)	07:43
16	21:57	21:16	20:11	19:38 (3)	18:21 (4)	16:59
17	05:29	06:11	07:01	19:12 (3)	17:34 (4)	07:45
18	21:56	21:14	20:08	19:37 (3)	18:21 (4)	16:57
19	05:30	06:12	07:03	19:12 (3)	17:34 (4)	07:47
20	21:55	21:13	20:06	19:38 (3)	18:19 (4)	16:56
21	05:31	06:14	07:04	19:12 (3)	17:35 (4)	07:48
22	21:55	21:11	20:04	19:37 (3)	18:17 (4)	16:54
23	05:32	06:16	07:06	19:11 (3)	17:36 (4)	07:50
24	21:54	21:09	20:01	19:34 (3)	18:16 (4)	16:53
25	05:33	06:17	07:07	19:12 (3)	17:37 (4)	07:52
26	21:53	21:07	19:59	19:32 (3)	18:15 (4)	16:51
27	05:34	06:19	07:09	19:11 (3)	17:38 (4)	07:54
28	21:52	21:05	19:57	19:30 (3)	18:12 (4)	16:50
29	05:35	06:20	07:11	18:03 (4)	17:40 (4)	07:55
30	21:51	21:03	19:54	19:28 (3)	18:10 (4)	16:48
31	05:36	06:22	07:12	17:57 (4)	17:42 (4)	07:57
32	21:50	21:01	19:52	19:25 (3)	18:08 (4)	16:47
33	05:38	06:24	07:14	17:53 (4)	17:45 (4)	07:59
34	21:49	20:59	19:50	19:23 (3)	18:05 (4)	16:45
35	05:39	06:25	07:16	17:51 (4)	17:49 (4)	08:01
36	21:48	20:57	19:47	19:21 (3)	18:00 (4)	16:44
37	05:40	06:27	07:17	17:48 (4)	18:02	08:02
38	21:47	20:55	19:45	18:22 (4)	16:43	16:43
39	05:41	06:29	07:19	17:46 (4)	18:04	08:04
40	21:46	20:53	19:43	18:23 (4)	16:42	16:42
41	05:43	06:30	07:20	17:44 (4)	18:06	10:48 (5)
42	21:44	20:51	19:40	18:23 (4)	16:40	12:00 (5)
43	05:44	06:32	07:22	17:42 (4)	18:07	10:48 (5)
44	21:43	20:48	19:38	18:24 (4)	16:39	12:01 (5)
45	05:45	06:33	07:24	17:41 (4)	18:09	10:48 (5)
46	21:42	20:46	19:36	18:25 (4)	16:38	12:01 (5)
47	05:47	06:35	07:25	17:39 (4)	18:11	10:48 (5)
48	21:40	20:44	19:33	18:25 (4)	16:37	12:02 (5)
49	05:48	06:37	07:27	17:38 (4)	18:12	10:49 (5)
50	21:39	20:42	19:31	18:26 (4)	16:36	12:03 (5)
51	05:50	06:38	07:29	17:38 (4)	18:14	10:48 (5)
52	21:38	20:40	19:29	18:27 (4)	16:35	12:03 (5)
53	05:51	06:40	07:30	17:36 (4)	18:15	10:49 (5)
54	21:36	20:38	19:26	18:26 (4)	16:34	12:04 (5)
55	05:52	06:42	07:32	17:35 (4)	18:17	10:49 (5)
56	21:35	20:35	19:24	18:26 (4)	16:33	12:04 (5)
57	05:54	06:43	07:34	17:35 (4)	18:18	10:49 (5)
58	21:33	20:33	19:22	18:27 (4)	16:33	12:04 (5)
59	05:55	06:45	07:35	17:34 (4)	18:20	10:49 (5)
60	21:32	20:31	19:20	18:26 (4)	16:32	12:05 (5)
61	05:57	06:46	07:36	17:33 (4)	18:21	10:49 (5)
62	21:30	20:29	19:19	17:32 (4)	18:22	10:49 (5)
Potential sun hours	502	454	381	332	267	244
Total, worst case			933	738	1769	2374
Sun reduction			0.35	0.31	0.21	0.17
Oper. time red.			0.95	0.95	0.95	0.95
Wind dir. red.			0.64	0.65	0.63	0.63
Total reduction			0.21	0.19	0.13	0.10
Total, real			199	141	223	238

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

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

Project:

19065LE slagschaduw nieuwbouwwijk

Licensed user:

Bosch & Van Rijn

Franz-Lisztplantsoen 220

NL-3533 JG Utrecht

+31 6 51 71 04 93

Schreurs / leon@boschenvanrijn.nl

Calculated:

19-Aug-21 10:59 AM/3.4.388

SHADOW - Calendar

Calculation: VKA bovengrens met kantoren 12RD 210819 **Shadow receptor:** V - Shadow Receptor: 8.0 × 5.0 Azimuth: 0.0° Slope: 0.0° (10912)
Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) [DE BILT]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1.48 2.65 3.60 5.24 6.59 6.28 6.20 6.12 4.48 3.32 1.87 1.32

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 385 684 574 504 436 731 797 1,164 1,146 770 577 539 8,307

	January		February		March		April		May		June	
1	08:45	11:05 (5)	08:18	11:26 (5)	07:25	17:03 (4)	07:15	19:18 (3)	06:10	05:25		
2	08:37	11:06 (5)	08:17	11:28 (5)	07:23	17:01 (4)	07:12	19:18 (3)	06:08	05:24		
3	08:45	11:06 (5)	08:15	11:29 (5)	07:21	17:00 (4)	07:10	19:18 (3)	06:06	05:23		
4	08:44	11:07 (5)	08:14	11:31 (5)	07:19	16:59 (4)	07:08	19:19 (3)	06:04	05:23		
5	08:44	11:07 (5)	08:12	11:34 (5)	07:16	16:58 (4)	07:06	19:18 (3)	06:03	05:22		
6	08:44	11:08 (5)	08:10	11:36 (5)	07:14	16:56 (4)	07:03	19:19 (3)	06:01	05:21		
7	08:44	11:08 (5)	08:09	11:39 (5)	07:12	16:56 (4)	07:01	19:20 (3)	05:59	05:21		
8	08:43	11:09 (5)	08:07	11:44 (5)	07:10	16:56 (4)	06:59	19:22 (3)	05:57	05:20		
9	08:43	11:09 (5)	08:05	12:00 (5)	07:08	16:55 (4)	06:57	19:23 (3)	05:56	05:20		
10	08:42	11:09 (5)	08:03		07:05	16:54 (4)	06:54		05:54	05:19		
11	08:42	11:10 (5)	08:02		07:03	16:54 (4)	06:52		05:52	05:19		
12	08:41	11:11 (5)	08:00		07:01	16:54 (4)	06:50		05:50	05:19		
13	08:40	11:11 (5)	07:58		06:58	16:54 (4)	06:48		05:49	05:18		
14	08:40	11:12 (5)	07:56		06:56	16:54 (4)	06:45		05:47	05:18		
15	08:39	11:12 (5)	07:54		06:54	16:54 (4)	06:43		05:46	05:18		
16	08:38	11:13 (5)	07:52		06:52	16:54 (4)	06:41		05:44	05:18		
17	08:37	11:14 (5)	07:50		06:49	16:55 (4)	06:39		05:43	05:18		
18	08:36	11:14 (5)	07:48		06:47	16:55 (4)	06:37		05:41	05:18		
19	08:35	11:14 (5)	07:46		06:45	16:55 (4)	06:35		05:40	05:18		
20	08:34	11:15 (5)	07:44		06:42	16:56 (4)	06:32		05:38	05:18		
21	08:33	11:16 (5)	07:42		06:40	16:58 (4)	06:30		05:37	05:18		
22	08:32	11:17 (5)	07:40		06:38	16:58 (4)	06:28		05:36	05:18		
23	08:31	11:17 (5)	07:38	17:19 (4)	06:36	17:00 (4)	06:26		05:35	05:18		
24	08:30	11:18 (5)	07:36	17:27 (4)	06:34	17:02 (4)	06:24		05:33	05:19		
25	08:28	11:19 (5)	07:34	17:32 (4)	06:31	17:03 (4)	06:22		05:32	05:19		
26	08:27	11:19 (5)	07:32	17:34 (4)	06:29	18:32 (3)	06:20		05:31	05:19		
27	08:26	11:21 (5)	07:30	17:37 (4)	06:26	17:10 (4)	06:18		05:30	05:20		
28	08:24	11:21 (5)	07:27	17:39 (4)	06:24	18:36 (3)	06:16		05:29	05:20		
29	08:23	11:23 (5)	07:24	17:41 (4)	06:22	18:38 (3)	06:14		05:28	05:21		
30	08:21	11:24 (5)			07:19	19:20 (3)	06:12		05:27	05:21		
31	08:20	11:24 (5)			07:17	19:19 (3)	06:10		05:26	05:20		
Potential sun hours	259		278		367	416		485		498		
Total, worst case	2212		467		1277		192					
Sun reduction	0.18		0.27		0.30		0.38					
Oper. time red.	0.95		0.95		0.95		0.95					
Wind dir. red.	0.63		0.64		0.65		0.62					
Total reduction	0.11		0.16		0.19		0.22					
Total, real	234		75		238		42					

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

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

Project:

19065LE slagschaduw nieuwbouwwijk

Licensed user:

Bosch & Van Rijn

Franz-Lisztplantsoen 220

NL-3533 JG Utrecht

+31 6 51 71 04 93

Schreurs / leon@boschenvanrijn.nl

Calculated:

19-Aug-21 10:59 AM/3.4.388

SHADOW - Calendar

Calculation: VKA bovengrens met kantoren 12RD 210819**Shadow receptor:** V - Shadow Receptor: 8.0 × 5.0 Azimuth: 0.0° Slope: 0.0° (10912)
Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) [DE BILT]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1.48 2.65 3.60 5.24 6.59 6.28 6.20 6.12 4.48 3.32 1.87 1.32

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 385 684 574 504 436 731 797 1,164 1,146 770 577 539 8,307

	July	August	September	October	November	December
1	05:22	05:58	06:48	07:37	17:33 (4)	07:30
2	22:00	21:28	20:27	19:17	18:25 (4)	17:11
3	05:23	06:00	06:50	07:38	17:33 (4)	07:32
4	22:00	21:27	20:24	19:15	18:25 (4)	17:09
5	05:23	06:01	06:51	19:21 (3)	17:32 (4)	07:34
6	21:59	21:25	20:22	19:32 (3)	18:24 (4)	17:08
7	05:24	06:03	06:53	19:19 (3)	17:32 (4)	07:36
8	21:59	21:23	20:20	19:35 (3)	18:24 (4)	17:06
9	05:25	06:05	06:54	19:16 (3)	17:32 (4)	07:38
10	21:59	21:22	20:18	19:35 (3)	18:23 (4)	17:04
11	05:26	06:06	06:56	19:15 (3)	17:32 (4)	07:39
12	21:58	21:20	20:15	19:37 (3)	18:22 (4)	17:02
13	05:27	06:08	06:58	19:13 (3)	17:32 (4)	07:41
14	21:57	21:18	20:13	19:36 (3)	18:21 (4)	17:01
15	05:28	06:09	06:59	19:13 (3)	17:33 (4)	07:43
16	21:57	21:16	20:11	19:37 (3)	18:21 (4)	16:59
17	05:29	06:11	07:01	19:11 (3)	17:33 (4)	07:45
18	21:56	21:14	20:08	19:37 (3)	18:20 (4)	16:57
19	05:30	06:12	07:03	19:11 (3)	17:33 (4)	07:47
20	21:55	21:13	20:06	19:37 (3)	18:18 (4)	16:56
21	05:31	06:14	07:04	19:11 (3)	17:34 (4)	07:48
22	21:55	21:11	20:04	19:37 (3)	18:17 (4)	16:54
23	05:32	06:16	07:06	19:10 (3)	17:35 (4)	07:50
24	21:54	21:09	20:01	19:34 (3)	18:16 (4)	16:53
25	05:33	06:17	07:07	19:11 (3)	17:36 (4)	07:52
26	21:53	21:07	19:59	19:32 (3)	18:15 (4)	16:51
27	05:34	06:19	07:09	19:10 (3)	17:37 (4)	07:54
28	21:52	21:05	19:57	19:30 (3)	18:12 (4)	16:50
29	05:35	06:20	07:11	19:11 (3)	17:38 (4)	07:55
30	21:51	21:03	19:54	19:28 (3)	18:10 (4)	16:48
31	05:36	06:22	07:12	17:59 (4)	17:40 (4)	07:57
32	21:50	21:01	19:52	19:25 (3)	18:08 (4)	16:47
33	05:38	06:24	07:14	17:55 (4)	17:43 (4)	07:59
34	21:49	20:59	19:50	19:23 (3)	18:05 (4)	16:45
35	05:39	06:25	07:16	17:52 (4)	17:46 (4)	08:01
36	21:48	20:57	19:47	19:21 (3)	18:02 (4)	16:44
37	05:40	06:27	07:17	17:49 (4)	18:02	08:02
38	21:47	20:55	19:45	18:20 (4)	16:43	12:01 (5)
39	05:41	06:29	07:19	17:47 (4)	18:04	10:52 (5)
40	21:46	20:53	19:43	18:21 (4)	16:42	12:02 (5)
41	05:43	06:30	07:20	17:44 (4)	18:06	10:51 (5)
42	21:44	20:51	19:40	18:22 (4)	16:40	12:02 (5)
43	05:44	06:32	07:22	17:43 (4)	18:07	10:51 (5)
44	21:43	20:48	19:38	18:23 (4)	16:39	12:02 (5)
45	05:45	06:33	07:24	17:41 (4)	18:09	10:51 (5)
46	21:42	20:46	19:36	18:24 (4)	16:38	12:03 (5)
47	05:47	06:35	07:25	17:39 (4)	18:11	10:51 (5)
48	21:40	20:44	19:33	18:24 (4)	16:37	12:04 (5)
49	05:48	06:37	07:27	17:38 (4)	18:12	10:52 (5)
50	21:39	20:42	19:31	18:25 (4)	16:36	12:05 (5)
51	05:50	06:38	07:29	17:37 (4)	18:14	10:51 (5)
52	21:38	20:40	19:29	18:25 (4)	16:35	12:05 (5)
53	05:51	06:40	07:30	17:36 (4)	18:15	10:51 (5)
54	21:36	20:38	19:26	18:25 (4)	16:34	12:06 (5)
55	05:52	06:42	07:32	17:35 (4)	18:17	10:52 (5)
56	21:35	20:35	19:24	18:25 (4)	16:33	12:06 (5)
57	05:54	06:43	07:34	17:35 (4)	18:18	10:51 (5)
58	21:33	20:33	19:22	18:26 (4)	16:33	12:06 (5)
59	05:55	06:45	07:35	17:33 (4)	18:20	10:52 (5)
60	21:32	20:31	19:20	18:25 (4)	16:32	12:07 (5)
61	05:57	06:46		07:29		16:35
62	21:30	20:29		17:13		16:35
Potential sun hours	502	454	381	332	267	244
Total, worst case			893	754	1699	2363
Sun reduction			0.35	0.31	0.21	0.17
Oper. time red.			0.95	0.95	0.95	0.95
Wind dir. red.			0.64	0.65	0.63	0.63
Total reduction			0.21	0.19	0.13	0.10
Total, real			191	144	214	237

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

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

Project:

19065LE slagschaduw nieuwbouwwijk

Licensed user:

Bosch & Van Rijn

Franz-Lisztplantsoen 220

NL-3533 JG Utrecht

+31 6 51 71 04 93

Schreurs / leon@boschenvanrijn.nl

Calculated:

19-Aug-21 10:59 AM/3.4.388

SHADOW - Calendar

Calculation: VKA bovengrens met kantoren 12RD 210819 Shadow receptor: W - Shadow Receptor: 8.0 × 5.0 Azimuth: 0.0° Slope: 0.0° (10913)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [DE BILT]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec

1.48 2.65 3.60 5.24 6.59 6.28 6.20 6.12 4.48 3.32 1.87 1.32

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
385	684	574	504	436	731	797	1,164	1,146	770	577	539	8,307

	January		February		March		April		May		June	
1	08:45		11:09 (5)	08:18	11:32 (5)	07:25	17:03 (4)	07:15	19:18 (3)	06:10	05:25	
	16:37	76	12:25 (5)	17:24	12:24 (5)	18:16	17:42 (4)	20:10	19:43 (3)	21:01	21:46	
2	08:45		11:10 (5)	08:17	11:33 (5)	07:23	17:01 (4)	07:12	19:18 (3)	06:08	05:24	
	16:38	76	12:26 (5)	17:26	12:22 (5)	18:18	17:43 (4)	20:11	19:43 (3)	21:02	21:47	
3	08:45		11:11 (5)	08:15	11:35 (5)	07:21	17:00 (4)	07:10	19:18 (3)	06:06	05:23	
	16:39	76	12:27 (5)	17:28	12:20 (5)	18:20	17:44 (4)	20:13	19:43 (3)	21:04	21:48	
4	08:45		11:12 (5)	08:14	11:37 (5)	07:19	16:59 (4)	07:08	19:18 (3)	06:04	05:23	
	16:40	76	12:28 (5)	17:30	12:17 (5)	18:21	17:45 (4)	20:15	19:42 (3)	21:06	21:49	
5	08:44		11:12 (5)	08:12	11:40 (5)	07:16	16:58 (4)	07:06	19:18 (3)	06:03	05:22	
	16:41	75	12:27 (5)	17:32	12:16 (5)	18:23	17:45 (4)	20:17	19:41 (3)	21:07	21:50	
6	08:44		11:12 (5)	08:10	11:43 (5)	07:14	16:57 (4)	07:03	19:19 (3)	06:01	05:21	
	16:42	76	12:28 (5)	17:34	12:12 (5)	18:25	17:45 (4)	20:18	19:40 (3)	21:09	21:51	
7	08:44		11:12 (5)	08:09	11:47 (5)	07:12	16:56 (4)	07:01	19:21 (3)	05:59	05:21	
	16:44	76	12:28 (5)	17:36	12:06 (5)	18:27	17:46 (4)	20:20	19:38 (3)	21:10	21:52	
8	08:43		11:14 (5)	08:07		07:10	16:56 (4)	06:59	19:22 (3)	05:57	05:20	
	16:45	75	12:29 (5)	17:37		18:28	17:46 (4)	20:22	19:36 (3)	21:12	21:53	
9	08:43		11:14 (5)	08:05		07:08	16:56 (4)	06:57	19:24 (3)	05:56	05:20	
	16:46	75	12:29 (5)	17:39		18:30	17:46 (4)	20:23	19:32 (3)	21:14	21:54	
10	08:42		11:14 (5)	08:03		07:05	16:55 (4)	06:54		05:54	05:19	
	16:48	75	12:29 (5)	17:41		18:32	17:46 (4)	20:25		21:15	21:55	
11	08:42		11:14 (5)	08:02		07:03	16:55 (4)	06:52		05:52	05:19	
	16:49	75	12:29 (5)	17:43		18:34	17:46 (4)	20:27		21:17	21:56	
12	08:41		11:16 (5)	08:00		07:01	16:55 (4)	06:50		05:50	05:19	
	16:51	74	12:30 (5)	17:45		18:35	17:46 (4)	20:28		21:18	21:56	
13	08:40		11:16 (5)	07:58		06:58	16:54 (4)	06:48		05:49	05:18	
	16:52	74	12:30 (5)	17:47		18:37	17:45 (4)	20:30		21:20	21:57	
14	08:40		11:17 (5)	07:56		06:56	16:54 (4)	06:45		05:47	05:18	
	16:54	73	12:30 (5)	17:49		18:39	17:45 (4)	20:32		21:22	21:58	
15	08:39		11:17 (5)	07:54		06:54	16:55 (4)	06:43		05:46	05:18	
	16:55	74	12:31 (5)	17:50		18:41	17:44 (4)	20:34		21:23	21:58	
16	08:38		11:18 (5)	07:52		06:52	16:54 (4)	06:41		05:44	05:18	
	16:57	73	12:31 (5)	17:52		18:42	17:43 (4)	20:35		21:25	21:59	
17	08:37		11:18 (5)	07:50		06:49	16:55 (4)	06:39		05:43	05:18	
	16:58	73	12:31 (5)	17:54		18:44	17:42 (4)	20:37		21:26	21:59	
18	08:36		11:19 (5)	07:48		06:47	16:56 (4)	06:37		05:41	05:18	
	17:00	72	12:31 (5)	17:56		18:46	17:42 (4)	20:39		21:28	21:59	
19	08:35		11:19 (5)	07:46		06:45	16:56 (4)	06:35		05:40	05:18	
	17:02	71	12:30 (5)	17:58		18:48	17:40 (4)	20:40		21:29	22:00	
20	08:34		11:20 (5)	07:44		06:42	16:57 (4)	06:32		05:38	05:18	
	17:03	70	12:30 (5)	18:00		18:49	17:39 (4)	20:42		21:31	22:00	
21	08:33		11:21 (5)	07:42		06:40	16:59 (4)	06:30		05:37	05:18	
	17:05	69	12:30 (5)	18:01		18:51	17:38 (4)	20:44		21:32	22:00	
22	08:32		11:22 (5)	07:40		06:38	16:59 (4)	06:28		05:36	05:18	
	17:07	68	12:30 (5)	18:03		18:53	17:35 (4)	20:45		21:33	22:01	
23	08:31		11:22 (5)	07:38	17:17 (4)	06:36	17:01 (4)	06:26		05:35	05:18	
	17:08	68	12:30 (5)	18:05	17:28 (4)	18:54	17:34 (4)	20:47		21:35	22:01	
24	08:30		11:23 (5)	07:36	17:13 (4)	06:33	17:03 (4)	06:24		05:33	05:19	
	17:10	67	12:30 (5)	18:07	17:33 (4)	18:56	17:32 (4)	20:49		21:36	22:01	
25	08:28		11:24 (5)	07:34	17:09 (4)	06:31	17:05 (4)	06:22		05:32	05:19	
	17:12	66	12:30 (5)	18:09	17:35 (4)	18:58	18:32 (3)	20:50		21:38	22:01	
26	08:27		11:24 (5)	07:32	17:07 (4)	06:29	17:08 (4)	06:20		05:31	05:19	
	17:14	65	12:29 (5)	18:11	17:37 (4)	19:00	18:34 (3)	20:52		21:39	22:01	
27	08:26		11:26 (5)	07:30	17:05 (4)	06:26	17:14 (4)	06:18		05:30	05:20	
	17:15	62	12:28 (5)	18:12	17:39 (4)	19:01	18:36 (3)	20:54		21:40	22:01	
28	08:24		11:26 (5)	07:27	17:04 (4)	06:24	18:21 (3)	06:16		05:29	05:20	
	17:17	61	12:27 (5)	18:14	17:41 (4)	19:03	18:38 (3)	20:56		21:41	22:01	
29	08:23		11:28 (5)			07:22	19:20 (3)	06:14		05:28	05:21	
	17:19	59	12:27 (5)			20:05	19:39 (3)	20:57		21:43	22:01	
30	08:21		11:29 (5)			07:19	19:19 (3)	06:12		05:27	05:21	
	17:21	57	12:26 (5)			20:06	19:41 (3)	20:59		21:44	22:00	
31	08:20		11:30 (5)			07:17	19:19 (3)			05:26		
	17:23	54	12:24 (5)			20:08	19:43 (3)			21:45		
Potential sun hours	259		278			367	416			485	498	
Total, worst case	2181		428			1245			182			
Sun reduction	0.18		0.27			0.30			0.38			
Oper. time red.	0.95		0.95			0.95			0.95			
Wind dir. red.	0.63		0.64			0.65			0.62			
Total reduction	0.11		0.16			0.19			0.22			
Total, real	232		69			232			40			

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

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

19065LE slagschaduw nieuwbouwwijk

Licensed user:

Bosch & Van Rijn

Franz-Lisztplantsoen 220

NL-3533 JG Utrecht

+31 6 51 71 04 93

Schreurs / leon@boschenvanrijn.nl

Calculated:

19-Aug-21 10:59 AM/3.4.388

SHADOW - Calendar

Calculation: VKA bovengrens met kantoren 12RD 210819 **Shadow receptor:** W - Shadow Receptor: 8.0 × 5.0 Azimuth: 0.0° Slope: 0.0° (10913)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [DE BILT]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.48	2.65	3.60	5.24	6.59	6.28	6.20	6.12	4.48	3.32	1.87	1.32

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
385	684	574	504	436	731	797	1,164	1,146	770	577	539	8,307

	July	August	September	October	November	December
1	05:22	05:58	06:48	07:37	17:34 (4)	07:30
	22:00	21:28	20:27	19:17	18:25 (4)	17:11
2	05:23	06:00	06:50	07:38	17:34 (4)	07:32
	22:00	21:27	20:24	19:15	18:25 (4)	17:09
3	05:23	06:01	06:51	19:22 (3)	07:40	17:32 (4)
	21:59	21:25	20:22	19:30 (3)	19:13	18:24 (4)
4	05:24	06:03	06:53	19:19 (3)	07:42	17:33 (4)
	21:59	21:23	20:20	19:33 (3)	19:10	18:23 (4)
5	05:25	06:05	06:54	19:17 (3)	07:44	17:33 (4)
	21:59	21:22	20:18	19:34 (3)	19:08	18:23 (4)
6	05:26	06:06	06:56	19:15 (3)	07:45	17:32 (4)
	21:58	21:20	20:15	19:36 (3)	19:06	18:22 (4)
7	05:27	06:08	06:58	19:13 (3)	07:47	17:32 (4)
	21:57	21:18	20:13	19:36 (3)	19:04	18:21 (4)
8	05:28	06:09	06:59	19:13 (3)	07:49	17:33 (4)
	21:57	21:16	20:11	19:36 (3)	19:01	18:21 (4)
9	05:29	06:11	07:01	19:11 (3)	07:50	17:33 (4)
	21:56	21:14	20:08	19:36 (3)	18:59	18:20 (4)
10	05:30	06:12	07:03	19:11 (3)	07:52	17:33 (4)
	21:55	21:13	20:06	19:36 (3)	18:57	18:18 (4)
11	05:31	06:14	07:04	19:11 (3)	07:54	17:34 (4)
	21:55	21:11	20:04	19:37 (3)	18:55	18:17 (4)
12	05:32	06:16	07:06	19:10 (3)	07:55	17:35 (4)
	21:54	21:09	20:01	19:34 (3)	18:52	18:16 (4)
13	05:33	06:17	07:07	19:10 (3)	07:57	17:36 (4)
	21:53	21:07	19:59	19:32 (3)	18:50	18:15 (4)
14	05:34	06:19	07:09	19:10 (3)	07:59	17:36 (4)
	21:52	21:05	19:57	19:30 (3)	18:48	18:12 (4)
15	05:35	06:20	07:11	19:11 (3)	08:00	17:38 (4)
	21:51	21:03	19:54	19:28 (3)	18:46	18:10 (4)
16	05:36	06:22	07:12	19:11 (3)	08:02	17:40 (4)
	21:50	21:01	19:52	19:25 (3)	18:44	18:08 (4)
17	05:38	06:24	07:14	17:57 (4)	08:04	17:42 (4)
	21:49	20:59	19:50	19:23 (3)	18:41	18:06 (4)
18	05:39	06:25	07:16	17:54 (4)	08:06	17:45 (4)
	21:48	20:57	19:47	19:21 (3)	18:39	18:03 (4)
19	05:40	06:27	07:17	17:50 (4)	08:07	17:51 (4)
	21:47	20:55	19:45	19:18 (3)	18:37	17:57 (4)
20	05:41	06:29	07:19	17:48 (4)	08:09	18:04
	21:46	20:53	19:43	18:20 (4)	18:35	16:42
21	05:43	06:30	07:20	17:45 (4)	08:11	18:06
	21:44	20:51	19:40	18:21 (4)	18:33	16:40
22	05:44	06:32	07:22	17:44 (4)	08:13	18:07
	21:43	20:48	19:38	18:22 (4)	18:31	16:39
23	05:45	06:33	07:24	17:42 (4)	08:14	18:09
	21:42	20:46	19:36	18:23 (4)	18:29	16:38
24	05:47	06:35	07:25	17:40 (4)	08:16	18:11
	21:40	20:44	19:33	18:23 (4)	18:27	16:37
25	05:48	06:37	07:27	17:39 (4)	07:18	18:12
	21:39	20:42	19:31	18:24 (4)	17:25	16:36
26	05:50	06:38	07:29	17:38 (4)	07:20	18:14
	21:38	20:40	19:29	18:25 (4)	17:23	16:35
27	05:51	06:40	07:30	17:36 (4)	07:22	18:15
	21:36	20:38	19:26	18:24 (4)	17:21	16:34
28	05:52	06:42	07:32	17:36 (4)	07:23	18:17
	21:35	20:35	19:24	18:25 (4)	17:19	16:33
29	05:54	06:43	07:34	17:35 (4)	07:25	18:18
	21:33	20:33	19:22	18:25 (4)	17:17	16:33
30	05:55	06:45	07:35	17:34 (4)	07:27	18:20
	21:32	20:31	19:20	18:24 (4)	17:15	16:32
31	05:57	06:46		07:29		
	21:30	20:29		17:13		16:35
Potential sun hours	502	454	381	332	267	244
Total, worst case			845	760	1626	2352
Sun reduction			0.35	0.31	0.21	0.17
Oper. time red.			0.95	0.95	0.95	0.95
Wind dir. red.			0.64	0.65	0.63	0.63
Total reduction			0.21	0.19	0.13	0.10
Total, real			180	145	206	237

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

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

19065LE slagschaduw nieuwbouwwijk

Licensed user:

Bosch & Van Rijn

Franz-Lisztplantsoen 220

NL-3533 JG Utrecht

+31 6 51 71 04 93

Schreurs / leon@boschenvanrijn.nl

Calculated:

19-Aug-21 10:59 AM/3.4.388

SHADOW - Calendar

Calculation: VKA bovengrens met kantoren 12RD 210819 **Shadow receptor:** X - Shadow Receptor: 8.0 × 5.0 Azimuth: 0.0° Slope: 0.0° (10914)
Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) [DE BILT]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1.48 2.65 3.60 5.24 6.59 6.28 6.20 6.12 4.48 3.32 1.87 1.32

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 385 684 574 504 436 731 797 1,164 1,146 770 577 539 8,307

	January		February		March		April		May		June	
1	08:45		10:02 (5)	08:18	10:22 (5)	07:25	15:56 (4)	07:15	19:04 (3)	06:10	05:25	
	16:37	59	11:01 (5)	17:24	16:33 (4)	18:16	17:01 (4)	20:10	19:33 (3)	21:01	21:46	
2	08:45		10:03 (5)	08:17	10:23 (5)	07:23	15:55 (4)	07:12	19:05 (3)	06:08	05:24	
	16:38	59	11:02 (5)	17:26	16:37 (4)	18:18	16:59 (4)	20:11	19:32 (3)	21:02	21:47	
3	08:45		10:03 (5)	08:15	10:24 (5)	07:21	15:56 (4)	07:10	19:06 (3)	06:06	05:23	
	16:39	60	11:03 (5)	17:28	16:40 (4)	18:20	16:59 (4)	20:13	19:31 (3)	21:04	21:48	
4	08:45		10:04 (5)	08:14	10:26 (5)	07:19	15:56 (4)	07:08	19:07 (3)	06:04	05:23	
	16:40	59	11:03 (5)	17:30	16:43 (4)	18:21	16:59 (4)	20:15	19:30 (3)	21:06	21:49	
5	08:45		10:04 (5)	08:12	10:29 (5)	07:16	15:57 (4)	07:06	19:07 (3)	06:03	05:22	
	16:41	59	11:03 (5)	17:32	16:45 (4)	18:23	16:58 (4)	20:17	19:28 (3)	21:07	21:50	
6	08:44		10:05 (5)	08:10	10:32 (5)	07:14	15:57 (4)	07:03	19:09 (3)	06:01	05:21	
	16:43	59	11:04 (5)	17:34	16:47 (4)	18:25	16:56 (4)	20:18	19:26 (3)	21:09	21:51	
7	08:44		10:05 (5)	08:09	10:39 (5)	07:12	15:58 (4)	07:01	19:12 (3)	05:59	05:21	
	16:44	59	11:04 (5)	17:36	16:49 (4)	18:27	16:56 (4)	20:20	19:23 (3)	21:10	21:52	
8	08:43		10:06 (5)	08:07	16:05 (4)	07:10	15:59 (4)	06:59		05:57	05:20	
	16:45	59	11:05 (5)	17:37	16:51 (4)	18:28	16:55 (4)	20:22		21:12	21:53	
9	08:43		10:06 (5)	08:05	16:04 (4)	07:08	16:01 (4)	06:57		05:56	05:20	
	16:46	59	11:05 (5)	17:39	16:52 (4)	18:30	16:54 (4)	20:23		21:14	21:54	
10	08:42		10:06 (5)	08:03	16:03 (4)	07:05	16:01 (4)	06:54		05:54	05:19	
	16:48	60	11:06 (5)	17:41	16:53 (4)	18:32	16:52 (4)	20:25		21:15	21:55	
11	08:42		10:06 (5)	08:02	16:01 (4)	07:03	16:03 (4)	06:52		05:52	05:19	
	16:49	60	11:06 (5)	17:43	16:54 (4)	18:34	16:51 (4)	20:27		21:17	21:56	
12	08:41		10:07 (5)	08:00	16:02 (4)	07:01	16:05 (4)	06:50		05:50	05:19	
	16:51	60	11:07 (5)	17:45	16:57 (4)	18:35	16:49 (4)	20:28		21:18	21:56	
13	08:40		10:08 (5)	07:58	16:01 (4)	06:59	16:06 (4)	06:48		05:49	05:18	
	16:52	59	11:07 (5)	17:47	16:57 (4)	18:37	16:47 (4)	20:30		21:20	21:57	
14	08:40		10:08 (5)	07:56	16:00 (4)	06:56	16:09 (4)	06:45		05:47	05:18	
	16:54	59	11:07 (5)	17:49	16:58 (4)	18:39	16:45 (4)	20:32		21:22	21:58	
15	08:39		10:08 (5)	07:54	15:59 (4)	06:54	16:12 (4)	06:43		05:46	05:18	
	16:55	59	11:07 (5)	17:50	16:59 (4)	18:41	16:42 (4)	20:34		21:23	21:58	
16	08:38		10:09 (5)	07:52	15:59 (4)	06:52	16:14 (4)	06:41		05:44	05:18	
	16:57	59	11:08 (5)	17:52	17:00 (4)	18:42	16:38 (4)	20:35		21:25	21:59	
17	08:37		10:10 (5)	07:50	15:57 (4)	06:49	16:19 (4)	06:39		05:43	05:18	
	16:58	58	11:08 (5)	17:54	16:59 (4)	18:44	16:34 (4)	20:37		21:26	21:59	
18	08:36		10:10 (5)	07:48	15:56 (4)	06:47		06:37		05:41	05:18	
	17:00	58	11:08 (5)	17:56	17:00 (4)	18:46		20:39		21:28	21:59	
19	08:35		10:10 (5)	07:46	15:56 (4)	06:45		06:35		05:40	05:18	
	17:02	57	11:07 (5)	17:58	17:00 (4)	18:48		20:40		21:29	22:00	
20	08:34		10:11 (5)	07:44	15:56 (4)	06:42	18:17 (3)	06:32		05:38	05:18	
	17:03	57	11:08 (5)	18:00	17:01 (4)	18:49	18:24 (3)	20:42		21:31	22:00	
21	08:33		10:12 (5)	07:42	15:56 (4)	06:40	18:14 (3)	06:30		05:37	05:18	
	17:05	56	11:08 (5)	18:01	17:01 (4)	18:51	18:26 (3)	20:44		21:32	22:00	
22	08:32		10:12 (5)	07:40	15:55 (4)	06:38	18:11 (3)	06:28		05:36	05:18	
	17:07	56	11:08 (5)	18:03	17:01 (4)	18:53	18:27 (3)	20:45		21:33	22:01	
23	08:31		10:13 (5)	07:38	15:55 (4)	06:36	18:10 (3)	06:26		05:35	05:18	
	17:08	54	11:07 (5)	18:05	17:02 (4)	18:54	18:29 (3)	20:47		21:35	22:01	
24	08:30		10:14 (5)	07:36	15:55 (4)	06:33	18:09 (3)	06:24		05:33	05:19	
	17:10	53	11:07 (5)	18:07	17:02 (4)	18:56	18:31 (3)	20:49		21:36	22:01	
25	08:28		10:15 (5)	07:34	15:54 (4)	06:31	18:07 (3)	06:22		05:32	05:19	
	17:12	53	11:08 (5)	18:09	17:01 (4)	18:58	18:32 (3)	20:50		21:38	22:01	
26	08:27		10:15 (5)	07:32	15:55 (4)	06:29	18:06 (3)	06:20		05:31	05:19	
	17:14	52	11:07 (5)	18:11	17:01 (4)	19:00	18:34 (3)	20:52		21:39	22:01	
27	08:26		10:16 (5)	07:30	15:55 (4)	06:26	18:06 (3)	06:18		05:30	05:20	
	17:15	51	11:07 (5)	18:12	17:01 (4)	19:01	18:35 (3)	20:54		21:40	22:01	
28	08:24		10:17 (5)	07:27	15:55 (4)	06:24	18:06 (3)	06:16		05:29	05:20	
	17:17	49	11:06 (5)	18:14	17:01 (4)	19:03	18:36 (3)	20:56		21:41	22:01	
29	08:23		10:18 (5)			07:22	19:04 (3)	06:14		05:28	05:21	
	17:19	47	11:05 (5)			20:05	19:35 (3)	20:57		21:43	22:01	
30	08:21		10:19 (5)			07:19	19:05 (3)	06:12		05:27	05:21	
	17:21	45	11:04 (5)			20:06	19:35 (3)	20:59		21:44	22:00	
31	08:20		10:20 (5)			07:17	19:05 (3)			05:26		
	17:23	43	11:03 (5)			20:08	19:34 (3)			21:45		
Potential sun hours	259			278		367		416		485	498	
Total, worst case	1737			1666		1109		153				
Sun reduction	0.18			0.27		0.30		0.38				
Oper. time red.	0.95			0.95		0.95		0.95				
Wind dir. red.	0.62			0.67		0.66		0.62				
Total reduction	0.10			0.17		0.19		0.22				
Total, real	179			279		209		34				

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

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

Project:

19065LE slagschaduw nieuwbouwwijk

Licensed user:

Bosch & Van Rijn

Franz-Lisztplantsoen 220

NL-3533 JG Utrecht

+31 6 51 71 04 93

Schreurs / leon@boschenvanrijn.nl

Calculated:

19-Aug-21 10:59 AM/3.4.388

SHADOW - Calendar

Calculation: VKA bovengrens met kantoren 12RD 210819**Shadow receptor:** X - Shadow Receptor: 8.0 × 5.0 Azimuth: 0.0° Slope: 0.0° (10914)
Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) [DE BILT]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1.48 2.65 3.60 5.24 6.59 6.28 6.20 6.12 4.48 3.32 1.87 1.32

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 385 684 574 504 436 731 797 1,164 1,146 770 577 539 8,307

	July	August	September	October	November	December
1	05:22	05:58	06:48	07:37	16:45 (4)	07:30
	22:00	21:28	20:27	19:17	17:27 (4)	17:11
2	05:23	06:00	06:50	07:39	16:43 (4)	07:32
	22:00	21:27	20:24	19:15	17:29 (4)	17:09
3	05:23	06:02	06:51	07:40	16:40 (4)	07:34
	21:59	21:25	20:22	19:13	17:29 (4)	17:08
4	05:24	06:03	06:53	07:42	16:38 (4)	07:36
	21:59	21:23	20:20	19:10	17:30 (4)	17:06
5	05:25	06:05	06:55	19:08 (3)	16:37 (4)	07:38
	21:59	21:22	20:18	19:05 (3)	17:31 (4)	17:04
6	05:26	06:06	06:56	19:05 (3)	16:35 (4)	07:39
	21:58	21:20	20:15	19:06	17:31 (4)	17:02
7	05:27	06:08	06:58	19:03 (3)	16:34 (4)	07:41
	21:57	21:18	20:13	19:04	17:32 (4)	17:01
8	05:28	06:09	06:59	19:01 (3)	16:33 (4)	07:43
	21:57	21:16	20:11	19:01	17:33 (4)	16:59
9	05:29	06:11	07:01	18:59 (3)	16:32 (4)	07:45
	21:56	21:14	20:08	18:59	17:33 (4)	16:57
10	05:30	06:12	07:03	18:58 (3)	16:30 (4)	07:47
	21:55	21:13	20:06	18:57	17:33 (4)	16:56
11	05:31	06:14	07:04	18:58 (3)	16:30 (4)	07:48
	21:55	21:11	20:04	18:55 (3)	17:33 (4)	16:54
12	05:32	06:16	07:06	18:56 (3)	16:29 (4)	07:50
	21:54	21:09	20:01	18:52	17:34 (4)	16:53
13	05:33	06:17	07:07	18:56 (3)	16:29 (4)	07:52
	21:53	21:07	19:59	18:50	17:34 (4)	16:51
14	05:34	06:19	07:09	18:55 (3)	16:27 (4)	07:54
	21:52	21:05	19:57	18:48	17:33 (4)	16:50
15	05:35	06:20	07:11	18:55 (3)	16:27 (4)	07:55
	21:51	21:03	19:54	18:46	17:33 (4)	16:48
16	05:36	06:22	07:12	18:55 (3)	16:27 (4)	07:57
	21:50	21:01	19:52	18:44	17:33 (4)	16:47
17	05:38	06:24	07:14	18:55 (3)	16:27 (4)	07:59
	21:49	20:59	19:50	18:41	17:33 (4)	16:45
18	05:39	06:25	07:16	18:55 (3)	16:27 (4)	08:01
	21:48	20:57	19:47	18:39	17:33 (4)	16:44
19	05:40	06:27	07:17	18:55 (3)	16:27 (4)	08:02
	21:47	20:55	19:45	18:37	17:33 (4)	16:43
20	05:41	06:29	07:19	18:56 (3)	16:26 (4)	08:04
	21:46	20:53	19:43	18:35	17:32 (4)	16:42
21	05:43	06:30	07:20	18:56 (3)	16:26 (4)	08:06
	21:44	20:51	19:40	18:33	17:31 (4)	16:40
22	05:44	06:32	07:22	18:58 (3)	16:26 (4)	08:07
	21:43	20:48	19:38	18:31	17:31 (4)	16:39
23	05:45	06:33	07:24	19:01 (3)	16:27 (4)	08:09
	21:42	20:46	19:36	18:29	17:31 (4)	16:38
24	05:47	06:35	07:25	18:26	16:27 (4)	08:11
	21:40	20:44	19:33	18:27	17:30 (4)	16:37
25	05:48	06:37	07:27	17:18	15:28 (4)	08:12
	21:39	20:42	19:31	17:25	16:30 (4)	16:36
26	05:50	06:38	07:29	17:04 (4)	15:28 (4)	08:14
	21:38	20:40	19:29	17:14 (4)	16:29 (4)	16:35
27	05:51	06:40	07:30	16:57 (4)	15:29 (4)	08:15
	21:36	20:38	19:26	17:19 (4)	16:28 (4)	16:34
28	05:52	06:42	07:32	16:54 (4)	15:30 (4)	08:17
	21:35	20:35	19:24	17:22 (4)	16:28 (4)	16:33
29	05:54	06:43	07:34	16:51 (4)	15:29 (4)	08:18
	21:33	20:33	19:22	17:25 (4)	16:26 (4)	16:33
30	05:55	06:45	07:35	16:47 (4)	15:30 (4)	08:20
	21:32	20:31	19:20	17:26 (4)	16:25 (4)	16:32
31	05:57	06:46		07:29	15:31 (4)	
	21:30	20:29		17:13	16:24 (4)	
Potential sun hours	502	454	381	332	267	244
Total, worst case			570	1858	1627	1823
Sun reduction			0.35	0.31	0.21	0.17
Oper. time red.			0.95	0.95	0.95	0.95
Wind dir. red.			0.63	0.67	0.63	0.62
Total reduction			0.21	0.20	0.12	0.10
Total, real			120	365	203	178

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

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

Project:

19065LE slagschaduw nieuwbouwwijk

Licensed user:

Bosch & Van Rijn

Franz-Lisztplantsoen 220

NL-3533 JG Utrecht

+31 6 51 71 04 93

Schreurs / leon@boschenvanrijn.nl

Calculated:

19-Aug-21 10:59 AM/3.4.388

SHADOW - Calendar

Calculation: VKA bovengrens met kantoren 12RD 210819 **Shadow receptor:** Y - Shadow Receptor: 8.0 × 5.0 Azimuth: 0.0° Slope: 0.0° (10915)
Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) [DE BILT]

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 1.48 2.65 3.60 5.24 6.59 6.28 6.20 6.12 4.48 3.32 1.87 1.32

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 385 684 574 504 436 731 797 1,164 1,146 770 577 539 8,307

	January		February		March		April		May		June	
1	08:45		10:05 (5)	08:18	10:23 (5)	07:25	16:03 (4)	07:15	19:06 (3)	06:10	05:25	
	16:37	60	11:05 (5)	17:24	11:07 (5)	18:16	17:08 (4)	20:10	19:35 (3)	21:01	21:46	
2	08:45		10:05 (5)	08:17	10:24 (5)	07:23	16:02 (4)	07:12	19:07 (3)	06:08	05:24	
	16:38	61	11:06 (5)	17:26	11:06 (5)	18:18	17:07 (4)	20:11	19:35 (3)	21:02	21:47	
3	08:45		10:06 (5)	08:15	10:26 (5)	07:21	16:03 (4)	07:10	19:07 (3)	06:06	05:23	
	16:39	61	11:07 (5)	17:28	11:04 (5)	18:20	17:07 (4)	20:13	19:34 (3)	21:04	21:48	
4	08:45		10:07 (5)	08:14	10:27 (5)	07:19	16:03 (4)	07:08	19:08 (3)	06:04	05:23	
	16:40	61	11:08 (5)	17:30	11:02 (5)	18:21	17:07 (4)	20:15	19:33 (3)	21:06	21:49	
5	08:45		10:06 (5)	08:12	10:30 (5)	07:16	16:04 (4)	07:06	19:08 (3)	06:03	05:22	
	16:41	62	11:08 (5)	17:32	16:43 (4)	18:23	17:06 (4)	20:17	19:31 (3)	21:07	21:50	
6	08:44		10:07 (5)	08:10	10:32 (5)	07:14	16:03 (4)	07:03	19:10 (3)	06:01	05:21	
	16:43	62	11:09 (5)	17:34	16:47 (4)	18:25	17:05 (4)	20:18	19:30 (3)	21:09	21:51	
7	08:44		10:07 (5)	08:09	10:36 (5)	07:12	16:04 (4)	07:01	19:12 (3)	05:59	05:21	
	16:44	62	11:09 (5)	17:36	16:50 (4)	18:27	17:05 (4)	20:20	19:28 (3)	21:10	21:52	
8	08:43		10:08 (5)	08:07	16:18 (4)	07:10	16:05 (4)	06:59	19:15 (3)	05:57	05:20	
	16:45	62	11:10 (5)	17:37	16:52 (4)	18:28	17:04 (4)	20:22	19:25 (3)	21:12	21:53	
9	08:43		10:08 (5)	08:05	16:16 (4)	07:08	16:06 (4)	06:57		05:56	05:20	
	16:46	62	11:10 (5)	17:39	16:54 (4)	18:30	17:03 (4)	20:23		21:14	21:54	
10	08:42		10:08 (5)	08:03	16:15 (4)	07:05	16:06 (4)	06:54		05:54	05:19	
	16:48	62	11:10 (5)	17:41	16:56 (4)	18:32	17:01 (4)	20:25		21:15	21:55	
11	08:42		10:09 (5)	08:02	16:13 (4)	07:03	16:07 (4)	06:52		05:52	05:19	
	16:49	61	11:10 (5)	17:43	16:58 (4)	18:34	17:01 (4)	20:27		21:17	21:56	
12	08:41		10:10 (5)	08:00	16:13 (4)	07:01	16:09 (4)	06:50		05:50	05:19	
	16:51	61	11:11 (5)	17:45	17:00 (4)	18:35	16:59 (4)	20:28		21:18	21:56	
13	08:40		10:10 (5)	07:58	16:12 (4)	06:59	16:09 (4)	06:48		05:49	05:18	
	16:52	61	11:11 (5)	17:47	17:01 (4)	18:37	16:57 (4)	20:30		21:20	21:57	
14	08:40		10:10 (5)	07:56	16:11 (4)	06:56	16:11 (4)	06:45		05:47	05:18	
	16:54	62	11:12 (5)	17:49	17:03 (4)	18:39	16:56 (4)	20:32		21:22	21:58	
15	08:39		10:11 (5)	07:54	16:10 (4)	06:54	16:13 (4)	06:43		05:46	05:18	
	16:55	61	11:12 (5)	17:50	17:04 (4)	18:41	16:55 (4)	20:34		21:23	21:58	
16	08:38		10:11 (5)	07:52	16:09 (4)	06:52	16:15 (4)	06:41		05:44	05:18	
	16:57	61	11:12 (5)	17:52	17:05 (4)	18:42	16:52 (4)	20:35		21:25	21:59	
17	08:37		10:12 (5)	07:50	16:07 (4)	06:49	16:18 (4)	06:39		05:43	05:18	
	16:58	60	11:12 (5)	17:54	17:05 (4)	18:44	16:50 (4)	20:37		21:26	21:59	
18	08:36		10:13 (5)	07:48	16:06 (4)	06:47	16:21 (4)	06:37		05:41	05:18	
	17:00	60	11:13 (5)	17:56	17:05 (4)	18:46	16:47 (4)	20:39		21:28	21:59	
19	08:35		10:12 (5)	07:46	16:06 (4)	06:45	16:24 (4)	06:35		05:40	05:18	
	17:02	60	11:12 (5)	17:58	17:06 (4)	18:48	16:42 (4)	20:40		21:29	22:00	
20	08:34		10:13 (5)	07:44	16:05 (4)	06:42		06:32		05:38	05:18	
	17:03	59	11:12 (5)	18:00	17:07 (4)	18:49		20:42		21:31	22:00	
21	08:33		10:14 (5)	07:42	16:05 (4)	06:40	18:20 (3)	06:30		05:37	05:18	
	17:05	58	11:12 (5)	18:01	17:07 (4)	18:51	18:26 (3)	20:44		21:32	22:00	
22	08:32		10:15 (5)	07:40	16:04 (4)	06:38	18:16 (3)	06:28		05:36	05:18	
	17:07	58	11:13 (5)	18:03	17:08 (4)	18:53	18:27 (3)	20:45		21:33	22:01	
23	08:31		10:15 (5)	07:38	16:04 (4)	06:36	18:14 (3)	06:26		05:35	05:18	
	17:08	57	11:12 (5)	18:05	17:08 (4)	18:54	18:29 (3)	20:47		21:35	22:01	
24	08:30		10:16 (5)	07:36	16:04 (4)	06:33	18:12 (3)	06:24		05:33	05:19	
	17:10	56	11:12 (5)	18:07	17:09 (4)	18:56	18:31 (3)	20:49		21:36	22:01	
25	08:28		10:17 (5)	07:34	16:03 (4)	06:31	18:10 (3)	06:22		05:32	05:19	
	17:12	55	11:12 (5)	18:09	17:08 (4)	18:58	18:32 (3)	20:50		21:38	22:01	
26	08:27		10:17 (5)	07:32	16:03 (4)	06:29	18:09 (3)	06:20		05:31	05:19	
	17:14	54	11:11 (5)	18:11	17:08 (4)	19:00	18:34 (3)	20:52		21:39	22:01	
27	08:26		10:18 (5)	07:30	16:03 (4)	06:26	18:09 (3)	06:18		05:30	05:20	
	17:15	53	11:11 (5)	18:12	17:08 (4)	19:01	18:36 (3)	20:54		21:40	22:01	
28	08:24		10:19 (5)	07:27	16:03 (4)	06:24	18:08 (3)	06:16		05:29	05:20	
	17:17	51	11:10 (5)	18:14	17:08 (4)	19:03	18:37 (3)	20:56		21:41	22:01	
29	08:23		10:20 (5)			07:22	19:07 (3)	06:14		05:28	05:21	
	17:19	50	11:10 (5)			20:05	19:37 (3)	20:57		21:43	22:01	
30	08:21		10:21 (5)			07:19	19:07 (3)	06:12		05:27	05:21	
	17:21	48	11:09 (5)			20:06	19:37 (3)	20:59		21:44	22:00	
31	08:20		10:21 (5)			07:17	19:07 (3)			05:26		
	17:23	47	11:08 (5)			20:08	19:37 (3)			21:45		
Potential sun hours	259		278		367		416		485		498	
Total, worst case	1808		1468		1210		178					
Sun reduction	0.18		0.27		0.30		0.38					
Oper. time red.	0.95		0.95		0.95		0.95					
Wind dir. red.	0.62		0.66		0.66		0.62					
Total reduction	0.10		0.17		0.19		0.22					
Total, real	186		245		229		39					

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

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

Project:

19065LE slagschaduw nieuwbouwwijk

Licensed user:

Bosch & Van Rijn

Franz-Lisztplantsoen 220

NL-3533 JG Utrecht

+31 6 51 71 04 93

Schreurs / leon@boschenvanrijn.nl

Calculated:

19-Aug-21 10:59 AM/3.4.388

SHADOW - Calendar

Calculation: VKA bovengrens met kantoren 12RD 210819 **Shadow receptor:** Y - Shadow Receptor: 8.0 × 5.0 Azimuth: 0.0° Slope: 0.0° (10915)
Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) [DE BILT]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1.48 2.65 3.60 5.24 6.59 6.28 6.20 6.12 4.48 3.32 1.87 1.32

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 385 684 574 504 436 731 797 1,164 1,146 770 577 539 8,307

	July	August	September	October	November	December
1	05:22	05:58	06:48	07:37	16:48 (4)	07:30
	22:00	21:28	20:27	19:17	17:38 (4)	17:11
2	05:23	06:00	06:50	07:39	16:47 (4)	07:32
	22:00	21:27	20:24	19:15	17:39 (4)	17:09
3	05:23	06:02	06:51	07:40	16:44 (4)	07:34
	21:59	21:25	20:22	19:13	17:39 (4)	17:08
4	05:24	06:03	06:53	19:12 (3)	16:43 (4)	07:36
	21:59	21:23	20:20	19:22 (3)	17:40 (4)	17:06
5	05:25	06:05	06:55	19:08 (3)	16:42 (4)	07:38
	21:59	21:22	20:18	19:24 (3)	17:41 (4)	17:04
6	05:26	06:06	06:56	19:06 (3)	16:40 (4)	07:39
	21:58	21:20	20:15	19:26 (3)	17:40 (4)	17:02
7	05:27	06:08	06:58	19:04 (3)	16:40 (4)	07:41
	21:57	21:18	20:13	19:26 (3)	17:41 (4)	17:01
8	05:28	06:09	06:59	19:03 (3)	16:39 (4)	07:43
	21:57	21:16	20:11	19:27 (3)	17:41 (4)	16:59
9	05:29	06:11	07:01	19:01 (3)	16:38 (4)	07:45
	21:56	21:14	20:08	19:27 (3)	17:42 (4)	16:57
10	05:30	06:12	07:03	19:00 (3)	16:37 (4)	07:47
	21:55	21:13	20:06	19:28 (3)	17:41 (4)	16:56
11	05:31	06:14	07:04	19:00 (3)	16:36 (4)	07:48
	21:55	21:11	20:04	19:29 (3)	17:41 (4)	16:54
12	05:32	06:16	07:06	18:58 (3)	16:36 (4)	07:50
	21:54	21:09	20:01	19:28 (3)	17:41 (4)	16:53
13	05:33	06:17	07:07	18:58 (3)	16:36 (4)	07:52
	21:53	21:07	19:59	19:28 (3)	17:41 (4)	16:51
14	05:34	06:19	07:09	18:57 (3)	16:35 (4)	07:54
	21:52	21:05	19:57	19:27 (3)	17:40 (4)	16:50
15	05:35	06:20	07:11	18:58 (3)	16:35 (4)	07:55
	21:51	21:03	19:54	19:27 (3)	17:40 (4)	16:48
16	05:36	06:22	07:12	18:58 (3)	16:35 (4)	07:57
	21:50	21:01	19:52	19:26 (3)	17:40 (4)	16:47
17	05:38	06:24	07:14	18:58 (3)	16:35 (4)	07:59
	21:49	20:59	19:50	19:23 (3)	17:40 (4)	16:45
18	05:39	06:25	07:16	18:58 (3)	16:35 (4)	08:01
	21:48	20:57	19:47	19:21 (3)	17:40 (4)	16:44
19	05:40	06:27	07:17	18:59 (3)	16:35 (4)	08:02
	21:47	20:55	19:45	19:18 (3)	17:39 (4)	16:43
20	05:41	06:29	07:19	19:00 (3)	16:35 (4)	08:04
	21:46	20:53	19:43	19:16 (3)	17:38 (4)	16:42
21	05:43	06:30	07:20	19:01 (3)	16:35 (4)	08:06
	21:44	20:51	19:40	19:13 (3)	17:37 (4)	16:40
22	05:44	06:32	07:22	19:03 (3)	16:36 (4)	08:07
	21:43	20:48	19:38	19:11 (3)	17:37 (4)	16:39
23	05:45	06:33	07:24	08:14	16:36 (4)	08:09
	21:42	20:46	19:36	18:29	17:36 (4)	16:38
24	05:47	06:35	07:25	17:10 (4)	16:37 (4)	08:11
	21:40	20:44	19:33	17:24 (4)	17:36 (4)	16:37
25	05:48	06:37	07:27	17:05 (4)	15:38 (4)	08:12
	21:39	20:42	19:31	17:28 (4)	16:35 (4)	16:36
26	05:50	06:38	07:29	17:01 (4)	15:38 (4)	08:14
	21:38	20:40	19:29	17:31 (4)	16:34 (4)	16:35
27	05:51	06:40	07:30	16:58 (4)	15:39 (4)	08:15
	21:36	20:38	19:26	17:33 (4)	16:33 (4)	16:34
28	05:52	06:42	07:32	16:55 (4)	15:40 (4)	08:17
	21:35	20:35	19:24	17:35 (4)	16:32 (4)	16:33
29	05:54	06:43	07:34	16:53 (4)	15:40 (4)	08:18
	21:33	20:33	19:22	17:36 (4)	16:30 (4)	16:33
30	05:55	06:45	07:35	16:50 (4)	15:42 (4)	08:20
	21:32	20:31	19:20	17:37 (4)	16:28 (4)	16:32
31	05:57	06:46		07:29	15:43 (4)	
	21:30	20:29		17:13	16:27 (4)	
Potential sun hours	502	454	381	332	267	244
Total, worst case			657	1832	1545	1877
Sun reduction			0.35	0.31	0.21	0.17
Oper. time red.			0.95	0.95	0.95	0.95
Wind dir. red.			0.64	0.67	0.62	0.62
Total reduction			0.21	0.20	0.12	0.10
Total, real			140	360	191	183

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

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

Project:

19065LE slagschaduw nieuwbouwwijk

Licensed user:

Bosch & Van Rijn

Franz-Lisztplantsoen 220

NL-3533 JG Utrecht

+31 6 51 71 04 93

Schreurs / leon@boschenvanrijn.nl

Calculated:

19-Aug-21 10:59 AM/3.4.388

SHADOW - Calendar

Calculation: VKA bovengrens met kantoren 12RD 210819**Shadow receptor:** Z - Shadow Receptor: 8.0 × 5.0 Azimuth: 0.0° Slope: 0.0° (10916)
Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) [DE BILT]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1.48 2.65 3.60 5.24 6.59 6.28 6.20 6.12 4.48 3.32 1.87 1.32

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 385 684 574 504 436 731 797 1,164 1,146 770 577 539 8,307

	January		February		March		April		May		June	
1	08:45		10:05 (5)	08:18	10:23 (5)	07:25	16:08 (4)	07:15	19:08 (3)	06:10	05:25	
	16:37	62	11:07 (5)	17:24	11:10 (5)	18:16	17:13 (4)	20:10	19:37 (3)	21:01	21:46	
2	08:45		10:06 (5)	08:17	10:24 (5)	07:23	16:07 (4)	07:12	19:08 (3)	06:08	05:24	
	16:38	62	11:08 (5)	17:26	11:09 (5)	18:18	17:12 (4)	20:11	19:37 (3)	21:02	21:47	
3	08:45		10:07 (5)	08:15	10:25 (5)	07:21	16:07 (4)	07:10	19:09 (3)	06:06	05:23	
	16:39	62	11:09 (5)	17:28	11:07 (5)	18:20	17:12 (4)	20:13	19:36 (3)	21:04	21:48	
4	08:45		10:07 (5)	08:14	10:27 (5)	07:19	16:08 (4)	07:08	19:09 (3)	06:04	05:23	
	16:40	63	11:10 (5)	17:30	11:05 (5)	18:21	17:12 (4)	20:15	19:36 (3)	21:06	21:49	
5	08:45		10:07 (5)	08:12	10:29 (5)	07:16	16:08 (4)	07:06	19:09 (3)	06:03	05:22	
	16:41	63	11:10 (5)	17:32	11:04 (5)	18:23	17:12 (4)	20:17	19:34 (3)	21:07	21:50	
6	08:44		10:08 (5)	08:10	10:31 (5)	07:14	16:07 (4)	07:03	19:11 (3)	06:01	05:21	
	16:43	62	11:10 (5)	17:34	11:02 (5)	18:25	17:11 (4)	20:18	19:32 (3)	21:09	21:51	
7	08:44		10:08 (5)	08:09	10:33 (5)	07:12	16:08 (4)	07:01	19:12 (3)	05:59	05:21	
	16:44	62	11:10 (5)	17:36	16:45 (4)	18:27	17:10 (4)	20:20	19:31 (3)	21:10	21:52	
8	08:43		10:09 (5)	08:07	10:37 (5)	07:10	16:09 (4)	06:59	19:14 (3)	05:57	05:20	
	16:45	63	11:12 (5)	17:37	16:50 (4)	18:28	17:10 (4)	20:22	19:29 (3)	21:12	21:53	
9	08:43		10:09 (5)	08:05	16:27 (4)	07:08	16:09 (4)	06:57	19:17 (3)	05:56	05:20	
	16:46	63	11:12 (5)	17:39	16:54 (4)	18:30	17:09 (4)	20:23	19:24 (3)	21:14	21:54	
10	08:42		10:09 (5)	08:03	16:24 (4)	07:05	16:09 (4)	06:54		05:54	05:19	
	16:48	63	11:12 (5)	17:41	16:56 (4)	18:32	17:08 (4)	20:25		21:15	21:55	
11	08:42		10:09 (5)	08:02	16:22 (4)	07:03	16:10 (4)	06:52		05:52	05:19	
	16:49	63	11:12 (5)	17:43	16:58 (4)	18:34	17:07 (4)	20:27		21:17	21:56	
12	08:41		10:10 (5)	08:00	16:21 (4)	07:01	16:12 (4)	06:50		05:50	05:19	
	16:51	63	11:13 (5)	17:45	17:01 (4)	18:35	17:06 (4)	20:28		21:18	21:56	
13	08:40		10:11 (5)	07:58	16:20 (4)	06:59	16:12 (4)	06:48		05:49	05:18	
	16:52	62	11:13 (5)	17:47	17:03 (4)	18:37	17:04 (4)	20:30		21:20	21:57	
14	08:40		10:11 (5)	07:56	16:18 (4)	06:56	16:13 (4)	06:45		05:47	05:18	
	16:54	63	11:14 (5)	17:49	17:05 (4)	18:39	17:03 (4)	20:32		21:22	21:58	
15	08:39		10:11 (5)	07:54	16:17 (4)	06:54	16:15 (4)	06:43		05:46	05:18	
	16:55	63	11:14 (5)	17:50	17:06 (4)	18:41	17:02 (4)	20:34		21:23	21:58	
16	08:38		10:12 (5)	07:52	16:16 (4)	06:52	16:16 (4)	06:41		05:44	05:18	
	16:57	62	11:14 (5)	17:52	17:07 (4)	18:42	17:00 (4)	20:35		21:25	21:59	
17	08:37		10:12 (5)	07:50	16:14 (4)	06:49	16:18 (4)	06:39		05:43	05:18	
	16:58	62	11:14 (5)	17:54	17:07 (4)	18:44	16:58 (4)	20:37		21:26	21:59	
18	08:36		10:13 (5)	07:48	16:13 (4)	06:47	16:21 (4)	06:37		05:41	05:18	
	17:00	62	11:15 (5)	17:56	17:08 (4)	18:46	16:56 (4)	20:39		21:28	21:59	
19	08:35		10:13 (5)	07:46	16:12 (4)	06:45	16:22 (4)	06:35		05:40	05:18	
	17:02	61	11:14 (5)	17:58	17:09 (4)	18:48	16:53 (4)	20:40		21:29	22:00	
20	08:34		10:13 (5)	07:44	16:12 (4)	06:42	16:26 (4)	06:32		05:38	05:18	
	17:03	61	11:14 (5)	18:00	17:10 (4)	18:49	16:50 (4)	20:42		21:31	22:00	
21	08:33		10:14 (5)	07:42	16:11 (4)	06:40	16:30 (4)	06:30		05:37	05:18	
	17:05	61	11:15 (5)	18:01	17:11 (4)	18:51	16:46 (4)	20:44		21:32	22:00	
22	08:32		10:15 (5)	07:40	16:10 (4)	06:38	18:20 (3)	06:28		05:36	05:18	
	17:07	60	11:15 (5)	18:03	17:12 (4)	18:53	18:27 (3)	20:45		21:33	22:01	
23	08:31		10:15 (5)	07:38	16:10 (4)	06:36	18:17 (3)	06:26		05:35	05:18	
	17:08	59	11:14 (5)	18:05	17:12 (4)	18:54	18:29 (3)	20:47		21:35	22:01	
24	08:30		10:16 (5)	07:36	16:10 (4)	06:33	18:15 (3)	06:24		05:33	05:19	
	17:10	58	11:14 (5)	18:07	17:13 (4)	18:56	18:31 (3)	20:49		21:36	22:01	
25	08:28		10:17 (5)	07:34	16:08 (4)	06:31	18:13 (3)	06:22		05:32	05:19	
	17:12	58	11:15 (5)	18:09	17:12 (4)	18:58	18:32 (3)	20:50		21:38	22:01	
26	08:27		10:17 (5)	07:32	16:08 (4)	06:29	18:12 (3)	06:20		05:31	05:19	
	17:14	57	11:14 (5)	18:11	17:13 (4)	19:00	18:34 (3)	20:52		21:39	22:01	
27	08:26		10:19 (5)	07:30	16:08 (4)	06:26	18:11 (3)	06:18		05:30	05:20	
	17:15	55	11:14 (5)	18:12	17:13 (4)	19:01	18:36 (3)	20:54		21:40	22:01	
28	08:24		10:19 (5)	07:27	16:08 (4)	06:24	18:10 (3)	06:16		05:29	05:20	
	17:17	54	11:13 (5)	18:14	17:13 (4)	19:03	18:38 (3)	20:56		21:41	22:01	
29	08:23		10:20 (5)			07:22	19:09 (3)	06:14		05:28	05:21	
	17:19	53	11:13 (5)			20:05	19:38 (3)	20:57		21:43	22:01	
30	08:21		10:21 (5)			07:19	19:09 (3)	06:12		05:27	05:21	
	17:21	51	11:12 (5)			20:06	19:38 (3)	20:59		21:44	22:00	
31	08:20		10:21 (5)			07:17	19:09 (3)			05:26		
	17:23	50	11:11 (5)			20:08	19:38 (3)			21:45		
Potential sun hours	259		278		367		416		485		498	
Total, worst case	1863		1363		1295		199					
Sun reduction	0.18		0.27		0.30		0.38					
Oper. time red.	0.95		0.95		0.95		0.95					
Wind dir. red.	0.62		0.66		0.66		0.62					
Total reduction	0.10		0.17		0.19		0.22					
Total, real	192		226		245		44					

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

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

Project:

19065LE slagschaduw nieuwbouwwijk

Licensed user:

Bosch & Van Rijn

Franz-Lisztplantsoen 220

NL-3533 JG Utrecht

+31 6 51 71 04 93

Schreurs / leon@boschenvanrijn.nl

Calculated:

19-Aug-21 10:59 AM/3.4.388

SHADOW - Calendar

Calculation: VKA bovengrens met kantoren 12RD 210819 **Shadow receptor:** Z - Shadow Receptor: 8.0 × 5.0 Azimuth: 0.0° Slope: 0.0° (10916)
Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) [DE BILT]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1.48 2.65 3.60 5.24 6.59 6.28 6.20 6.12 4.48 3.32 1.87 1.32

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 385 684 574 504 436 731 797 1,164 1,146 770 577 539 8,307

	July	August	September	October	November	December
1	05:22	05:58	06:48	07:37	16:51 (4)	07:30
	22:00	21:28	20:27	19:17	17:45 (4)	17:11
2	05:23	06:00	06:50	07:39	16:50 (4)	07:32
	22:00	21:27	20:24	19:15	17:46 (4)	17:09
3	05:23	06:02	06:51	19:15 (3)	07:40	16:48 (4)
	21:59	21:25	20:22	19:22 (3)	19:13	17:45 (4)
4	05:24	06:03	06:53	19:11 (3)	07:42	16:47 (4)
	21:59	21:23	20:20	19:26 (3)	19:10	17:46 (4)
5	05:25	06:05	06:55	19:08 (3)	07:44	16:46 (4)
	21:59	21:22	20:18	19:27 (3)	19:08	17:47 (4)
6	05:26	06:06	06:56	19:07 (3)	07:45	16:44 (4)
	21:58	21:20	20:15	19:28 (3)	19:06	17:46 (4)
7	05:27	06:08	06:58	19:05 (3)	07:47	16:44 (4)
	21:57	21:18	20:13	19:29 (3)	19:04	17:47 (4)
8	05:28	06:09	06:59	19:04 (3)	07:49	16:43 (4)
	21:57	21:16	20:11	19:30 (3)	19:01	17:47 (4)
9	05:29	06:11	07:01	19:02 (3)	07:50	16:43 (4)
	21:56	21:14	20:08	19:30 (3)	18:59	17:47 (4)
10	05:30	06:12	07:03	19:01 (3)	07:52	16:41 (4)
	21:55	21:13	20:06	19:30 (3)	18:57	17:46 (4)
11	05:31	06:14	07:04	19:01 (3)	07:54	16:41 (4)
	21:55	21:11	20:04	19:30 (3)	18:55	17:46 (4)
12	05:32	06:16	07:06	19:00 (3)	07:55	16:41 (4)
	21:54	21:09	20:01	19:30 (3)	18:52	17:46 (4)
13	05:33	06:17	07:07	19:00 (3)	07:57	16:41 (4)
	21:53	21:07	19:59	19:30 (3)	18:50	17:46 (4)
14	05:34	06:19	07:09	18:59 (3)	07:59	16:40 (4)
	21:52	21:05	19:57	19:29 (3)	18:48	17:45 (4)
15	05:35	06:20	07:11	19:00 (3)	08:00	16:40 (4)
	21:51	21:03	19:54	19:28 (3)	18:46	17:45 (4)
16	05:36	06:22	07:12	19:00 (3)	08:02	16:40 (4)
	21:50	21:01	19:52	19:26 (3)	18:44	17:45 (4)
17	05:38	06:24	07:14	19:00 (3)	08:04	16:41 (4)
	21:49	20:59	19:50	19:23 (3)	18:41	17:44 (4)
18	05:39	06:25	07:16	19:01 (3)	08:06	16:41 (4)
	21:48	20:57	19:47	19:21 (3)	18:39	17:44 (4)
19	05:40	06:27	07:17	19:01 (3)	08:07	16:41 (4)
	21:47	20:55	19:45	19:18 (3)	18:37	17:43 (4)
20	05:41	06:29	07:19	19:03 (3)	08:09	16:41 (4)
	21:46	20:53	19:43	19:16 (3)	18:35	17:42 (4)
21	05:43	06:30	07:20	19:04 (3)	08:11	16:42 (4)
	21:44	20:51	19:40	19:13 (3)	18:33	17:41 (4)
22	05:44	06:32	07:22	17:17 (4)	08:13	16:42 (4)
	21:43	20:48	19:38	19:11 (3)	18:31	17:40 (4)
23	05:45	06:33	07:24	17:11 (4)	08:14	16:43 (4)
	21:42	20:46	19:36	17:34 (4)	18:29	17:40 (4)
24	05:47	06:35	07:25	17:07 (4)	08:16	16:44 (4)
	21:40	20:44	19:33	17:36 (4)	18:27	17:39 (4)
25	05:48	06:37	07:27	17:04 (4)	07:18	15:45 (4)
	21:39	20:42	19:31	17:38 (4)	17:25	16:38 (4)
26	05:50	06:38	07:29	17:02 (4)	07:20	15:46 (4)
	21:38	20:40	19:29	17:40 (4)	17:23	16:36 (4)
27	05:51	06:40	07:30	16:58 (4)	07:22	15:47 (4)
	21:36	20:38	19:26	17:41 (4)	17:21	16:35 (4)
28	05:52	06:42	07:32	16:56 (4)	07:23	15:48 (4)
	21:35	20:35	19:24	17:42 (4)	17:19	16:34 (4)
29	05:54	06:43	07:34	16:55 (4)	07:25	15:49 (4)
	21:33	20:33	19:22	17:44 (4)	17:17	16:31 (4)
30	05:55	06:45	07:35	16:52 (4)	07:27	15:50 (4)
	21:32	20:31	19:20	17:44 (4)	17:15	16:29 (4)
31	05:57	06:46		07:29		15:52 (4)
	21:30	20:29		17:13	35	16:27 (4)
Potential sun hours	502	454	381	332	267	244
Total, worst case			750	1786	1540	1913
Sun reduction			0.35	0.31	0.21	0.17
Oper. time red.			0.95	0.95	0.95	0.95
Wind dir. red.			0.64	0.67	0.62	0.62
Total reduction			0.21	0.20	0.12	0.10
Total, real			160	350	190	187

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

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

Project:

19065LE slagschaduw nieuwbouwwijk

Licensed user:

Bosch & Van Rijn

Franz-Lisztplantsoen 220

NL-3533 JG Utrecht

+31 6 51 71 04 93

Schreurs / leon@boschenvanrijn.nl

Calculated:

19-Aug-21 10:59 AM/3.4.388

SHADOW - Calendar

Calculation: VKA bovengrens met kantoren 12RD 210819 **Shadow receptor:** AA - Shadow Receptor: 8.0 × 5.0 Azimuth: 0.0° Slope: 0.0° (10917)
Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) [DE BILT]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1.48 2.65 3.60 5.24 6.59 6.28 6.20 6.12 4.48 3.32 1.87 1.32

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 385 684 574 504 436 731 797 1,164 1,146 770 577 539 8,307

January		February		March		April		May		June	
1	08:45	11:29 (5)	08:18	07:25	16:48 (4)	07:15	19:12 (3)	06:10	05:25		
	16:37	12:36 (5)	17:24	18:16	17:35 (4)	20:10	22	19:34 (3)	21:01	21:46	
2	08:45	11:30 (5)	08:17	07:23	16:47 (4)	07:12		19:13 (3)	06:08	05:24	
	16:38	12:37 (5)	17:26	18:18	17:35 (4)	20:11	20	19:33 (3)	21:02	21:47	
3	08:45	11:31 (5)	08:15	07:21	16:47 (4)	07:10		19:15 (3)	06:06	05:23	
	16:39	12:38 (5)	17:28	18:20	17:35 (4)	20:13	16	19:31 (3)	21:04	21:48	
4	08:45	11:32 (5)	08:14	07:19	16:47 (4)	07:08		19:17 (3)	06:04	05:23	
	16:40	12:38 (5)	17:30	18:21	17:35 (4)	20:15	12	19:29 (3)	21:06	21:49	
5	08:44	11:32 (5)	08:12	07:16	16:47 (4)	07:06		19:20 (3)	06:03	05:22	
	16:41	12:38 (5)	17:32	18:23	17:35 (4)	20:17	4	19:24 (3)	21:07	21:50	
6	08:44	11:33 (5)	08:10	07:14	16:46 (4)	07:03			06:01	05:21	
	16:42	12:39 (5)	17:34	18:25	17:34 (4)	20:18			21:09	21:51	
7	08:44	11:33 (5)	08:09	07:12	16:46 (4)	07:01			05:59	05:21	
	16:44	12:38 (5)	17:36	18:27	17:34 (4)	20:20			21:10	21:52	
8	08:43	11:34 (5)	08:07	07:10	16:47 (4)	06:59			05:57	05:20	
	16:45	12:39 (5)	17:37	18:28	17:33 (4)	20:22			21:12	21:53	
9	08:43	11:34 (5)	08:05	07:08	16:47 (4)	06:57			05:56	05:20	
	16:46	12:39 (5)	17:39	18:30	17:33 (4)	20:23			21:14	21:54	
10	08:42	11:35 (5)	08:03	07:05	16:47 (4)	06:54			05:54	05:19	
	16:48	12:39 (5)	17:41	18:32	17:32 (4)	20:25			21:15	21:55	
11	08:42	11:35 (5)	08:02	07:03	16:48 (4)	06:52			05:52	05:19	
	16:49	12:39 (5)	17:43	18:34	17:31 (4)	20:27			21:17	21:56	
12	08:41	11:37 (5)	08:00	07:01	16:49 (4)	06:50			05:50	05:19	
	16:51	12:39 (5)	17:45	18:35	17:30 (4)	20:28			21:18	21:56	
13	08:40	11:37 (5)	07:58	06:58	16:49 (4)	06:48			05:49	05:18	
	16:52	12:39 (5)	17:47	18:37	17:28 (4)	20:30			21:20	21:57	
14	08:40	11:38 (5)	07:56	06:56	16:51 (4)	06:45			05:47	05:18	
	16:54	12:39 (5)	17:49	18:39	17:27 (4)	20:32			21:22	21:58	
15	08:39	11:39 (5)	07:54	06:54	16:53 (4)	06:43			05:46	05:18	
	16:55	12:39 (5)	17:50	18:41	17:26 (4)	20:34			21:23	21:58	
16	08:38	11:40 (5)	07:52	06:52	16:54 (4)	06:41			05:44	05:18	
	16:57	12:39 (5)	17:52	18:42	17:23 (4)	20:35			21:25	21:59	
17	08:37	11:41 (5)	07:50	17:04 (4)	06:49	16:56 (4)	06:39		05:43	05:18	
	16:58	12:39 (5)	17:54	18:44	17:21 (4)	20:37			21:26	21:59	
18	08:36	11:42 (5)	07:48	17:01 (4)	06:47	16:59 (4)	06:37		05:41	05:18	
	17:00	12:38 (5)	17:56	17:23 (4)	18:46	17:18 (4)	20:39		21:28	21:59	
19	08:35	11:42 (5)	07:46	16:58 (4)	06:45	17:03 (4)	06:35		05:40	05:18	
	17:02	12:37 (5)	17:58	17:25 (4)	18:48	17:13 (4)	20:40		21:29	22:00	
20	08:34	11:43 (5)	07:44	16:56 (4)	06:42		06:32		05:38	05:18	
	17:03	12:37 (5)	18:00	17:27 (4)	18:49		20:42		21:31	22:00	
21	08:33	11:45 (5)	07:42	16:55 (4)	06:40	18:21 (3)	06:30		05:37	05:18	
	17:05	12:36 (5)	18:01	17:29 (4)	18:51	18:26 (3)	20:44		21:32	22:00	
22	08:32	11:46 (5)	07:40	16:54 (4)	06:38	18:18 (3)	06:28		05:36	05:18	
	17:07	12:36 (5)	18:03	17:30 (4)	18:53	18:27 (3)	20:45		21:33	22:01	
23	08:31	11:47 (5)	07:38	16:53 (4)	06:36	18:16 (3)	06:26		05:35	05:18	
	17:08	12:34 (5)	18:05	17:32 (4)	18:54	18:29 (3)	20:47		21:35	22:01	
24	08:30	11:49 (5)	07:36	16:52 (4)	06:33	18:15 (3)	06:24		05:33	05:19	
	17:10	12:34 (5)	18:07	17:33 (4)	18:56	18:31 (3)	20:49		21:36	22:01	
25	08:28	11:51 (5)	07:34	16:50 (4)	06:31	18:13 (3)	06:22		05:32	05:19	
	17:12	12:33 (5)	18:09	17:33 (4)	18:58	18:32 (3)	20:50		21:38	22:01	
26	08:27	11:52 (5)	07:32	16:49 (4)	06:29	18:13 (3)	06:20		05:31	05:19	
	17:14	12:31 (5)	18:11	17:34 (4)	19:00	18:34 (3)	20:52		21:39	22:01	
27	08:26	11:55 (5)	07:30	16:49 (4)	06:26	18:12 (3)	06:18		05:30	05:20	
	17:15	12:29 (5)	18:12	17:34 (4)	19:01	18:36 (3)	20:54		21:40	22:01	
28	08:24	11:57 (5)	07:27	16:48 (4)	06:24	18:12 (3)	06:16		05:29	05:20	
	17:17	12:27 (5)	18:14	17:35 (4)	19:03	18:38 (3)	20:56		21:41	22:01	
29	08:23	12:01 (5)			07:22	19:11 (3)	06:14		05:28	05:21	
	17:19	12:24 (5)			20:05	19:36 (3)	20:57		21:43	22:01	
30	08:21	12:06 (5)			07:19	19:12 (3)	06:12		05:27	05:21	
	17:21	12:17 (5)			20:06	19:36 (3)	20:59		21:44	22:00	
31	08:20				07:17	19:12 (3)			05:26		
	17:23				20:08	19:36 (3)			21:45		
Potential sun hours	259		278		367		416		485		498
Total, worst case	1621		425		953		74				
Sun reduction	0.18		0.27		0.30		0.38				
Oper. time red.	0.95		0.95		0.95		0.95				
Wind dir. red.	0.65		0.66		0.65		0.62				
Total reduction	0.11		0.17		0.19		0.22				
Total, real	177		71		179		16				

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

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

Project:

19065LE slagschaduw nieuwbouwwijk

Licensed user:

Bosch & Van Rijn

Franz-Lisztplantsoen 220

NL-3533 JG Utrecht

+31 6 51 71 04 93

Schreurs / leon@boschenvanrijn.nl

Calculated:

19-Aug-21 10:59 AM/3.4.388

SHADOW - Calendar

Calculation: VKA bovengrens met kantoren 12RD 210819 **Shadow receptor:** AA - Shadow Receptor: 8.0 × 5.0 Azimuth: 0.0° Slope: 0.0° (10917)
Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) [DE BILT]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.48	2.65	3.60	5.24	6.59	6.28	6.20	6.12	4.48	3.32	1.87	1.32

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
385	684	574	504	436	731	797	1,164	1,146	770	577	539	8,307

	July	August	September	October	November	December
1	05:22	05:58	06:48	07:37	17:28 (4)	07:30
	22:00	21:28	20:27	19:17	18:08 (4)	17:11
2	05:23	06:00	06:50	07:38	17:27 (4)	07:32
	22:00	21:27	20:24	19:15	18:09 (4)	17:09
3	05:23	06:01	06:51	07:40	17:25 (4)	07:34
	21:59	21:25	20:22	19:13	18:09 (4)	17:08
4	05:24	06:03	06:53	07:42	17:25 (4)	07:36
	21:59	21:23	20:20	19:10	18:10 (4)	17:06
5	05:25	06:05	06:54	07:44	17:24 (4)	07:38
	21:59	21:22	20:18	19:08	18:10 (4)	17:04
6	05:26	06:06	06:56	07:45	17:23 (4)	07:39
	21:58	21:20	20:15	19:06	18:10 (4)	17:02
7	05:27	06:08	06:58	19:17 (3)	07:47	17:22 (4)
	21:57	21:18	20:13	19:18 (3)	19:04	18:10 (4)
8	05:28	06:09	06:59	19:11 (3)	07:49	17:22 (4)
	21:57	21:16	20:11	19:23 (3)	19:01	18:10 (4)
9	05:29	06:11	07:01	19:08 (3)	07:50	17:22 (4)
	21:56	21:14	20:08	19:24 (3)	18:59	18:10 (4)
10	05:30	06:12	07:03	19:07 (3)	07:52	17:21 (4)
	21:55	21:13	20:06	19:26 (3)	18:57	18:09 (4)
11	05:31	06:14	07:04	19:06 (3)	07:54	17:21 (4)
	21:55	21:11	20:04	19:27 (3)	18:55	18:09 (4)
12	05:32	06:16	07:06	19:04 (3)	07:55	17:21 (4)
	21:54	21:09	20:01	19:27 (3)	18:52	18:09 (4)
13	05:33	06:17	07:07	19:03 (3)	07:57	17:21 (4)
	21:53	21:07	19:59	19:27 (3)	18:50	18:08 (4)
14	05:34	06:19	07:09	19:02 (3)	07:59	17:21 (4)
	21:52	21:05	19:57	19:27 (3)	18:48	18:07 (4)
15	05:35	06:20	07:11	19:02 (3)	08:00	17:21 (4)
	21:51	21:03	19:54	19:27 (3)	18:46	18:06 (4)
16	05:36	06:22	07:12	19:01 (3)	08:02	17:22 (4)
	21:50	21:01	19:52	19:25 (3)	18:44	18:05 (4)
17	05:37	06:24	07:14	19:01 (3)	08:04	17:22 (4)
	21:49	20:59	19:50	19:23 (3)	18:41	18:05 (4)
18	05:39	06:25	07:16	19:02 (3)	08:06	17:23 (4)
	21:48	20:57	19:47	19:21 (3)	18:39	18:04 (4)
19	05:40	06:27	07:17	19:01 (3)	08:07	17:24 (4)
	21:47	20:55	19:45	19:18 (3)	18:37	18:03 (4)
20	05:41	06:29	07:19	19:02 (3)	08:09	17:24 (4)
	21:46	20:53	19:43	19:16 (3)	18:35	18:00 (4)
21	05:43	06:30	07:20	19:03 (3)	08:11	17:26 (4)
	21:44	20:51	19:40	19:13 (3)	18:33	17:59 (4)
22	05:44	06:32	07:22	19:04 (3)	08:13	17:27 (4)
	21:43	20:48	19:38	19:11 (3)	18:31	17:57 (4)
23	05:45	06:33	07:24	19:08 (3)	08:14	17:29 (4)
	21:42	20:46	19:36	19:09 (3)	18:29	17:55 (4)
24	05:47	06:35	07:25	17:50 (4)	08:16	17:32 (4)
	21:40	20:44	19:33	17:52 (4)	18:27	17:52 (4)
25	05:48	06:37	07:27	17:43 (4)	07:18	16:35 (4)
	21:39	20:42	19:31	18:00 (4)	17:25	16:49 (4)
26	05:50	06:38	07:29	17:40 (4)	07:20	16:36
	21:38	20:40	19:29	18:03 (4)	17:23	16:35
27	05:51	06:40	07:30	17:36 (4)	07:22	16:35
	21:36	20:38	19:26	18:04 (4)	17:21	16:34
28	05:52	06:42	07:32	17:34 (4)	07:23	16:33
	21:35	20:35	19:24	18:06 (4)	17:19	16:33
29	05:54	06:43	07:34	17:32 (4)	07:25	16:33
	21:33	20:33	19:22	18:07 (4)	17:17	16:33
30	05:55	06:45	07:35	17:30 (4)	07:27	16:32
	21:32	20:31	19:20	18:07 (4)	17:15	16:32
31	05:57	06:46		07:29		16:32
	21:30	20:29		17:13		16:35
Potential sun hours	502	454	381	332	267	244
Total, worst case			454	1015	899	2078
Sun reduction			0.35	0.31	0.21	0.17
Oper. time red.			0.95	0.95	0.95	0.95
Wind dir. red.			0.64	0.66	0.65	0.65
Total reduction			0.21	0.19	0.13	0.10
Total, real			97	197	117	215

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

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

19065LE slagschaduw nieuwbouwwijk

Licensed user:

Bosch & Van Rijn

Franz-Lisztplantsoen 220

NL-3533 JG Utrecht

+31 6 51 71 04 93

Schreurs / leon@boschenvanrijn.nl

Calculated:

19-Aug-21 10:59 AM/3.4.388

SHADOW - Calendar

Calculation: VKA bovengrens met kantoren 12RD 210819 **Shadow receptor:** AB - Shadow Receptor: 8.0 × 5.0 Azimuth: 0.0° Slope: 0.0° (10918)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [DE BILT]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.48	2.65	3.60	5.24	6.59	6.28	6.20	6.12	4.48	3.32	1.87	1.32

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
385	684	574	504	436	731	797	1,164	1,146	770	577	539	8,307

	January		February		March		April		May		June	
1	08:45	15:24 (5)	08:18	15:14 (5)	07:25		07:15	06:10	05:25			
	16:37	19 15:43 (5)	17:24	63 16:17 (5)	18:16		20:10	21:00	21:46			
2	08:45	15:24 (5)	08:17	15:13 (5)	07:23		07:12	06:08	05:24			
	16:38	20 15:44 (5)	17:26	64 16:17 (5)	18:18		20:11	21:02	21:47			
3	08:45	15:24 (5)	08:15	15:13 (5)	07:21		07:10	06:06	05:23			
	16:39	22 15:46 (5)	17:28	64 16:17 (5)	18:19		20:13	21:04	21:48			
4	08:45	15:23 (5)	08:14	15:13 (5)	07:19		07:08	06:04	05:23			
	16:40	25 15:48 (5)	17:30	64 16:17 (5)	18:21		20:15	21:05	21:49			
5	08:44	15:22 (5)	08:12	15:14 (5)	07:16		07:06	06:03	05:22			
	16:41	27 15:49 (5)	17:32	64 16:18 (5)	18:23		20:17	21:07	21:50			
6	08:44	15:22 (5)	08:10	15:14 (5)	07:14		07:03	06:01	05:21			
	16:42	29 15:51 (5)	17:34	64 16:18 (5)	18:25		20:18	21:09	21:51			
7	08:44	15:21 (5)	08:09	15:14 (5)	07:12		07:01	05:59	05:21			
	16:44	31 15:52 (5)	17:36	64 16:18 (5)	18:27		20:20	21:10	21:52			
8	08:43	15:20 (5)	08:07	15:14 (5)	07:10		06:59	05:57	05:20			
	16:45	33 15:53 (5)	17:37	64 16:18 (5)	18:28		20:22	21:12	21:53			
9	08:43	15:20 (5)	08:05	15:14 (5)	07:08		06:57	05:55	05:20			
	16:46	35 15:55 (5)	17:39	64 16:18 (5)	18:30		20:23	21:14	21:54			
10	08:42	15:19 (5)	08:03	15:14 (5)	07:05		06:54	05:54	05:19			
	16:48	37 15:56 (5)	17:41	63 16:17 (5)	18:32		20:25	21:15	21:55			
11	08:42	15:19 (5)	08:02	15:15 (5)	07:03		18:03 (4)	06:52	05:19			
	16:49	38 15:57 (5)	17:43	62 16:17 (5)	18:34	5	18:08 (4)	20:27	21:17	21:56		
12	08:41	15:19 (5)	08:00	15:15 (5)	07:01		17:59 (4)	06:50	05:19			
	16:51	41 16:00 (5)	17:45	62 16:17 (5)	18:35	11	18:10 (4)	20:28	21:18	21:56		
13	08:40	15:19 (5)	07:58	15:17 (5)	06:58		17:56 (4)	06:48	05:18			
	16:52	42 16:01 (5)	17:47	60 16:17 (5)	18:37	15	18:11 (4)	20:30	21:20	21:57		
14	08:40	15:18 (5)	07:56	15:17 (5)	06:56		17:55 (4)	06:45	05:18			
	16:54	44 16:02 (5)	17:49	60 16:17 (5)	18:39	18	18:13 (4)	20:32	21:22	21:57		
15	08:39	15:18 (5)	07:54	15:18 (5)	06:54		17:53 (4)	06:43	05:18			
	16:55	45 16:03 (5)	17:50	58 16:16 (5)	18:41	23	18:16 (4)	20:34	21:23	21:58		
16	08:38	15:17 (5)	07:52	15:18 (5)	06:52		17:51 (4)	06:41	05:18			
	16:57	47 16:04 (5)	17:52	56 16:14 (5)	18:42	26	18:17 (4)	20:35	21:25	21:59		
17	08:37	15:17 (5)	07:50	15:19 (5)	06:49		17:51 (4)	06:39	05:18			
	16:58	49 16:06 (5)	17:54	55 16:14 (5)	18:44	28	18:19 (4)	20:37	21:26	21:59		
18	08:36	15:17 (5)	07:48	15:20 (5)	06:47		17:50 (4)	06:37	05:18			
	17:00	50 16:07 (5)	17:56	53 16:13 (5)	18:46	30	18:20 (4)	20:39	21:28	21:59		
19	08:35	15:16 (5)	07:46	15:21 (5)	06:45		17:49 (4)	06:35	05:18			
	17:02	51 16:07 (5)	17:58	51 16:12 (5)	18:48	31	18:20 (4)	20:40	21:29	22:00		
20	08:34	15:15 (5)	07:44	15:23 (5)	06:42		17:49 (4)	06:32	05:18			
	17:03	53 16:08 (5)	18:00	48 16:11 (5)	18:49	31	18:20 (4)	20:42	21:31	22:00		
21	08:33	15:15 (5)	07:42	15:24 (5)	06:40		17:49 (4)	06:30	05:17	05:18		
	17:05	54 16:09 (5)	18:01	46 16:10 (5)	18:51	31	18:20 (4)	20:44	21:32	22:00		
22	08:32	15:15 (5)	07:40	15:26 (5)	06:38		17:48 (4)	06:28	05:17			
	17:07	56 16:11 (5)	18:03	42 16:08 (5)	18:53	31	18:19 (4)	20:45	21:33	22:01		
23	08:31	15:15 (5)	07:38	15:28 (5)	06:35		17:49 (4)	06:26	05:17			
	17:08	56 16:11 (5)	18:05	39 16:07 (5)	18:54	29	18:18 (4)	20:47	21:35	22:01		
24	08:30	15:15 (5)	07:36	15:31 (5)	06:33		17:49 (4)	06:24	05:17			
	17:10	57 16:12 (5)	18:07	34 16:05 (5)	18:56	29	18:18 (4)	20:49	21:36	22:01		
25	08:28	15:14 (5)	07:34	15:33 (5)	06:31		17:49 (4)	06:22	05:17			
	17:12	58 16:12 (5)	18:09	28 16:01 (5)	18:58	27	18:16 (4)	20:50	21:38	22:01		
26	08:27	15:14 (5)	07:32	15:37 (5)	06:29		17:50 (4)	06:20	05:17			
	17:14	59 16:13 (5)	18:10	21 15:58 (5)	19:00	25	18:15 (4)	20:52	21:39	22:01		
27	08:26	15:14 (5)	07:30	15:43 (5)	06:26		17:51 (4)	06:18	05:17			
	17:15	61 16:15 (5)	18:12	9 15:52 (5)	19:01	23	18:14 (4)	20:54	21:40	22:01		
28	08:24	15:14 (5)	07:27		06:24		17:52 (4)	06:16	05:17			
	17:17	61 16:15 (5)	18:14		19:03	19	18:11 (4)	20:55	21:41	22:01		
29	08:23	15:13 (5)			07:22		18:55 (4)	06:14	05:17			
	17:19	62 16:15 (5)			20:05	14	19:09 (4)	20:57	21:43	22:01		
30	08:21	15:14 (5)			07:19		18:59 (4)	06:12	05:17			
	17:21	62 16:16 (5)			20:06	6	19:05 (4)	20:59	21:44	22:00		
31	08:20	15:13 (5)			07:17				05:16			
	17:23	63 16:16 (5)			20:08				21:45			
Potential sun hours	259		278		367		416		485		498	
Total, worst case	1387		1422		452							
Sun reduction	0.18		0.27		0.30							
Oper. time red.	0.95		0.95		0.95							
Wind dir. red.	0.68		0.68		0.63							
Total reduction	0.11		0.17		0.18							
Total, real	158		245		82							

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

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

Calculation: VKA bovengrens met kantoren 12RD 210819 **Shadow receptor:** AB - Shadow Receptor: 8.0 × 5.0 Azimuth: 0.0° Slope: 0.0° (10918)
Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) [DE BILT]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1.48 2.65 3.60 5.24 6.59 6.28 6.20 6.12 4.48 3.32 1.87 1.32

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 385 684 574 504 436 731 797 1,164 1,146 770 577 539 8,307

	July	August	September	October	November	December
1	05:22	05:58	06:48	07:37	18:37 (4)	07:30
	22:00	21:28	20:27	19:17	18:50 (4)	17:11
2	05:23	06:00	06:50	07:38	18:40 (4)	07:32
	22:00	21:27	20:24	19:15	18:48 (4)	17:09
3	05:23	06:01	06:51	07:40		07:34
	21:59	21:25	20:22	19:13		17:08
4	05:24	06:03	06:53	07:42		07:36
	21:59	21:23	20:20	19:10		17:06
5	05:25	06:05	06:54	07:43		07:38
	21:59	21:22	20:17	19:08		17:04
6	05:26	06:06	06:56	07:45		07:39
	21:58	21:20	20:15	19:06		17:02
7	05:27	06:08	06:58	07:47		07:41
	21:57	21:18	20:13	19:03		17:01
8	05:28	06:09	06:59	07:49		07:43
	21:57	21:16	20:11	19:01		16:59
9	05:29	06:11	07:01	07:50		07:45
	21:56	21:14	20:08	18:59		16:57
10	05:30	06:12	07:03	07:52		07:47
	21:55	21:12	20:06	18:57		16:56
11	05:31	06:14	07:04	07:54		07:48
	21:55	21:11	20:04	18:55		16:54
12	05:32	06:16	07:06	07:55		07:50
	21:54	21:09	20:01	18:52		16:53
13	05:33	06:17	07:07	18:51 (4)	07:57	07:52
	21:53	21:07	19:59	18:55 (4)	18:50	16:51
14	05:34	06:19	07:09	18:45 (4)	07:59	07:54
	21:52	21:05	19:57	18:59 (4)	18:48	16:50
15	05:35	06:20	07:11	18:43 (4)	08:00	07:55
	21:51	21:03	19:54	18:46	15	16:27 (5)
16	05:36	06:22	07:12	18:40 (4)	08:02	16:08 (5)
	21:50	21:01	19:52	18:44	24	16:32 (5)
17	05:37	06:24	07:14	18:39 (4)	08:04	16:04 (5)
	21:49	20:59	19:50	18:41	30	16:34 (5)
18	05:39	06:25	07:15	18:38 (4)	08:06	16:01 (5)
	21:48	20:57	19:47	18:39	36	16:37 (5)
19	05:40	06:27	07:17	18:36 (4)	08:07	15:59 (5)
	21:47	20:55	19:45	18:37	40	16:39 (5)
20	05:41	06:29	07:19	18:35 (4)	08:09	15:56 (5)
	21:46	20:53	19:43	18:35	43	16:39 (5)
21	05:43	06:30	07:20	18:34 (4)	08:11	15:54 (5)
	21:44	20:50	19:40	18:33	46	16:40 (5)
22	05:44	06:32	07:22	18:34 (4)	08:13	15:53 (5)
	21:43	20:48	19:38	18:31	49	16:42 (5)
23	05:45	06:33	07:24	18:33 (4)	08:14	15:51 (5)
	21:42	20:46	19:36	18:29	52	16:43 (5)
24	05:47	06:35	07:25	18:33 (4)	08:16	15:50 (5)
	21:40	20:44	19:33	18:27	53	16:43 (5)
25	05:48	06:37	07:27	18:33 (4)	07:18	14:49 (5)
	21:39	20:42	19:31	18:25	55	15:44 (5)
26	05:50	06:38	07:29	18:33 (4)	07:20	14:48 (5)
	21:38	20:40	19:29	18:23 (4)	07:23	15:45 (5)
27	05:51	06:40	07:30	18:33 (4)	07:21	14:47 (5)
	21:36	20:38	19:26	18:29	59	15:46 (5)
28	05:52	06:41	07:32	18:34 (4)	07:23	14:46 (5)
	21:35	20:35	19:24	18:27	59	15:45 (5)
29	05:54	06:43	07:33	18:35 (4)	07:25	14:45 (5)
	21:33	20:33	19:22	18:25	61	15:46 (5)
30	05:55	06:45	07:35	18:35 (4)	07:27	14:45 (5)
	21:32	20:31	19:19	18:24	61	15:46 (5)
31	05:57	06:46		07:29		14:44 (5)
	21:30	20:29		17:13	63	15:47 (5)
Potential sun hours	502	454	381	332	267	244
Total, worst case			432	824	1706	419
Sun reduction			0.35	0.31	0.21	0.17
Oper. time red.			0.95	0.95	0.95	0.95
Wind dir. red.			0.63	0.68	0.68	0.68
Total reduction			0.21	0.20	0.14	0.11
Total, real			91	165	232	45

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

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

Project:

19065LE slagschaduw nieuwbouwwijk

Licensed user:

Bosch & Van Rijn

Franz-Lisztplantsoen 220

NL-3533 JG Utrecht

+31 6 51 71 04 93

Schreurs / leon@boschenvanrijn.nl

Calculated:

19-Aug-21 10:59 AM/3.4.388

SHADOW - Calendar

Calculation: VKA bovengrens met kantoren 12RD 210819 **Shadow receptor:** AC - Shadow Receptor: 8.0 × 5.0 Azimuth: 0.0° Slope: 0.0° (10919)
Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) [DE BILT]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1.48 2.65 3.60 5.24 6.59 6.28 6.20 6.12 4.48 3.32 1.87 1.32

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 385 684 574 504 436 731 797 1,164 1,146 770 577 539 8,307

	January	February	March	April	May	June
1	08:45	08:18	15:18 (5)	07:25	07:15	05:25
	16:37	17:24	16:21 (5)	18:16	20:10	21:46
2	08:45	08:17	15:18 (5)	07:23	07:12	05:24
	16:38	17:26	16:21 (5)	18:18	20:11	21:47
3	08:45	08:15	15:18 (5)	07:21	07:10	05:23
	16:39	17:28	16:21 (5)	18:19	20:13	21:48
4	08:45	15:35 (5)	08:14	15:17 (5)	07:19	07:08
	16:40	15:45 (5)	17:30	16:21 (5)	18:21	20:15
5	08:44	15:33 (5)	08:12	15:18 (5)	07:16	07:06
	16:41	15:47 (5)	17:32	16:22 (5)	18:23	20:17
6	08:44	15:32 (5)	08:10	15:18 (5)	07:14	07:03
	16:42	15:50 (5)	17:34	16:22 (5)	18:25	20:18
7	08:44	15:30 (5)	08:09	15:18 (5)	07:12	07:01
	16:44	15:51 (5)	17:36	16:22 (5)	18:27	20:20
8	08:43	15:29 (5)	08:07	15:18 (5)	07:10	06:59
	16:45	15:53 (5)	17:37	16:22 (5)	18:28	20:22
9	08:43	15:28 (5)	08:05	15:18 (5)	07:08	06:57
	16:46	15:55 (5)	17:39	16:22 (5)	18:30	20:23
10	08:42	15:27 (5)	08:03	15:18 (5)	07:05	06:54
	16:48	15:56 (5)	17:41	16:22 (5)	18:32	20:25
11	08:42	15:26 (5)	08:02	15:18 (5)	07:03	06:52
	16:49	15:58 (5)	17:43	16:22 (5)	18:34	20:27
12	08:41	15:26 (5)	08:00	15:19 (5)	07:01	18:04 (4)
	16:51	16:00 (5)	17:45	16:21 (5)	18:35	18:10 (4)
13	08:40	15:26 (5)	07:58	15:20 (5)	06:58	17:59 (4)
	16:52	16:02 (5)	17:47	16:22 (5)	18:37	18:11 (4)
14	08:40	15:25 (5)	07:56	15:20 (5)	06:56	17:57 (4)
	16:54	16:03 (5)	17:49	16:22 (5)	18:39	18:13 (4)
15	08:39	15:24 (5)	07:54	15:21 (5)	06:54	17:56 (4)
	16:55	16:05 (5)	17:50	16:21 (5)	18:41	18:16 (4)
16	08:38	15:24 (5)	07:52	15:21 (5)	06:52	17:54 (4)
	16:57	16:06 (5)	17:52	16:20 (5)	18:42	18:17 (4)
17	08:37	15:23 (5)	07:50	15:22 (5)	06:49	17:53 (4)
	16:58	16:07 (5)	17:54	16:19 (5)	18:44	18:19 (4)
18	08:36	15:23 (5)	07:48	15:22 (5)	06:47	17:52 (4)
	17:00	16:09 (5)	17:56	16:18 (5)	18:46	18:21 (4)
19	08:35	15:21 (5)	07:46	15:23 (5)	06:45	17:51 (4)
	17:02	16:09 (5)	17:58	16:18 (5)	18:48	18:21 (4)
20	08:34	15:21 (5)	07:44	15:25 (5)	06:42	17:51 (4)
	17:03	16:11 (5)	18:00	16:17 (5)	18:49	18:21 (4)
21	08:33	15:21 (5)	07:42	15:26 (5)	06:40	17:51 (4)
	17:05	16:12 (5)	18:01	16:16 (5)	18:51	18:21 (4)
22	08:32	15:21 (5)	07:40	15:28 (5)	06:38	17:50 (4)
	17:07	16:13 (5)	18:03	16:15 (5)	18:53	18:20 (4)
23	08:31	15:20 (5)	07:38	15:29 (5)	06:35	17:50 (4)
	17:08	16:14 (5)	18:05	16:13 (5)	18:54	18:20 (4)
24	08:30	15:20 (5)	07:36	15:31 (5)	06:33	17:50 (4)
	17:10	16:15 (5)	18:07	16:12 (5)	18:56	18:20 (4)
25	08:28	15:19 (5)	07:34	15:33 (5)	06:31	17:50 (4)
	17:12	16:15 (5)	18:09	16:09 (5)	18:58	18:18 (4)
26	08:27	15:19 (5)	07:32	15:36 (5)	06:29	17:51 (4)
	17:14	16:16 (5)	18:10	16:07 (5)	19:00	18:17 (4)
27	08:26	15:20 (5)	07:30	15:39 (5)	06:26	17:52 (4)
	17:15	16:18 (5)	18:12	16:04 (5)	19:01	18:16 (4)
28	08:24	15:19 (5)	07:27	15:43 (5)	06:24	17:53 (4)
	17:17	16:18 (5)	18:14	16:00 (5)	19:03	18:14 (4)
29	08:23	15:18 (5)			07:22	18:55 (4)
	17:19	16:18 (5)			20:05	19:12 (4)
30	08:21	15:18 (5)			07:19	18:57 (4)
	17:21	16:19 (5)			20:06	19:10 (4)
31	08:20	15:18 (5)			07:17	
	17:23	16:20 (5)			20:08	
Potential sun hours	259	278	367		416	498
Total, worst case	1179	1517	441			
Sun reduction	0.18	0.27	0.30			
Oper. time red.	0.95	0.95	0.95			
Wind dir. red.	0.67	0.67	0.63			
Total reduction	0.11	0.17	0.18			
Total, real	134	260	80			

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

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

Project:

19065LE slagschaduw nieuwbouwwijk

Licensed user:

Bosch & Van Rijn

Franz-Lisztplantsoen 220

NL-3533 JG Utrecht

+31 6 51 71 04 93

Schreurs / leon@boschenvanrijn.nl

Calculated:

19-Aug-21 10:59 AM/3.4.388

SHADOW - Calendar

Calculation: VKA bovengrens met kantoren 12RD 210819 **Shadow receptor:** AC - Shadow Receptor: 8.0 × 5.0 Azimuth: 0.0° Slope: 0.0° (10919)
Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) [DE BILT]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1.48 2.65 3.60 5.24 6.59 6.28 6.20 6.12 4.48 3.32 1.87 1.32

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 385 684 574 504 436 731 797 1,164 1,146 770 577 539 8,307

	July	August	September	October	November	December
1	05:22	05:58	06:48	07:37	18:41 (4)	07:30
	22:00	21:28	20:27	19:17	18:50 (4)	17:11
2	05:23	06:00	06:50	07:38		17:32
	22:00	21:27	20:24	19:15	64	17:09
3	05:23	06:01	06:51	07:40		17:34
	21:59	21:25	20:22	19:13	64	17:08
4	05:24	06:03	06:53	07:42		17:36
	21:59	21:23	20:20	19:10	64	17:06
5	05:25	06:05	06:54	07:43		17:38
	21:59	21:22	20:17	19:08	64	17:04
6	05:26	06:06	06:56	07:45		17:39
	21:58	21:20	20:15	19:06	64	17:02
7	05:27	06:08	06:58	07:47		17:41
	21:57	21:18	20:13	19:03	64	17:01
8	05:28	06:09	06:59	07:49		17:43
	21:57	21:16	20:11	19:01	64	16:59
9	05:29	06:11	07:01	07:50		17:45
	21:56	21:14	20:08	18:59	63	16:57
10	05:30	06:12	07:03	07:52		17:47
	21:55	21:12	20:06	18:57	63	16:56
11	05:31	06:14	07:04	07:54		17:48
	21:55	21:11	20:04	18:55	62	16:54
12	05:32	06:16	07:06	07:55		17:50
	21:54	21:09	20:01	18:52	61	16:53
13	05:33	06:17	07:07	18:49 (4)	07:57	16:21 (5)
	21:53	21:07	19:59	18:50	9	16:30 (5)
14	05:34	06:19	07:09	18:45 (4)	07:59	16:14 (5)
	21:52	21:05	19:57	18:48	20	16:34 (5)
15	05:35	06:20	07:11	18:43 (4)	08:00	16:10 (5)
	21:51	21:03	19:54	18:46	28	16:38 (5)
16	05:36	06:22	07:12	18:41 (4)	08:02	16:07 (5)
	21:50	21:01	19:52	18:44	33	16:40 (5)
17	05:37	06:24	07:14	18:40 (4)	08:04	16:04 (5)
	21:49	20:59	19:50	18:41	38	16:42 (5)
18	05:39	06:25	07:15	18:39 (4)	08:06	16:02 (5)
	21:48	20:57	19:47	18:39	42	16:44 (5)
19	05:40	06:27	07:17	18:37 (4)	08:07	16:00 (5)
	21:47	20:55	19:45	18:37	45	16:45 (5)
20	05:41	06:29	07:19	18:37 (4)	08:09	15:57 (5)
	21:46	20:53	19:43	18:35	48	16:45 (5)
21	05:43	06:30	07:20	18:35 (4)	08:11	15:56 (5)
	21:44	20:50	19:40	18:33	50	16:46 (5)
22	05:44	06:32	07:22	18:35 (4)	08:13	15:55 (5)
	21:43	20:48	19:38	18:31	52	16:47 (5)
23	05:45	06:33	07:24	18:35 (4)	08:14	15:54 (5)
	21:42	20:46	19:36	18:29	54	16:48 (5)
24	05:47	06:35	07:25	18:35 (4)	08:16	15:53 (5)
	21:40	20:44	19:33	18:27	56	16:49 (5)
25	05:48	06:37	07:27	18:35 (4)	07:18	14:52 (5)
	21:39	20:42	19:31	18:25 (4)	17:25	15:50 (5)
26	05:50	06:38	07:29	18:35 (4)	07:20	14:51 (5)
	21:38	20:40	19:29	18:23 (4)	17:23	15:50 (5)
27	05:51	06:40	07:30	18:35 (4)	07:21	14:50 (5)
	21:36	20:38	19:26	18:29 (4)	17:21	15:51 (5)
28	05:52	06:41	07:32	18:36 (4)	07:23	14:49 (5)
	21:35	20:35	19:24	18:27 (4)	17:19	15:50 (5)
29	05:54	06:43	07:33	18:38 (4)	07:25	14:48 (5)
	21:33	20:33	19:22	18:25 (4)	17:17	15:51 (5)
30	05:55	06:45	07:35	18:38 (4)	07:27	14:48 (5)
	21:32	20:31	19:19	18:22 (4)	17:15	15:51 (5)
31	05:57	06:46		07:29	14:48 (5)	
	21:30	20:29		17:13	63	15:51 (5)
Potential sun hours	502	454	381	332	267	244
Total, worst case			442	912	1643	176
Sun reduction			0.35	0.31	0.21	0.17
Oper. time red.			0.95	0.95	0.95	0.95
Wind dir. red.			0.63	0.67	0.67	0.67
Total reduction			0.21	0.20	0.13	0.11
Total, real			93	181	222	19

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

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

Project:

19065LE slagschaduw nieuwbouwwijk

Licensed user:

Bosch & Van Rijn

Franz-Lisztplantsoen 220

NL-3533 JG Utrecht

+31 6 51 71 04 93

Schreurs / leon@boschenvanrijn.nl

Calculated:

19-Aug-21 10:59 AM/3.4.388

SHADOW - Calendar

Calculation: VKA bovengrens met kantoren 12RD 210819 **Shadow receptor:** AD - Shadow Receptor: 8.0 × 5.0 Azimuth: 0.0° Slope: 0.0° (10920)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [DE BILT]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.48	2.65	3.60	5.24	6.59	6.28	6.20	6.12	4.48	3.32	1.87	1.32

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
385	684	574	504	436	731	797	1,164	1,146	770	577	539	8,307

January		February		March		April		May		June	
1	08:45	08:18	15:22 (5)	07:25	15:37 (5)	07:15	18:59 (4)	06:10	05:25		
	16:37	17:24	62 16:24 (5)	18:16	36 16:13 (5)	20:10	15	19:14 (4)	21:00	21:46	
2	08:45	08:17	15:21 (5)	07:23	15:39 (5)	07:12	19:03 (4)	06:08	05:24		
	16:38	17:26	63 16:24 (5)	18:18	31 16:10 (5)	20:11	7 19:10 (4)	21:02	21:47		
3	08:45	08:15	15:20 (5)	07:21	15:42 (5)	07:10		06:06	05:23		
	16:39	17:28	65 16:25 (5)	18:19	25 16:07 (5)	20:13		21:04	21:48		
4	08:45	08:14	15:20 (5)	07:19	15:47 (5)	07:08		06:04	05:23		
	16:40	17:30	65 16:25 (5)	18:21	15 16:02 (5)	20:15		21:05	21:49		
5	08:44	08:12	15:20 (5)	07:16		07:06		06:03	05:22		
	16:41	17:32	66 16:26 (5)	18:23		20:17		21:07	21:50		
6	08:44	08:10	15:20 (5)	07:14		07:03		06:01	05:21		
	16:42	17:34	66 16:26 (5)	18:25		20:18		21:09	21:51		
7	08:44	08:09	15:20 (5)	07:12		07:01		05:59	05:21		
	16:44	17:36	66 16:26 (5)	18:27		20:20		21:10	21:52		
8	08:43	08:07	15:20 (5)	07:10		06:59		05:57	05:20		
	16:45	17:37	67 16:27 (5)	18:28		20:22		21:12	21:53		
9	08:43	08:05	15:20 (5)	07:08		06:57		05:55	05:20		
	16:46	17:39	67 16:27 (5)	18:30		20:23		21:14	21:54		
10	08:42	15:39 (5) 08:03	15:19 (5)	07:05		06:54		05:54	05:19		
	16:48	12 15:51 (5) 17:41	68 16:27 (5)	18:32		20:25		21:15	21:55		
11	08:42	15:36 (5) 08:02	15:19 (5)	07:03		06:52		05:52	05:19		
	16:49	18 15:54 (5) 17:43	68 16:27 (5)	18:34		20:27		21:17	21:56		
12	08:41	15:35 (5) 08:00	15:20 (5)	07:01		06:50		05:50	05:19		
	16:51	22 15:57 (5) 17:45	67 16:27 (5)	18:35		20:28		21:18	21:56		
13	08:40	15:34 (5) 07:58	15:21 (5)	06:58		06:48		05:49	05:18		
	16:52	25 15:59 (5) 17:47	66 16:27 (5)	18:37		20:30		21:20	21:57		
14	08:40	15:32 (5) 07:56	15:21 (5)	06:56		18:07 (4) 06:45		05:47	05:18		
	16:54	29 16:01 (5) 17:49	66 16:27 (5)	18:39	6 18:13 (4)	20:32		21:22	21:57		
15	08:39	15:31 (5) 07:54	15:20 (5)	06:54		18:04 (4) 06:43		05:46	05:18		
	16:55	32 16:03 (5) 17:50	66 16:26 (5)	18:41	12 18:16 (4)	20:34		21:23	21:58		
16	08:38	15:30 (5) 07:52	15:21 (5)	06:52		18:01 (4) 06:41		05:44	05:18		
	16:57	35 16:05 (5) 17:52	65 16:26 (5)	18:42	16 18:17 (4)	20:35		21:25	21:59		
17	08:37	15:30 (5) 07:50	15:21 (5)	06:49		17:59 (4) 06:39		05:43	05:18		
	16:58	37 16:07 (5) 17:54	64 16:25 (5)	18:44	20 18:19 (4)	20:37		21:26	21:59		
18	08:36	15:29 (5) 07:48	15:22 (5)	06:47		17:58 (4) 06:37		05:41	05:18		
	17:00	40 16:09 (5) 17:56	63 16:25 (5)	18:46	23 18:21 (4)	20:39		21:28	21:59		
19	08:35	15:27 (5) 07:46	15:22 (5)	06:45		17:56 (4) 06:35		05:40	05:18		
	17:02	42 16:09 (5) 17:58	63 16:25 (5)	18:48	26 18:22 (4)	20:40		21:29	22:00		
20	08:34	15:27 (5) 07:44	15:23 (5)	06:42		17:55 (4) 06:32		05:38	05:18		
	17:03	44 16:11 (5) 18:00	61 16:24 (5)	18:49	29 18:24 (4)	20:42		21:31	22:00		
21	08:33	15:26 (5) 07:42	15:24 (5)	06:40		17:55 (4) 06:30		05:37	05:18		
	17:05	47 16:13 (5) 18:01	59 16:23 (5)	18:51	30 18:25 (4)	20:44		21:32	22:00		
22	08:32	15:26 (5) 07:40	15:25 (5)	06:38		17:54 (4) 06:28		05:36	05:18		
	17:07	48 16:14 (5) 18:03	58 16:23 (5)	18:53	30 18:24 (4)	20:45		21:33	22:01		
23	08:31	15:25 (5) 07:38	15:26 (5)	06:35		17:53 (4) 06:26		05:34	05:18		
	17:08	50 16:15 (5) 18:05	56 16:22 (5)	18:54	32 18:25 (4)	20:47		21:35	22:01		
24	08:30	15:24 (5) 07:36	15:28 (5)	06:33		17:53 (4) 06:24		05:33	05:19		
	17:10	52 16:16 (5) 18:07	53 16:21 (5)	18:56	32 18:25 (4)	20:49		21:36	22:01		
25	08:28	15:23 (5) 07:34	15:28 (5)	06:31		17:53 (4) 06:22		05:32	05:19		
	17:12	54 16:17 (5) 18:09	51 16:19 (5)	18:58	30 18:23 (4)	20:50		21:38	22:01		
26	08:27	15:23 (5) 07:32	15:30 (5)	06:29		17:53 (4) 06:20		05:31	05:19		
	17:14	55 16:18 (5) 18:11	48 16:18 (5)	19:00	30 18:23 (4)	20:52		21:39	22:01		
27	08:26	15:23 (5) 07:30	15:32 (5)	06:26		17:54 (4) 06:18		05:30	05:20		
	17:15	57 16:20 (5) 18:12	44 16:16 (5)	19:01	29 18:23 (4)	20:54		21:40	22:01		
28	08:24	15:22 (5) 07:27	15:34 (5)	06:24		17:53 (4) 06:16		05:29	05:20		
	17:17	58 16:20 (5) 18:14	41 16:15 (5)	19:03	28 18:21 (4)	20:55		21:41	22:01		
29	08:23	15:22 (5)		07:22		18:55 (4) 06:14		05:28	05:21		
	17:19	59 16:21 (5)		20:05	25 19:20 (4)	20:57		21:43	22:01		
30	08:21	15:22 (5)		07:19		18:56 (4) 06:12		05:27	05:21		
	17:21	60 16:22 (5)		20:06	23 19:19 (4)	20:59		21:44	22:00		
31	08:20	15:21 (5)		07:17		18:58 (4)		05:26			
	17:23	62 16:23 (5)		20:08	19 19:17 (4)			21:45			
Potential sun hours	259		278		367		416		485		498
Total, worst case	938		1714		547		22				
Sun reduction	0.18		0.27		0.30						
Oper. time red.	0.95		0.95		0.95						
Wind dir. red.	0.67		0.67		0.63						
Total reduction	0.11		0.17		0.18						
Total, real	106		292		100		5				

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

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

19065LE slagschaduw nieuwbouwwijk

Licensed user:

Bosch & Van Rijn

Franz-Lisztplantsoen 220

NL-3533 JG Utrecht

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Schreurs / leon@boschenvanrijn.nl

Calculated:

19-Aug-21 10:59 AM/3.4.388

SHADOW - Calendar

Calculation: VKA bovengrens met kantoren 12RD 210819 **Shadow receptor:** AD - Shadow Receptor: 8.0 × 5.0 Azimuth: 0.0° Slope: 0.0° (10920)
Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) [DE BILT]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1.48 2.65 3.60 5.24 6.59 6.28 6.20 6.12 4.48 3.32 1.87 1.32

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 385 684 574 504 436 731 797 1,164 1,146 770 577 539 8,307

	July	August	September	October	November	December
1	05:22	05:58	06:48	07:37	07:30	14:49 (5)
	22:00	21:28	20:27	19:17	17:11	15:56 (5)
2	05:23	06:00	06:50	07:38	07:32	14:49 (5)
	22:00	21:27	20:24	19:15	17:09	15:56 (5)
3	05:23	06:01	06:51	07:40	07:34	14:49 (5)
	21:59	21:25	20:22	19:13	17:08	15:56 (5)
4	05:24	06:03	06:53	07:42	07:36	14:50 (5)
	21:59	21:23	20:20	19:10	17:06	15:56 (5)
5	05:25	06:05	06:54	07:43	07:38	14:50 (5)
	21:59	21:22	20:17	19:08	17:04	15:56 (5)
6	05:26	06:06	06:56	07:45	07:39	14:50 (5)
	21:58	21:20	20:15	19:06	17:02	15:56 (5)
7	05:27	06:08	06:58	07:47	07:41	14:51 (5)
	21:57	21:18	20:13	19:03	17:01	15:56 (5)
8	05:28	06:09	06:59	07:49	07:43	14:51 (5)
	21:57	21:16	20:11	19:01	16:59	15:55 (5)
9	05:29	06:11	07:01	07:50	16:28 (5)	14:52 (5)
	21:56	21:14	20:08	18:59	16:31 (5)	15:55 (5)
10	05:30	06:12	07:03	18:56 (4)	16:19 (5)	14:52 (5)
	21:55	21:12	20:06	19:03 (4)	16:38 (5)	15:55 (5)
11	05:31	06:14	07:04	18:52 (4)	16:15 (5)	14:53 (5)
	21:55	21:11	20:04	19:07 (4)	16:42 (5)	15:54 (5)
12	05:32	06:16	07:06	18:49 (4)	16:11 (5)	14:54 (5)
	21:54	21:09	20:01	19:08 (4)	16:45 (5)	15:54 (5)
13	05:33	06:17	07:07	18:47 (4)	16:09 (5)	14:54 (5)
	21:53	21:07	19:59	19:10 (4)	16:47 (5)	15:53 (5)
14	05:34	06:19	07:09	18:45 (4)	16:05 (5)	14:54 (5)
	21:52	21:05	19:57	19:10 (4)	16:48 (5)	15:52 (5)
15	05:35	06:20	07:11	18:44 (4)	16:03 (5)	14:55 (5)
	21:51	21:03	19:54	19:11 (4)	16:49 (5)	15:52 (5)
16	05:36	06:22	07:12	18:42 (4)	16:01 (5)	14:56 (5)
	21:50	21:01	19:52	19:11 (4)	16:50 (5)	15:51 (5)
17	05:37	06:24	07:14	18:42 (4)	16:00 (5)	14:57 (5)
	21:49	20:59	19:50	19:11 (4)	16:51 (5)	15:51 (5)
18	05:39	06:25	07:15	18:41 (4)	15:58 (5)	14:58 (5)
	21:48	20:57	19:47	19:12 (4)	16:52 (5)	15:50 (5)
19	05:40	06:27	07:17	18:40 (4)	15:57 (5)	15:00 (5)
	21:47	20:55	19:45	19:11 (4)	16:53 (5)	15:50 (5)
20	05:41	06:29	07:19	18:40 (4)	15:55 (5)	15:01 (5)
	21:46	20:53	19:43	19:11 (4)	16:53 (5)	15:49 (5)
21	05:43	06:30	07:20	18:39 (4)	15:54 (5)	15:01 (5)
	21:44	20:50	19:40	19:10 (4)	16:54 (5)	15:48 (5)
22	05:44	06:32	07:22	18:39 (4)	15:53 (5)	15:03 (5)
	21:43	20:48	19:38	19:10 (4)	16:55 (5)	15:47 (5)
23	05:45	06:33	07:24	18:40 (4)	15:53 (5)	15:04 (5)
	21:42	20:46	19:36	19:09 (4)	16:55 (5)	15:46 (5)
24	05:47	06:35	07:25	18:39 (4)	15:52 (5)	15:06 (5)
	21:40	20:44	19:33	19:06 (4)	16:56 (5)	15:46 (5)
25	05:48	06:37	07:27	18:40 (4)	14:51 (5)	15:08 (5)
	21:39	20:42	19:31	19:04 (4)	15:56 (5)	15:45 (5)
26	05:50	06:38	07:29	18:41 (4)	14:51 (5)	15:08 (5)
	21:38	20:40	19:29	19:02 (4)	15:56 (5)	15:43 (5)
27	05:51	06:40	07:30	18:42 (4)	14:51 (5)	15:10 (5)
	21:36	20:38	19:26	18:59 (4)	15:57 (5)	15:42 (5)
28	05:52	06:41	07:32	18:44 (4)	14:49 (5)	15:12 (5)
	21:35	20:35	19:24	18:57 (4)	15:56 (5)	15:41 (5)
29	05:54	06:43	07:33	18:46 (4)	14:49 (5)	15:14 (5)
	21:33	20:33	19:22	18:55 (4)	15:56 (5)	15:39 (5)
30	05:55	06:45	07:35		14:49 (5)	15:16 (5)
	21:32	20:31	19:19		15:56 (5)	15:38 (5)
31	05:57	06:46			14:49 (5)	
	21:30	20:29			15:56 (5)	
Potential sun hours	502	454	381	332	267	244
Total, worst case			469	1190	1561	31
Sun reduction			0.35	0.31	0.21	0.17
Oper. time red.			0.95	0.95	0.95	0.95
Wind dir. red.			0.63	0.67	0.67	0.67
Total reduction			0.21	0.20	0.13	0.11
Total, real			99	235	209	3

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

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

Project:

19065LE slagschaduw nieuwbouwwijk

Licensed user:

Bosch & Van Rijn

Franz-Lisztplantsoen 220

NL-3533 JG Utrecht

+31 6 51 71 04 93

Schreurs / leon@boschenvanrijn.nl

Calculated:

19-Aug-21 10:59 AM/3.4.388

SHADOW - Calendar

Calculation: VKA bovengrens met kantoren 12RD 210819 Shadow receptor: AE - Shadow Receptor: 8.0 × 5.0 Azimuth: 0.0° Slope: 0.0° (10921)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [DE BILT]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.48	2.65	3.60	5.24	6.59	6.28	6.20	6.12	4.48	3.32	1.87	1.32

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
385	684	574	504	436	731	797	1,164	1,146	770	577	539	8,307

	January		February		March		April	May	June
1	08:45		14:25 (5)	08:18	14:37 (5)	07:25	07:15	06:10	05:25
	16:37	60	15:25 (5)	17:24	15:36 (5)	18:16	20:10	21:01	21:46
2	08:45		14:26 (5)	08:17	14:37 (5)	07:23	07:12	06:08	05:24
	16:38	60	15:26 (5)	17:26	15:35 (5)	18:18	20:11	21:02	21:47
3	08:45		14:26 (5)	08:15	14:38 (5)	07:21	07:10	06:06	05:23
	16:39	61	15:27 (5)	17:28	15:35 (5)	18:19	20:13	21:04	21:48
4	08:45		14:27 (5)	08:14	14:38 (5)	07:19	07:08	06:04	05:23
	16:40	61	15:28 (5)	17:30	15:34 (5)	18:21	20:15	21:05	21:49
5	08:44		14:26 (5)	08:12	14:40 (5)	07:16	17:48 (4)	07:06	06:03
	16:41	62	15:28 (5)	17:32	15:34 (5)	18:23	20:17	21:07	21:50
6	08:44		14:27 (5)	08:10	14:41 (5)	07:14	17:44 (4)	07:03	06:01
	16:42	62	15:29 (5)	17:34	15:33 (5)	18:25	20:18	21:09	21:51
7	08:44		14:27 (5)	08:09	14:42 (5)	07:12	17:43 (4)	07:01	05:59
	16:44	62	15:29 (5)	17:36	15:32 (5)	18:27	20:20	21:10	21:52
8	08:43		14:27 (5)	08:07	14:44 (5)	07:10	17:41 (4)	06:59	05:57
	16:45	62	15:29 (5)	17:37	15:31 (5)	18:28	20:22	21:12	21:53
9	08:43		14:28 (5)	08:05	14:45 (5)	07:08	17:40 (4)	06:57	05:55
	16:46	62	15:30 (5)	17:39	15:30 (5)	18:30	20:23	21:14	21:54
10	08:42		14:28 (5)	08:03	14:47 (5)	07:05	17:38 (4)	06:54	05:51
	16:48	63	15:31 (5)	17:41	15:28 (5)	18:32	20:25	21:15	21:55
11	08:42		14:28 (5)	08:02	14:49 (5)	07:03	17:37 (4)	06:52	05:52
	16:49	63	15:31 (5)	17:43	15:26 (5)	18:34	20:27	21:17	21:56
12	08:41		14:29 (5)	08:00	14:51 (5)	07:01	17:37 (4)	06:50	05:50
	16:51	63	15:32 (5)	17:45	15:24 (5)	18:35	20:28	21:18	21:56
13	08:40		14:29 (5)	07:58	14:56 (5)	06:58	17:36 (4)	06:48	05:49
	16:52	64	15:33 (5)	17:47	15:23 (5)	18:37	20:30	21:20	21:57
14	08:40		14:29 (5)	07:56	15:00 (5)	06:56	17:36 (4)	06:45	05:47
	16:54	64	15:33 (5)	17:49	15:20 (5)	18:39	20:32	21:22	21:57
15	08:39		14:29 (5)	07:54	15:07 (5)	06:54	17:36 (4)	06:43	05:46
	16:55	64	15:33 (5)	17:50	15:13 (5)	18:41	20:34	21:23	21:58
16	08:38		14:29 (5)	07:52		06:52	17:35 (4)	06:41	05:44
	16:57	65	15:34 (5)	17:52		18:42	20:35	21:25	21:59
17	08:37		14:30 (5)	07:50		06:49	17:35 (4)	06:39	05:43
	16:58	64	15:34 (5)	17:54		18:44	20:37	21:26	21:59
18	08:36		14:30 (5)	07:48		06:47	17:36 (4)	06:37	05:41
	17:00	65	15:35 (5)	17:56		18:46	20:39	21:28	21:59
19	08:35		14:30 (5)	07:46		06:45	17:35 (4)	06:35	05:40
	17:02	65	15:35 (5)	17:58		18:48	20:40	21:29	22:00
20	08:34		14:30 (5)	07:44		06:42	17:36 (4)	06:32	05:38
	17:03	65	15:35 (5)	18:00		18:49	20:42	21:31	22:00
21	08:33		14:31 (5)	07:42		06:40	17:38 (4)	06:30	05:37
	17:05	65	15:36 (5)	18:01		18:51	20:44	21:32	22:00
22	08:32		14:31 (5)	07:40		06:38	17:38 (4)	06:28	05:36
	17:07	65	15:36 (5)	18:03		18:53	20:45	21:33	22:01
23	08:31		14:31 (5)	07:38		06:35	17:40 (4)	06:26	05:34
	17:08	65	15:36 (5)	18:05		18:54	20:47	21:35	22:01
24	08:30		14:32 (5)	07:36		06:33	17:43 (4)	06:24	05:33
	17:10	64	15:36 (5)	18:07		18:56	20:49	21:36	22:01
25	08:28		14:33 (5)	07:34		06:31		06:22	05:32
	17:12	64	15:37 (5)	18:09		18:58		20:50	21:38
26	08:27		14:32 (5)	07:32		06:29		06:20	05:31
	17:14	64	15:36 (5)	18:11		19:00		20:52	21:39
27	08:26		14:33 (5)	07:30		06:26		06:18	05:30
	17:15	64	15:37 (5)	18:12		19:01		20:54	21:40
28	08:24		14:34 (5)	07:27		06:24		06:16	05:29
	17:17	62	15:36 (5)	18:14		19:03		20:55	21:41
29	08:23		14:34 (5)			07:22		06:14	05:28
	17:19	62	15:36 (5)			20:05		20:57	21:43
30	08:21		14:35 (5)			07:19		06:12	05:27
	17:21	61	15:36 (5)			20:06		20:59	21:44
31	08:20		14:35 (5)			07:17			05:26
	17:23	61	15:36 (5)			20:08			21:45
Potential sun hours	259		278		367		416		498
Total, worst case	1954		642		510				
Sun reduction	0.18		0.27		0.30				
Oper. time red.	0.95		0.95		0.95				
Wind dir. red.	0.69		0.69		0.63				
Total reduction	0.12		0.18		0.18				
Total, real	230		114		93				

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

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

19065LE slagschaduw nieuwbouwwijk

Licensed user:

Bosch & Van Rijn

Franz-Lisztplantsoen 220

NL-3533 JG Utrecht

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Schreurs / leon@boschenvanrijn.nl

Calculated:

19-Aug-21 10:59 AM/3.4.388

SHADOW - Calendar

Calculation: VKA bovengrens met kantoren 12RD 210819 **Shadow receptor:** AE - Shadow Receptor: 8.0 × 5.0 Azimuth: 0.0° Slope: 0.0° (10921)
Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) [DE BILT]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1.48 2.65 3.60 5.24 6.59 6.28 6.20 6.12 4.48 3.32 1.87 1.32

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 385 684 574 504 436 731 797 1,164 1,146 770 577 539 8,307

	July	August	September	October	November	December
1	05:22	05:58	06:48	07:37	18:16 (4)	07:30
	22:00	21:28	20:27	19:17	18:48 (4)	17:11
2	05:23	06:00	06:50	07:38	18:16 (4)	07:32
	22:00	21:27	20:24	19:15	18:47 (4)	17:09
3	05:23	06:01	06:51	07:40	18:16 (4)	07:34
	21:59	21:25	20:22	19:13	18:45 (4)	17:08
4	05:24	06:03	06:53	07:42	18:16 (4)	07:36
	21:59	21:23	20:20	19:10	18:43 (4)	17:06
5	05:25	06:05	06:54	07:43	18:18 (4)	07:38
	21:59	21:22	20:17	19:08	18:41 (4)	17:04
6	05:26	06:06	06:56	07:45	18:18 (4)	07:39
	21:58	21:20	20:15	19:06	18:38 (4)	17:02
7	05:27	06:08	06:58	07:47	18:19 (4)	07:41
	21:57	21:18	20:13	19:03	18:36 (4)	17:01
8	05:28	06:09	06:59	07:49	18:22 (4)	07:43
	21:57	21:16	20:11	19:01	18:34 (4)	16:59
9	05:29	06:11	07:01	07:50	18:26 (4)	07:45
	21:56	21:14	20:08	18:59	18:32 (4)	16:57
10	05:30	06:12	07:03	07:52		07:47
	21:55	21:12	20:06	18:57		16:56
11	05:31	06:14	07:04	07:54		07:48
	21:55	21:11	20:04	18:55		16:54
12	05:32	06:16	07:06	07:55		07:50
	21:54	21:09	20:01	18:52		16:53
13	05:33	06:17	07:07	07:57		07:52
	21:53	21:07	19:59	18:50		16:51
14	05:34	06:19	07:09	07:59		07:54
	21:52	21:05	19:57	18:48		16:50
15	05:35	06:20	07:11	08:00		07:55
	21:51	21:03	19:54	18:46		16:48
16	05:36	06:22	07:12	08:02		07:57
	21:50	21:01	19:52	18:44		16:47
17	05:37	06:24	07:14	08:04		07:59
	21:49	20:59	19:50	18:41		16:45
18	05:39	06:25	07:15	08:06		08:01
	21:48	20:57	19:47	18:39		16:44
19	05:40	06:27	07:17	18:30 (4)		08:02
	21:47	20:55	19:45	18:37		16:43
20	05:41	06:29	07:19	18:27 (4)		08:04
	21:46	20:53	19:43	18:35		16:42
21	05:43	06:30	07:20	18:24 (4)		08:06
	21:44	20:50	19:40	18:33		16:40
22	05:44	06:32	07:22	18:23 (4)		08:07
	21:43	20:48	19:38	18:31		16:39
23	05:45	06:33	07:24	18:21 (4)		08:09
	21:42	20:46	19:36	18:29		16:38
24	05:47	06:35	07:25	18:19 (4)		08:11
	21:40	20:44	19:33	18:27		16:37
25	05:48	06:37	07:27	18:19 (4)		08:12
	21:39	20:42	19:31	18:25		16:36
26	05:50	06:38	07:29	18:18 (4)		08:14
	21:38	20:40	19:29	18:23		16:35
27	05:51	06:40	07:30	18:17 (4)		08:15
	21:36	20:38	19:26	18:19 (4)		14:34 (5)
28	05:52	06:41	07:32	18:16 (4)		08:17
	21:35	20:35	19:24	18:19 (4)		14:27 (5)
29	05:54	06:43	07:33	18:16 (4)		08:18
	21:33	20:33	19:22	18:17		14:49 (5)
30	05:55	06:45	07:35	18:15 (4)		08:20
	21:32	20:31	19:20	18:18 (4)		14:52 (5)
31	05:57	06:46		17:15		08:20
	21:30	20:29		17:13		14:18 (5)
Potential sun hours	502	454	381	332	267	244
Total, worst case			325	330	1800	1851
Sun reduction			0.35	0.31	0.21	0.17
Oper. time red.			0.95	0.95	0.95	0.95
Wind dir. red.			0.63	0.65	0.69	0.69
Total reduction			0.21	0.19	0.14	0.11
Total, real			69	64	251	206

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

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

Project:

19065LE slagschaduw nieuwbouwwijk

Licensed user:

Bosch & Van Rijn

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NL-3533 JG Utrecht

+31 6 51 71 04 93

Schreurs / leon@boschenvanrijn.nl

Calculated:

19-Aug-21 10:59 AM/3.4.388

SHADOW - Calendar

Calculation: VKA bovengrens met kantoren 12RD 210819 **Shadow receptor:** AF - Shadow Receptor: 8.0 × 5.0 Azimuth: 0.0° Slope: 0.0° (10922)
Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) [DE BILT]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1.48 2.65 3.60 5.24 6.59 6.28 6.20 6.12 4.48 3.32 1.87 1.32

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 385 684 574 504 436 731 797 1,164 1,146 770 577 539 8,307

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:45	08:18	07:25	07:15	06:10	05:25	05:22	05:58	06:48	07:37	07:30	08:21
	16:37	17:24	18:16	20:10	21:00	21:46	22:00	21:28	20:26	19:17	17:11	16:31
2	08:45	08:17	07:23	07:12	06:08	05:24	05:23	06:00	06:50	07:38	07:32	08:23
	16:38	17:26	18:18	20:11	21:02	21:47	22:00	21:27	20:24	19:15	17:09	16:30
3	08:45	08:15	07:21	07:10	06:06	05:23	05:23	06:01	06:51	07:40	07:34	08:24
	16:39	17:28	18:19	20:13	21:04	21:48	21:59	21:25	20:22	19:13	17:08	16:30
4	08:45	08:14	07:19	07:08	06:04	05:23	05:24	06:03	06:53	07:42	07:36	08:25
	16:40	17:30	18:21	20:15	21:05	21:49	21:59	21:23	20:20	19:10	17:06	16:29
5	08:44	08:12	07:16	07:06	06:03	05:22	05:25	06:04	06:54	07:43	07:38	08:27
	16:41	17:32	18:23	20:17	21:07	21:50	21:59	21:22	20:17	19:08	17:04	16:29
6	08:44	08:10	07:14	07:03	06:01	05:21	05:26	06:06	06:56	07:45	07:39	08:28
	16:42	17:34	18:25	20:18	21:09	21:51	21:58	21:20	20:15	19:06	17:02	16:28
7	08:44	08:09	07:12	07:01	05:59	05:21	05:27	06:08	06:58	07:47	07:41	08:29
	16:44	17:35	18:27	20:20	21:10	21:52	21:57	21:18	20:13	19:03	17:01	16:28
8	08:43	08:07	07:10	06:59	05:57	05:20	05:28	06:09	06:59	07:48	07:43	08:31
	16:45	17:37	18:28	20:22	21:12	21:53	21:57	21:16	20:11	19:01	16:59	16:27
9	08:43	08:05	07:07	06:57	05:55	05:20	05:28	06:11	07:01	07:50	07:45	08:32
	16:46	17:39	18:30	20:23	21:14	21:54	21:56	21:14	20:08	18:59	16:57	16:27
10	08:42	08:03	07:05	06:54	05:54	05:19	05:29	06:12	07:02	07:52	07:47	08:33
	16:48	17:41	18:32	20:25	21:15	21:55	21:55	21:12	20:06	18:57	16:56	16:27
11	08:42	08:02	07:03	06:52	05:52	05:19	05:31	06:14	07:04	07:54	07:48	08:34
	16:49	17:43	18:34	20:27	21:17	21:56	21:55	21:11	20:04	18:54	16:54	16:27
12	08:41	08:00	07:01	06:50	05:50	05:18	05:32	06:16	07:06	07:55	07:50	08:35
	16:51	17:45	18:35	20:28	21:18	21:56	21:54	21:09	20:01	18:52	16:52	16:27
13	08:40	07:58	06:58	06:48	05:49	05:18	05:33	06:17	07:07	07:57	07:52	08:36
	16:52	17:47	18:37	20:30	21:20	21:57	21:53	21:07	19:59	18:50	16:51	16:27
14	08:40	07:56	06:56	06:45	05:47	05:18	05:34	06:19	07:09	07:59	07:54	08:37
	16:54	17:48	18:39	20:32	21:22	21:57	21:52	21:05	19:57	18:48	16:50	16:27
15	08:39	07:54	06:54	06:43	05:46	05:18	05:35	06:20	07:11	08:00	07:55	08:38
	16:55	17:50	18:41	20:33	21:23	21:58	21:51	21:03	19:54	18:46	16:48	16:27
16	08:38	07:52	06:52	06:41	05:44	05:18	05:36	06:22	07:12	08:02	07:57	08:39
	16:57	17:52	18:42	20:35	21:25	21:59	21:50	21:01	19:52	18:44	16:47	16:27
17	08:37	07:50	06:49	06:39	05:43	05:18	05:37	06:24	07:14	08:04	07:59	08:39
	16:58	17:54	18:44	20:37	21:26	21:59	21:49	20:59	19:50	18:41	16:45	16:27
18	08:36	07:48	06:47	06:37	05:41	05:18	05:39	06:25	07:15	08:06	08:01	08:40
	17:00	17:56	18:46	20:39	21:28	21:59	21:48	20:57	19:47	18:39	16:44	16:27
19	08:35	07:46	06:45	06:35	05:40	05:18	05:40	06:27	07:17	08:07	08:02	08:41
	17:02	17:58	18:47	20:40	21:29	22:00	21:47	20:55	19:45	18:37	16:43	16:27
20	08:34	07:44	06:42	06:32	05:38	05:18	05:41	06:28	07:19	08:09	08:04	08:42
	17:03	18:00	18:49	20:42	21:31	22:00	21:46	20:53	19:43	18:35	16:41	16:28
21	08:33	07:42	06:40	06:30	05:37	05:18	05:43	06:30	07:20	08:11	08:06	08:42
	17:05	18:01	18:51	20:44	21:32	22:00	21:44	20:50	19:40	18:33	16:40	16:28
22	08:32	07:40	06:38	06:28	05:36	05:18	05:44	06:32	07:22	08:13	08:07	08:43
	17:07	18:03	18:53	20:45	21:33	22:01	21:43	20:48	19:38	18:31	16:39	16:29
23	08:31	07:38	06:35	06:26	05:34	05:18	05:45	06:33	07:24	08:14	08:09	08:43
	17:08	18:05	18:54	20:47	21:35	22:01	21:42	20:46	19:36	18:29	16:38	16:29
24	08:30	07:36	06:33	06:24	05:33	05:19	05:47	06:35	07:25	08:16	08:11	08:44
	17:10	18:07	18:56	20:49	21:36	22:01	21:40	20:44	19:33	18:27	16:37	16:30
25	08:28	07:34	06:31	06:22	05:32	05:19	05:48	06:37	07:27	08:18	08:12	08:44
	17:12	18:09	18:58	20:50	21:38	22:01	21:39	20:42	19:31	17:25	16:36	16:30
26	08:27	07:32	06:29	06:20	05:31	05:19	05:49	06:38	07:29	08:20	08:14	08:44
	17:14	18:10	18:59	20:52	21:39	22:01	21:38	20:40	19:29	17:23	16:35	16:31
27	08:26	07:29	06:26	06:18	05:30	05:20	05:51	06:40	07:30	08:21	08:15	08:45
	17:15	18:12	19:01	20:54	21:40	22:01	21:36	20:38	19:26	17:21	16:34	16:32
28	08:24	07:27	06:24	06:16	05:29	05:20	05:52	06:41	07:32	08:23	08:17	08:45
	17:17	18:14	19:03	20:55	21:41	22:01	21:35	20:35	19:24	17:19	16:33	16:33
29	08:23		07:22	06:14	05:28	05:21	05:54	06:43	07:33	08:25	08:18	08:45
	17:19		20:05	20:57	21:43	22:01	21:33	20:33	19:22	17:17	16:32	16:34
30	08:21		07:19	06:12	05:27	05:21	05:55	06:45	07:35	08:27	08:20	08:45
	17:21		20:06	20:59	21:44	22:00	21:32	20:31	19:19	17:15	16:32	16:34
31	08:20		07:17		05:26		05:57	06:46		07:29		08:45
	17:23		20:08		21:45		21:30	20:29		17:13		16:35
Potential sun hours	259	278	367	416	485	498	502	454	381	332	266	244
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

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

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

Project:

19065LE slagschaduw nieuwbouwwijk

Licensed user:

Bosch & Van Rijn

Franz-Lisztplantsoen 220

NL-3533 JG Utrecht

+31 6 51 71 04 93

Schreurs / leon@boschenvanrijn.nl

Calculated:

19-Aug-21 10:59 AM/3.4.388

SHADOW - Calendar

Calculation: VKA bovengrens met kantoren 12RD 210819 **Shadow receptor:** AG - Shadow Receptor: 8.0 × 5.0 Azimuth: 0.0° Slope: 0.0° (10923)
Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) [DE BILT]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1.48 2.65 3.60 5.24 6.59 6.28 6.20 6.12 4.48 3.32 1.87 1.32

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 385 684 574 504 436 731 797 1,164 1,146 770 577 539 8,307

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:45	08:18	07:25	07:15	06:10	05:25	05:22	05:58	06:48	07:37	07:30	08:21
	16:37	17:24	18:16	20:10	21:00	21:46	22:00	21:28	20:26	19:17	17:11	16:31
2	08:45	08:17	07:23	07:12	06:08	05:24	05:23	06:00	06:50	07:38	07:32	08:23
	16:38	17:26	18:18	20:11	21:02	21:47	22:00	21:27	20:24	19:15	17:09	16:30
3	08:45	08:15	07:21	07:10	06:06	05:23	05:23	06:01	06:51	07:40	07:34	08:24
	16:39	17:28	18:19	20:13	21:04	21:48	21:59	21:25	20:22	19:13	17:08	16:30
4	08:45	08:14	07:19	07:08	06:04	05:23	05:24	06:03	06:53	07:42	07:36	08:25
	16:40	17:30	18:21	20:15	21:05	21:49	21:59	21:23	20:20	19:10	17:06	16:29
5	08:44	08:12	07:16	07:06	06:03	05:22	05:25	06:04	06:54	07:43	07:38	08:27
	16:41	17:32	18:23	20:17	21:07	21:50	21:59	21:22	20:17	19:08	17:04	16:29
6	08:44	08:10	07:14	07:03	06:01	05:21	05:26	06:06	06:56	07:45	07:39	08:28
	16:42	17:34	18:25	20:18	21:09	21:51	21:58	21:20	20:15	19:06	17:02	16:28
7	08:44	08:09	07:12	07:01	05:59	05:21	05:27	06:08	06:58	07:47	07:41	08:29
	16:44	17:35	18:27	20:20	21:10	21:52	21:57	21:18	20:13	19:03	17:01	16:28
8	08:43	08:07	07:10	06:59	05:57	05:20	05:28	06:09	06:59	07:48	07:43	08:31
	16:45	17:37	18:28	20:22	21:12	21:53	21:57	21:16	20:11	19:01	16:59	16:27
9	08:43	08:05	07:07	06:57	05:55	05:20	05:28	06:11	07:01	07:50	07:45	08:32
	16:46	17:39	18:30	20:23	21:14	21:54	21:56	21:14	20:08	18:59	16:57	16:27
10	08:42	08:03	07:05	06:54	05:54	05:19	05:29	06:12	07:02	07:52	07:47	08:33
	16:48	17:41	18:32	20:25	21:15	21:55	21:55	21:12	20:06	18:57	16:56	16:27
11	08:42	08:02	07:03	06:52	05:52	05:19	05:31	06:14	07:04	07:54	07:48	08:34
	16:49	17:43	18:34	20:27	21:17	21:56	21:55	21:11	20:04	18:54	16:54	16:27
12	08:41	08:00	07:01	06:50	05:50	05:18	05:32	06:16	07:06	07:55	07:50	08:35
	16:51	17:45	18:35	20:28	21:18	21:56	21:54	21:09	20:01	18:52	16:52	16:27
13	08:40	07:58	06:58	06:48	05:49	05:18	05:33	06:17	07:07	07:57	07:52	08:36
	16:52	17:47	18:37	20:30	21:20	21:57	21:53	21:07	19:59	18:50	16:51	16:27
14	08:40	07:56	06:56	06:45	05:47	05:18	05:34	06:19	07:09	07:59	07:54	08:37
	16:54	17:48	18:39	20:32	21:22	21:57	21:52	21:05	19:57	18:48	16:50	16:27
15	08:39	07:54	06:54	06:43	05:46	05:18	05:35	06:20	07:11	08:00	07:55	08:38
	16:55	17:50	18:41	20:33	21:23	21:58	21:51	21:03	19:54	18:46	16:48	16:27
16	08:38	07:52	06:52	06:41	05:44	05:18	05:36	06:22	07:12	08:02	07:57	08:39
	16:57	17:52	18:42	20:35	21:25	21:59	21:50	21:01	19:52	18:44	16:47	16:27
17	08:37	07:50	06:49	06:39	05:43	05:18	05:37	06:24	07:14	08:04	07:59	08:39
	16:58	17:54	18:44	20:37	21:26	21:59	21:49	20:59	19:50	18:41	16:45	16:27
18	08:36	07:48	06:47	06:37	05:41	05:18	05:39	06:25	07:15	08:06	08:01	08:40
	17:00	17:56	18:46	20:39	21:28	21:59	21:48	20:57	19:47	18:39	16:44	16:27
19	08:35	07:46	06:45	06:35	05:40	05:18	05:40	06:27	07:17	08:07	08:02	08:41
	17:01	17:58	18:47	20:40	21:29	22:00	21:47	20:55	19:45	18:37	16:43	16:27
20	08:34	07:44	06:42	06:32	05:38	05:18	05:41	06:28	07:19	08:09	08:04	08:42
	17:03	18:00	18:49	20:42	21:31	22:00	21:46	20:53	19:43	18:35	16:41	16:28
21	08:33	07:42	06:40	06:30	05:37	05:18	05:43	06:30	07:20	08:11	08:06	08:42
	17:05	18:01	18:51	20:44	21:32	22:00	21:44	20:50	19:40	18:33	16:40	16:28
22	08:32	07:40	06:38	06:28	05:36	05:18	05:44	06:32	07:22	08:13	08:07	08:43
	17:07	18:03	18:53	20:45	21:33	22:01	21:43	20:48	19:38	18:31	16:39	16:29
23	08:31	07:38	06:35	06:26	05:34	05:18	05:45	06:33	07:24	08:14	08:09	08:43
	17:08	18:05	18:54	20:47	21:35	22:01	21:42	20:46	19:36	18:29	16:38	16:29
24	08:30	07:36	06:33	06:24	05:33	05:19	05:47	06:35	07:25	08:16	08:11	08:44
	17:10	18:07	18:56	20:49	21:36	22:01	21:40	20:44	19:33	18:27	16:37	16:30
25	08:28	07:34	06:31	06:22	05:32	05:19	05:48	06:37	07:27	08:18	08:12	08:44
	17:12	18:09	18:58	20:50	21:38	22:01	21:39	20:42	19:31	17:25	16:36	16:30
26	08:27	07:32	06:29	06:20	05:31	05:19	05:49	06:38	07:29	08:20	08:14	08:44
	17:14	18:10	18:59	20:52	21:39	22:01	21:38	20:40	19:29	17:23	16:35	16:31
27	08:26	07:29	06:26	06:18	05:30	05:20	05:51	06:40	07:30	07:21	08:15	08:45
	17:15	18:12	19:01	20:54	21:40	22:01	21:36	20:38	19:26	17:21	16:34	16:32
28	08:24	07:27	06:24	06:16	05:29	05:20	05:52	06:41	07:32	07:23	08:17	08:45
	17:17	18:14	19:03	20:55	21:41	22:01	21:35	20:35	19:24	17:19	16:33	16:33
29	08:23		07:22	06:14	05:28	05:21	05:54	06:43	07:33	07:25	08:18	08:45
	17:19		20:05	20:57	21:43	22:01	21:33	20:33	19:22	17:17	16:32	16:34
30	08:21		07:19	06:12	05:27	05:21	05:55	06:45	07:35	07:27	08:20	08:45
	17:21		20:06	20:59	21:44	22:00	21:32	20:31	19:19	17:15	16:32	16:34
31	08:20		07:17		05:26		05:57	06:46		07:29		08:45
	17:23		20:08		21:45		21:30	20:29		17:13		16:35
Potential sun hours	259	278	367	416	485	498	502	454	381	332	266	244
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

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

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

Project:

19065LE slagschaduw nieuwbouwwijk

Licensed user:

Bosch & Van Rijn

Franz-Lisztplantsoen 220

NL-3533 JG Utrecht

+31 6 51 71 04 93

Schreurs / leon@boschenvanrijn.nl

Calculated:

19-Aug-21 10:59 AM/3.4.388

SHADOW - Calendar

Calculation: VKA bovengrens met kantoren 12RD 210819 **Shadow receptor:** AH - Shadow Receptor: 8.0 × 5.0 Azimuth: 0.0° Slope: 0.0° (10924)
Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) [DE BILT]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1.48 2.65 3.60 5.24 6.59 6.28 6.20 6.12 4.48 3.32 1.87 1.32

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 385 684 574 504 436 731 797 1,164 1,146 770 577 539 8,307

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:45	08:19	07:25	07:15	06:10	05:25	05:22	05:58	06:48	07:37	07:30	08:21
	16:37	17:24	18:16	20:10	21:01	21:46	22:00	21:28	20:27	19:17	17:11	16:31
2	08:45	08:17	07:23	07:12	06:08	05:24	05:23	06:00	06:50	07:38	07:32	08:23
	16:38	17:26	18:18	20:11	21:02	21:47	22:00	21:27	20:24	19:15	17:09	16:30
3	08:45	08:15	07:21	07:10	06:06	05:23	05:23	06:01	06:51	07:40	07:34	08:24
	16:39	17:28	18:20	20:13	21:04	21:48	22:00	21:25	20:22	19:13	17:08	16:30
4	08:45	08:14	07:19	07:08	06:04	05:23	05:24	06:03	06:53	07:42	07:36	08:26
	16:40	17:30	18:21	20:15	21:06	21:49	21:59	21:23	20:20	19:10	17:06	16:29
5	08:45	08:12	07:16	07:06	06:03	05:22	05:25	06:05	06:54	07:44	07:38	08:27
	16:41	17:32	18:23	20:17	21:07	21:50	21:59	21:22	20:18	19:08	17:04	16:29
6	08:44	08:10	07:14	07:03	06:01	05:21	05:26	06:06	06:56	07:45	07:39	08:28
	16:42	17:34	18:25	20:18	21:09	21:51	21:58	21:20	20:15	19:06	17:02	16:28
7	08:44	08:09	07:12	07:01	05:59	05:21	05:27	06:08	06:58	07:47	07:41	08:29
	16:44	17:35	18:27	20:20	21:10	21:52	21:58	21:18	20:13	19:04	17:01	16:28
8	08:43	08:07	07:10	06:59	05:57	05:20	05:28	06:09	06:59	07:49	07:43	08:31
	16:45	17:37	18:28	20:22	21:12	21:53	21:57	21:16	20:11	19:01	16:59	16:27
9	08:43	08:05	07:08	06:57	05:55	05:20	05:29	06:11	07:01	07:50	07:45	08:32
	16:46	17:39	18:30	20:23	21:14	21:54	21:56	21:14	20:08	18:59	16:57	16:27
10	08:42	08:03	07:05	06:54	05:54	05:19	05:30	06:12	07:03	07:52	07:47	08:33
	16:48	17:41	18:32	20:25	21:15	21:55	21:55	21:13	20:06	18:57	16:56	16:27
11	08:42	08:02	07:03	06:52	05:52	05:19	05:31	06:14	07:04	07:54	07:48	08:34
	16:49	17:43	18:34	20:27	21:17	21:56	21:55	21:11	20:04	18:55	16:54	16:27
12	08:41	08:00	07:01	06:50	05:50	05:19	05:32	06:16	07:06	07:55	07:50	08:35
	16:51	17:45	18:35	20:28	21:19	21:56	21:54	21:09	20:01	18:52	16:53	16:27
13	08:40	07:58	06:58	06:48	05:49	05:18	05:33	06:17	07:07	07:57	07:52	08:36
	16:52	17:47	18:37	20:30	21:20	21:57	21:53	21:07	19:59	18:50	16:51	16:27
14	08:40	07:56	06:56	06:45	05:47	05:18	05:34	06:19	07:09	07:59	07:54	08:37
	16:54	17:49	18:39	20:32	21:22	21:58	21:52	21:05	19:57	18:48	16:50	16:27
15	08:39	07:54	06:54	06:43	05:46	05:18	05:35	06:20	07:11	08:00	07:55	08:38
	16:55	17:50	18:41	20:34	21:23	21:58	21:51	21:03	19:54	18:46	16:48	16:27
16	08:38	07:52	06:52	06:41	05:44	05:18	05:36	06:22	07:12	08:02	07:57	08:39
	16:57	17:52	18:42	20:35	21:25	21:59	21:50	21:01	19:52	18:44	16:47	16:27
17	08:37	07:50	06:49	06:39	05:43	05:18	05:37	06:24	07:14	08:04	07:59	08:40
	16:58	17:54	18:44	20:37	21:26	21:59	21:49	20:59	19:50	18:41	16:45	16:27
18	08:36	07:48	06:47	06:37	05:41	05:18	05:39	06:25	07:16	08:06	08:01	08:40
	17:00	17:56	18:46	20:39	21:28	22:00	21:48	20:57	19:47	18:39	16:44	16:27
19	08:35	07:46	06:45	06:35	05:40	05:18	05:40	06:27	07:17	08:07	08:02	08:41
	17:02	17:58	18:48	20:40	21:29	22:00	21:47	20:55	19:45	18:37	16:43	16:28
20	08:34	07:44	06:42	06:32	05:38	05:18	05:41	06:29	07:19	08:09	08:04	08:42
	17:03	18:00	18:49	20:42	21:31	22:00	21:46	20:53	19:43	18:35	16:42	16:28
21	08:33	07:42	06:40	06:30	05:37	05:18	05:43	06:30	07:20	08:11	08:06	08:42
	17:05	18:01	18:51	20:44	21:32	22:00	21:44	20:51	19:40	18:33	16:40	16:28
22	08:32	07:40	06:38	06:28	05:36	05:18	05:44	06:32	07:22	08:13	08:07	08:43
	17:07	18:03	18:53	20:45	21:33	22:01	21:43	20:48	19:38	18:31	16:39	16:29
23	08:31	07:38	06:36	06:26	05:34	05:18	05:45	06:33	07:24	08:14	08:09	08:43
	17:08	18:05	18:54	20:47	21:35	22:01	21:42	20:46	19:36	18:29	16:38	16:29
24	08:30	07:36	06:33	06:24	05:33	05:19	05:47	06:35	07:25	08:16	08:11	08:44
	17:10	18:07	18:56	20:49	21:36	22:01	21:40	20:44	19:33	18:27	16:37	16:30
25	08:28	07:34	06:31	06:22	05:32	05:19	05:48	06:37	07:27	08:18	08:12	08:44
	17:12	18:09	18:58	20:50	21:38	22:01	21:39	20:42	19:31	17:25	16:36	16:30
26	08:27	07:32	06:29	06:20	05:31	05:19	05:49	06:38	07:29	08:20	08:14	08:44
	17:14	18:11	19:00	20:52	21:39	22:01	21:38	20:40	19:29	17:23	16:35	16:31
27	08:26	07:30	06:26	06:18	05:30	05:20	05:51	06:40	07:30	07:22	08:15	08:45
	17:15	18:12	19:01	20:54	21:40	22:01	21:36	20:38	19:26	17:21	16:34	16:32
28	08:24	07:27	06:24	06:16	05:29	05:20	05:52	06:41	07:32	07:23	08:17	08:45
	17:17	18:14	19:03	20:56	21:41	22:01	21:35	20:35	19:24	17:19	16:33	16:33
29	08:23		07:22	06:14	05:28	05:21	05:54	06:43	07:34	07:25	08:18	08:45
	17:19		20:05	20:57	21:43	22:01	21:33	20:33	19:22	17:17	16:32	16:34
30	08:22		07:19	06:12	05:27	05:21	05:55	06:45	07:35	07:27	08:20	08:45
	17:21		20:06	20:59	21:44	22:00	21:32	20:31	19:20	17:15	16:32	16:34
31	08:20		07:17		05:26		05:57	06:46		07:29		08:45
	17:23		20:08		21:45		21:30	20:29		17:13		16:35
Potential sun hours	259	278	367	416	485	498	502	454	381	332	266	244
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

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

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

Project:

19065LE slagschaduw nieuwbouwwijk

Licensed user:

Bosch & Van Rijn

Franz-Lisztplantsoen 220

NL-3533 JG Utrecht

+31 6 51 71 04 93

Schreurs / leon@boschenvanrijn.nl

Calculated:

19-Aug-21 10:59 AM/3.4.388

SHADOW - Calendar

Calculation: VKA bovengrens met kantoren 12RD 210819 **Shadow receptor:** AI - Shadow Receptor: 8.0 × 5.0 Azimuth: 0.0° Slope: 0.0° (10925)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [DE BILT]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.48	2.65	3.60	5.24	6.59	6.28	6.20	6.12	4.48	3.32	1.87	1.32

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
385	684	574	504	436	731	797	1,164	1,146	770	577	539	8,307

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:45	08:19	07:25	07:15	06:10	05:25	05:22	05:58	06:48	07:37	07:30	08:21
	16:37	17:24	18:16	20:10	21:01	21:46	22:00	21:28	20:27	19:17	17:11	16:31
2	08:45	08:17	07:23	07:12	06:08	05:24	05:23	06:00	06:50	07:38	07:32	08:23
	16:38	17:26	18:18	20:11	21:02	21:47	22:00	21:27	20:24	19:15	17:09	16:30
3	08:45	08:15	07:21	07:10	06:06	05:23	05:23	06:01	06:51	07:40	07:34	08:24
	16:39	17:28	18:20	20:13	21:04	21:48	22:00	21:25	20:22	19:13	17:08	16:30
4	08:45	08:14	07:19	07:08	06:04	05:23	05:24	06:03	06:53	07:42	07:36	08:26
	16:40	17:30	18:21	20:15	21:06	21:49	21:59	21:23	20:20	19:10	17:06	16:29
5	08:45	08:12	07:16	07:06	06:03	05:22	05:25	06:05	06:54	07:44	07:38	08:27
	16:41	17:32	18:23	20:17	21:07	21:50	21:59	21:22	20:18	19:08	17:04	16:29
6	08:44	08:10	07:14	07:03	06:01	05:21	05:26	06:06	06:56	07:45	07:39	08:28
	16:42	17:34	18:25	20:18	21:09	21:51	21:58	21:20	20:15	19:06	17:02	16:28
7	08:44	08:09	07:12	07:01	05:59	05:21	05:27	06:08	06:58	07:47	07:41	08:29
	16:44	17:35	18:27	20:20	21:10	21:52	21:58	21:18	20:13	19:04	17:01	16:28
8	08:43	08:07	07:10	06:59	05:57	05:20	05:28	06:09	06:59	07:49	07:43	08:31
	16:45	17:37	18:28	20:22	21:12	21:53	21:57	21:16	20:11	19:01	16:59	16:27
9	08:43	08:05	07:08	06:57	05:55	05:20	05:29	06:11	07:01	07:50	07:45	08:32
	16:46	17:39	18:30	20:23	21:14	21:54	21:56	21:14	20:08	18:59	16:57	16:27
10	08:42	08:03	07:05	06:54	05:54	05:19	05:30	06:12	07:03	07:52	07:47	08:33
	16:48	17:41	18:32	20:25	21:15	21:55	21:55	21:13	20:06	18:57	16:56	16:27
11	08:42	08:02	07:03	06:52	05:52	05:19	05:31	06:14	07:04	07:54	07:48	08:34
	16:49	17:43	18:34	20:27	21:17	21:56	21:55	21:11	20:04	18:55	16:54	16:27
12	08:41	08:00	07:01	06:50	05:50	05:19	05:32	06:16	07:06	07:55	07:50	08:35
	16:51	17:45	18:35	20:28	21:19	21:56	21:54	21:09	20:01	18:52	16:53	16:27
13	08:40	07:58	06:58	06:48	05:49	05:18	05:33	06:17	07:07	07:57	07:52	08:36
	16:52	17:47	18:37	20:30	21:20	21:57	21:53	21:07	19:59	18:50	16:51	16:27
14	08:40	07:56	06:56	06:45	05:47	05:18	05:34	06:19	07:09	07:59	07:54	08:37
	16:54	17:49	18:39	20:32	21:22	21:58	21:52	21:05	19:57	18:48	16:50	16:27
15	08:39	07:54	06:54	06:43	05:46	05:18	05:35	06:20	07:11	08:00	07:55	08:38
	16:55	17:50	18:41	20:34	21:23	21:58	21:51	21:03	19:54	18:46	16:48	16:27
16	08:38	07:52	06:52	06:41	05:44	05:18	05:36	06:22	07:12	08:02	07:57	08:39
	16:57	17:52	18:42	20:35	21:25	21:59	21:50	21:01	19:52	18:44	16:47	16:27
17	08:37	07:50	06:49	06:39	05:43	05:18	05:37	06:24	07:14	08:04	07:59	08:40
	16:58	17:54	18:44	20:37	21:26	21:59	21:49	20:59	19:50	18:41	16:45	16:27
18	08:36	07:48	06:47	06:37	05:41	05:18	05:39	06:25	07:16	08:06	08:01	08:40
	17:00	17:56	18:46	20:39	21:28	22:00	21:48	20:57	19:47	18:39	16:44	16:27
19	08:35	07:46	06:45	06:35	05:40	05:18	05:40	06:27	07:17	08:07	08:02	08:41
	17:02	17:58	18:48	20:40	21:29	22:00	21:47	20:55	19:45	18:37	16:43	16:28
20	08:34	07:44	06:42	06:32	05:38	05:18	05:41	06:29	07:19	08:09	08:04	08:42
	17:03	18:00	18:49	20:42	21:31	22:00	21:46	20:53	19:43	18:35	16:42	16:28
21	08:33	07:42	06:40	06:30	05:37	05:18	05:43	06:30	07:20	08:11	08:06	08:42
	17:05	18:01	18:51	20:44	21:32	22:00	21:44	20:51	19:40	18:33	16:40	16:28
22	08:32	07:40	06:38	06:28	05:36	05:18	05:44	06:32	07:22	08:13	08:07	08:43
	17:07	18:03	18:53	20:45	21:33	22:01	21:43	20:48	19:38	18:31	16:39	16:29
23	08:31	07:38	06:36	06:26	05:34	05:18	05:45	06:33	07:24	08:14	08:09	08:43
	17:08	18:05	18:54	20:47	21:35	22:01	21:42	20:46	19:36	18:29	16:38	16:29
24	08:30	07:36	06:33	06:24	05:33	05:19	05:47	06:35	07:25	08:16	08:11	08:44
	17:10	18:07	18:56	20:49	21:36	22:01	21:40	20:44	19:33	18:27	16:37	16:30
25	08:28	07:34	06:31	06:22	05:32	05:19	05:48	06:37	07:27	08:18	08:12	08:44
	17:12	18:09	18:58	20:50	21:38	22:01	21:39	20:42	19:31	17:25	16:36	16:30
26	08:27	07:32	06:29	06:20	05:31	05:19	05:49	06:38	07:29	08:20	08:14	08:44
	17:14	18:11	19:00	20:52	21:39	22:01	21:38	20:40	19:29	17:23	16:35	16:31
27	08:26	07:30	06:26	06:18	05:30	05:20	05:51	06:40	07:30	07:22	08:15	08:45
	17:15	18:12	19:01	20:54	21:40	22:01	21:36	20:38	19:26	17:21	16:34	16:32
28	08:24	07:27	06:24	06:16	05:29	05:20	05:52	06:41	07:32	07:23	08:17	08:45
	17:17	18:14	19:03	20:56	21:41	22:01	21:35	20:35	19:24	17:19	16:33	16:33
29	08:23		07:22	06:14	05:28	05:21	05:54	06:43	07:34	07:25	08:18	08:45
	17:19		20:05	20:57	21:43	22:01	21:33	20:33	19:22	17:17	16:32	16:34
30	08:22		07:19	06:12	05:27	05:21	05:55	06:45	07:35	07:27	08:20	08:45
	17:21		20:06	20:59	21:44	22:00	21:32	20:31	19:20	17:15	16:32	16:34
31	08:20		07:17		05:26		05:57	06:46		07:29		08:45
	17:23		20:08		21:45		21:30	20:29		17:13		16:35
Potential sun hours	259	278	367	416	485	498	502	454	381	332	266	244
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

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

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

19065LE slagschaduw nieuwbouwwijk

Licensed user:

Bosch & Van Rijn

Franz-Lisztplantsoen 220

NL-3533 JG Utrecht

+31 6 51 71 04 93

Schreurs / leon@boschenvanrijn.nl

Calculated:

19-Aug-21 10:59 AM/3.4.388

SHADOW - Calendar

Calculation: VKA bovengrens met kantoren 12RD 210819 Shadow receptor: AJ - Shadow Receptor: 8.0 × 5.0 Azimuth: 0.0° Slope: 0.0° (10926)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [DE BILT]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec

1.48 2.65 3.60 5.24 6.59 6.28 6.20 6.12 4.48 3.32 1.87 1.32

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
385	684	574	504	436	731	797	1,164	1,146	770	577	539	8,307

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:45	08:19	07:25	07:15	06:10	05:25	05:22	05:58	06:48	07:37	07:30	08:21
	16:37	17:24	18:16	20:10	21:01	21:46	22:00	21:28	20:27	19:17	17:11	16:31
2	08:45	08:17	07:23	07:12	06:08	05:24	05:23	06:00	06:50	07:38	07:32	08:23
	16:38	17:26	18:18	20:11	21:02	21:47	22:00	21:27	20:24	19:15	17:09	16:30
3	08:45	08:15	07:21	07:10	06:06	05:23	05:23	06:01	06:51	07:40	07:34	08:24
	16:39	17:28	18:20	20:13	21:04	21:48	22:00	21:25	20:22	19:13	17:08	16:30
4	08:45	08:14	07:19	07:08	06:04	05:23	05:24	06:03	06:53	07:42	07:36	08:26
	16:40	17:30	18:21	20:15	21:06	21:49	21:59	21:23	20:20	19:10	17:06	16:29
5	08:45	08:12	07:16	07:06	06:03	05:22	05:25	06:05	06:54	07:44	07:38	08:27
	16:41	17:32	18:23	20:17	21:07	21:50	21:59	21:22	20:18	19:08	17:04	16:29
6	08:44	08:10	07:14	07:03	06:01	05:21	05:26	06:06	06:56	07:45	07:39	08:28
	16:42	17:34	18:25	20:18	21:09	21:51	21:58	21:20	20:15	19:06	17:02	16:28
7	08:44	08:09	07:12	07:01	05:59	05:21	05:27	06:08	06:58	07:47	07:41	08:29
	16:44	17:35	18:27	20:20	21:10	21:52	21:58	21:18	20:13	19:04	17:01	16:28
8	08:43	08:07	07:10	06:59	05:57	05:20	05:28	06:09	06:59	07:49	07:43	08:31
	16:45	17:37	18:28	20:22	21:12	21:53	21:57	21:16	20:11	19:01	16:59	16:27
9	08:43	08:05	07:08	06:57	05:55	05:20	05:29	06:11	07:01	07:50	07:45	08:32
	16:46	17:39	18:30	20:23	21:14	21:54	21:56	21:14	20:08	18:59	16:57	16:27
10	08:42	08:03	07:05	06:54	05:54	05:19	05:30	06:12	07:03	07:52	07:47	08:33
	16:48	17:41	18:32	20:25	21:15	21:55	21:55	21:13	20:06	18:57	16:56	16:27
11	08:42	08:02	07:03	06:52	05:52	05:19	05:31	06:14	07:04	07:54	07:48	08:34
	16:49	17:43	18:34	20:27	21:17	21:56	21:55	21:11	20:04	18:55	16:54	16:27
12	08:41	08:00	07:01	06:50	05:50	05:19	05:32	06:16	07:06	07:55	07:50	08:35
	16:51	17:45	18:35	20:28	21:19	21:56	21:54	21:09	20:01	18:52	16:53	16:27
13	08:40	07:58	06:58	06:48	05:49	05:18	05:33	06:17	07:07	07:57	07:52	08:36
	16:52	17:47	18:37	20:30	21:20	21:57	21:53	21:07	19:59	18:50	16:51	16:27
14	08:40	07:56	06:56	06:45	05:47	05:18	05:34	06:19	07:09	07:59	07:54	08:37
	16:54	17:48	18:39	20:32	21:22	21:58	21:52	21:05	19:57	18:48	16:50	16:27
15	08:39	07:54	06:54	06:43	05:46	05:18	05:35	06:20	07:11	08:00	07:55	08:38
	16:55	17:50	18:41	20:34	21:23	21:58	21:51	21:03	19:54	18:46	16:48	16:27
16	08:38	07:52	06:52	06:41	05:44	05:18	05:36	06:22	07:12	08:02	07:57	08:39
	16:57	17:52	18:42	20:35	21:25	21:59	21:50	21:01	19:52	18:44	16:47	16:27
17	08:37	07:50	06:49	06:39	05:43	05:18	05:37	06:24	07:14	08:04	07:59	08:40
	16:58	17:54	18:44	20:37	21:26	21:59	21:49	20:59	19:50	18:41	16:45	16:27
18	08:36	07:48	06:47	06:37	05:41	05:18	05:39	06:25	07:16	08:06	08:01	08:40
	17:00	17:56	18:46	20:39	21:28	22:00	21:48	20:57	19:47	18:39	16:44	16:27
19	08:35	07:46	06:45	06:35	05:40	05:18	05:40	06:27	07:17	08:07	08:02	08:41
	17:02	17:58	18:48	20:40	21:29	22:00	21:47	20:55	19:45	18:37	16:43	16:28
20	08:34	07:44	06:42	06:32	05:38	05:18	05:41	06:29	07:19	08:09	08:04	08:42
	17:03	18:00	18:49	20:42	21:31	22:00	21:46	20:53	19:43	18:35	16:42	16:28
21	08:33	07:42	06:40	06:30	05:37	05:18	05:43	06:30	07:20	08:11	08:06	08:42
	17:05	18:01	18:51	20:44	21:32	22:00	21:44	20:51	19:40	18:33	16:40	16:28
22	08:32	07:40	06:38	06:28	05:36	05:18	05:44	06:32	07:22	08:13	08:07	08:43
	17:07	18:03	18:53	20:45	21:34	22:01	21:43	20:48	19:38	18:31	16:39	16:29
23	08:31	07:38	06:36	06:26	05:34	05:18	05:45	06:33	07:24	08:14	08:09	08:43
	17:08	18:05	18:54	20:47	21:35	22:01	21:42	20:46	19:36	18:29	16:38	16:29
24	08:30	07:36	06:33	06:24	05:33	05:19	05:47	06:35	07:25	08:16	08:11	08:44
	17:10	18:07	18:56	20:49	21:36	22:01	21:41	20:44	19:33	18:27	16:37	16:30
25	08:28	07:34	06:31	06:22	05:32	05:19	05:48	06:37	07:27	08:18	08:12	08:44
	17:12	18:09	18:58	20:50	21:38	22:01	21:39	20:42	19:31	17:25	16:36	16:30
26	08:27	07:32	06:29	06:20	05:31	05:19	05:49	06:38	07:29	08:20	08:14	08:44
	17:14	18:11	19:00	20:52	21:39	22:01	21:38	20:40	19:29	17:23	16:35	16:31
27	08:26	07:30	06:26	06:18	05:30	05:20	05:51	06:40	07:30	07:22	08:15	08:45
	17:15	18:12	19:01	20:54	21:40	22:01	21:36	20:38	19:26	17:21	16:34	16:32
28	08:24	07:27	06:24	06:16	05:29	05:20	05:52	06:41	07:32	07:23	08:17	08:45
	17:17	18:14	19:03	20:56	21:41	22:01	21:35	20:35	19:24	17:19	16:33	16:33
29	08:23		07:22	06:14	05:28	05:21	05:54	06:43	07:34	07:25	08:18	08:45
	17:19		20:05	20:57	21:43	22:01	21:33	20:33	19:22	17:17	16:32	16:34
30	08:22		07:19	06:12	05:27	05:21	05:55	06:45	07:35	07:27	08:20	08:45
	17:21		20:06	20:59	21:44	22:00	21:32	20:31	19:20	17:15	16:32	16:34
31	08:20		07:17		05:26		05:57	06:46		07:29		08:45
	17:23		20:08		21:45		21:30	20:29		17:13		16:35
Potential sun hours	259	278	367	416	485	498	502	454	381	332	266	244
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

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

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

19065LE slagschaduw nieuwbouwwijk

Licensed user:

Bosch & Van Rijn

Franz-Lisztplantsoen 220

NL-3533 JG Utrecht

+31 6 51 71 04 93

Schreurs / leon@boschenvanrijn.nl

Calculated:

19-Aug-21 10:59 AM/3.4.388

SHADOW - Calendar

Calculation: VKA bovengrens met kantoren 12RD 210819 **Shadow receptor:** AK - Shadow Receptor: 8.0 × 5.0 Azimuth: 0.0° Slope: 0.0° (10927)
Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) [DE BILT]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1.48 2.65 3.60 5.24 6.59 6.28 6.20 6.12 4.48 3.32 1.87 1.32

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 385 684 574 504 436 731 797 1,164 1,146 770 577 539 8,307

January		February		March		April		May		June	
1	08:45	13:34 (5)	08:18	13:50 (5)	07:25	07:15		19:25 (3)	06:10	05:25	
	16:37	75 14:49 (5)	17:24	66 14:56 (5)	18:16	20:10	19	19:44 (3)	21:01	21:46	
2	08:45	13:35 (5)	08:17	13:51 (5)	07:23	07:12		19:25 (3)	06:08	05:24	
	16:38	74 14:49 (5)	17:26	64 14:55 (5)	18:18	20:11	21	19:46 (3)	21:02	21:47	
3	08:45	13:36 (5)	08:15	13:51 (5)	07:21	07:10		19:25 (3)	06:06	05:23	
	16:39	74 14:50 (5)	17:28	63 14:54 (5)	18:20	20:13	20	19:45 (3)	21:04	21:48	
4	08:45	13:36 (5)	08:14	13:52 (5)	07:19	07:08		19:25 (3)	06:04	05:23	
	16:40	75 14:51 (5)	17:30	61 14:53 (5)	18:21	20:15	19	19:44 (3)	21:05	21:49	
5	08:44	13:36 (5)	08:12	13:54 (5)	07:16	17:50 (4)		19:26 (3)	06:03	05:22	
	16:41	75 14:51 (5)	17:32	59 14:53 (5)	18:23	20:17	17	19:43 (3)	21:07	21:50	
6	08:44	13:37 (5)	08:10	13:56 (5)	07:14	17:44 (4)		19:28 (3)	06:01	05:21	
	16:42	75 14:52 (5)	17:34	56 14:52 (5)	18:25	20:18	13	19:41 (3)	21:09	21:51	
7	08:44	13:37 (5)	08:09	13:57 (5)	07:12	17:41 (4)		19:30 (3)	05:59	05:21	
	16:44	75 14:52 (5)	17:36	54 14:51 (5)	18:27	20:20	9	19:39 (3)	21:10	21:52	
8	08:43	13:37 (5)	08:07	13:59 (5)	07:10	17:39 (4)		05:57	05:20		
	16:45	75 14:52 (5)	17:37	51 14:50 (5)	18:28	20:22		21:12	21:53		
9	08:43	13:38 (5)	08:05	14:00 (5)	07:08	17:38 (4)		05:56	05:20		
	16:46	75 14:53 (5)	17:39	48 14:48 (5)	18:30	20:23		21:14	21:54		
10	08:42	13:38 (5)	08:03	14:03 (5)	07:05	17:36 (4)		05:54	05:19		
	16:48	75 14:53 (5)	17:41	43 14:46 (5)	18:32	20:25		21:15	21:55		
11	08:42	13:38 (5)	08:02	14:05 (5)	07:03	17:35 (4)		05:52	05:19		
	16:49	76 14:54 (5)	17:43	39 14:44 (5)	18:34	20:27		21:17	21:56		
12	08:41	13:39 (5)	08:00	14:08 (5)	07:01	17:34 (4)		05:50	05:19		
	16:51	76 14:55 (5)	17:45	34 14:42 (5)	18:35	20:28		21:18	21:56		
13	08:40	13:39 (5)	07:58	14:14 (5)	06:58	17:33 (4)		05:49	05:18		
	16:52	76 14:55 (5)	17:47	25 14:39 (5)	18:37	20:30		21:20	21:57		
14	08:40	13:40 (5)	07:56	14:20 (5)	06:56	17:32 (4)		05:47	05:18		
	16:54	75 14:55 (5)	17:49	14 14:34 (5)	18:39	20:32		21:22	21:57		
15	08:39	13:40 (5)	07:54		06:54	17:32 (4)		05:46	05:18		
	16:55	76 14:56 (5)	17:50		18:41	20:34		21:23	21:58		
16	08:38	13:40 (5)	07:52		06:52	17:31 (4)		05:44	05:18		
	16:57	76 14:56 (5)	17:52		18:42	20:35		21:25	21:59		
17	08:37	13:41 (5)	07:50		06:49	17:31 (4)		05:43	05:18		
	16:58	76 14:57 (5)	17:54		18:44	20:37		21:26	21:59		
18	08:36	13:41 (5)	07:48		06:47	17:31 (4)		05:41	05:18		
	17:00	76 14:57 (5)	17:56		18:46	20:39		21:28	21:59		
19	08:35	13:41 (5)	07:46		06:45	17:30 (4)		05:40	05:18		
	17:02	75 14:56 (5)	17:58		18:48	20:40		21:29	22:00		
20	08:34	13:42 (5)	07:44		06:42	17:31 (4)		05:38	05:18		
	17:03	75 14:57 (5)	18:00		18:49	20:42		21:31	22:00		
21	08:33	13:42 (5)	07:42		06:40	17:32 (4)		05:37	05:18		
	17:05	75 14:57 (5)	18:01		18:51	20:44		21:32	22:00		
22	08:32	13:43 (5)	07:40		06:38	17:31 (4)		05:36	05:18		
	17:07	74 14:57 (5)	18:03		18:53	20:45		21:33	22:01		
23	08:31	13:43 (5)	07:38		06:36	17:33 (4)		05:35	05:18		
	17:08	74 14:57 (5)	18:05		18:54	20:47		21:35	22:01		
24	08:30	13:44 (5)	07:36		06:33	17:34 (4)		05:33	05:19		
	17:10	73 14:57 (5)	18:07		18:56	20:49		21:36	22:01		
25	08:28	13:45 (5)	07:34		06:31	17:35 (4)		05:32	05:19		
	17:12	73 14:58 (5)	18:09		18:58	20:50		21:38	22:01		
26	08:27	13:45 (5)	07:32		06:29	17:37 (4)		05:31	05:19		
	17:14	72 14:57 (5)	18:11		19:00	20:52		21:39	22:01		
27	08:26	13:46 (5)	07:30		06:26	17:39 (4)		05:30	05:20		
	17:15	71 14:57 (5)	18:12		19:01	20:54		21:40	22:01		
28	08:24	13:46 (5)	07:27		06:24	17:43 (4)		05:29	05:20		
	17:17	71 14:57 (5)	18:14		19:03	20:55		21:41	22:01		
29	08:23	13:46 (5)			07:22	19:27 (3)		05:28	05:21		
	17:19	70 14:56 (5)			20:05	19:39 (3)		21:43	22:01		
30	08:21	13:48 (5)			07:19	19:26 (3)		05:27	05:21		
	17:21	68 14:56 (5)			20:06	19:41 (3)		21:44	22:00		
31	08:20	13:48 (5)			07:17	19:26 (3)		05:26			
	17:23	68 14:56 (5)			20:08	19:43 (3)		21:45			
Potential sun hours	259		278		367		416		485	498	
Total, worst case	2294		677		727		118				
Sun reduction	0.18		0.27		0.30		0.38				
Oper. time red.	0.95		0.95		0.95		0.95				
Wind dir. red.	0.69		0.69		0.63		0.62				
Total reduction	0.12		0.18		0.18		0.22				
Total, real	268		119		132		26				

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

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

Project:

19065LE slagschaduw nieuwbouwwijk

Licensed user:

Bosch & Van Rijn

Franz-Lisztplantsoen 220

NL-3533 JG Utrecht

+31 6 51 71 04 93

Schreurs / leon@boschenvanrijn.nl

Calculated:

19-Aug-21 10:59 AM/3.4.388

SHADOW - Calendar

Calculation: VKA bovengrens met kantoren 12RD 210819 **Shadow receptor:** AK - Shadow Receptor: 8.0 × 5.0 Azimuth: 0.0° Slope: 0.0° (10927)
Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) [DE BILT]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1.48 2.65 3.60 5.24 6.59 6.28 6.20 6.12 4.48 3.32 1.87 1.32

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 385 684 574 504 436 731 797 1,164 1,146 770 577 539 8,307

	July	August	September	October	November	December
1	05:22	05:58	06:48	07:37	18:13 (4)	07:30
	22:00	21:28	20:27	19:17	18:47 (4)	17:11
2	05:23	06:00	06:50	07:38	18:13 (4)	07:32
	22:00	21:27	20:24	19:15	18:46 (4)	17:09
3	05:23	06:01	06:51	07:40	18:13 (4)	07:34
	21:59	21:25	20:22	19:13	18:44 (4)	17:08
4	05:24	06:03	06:53	07:42	18:14 (4)	07:36
	21:59	21:23	20:20	19:10	18:43 (4)	17:06
5	05:25	06:05	06:54	19:26 (3)	07:43	18:16 (4)
	21:59	21:22	20:17	19:35 (3)	19:08	18:41 (4)
6	05:26	06:06	06:56	19:24 (3)	07:45	18:16 (4)
	21:58	21:20	20:15	19:37 (3)	19:06	18:38 (4)
7	05:27	06:08	06:58	19:21 (3)	07:47	18:18 (4)
	21:57	21:18	20:13	19:38 (3)	19:04	18:36 (4)
8	05:28	06:09	06:59	19:20 (3)	07:49	18:21 (4)
	21:57	21:16	20:11	19:39 (3)	19:01	18:33 (4)
9	05:29	06:11	07:01	19:19 (3)	07:50	18:18 (4)
	21:56	21:14	20:08	19:39 (3)	18:59	18:18 (4)
10	05:30	06:12	07:03	19:18 (3)	07:52	18:18 (4)
	21:55	21:13	20:06	19:39 (3)	18:57	18:18 (4)
11	05:31	06:14	07:04	19:18 (3)	07:54	18:18 (4)
	21:55	21:11	20:04	19:37 (3)	18:55	18:18 (4)
12	05:32	06:16	07:06	19:17 (3)	07:55	18:18 (4)
	21:54	21:09	20:01	19:34 (3)	18:52	18:18 (4)
13	05:33	06:17	07:07	19:17 (3)	07:57	18:18 (4)
	21:53	21:07	19:59	19:32 (3)	18:50	18:18 (4)
14	05:34	06:19	07:09	19:17 (3)	07:59	18:18 (4)
	21:52	21:05	19:57	19:30 (3)	18:48	18:18 (4)
15	05:35	06:20	07:11	18:35 (4)	08:00	18:18 (4)
	21:51	21:03	19:54	19:28 (3)	18:46	18:18 (4)
16	05:36	06:22	07:12	18:28 (4)	08:02	18:18 (4)
	21:50	21:01	19:52	19:25 (3)	18:44	18:18 (4)
17	05:37	06:24	07:14	18:25 (4)	08:04	18:18 (4)
	21:49	20:59	19:50	19:23 (3)	18:41	18:18 (4)
18	05:39	06:25	07:16	18:23 (4)	08:06	18:18 (4)
	21:48	20:57	19:47	18:47 (4)	18:39	18:18 (4)
19	05:40	06:27	07:17	18:21 (4)	08:07	18:18 (4)
	21:47	20:55	19:45	18:48 (4)	18:37	18:18 (4)
20	05:41	06:29	07:19	18:19 (4)	08:09	18:18 (4)
	21:46	20:53	19:43	18:49 (4)	18:35	18:18 (4)
21	05:43	06:30	07:20	18:17 (4)	08:11	18:18 (4)
	21:44	20:50	19:40	18:49 (4)	18:33	18:18 (4)
22	05:44	06:32	07:22	18:16 (4)	08:13	18:18 (4)
	21:43	20:48	19:38	18:50 (4)	18:31	18:18 (4)
23	05:45	06:33	07:24	18:16 (4)	08:14	18:18 (4)
	21:42	20:46	19:36	18:50 (4)	18:29	18:18 (4)
24	05:47	06:35	07:25	18:14 (4)	08:16	18:18 (4)
	21:40	20:44	19:33	18:50 (4)	18:27	18:18 (4)
25	05:48	06:37	07:27	18:14 (4)	07:18	18:18 (4)
	21:39	20:42	19:31	18:50 (4)	17:25	18:18 (4)
26	05:50	06:38	07:29	18:14 (4)	07:20	18:18 (4)
	21:38	20:40	19:29	18:50 (4)	17:23	18:18 (4)
27	05:51	06:40	07:30	18:12 (4)	07:21	18:18 (4)
	21:36	20:38	19:26	18:49 (4)	17:21	18:18 (4)
28	05:52	06:41	07:32	18:13 (4)	07:23	18:18 (4)
	21:35	20:35	19:24	18:49 (4)	17:19	18:18 (4)
29	05:54	06:43	07:34	18:13 (4)	07:25	18:18 (4)
	21:33	20:33	19:22	18:49 (4)	17:17	18:18 (4)
30	05:55	06:45	07:35	18:12 (4)	07:27	18:18 (4)
	21:32	20:31	19:20	18:48 (4)	17:15	18:18 (4)
31	05:57	06:46		07:29	13:34 (5)	18:18 (4)
	21:30	20:29		17:13	14:14 (5)	18:18 (4)
Potential sun hours	502	454	381	332	267	244
Total, worst case			654	324	2042	2303
Sun reduction			0.35	0.31	0.21	0.17
Oper. time red.			0.95	0.95	0.95	0.95
Wind dir. red.			0.62	0.65	0.69	0.69
Total reduction			0.21	0.19	0.14	0.11
Total, real			138	63	283	255

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

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

Project:

19065LE slagschaduw nieuwbouwwijk

Licensed user:

Bosch & Van Rijn

Franz-Lisztplantsoen 220

NL-3533 JG Utrecht

+31 6 51 71 04 93

Schreurs / leon@boschenvanrijn.nl

Calculated:

19-Aug-21 10:59 AM/3.4.388

SHADOW - Calendar

Calculation: VKA bovengrens met kantoren 12RD 210819**Shadow receptor:** AL - Shadow Receptor: 8.0 × 5.0 Azimuth: 0.0° Slope: 0.0° (10928)
Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) [DE BILT]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1.48 2.65 3.60 5.24 6.59 6.28 6.20 6.12 4.48 3.32 1.87 1.32

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 385 684 574 504 436 731 797 1,164 1,146 770 577 539 8,307

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:45 16:37	08:19 17:25	07:25 18:16	07:15 20:10	06:10 21:01	05:25 21:46	05:54 (3) 22:00	05:53 (3) 21:29	05:59 20:27	06:48 19:17	07:37 17:11	08:21 16:31
2	08:45 16:38	08:17 17:27	07:23 18:18	07:13 20:12	06:08 21:02	05:24 21:47	05:53 (3) 22:00	05:54 (3) 21:27	06:00 20:24	06:50 19:15	07:39 17:10	08:23 16:31
3	08:45 16:39	08:15 17:28	07:21 18:20	07:10 20:13	06:07 21:04	05:24 21:49	05:52 (3) 22:00	05:54 (3) 21:25	06:02 20:22	06:51 19:13	07:40 17:08	08:24 16:30
4	08:45 16:40	08:14 17:30	07:19 18:22	07:08 20:15	06:05 21:06	05:23 21:50	05:52 (3) 21:59	05:55 (3) 21:24	06:03 20:20	06:53 19:11	07:42 17:06	08:26 16:29
5	08:45 16:41	08:12 17:32	07:17 18:23	07:06 20:17	06:03 21:07	05:22 21:51	05:51 (3) 21:59	05:56 (3) 21:22	06:05 20:18	06:55 19:08	07:44 17:04	08:27 16:29
6	08:44 16:43	08:11 17:34	07:14 18:25	07:04 20:18	06:01 21:09	05:22 21:52	05:51 (3) 21:58	05:57 (3) 21:20	06:06 20:15	06:56 19:06	07:45 17:03	08:28 16:28
7	08:44 16:44	08:09 17:36	07:12 18:27	07:01 20:20	05:59 21:11	05:21 21:52	05:50 (3) 21:58	05:57 (3) 21:18	06:08 20:13	06:58 19:04	07:47 17:01	08:29 16:28
8	08:44 16:45	08:07 17:38	07:10 18:29	06:59 20:22	05:57 21:12	05:20 21:53	05:50 (3) 21:57	05:58 (3) 21:16	06:10 20:11	07:00 19:01	07:49 16:59	08:31 16:28
9	08:43 16:47	08:05 17:39	07:08 18:30	06:57 20:24	05:56 21:14	05:20 21:54	05:49 (3) 21:56	05:59 (3) 21:15	06:11 20:09	07:01 18:59	07:50 16:58	08:32 16:27
10	08:43 16:48	08:04 17:41	07:05 18:32	06:55 20:25	05:54 21:15	05:20 21:55	05:49 (3) 21:56	06:00 (3) 21:13	06:13 20:06	07:03 18:57	07:52 16:56	08:33 16:27
11	08:42 16:49	08:02 17:43	07:03 18:34	06:52 20:27	05:52 21:17	05:19 21:56	05:49 (3) 21:55	06:01 (3) 21:11	06:14 20:04	07:04 18:55	07:54 16:54	08:34 16:27
12	08:41 16:51	08:00 17:45	07:01 18:36	06:50 20:29	05:51 21:19	05:19 21:56	05:49 (3) 21:54	06:02 (3) 21:09	06:16 20:02	07:06 18:53	07:56 16:53	08:35 16:27
13	08:41 16:52	07:58 17:47	06:59 18:37	06:48 20:30	05:49 21:20	05:19 21:57	05:48 (3) 21:53	06:03 (3) 21:07	06:17 19:59	07:08 18:50	07:57 16:51	08:36 16:27
14	08:40 16:54	07:56 17:49	06:56 18:39	06:46 20:32	05:47 21:22	05:18 21:58	05:48 (3) 21:52	06:19 21:05	07:09 19:57	07:59 18:48	07:54 16:50	08:37 16:27
15	08:39 16:55	07:54 17:51	06:54 18:41	06:43 20:34	05:46 21:23	05:18 21:58	05:48 (3) 21:51	06:21 21:03	07:11 19:55	08:01 18:46	07:56 16:48	08:38 16:27
16	08:38 16:57	07:52 17:52	06:52 18:43	06:41 20:35	05:44 21:25	05:18 21:59	05:48 (3) 21:50	06:22 21:01	07:12 19:52	08:02 18:44	07:57 16:47	08:39 16:27
17	08:37 16:59	07:50 17:54	06:50 18:44	06:39 20:37	05:43 21:26	05:18 21:59	05:48 (3) 21:49	06:24 20:59	07:14 19:50	08:04 18:42	07:59 16:46	08:40 16:27
18	08:36 17:00	07:48 17:56	06:47 18:46	06:37 20:39	05:41 21:28	05:18 22:00	05:48 (3) 21:48	06:26 20:57	07:16 19:48	08:06 18:40	08:01 16:44	08:41 16:28
19	08:35 17:02	07:46 17:58	06:45 18:48	06:35 20:40	05:40 21:29	05:18 22:00	05:48 (3) 21:47	06:27 20:55	07:17 19:45	08:08 18:37	08:02 16:43	08:41 16:28
20	08:34 17:04	07:44 18:00	06:43 18:49	06:33 20:42	05:39 21:31	05:18 22:00	05:48 (3) 21:46	06:29 20:53	07:19 19:43	08:09 18:35	08:04 16:42	08:42 16:28
21	08:33 17:05	07:42 18:02	06:40 18:51	06:31 20:44	05:37 21:32	05:18 22:01	05:49 (3) 21:45	06:30 20:51	07:21 19:41	08:11 18:33	08:06 16:41	08:42 16:29
22	08:32 17:07	07:40 18:03	06:38 18:53	06:28 20:46	05:36 21:34	05:18 22:01	05:49 (3) 21:43	06:32 20:49	07:22 19:38	08:13 18:31	08:07 16:39	08:43 16:29
23	08:31 17:09	07:38 18:05	06:36 18:55	06:26 20:47	05:35 21:35	05:19 22:01	05:49 (3) 21:42	06:34 20:46	07:24 19:36	08:15 18:29	08:09 16:38	08:43 16:30
24	08:30 17:10	07:36 18:07	06:33 18:56	06:24 20:49	05:34 21:36	05:19 22:01	05:49 (3) 21:41	06:35 20:44	07:25 19:34	08:16 18:27	08:11 16:37	08:44 16:30
25	08:28 17:12	07:34 18:09	06:31 18:58	06:22 20:51	05:32 21:38	05:19 22:01	05:50 (3) 21:39	06:37 20:42	07:27 19:31	07:18 17:25	08:12 16:36	08:44 16:31
26	08:27 17:14	07:32 18:11	06:29 19:00	06:20 20:52	05:31 21:39	05:20 22:01	05:50 (3) 21:38	06:38 20:40	07:29 19:29	07:20 17:23	08:14 16:35	08:45 16:31
27	08:26 17:16	07:30 18:13	06:26 19:01	06:18 20:54	05:30 21:40	05:20 22:01	05:51 (3) 21:36	06:40 20:38	07:30 19:27	07:22 17:21	08:15 16:34	08:45 16:32
28	08:24 17:17	07:28 18:14	06:24 19:03	06:16 20:56	05:29 21:42	05:21 22:01	05:51 (3) 21:35	06:42 20:36	07:32 19:24	07:23 17:19	08:17 16:34	08:45 16:33
29	08:23 17:19		07:22 20:05	06:14 20:57	05:28 21:43	05:21 22:01	05:52 (3) 21:33	06:43 20:33	07:34 19:22	07:25 17:17	08:19 16:33	08:45 16:34
30	08:22 17:21		07:20 20:07	06:12 20:59	05:27 21:44	05:22 22:01	05:52 (3) 21:32	06:45 20:31	07:35 19:20	07:27 17:15	08:20 16:32	08:45 16:35
31	08:20 17:23		07:17 20:08	05:26 21:45	05:26 21:45	05:55 (3) 05:57 (3)	06:07 (3) 21:30	06:47 20:29	07:29 17:13	07:29 16:32	08:45 16:36	08:45 16:36
Potential sun hours	259	278	367	416	485	498	502	454	381	332	267	244
Total, worst case					2	428	120					
Sun reduction					0.42	0.38	0.38					
Oper. time red.					0.95	0.95	0.95					
Wind dir. red.					0.67	0.67	0.67					
Total reduction					0.27	0.24	0.24					
Total, real					1	103	29					

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

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

Project:

19065LE slagschaduw nieuwbouwwijk

Licensed user:

Bosch & Van Rijn

Franz-Lisztplantsoen 220

NL-3533 JG Utrecht

+31 6 51 71 04 93

Schreurs / leon@boschenvanrijn.nl

Calculated:

19-Aug-21 10:59 AM/3.4.388

SHADOW - Calendar

Calculation: VKA bovengrens met kantoren 12RD 210819Shadow receptor: AM - Shadow Receptor: 8.0 × 5.0 Azimuth: 0.0° Slope: 0.0° (10929)
Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) [DE BILT]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1.48 2.65 3.60 5.24 6.59 6.28 6.20 6.12 4.48 3.32 1.87 1.32

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 385 684 574 504 436 731 797 1,164 1,146 770 577 539 8,307

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:45 16:37	08:18 17:24	07:25 18:16	17:15 (5) 21:10	06:10 21:00	05:25 21:46	05:22 22:00	05:58 21:28	06:48 20:26	07:37 19:17	07:30 17:11	08:21 16:31
2	08:45 16:38	08:17 17:26	07:23 18:18	17:15 (5) 21:11	06:08 21:02	05:24 21:47	05:23 22:00	06:00 21:27	06:50 20:24	07:38 19:15	07:32 17:09	08:23 16:30
3	08:45 16:39	08:15 17:28	07:21 18:19	17:17 (5) 21:13	06:06 21:04	05:23 21:48	05:23 21:59	06:01 21:25	06:51 20:22	07:40 19:13	07:34 17:08	08:24 16:30
4	08:45 16:40	08:14 17:30	07:19 18:21	17:20 (5) 21:15	06:04 21:05	05:23 21:49	05:24 21:59	06:03 21:23	06:53 20:20	07:42 19:10	07:36 17:06	08:25 16:29
5	08:44 16:41	08:12 17:32	07:16 18:23	17:30 (5) 21:16	06:03 21:07	05:22 21:50	05:25 21:58	06:04 21:22	06:54 20:17	07:43 19:08	07:38 17:04	08:27 16:29
6	08:44 16:42	08:10 17:34	07:14 18:25	17:30 (5) 21:18	06:01 21:09	05:21 21:51	05:26 21:58	06:06 21:20	06:56 20:15	07:45 19:06	07:39 17:02	08:28 16:28
7	08:44 16:44	08:09 17:35	07:12 18:27	17:30 (5) 21:20	05:59 21:10	05:21 21:52	05:27 21:57	06:08 21:18	06:58 20:13	07:47 19:03	07:41 17:01	08:29 16:28
8	08:43 16:45	08:07 17:37	07:10 18:28	17:30 (5) 21:22	06:59 21:12	05:20 21:53	05:28 21:57	06:09 21:16	06:59 20:11	07:48 19:01	07:43 16:59	08:30 16:27
9	08:43 16:46	08:05 17:39	07:07 18:30	17:30 (5) 21:23	06:56 21:14	05:20 21:54	05:29 21:56	06:11 21:14	07:01 20:08	17:57 (5) 18:59	07:45 16:57	08:32 16:27
10	08:42 16:48	08:03 17:41	07:05 18:32	17:30 (5) 21:25	06:54 21:15	05:19 21:55	05:30 21:55	06:12 21:12	07:02 20:06	18:03 (5) 18:57	07:46 16:56	08:33 16:27
11	08:42 16:49	08:01 17:43	07:03 18:34	17:30 (5) 21:27	06:52 21:17	05:19 21:55	05:31 21:55	06:14 21:11	07:04 20:04	18:06 (5) 18:54	07:48 16:54	08:34 16:27
12	08:41 16:51	08:00 17:45	07:01 18:35	17:30 (5) 21:28	06:50 21:18	05:18 21:56	05:32 21:54	06:16 21:09	07:06 20:01	18:08 (5) 18:52	07:50 16:52	08:35 16:27
13	08:40 16:52	07:58 17:47	06:58 18:37	17:30 (5) 21:30	06:48 21:20	05:18 21:57	05:33 21:53	06:17 21:07	07:07 19:59	18:09 (5) 18:50	07:52 16:51	08:36 16:27
14	08:40 16:54	07:56 17:48	06:56 18:39	17:30 (5) 21:32	06:45 21:21	05:18 21:57	05:34 21:52	06:19 21:05	07:09 19:57	18:10 (5) 18:48	07:54 16:50	08:37 16:27
15	08:39 16:55	07:54 17:50	06:54 18:41	17:30 (5) 21:33	06:43 21:23	05:18 21:58	05:35 21:51	06:20 21:03	07:11 19:54	18:10 (5) 18:46	07:55 16:48	08:38 16:27
16	08:38 16:57	07:52 17:52	17:21 (5) 18:42	17:30 (5) 21:35	06:41 21:25	05:18 21:58	05:36 21:50	06:22 21:01	07:12 19:52	18:10 (5) 18:43	07:57 16:47	08:39 16:27
17	08:37 16:58	07:50 17:54	17:18 (5) 18:44	17:30 (5) 21:37	06:39 21:26	05:18 21:59	05:37 21:49	06:24 20:59	07:14 19:50	18:11 (5) 18:41	07:59 16:45	08:39 16:27
18	08:36 17:00	07:48 17:56	17:17 (5) 18:46	17:30 (5) 21:39	06:37 21:28	05:18 21:59	05:39 21:48	06:25 20:57	07:15 19:47	17:44 (5) 18:39	08:00 16:44	08:40 16:27
19	08:35 17:02	07:46 17:58	17:15 (5) 18:47	17:30 (5) 21:40	06:35 21:29	05:18 22:00	05:40 21:47	06:27 20:55	07:17 19:45	17:44 (5) 18:37	08:02 16:43	08:41 16:27
20	08:34 17:03	07:44 18:00	17:15 (5) 18:49	17:30 (5) 21:42	06:32 21:31	05:18 22:00	05:41 21:45	06:28 20:53	07:19 19:43	17:44 (5) 18:35	08:04 16:42	08:42 16:28
21	08:33 17:05	07:42 18:01	17:14 (5) 18:51	17:30 (5) 21:44	06:30 21:32	05:18 22:00	05:43 21:44	06:30 20:50	07:20 19:40	17:44 (5) 18:33	08:06 16:40	08:42 16:28
22	08:32 17:07	07:40 18:03	17:13 (5) 18:53	17:30 (5) 21:45	06:28 21:33	05:18 22:01	05:44 21:43	06:32 20:48	07:22 19:38	17:45 (5) 18:31	08:07 16:39	08:43 16:29
23	08:31 17:08	07:38 18:05	17:13 (5) 18:54	17:30 (5) 21:46	06:26 21:35	05:18 22:01	05:45 21:42	06:33 20:46	07:24 19:36	17:46 (5) 18:29	08:09 16:38	08:43 16:29
24	08:29 17:10	07:36 18:07	17:13 (5) 18:56	17:30 (5) 21:47	06:24 21:36	05:19 22:01	05:47 21:40	06:35 20:44	07:25 19:33	17:47 (5) 18:27	08:10 16:37	08:44 16:30
25	08:28 17:12	07:34 18:09	17:12 (5) 18:58	17:30 (5) 21:48	06:22 21:37	05:19 22:01	05:48 21:39	06:37 20:42	07:27 19:31	16:49 (5) 17:25	08:12 16:36	08:44 16:30
26	08:27 17:14	07:32 18:10	17:12 (5) 18:59	17:30 (5) 21:49	06:20 21:39	05:19 22:01	05:49 21:38	06:38 20:40	07:28 19:29	16:52 (5) 17:23	08:14 16:35	08:44 16:31
27	08:26 17:15	07:29 18:12	17:13 (5) 19:01	17:30 (5) 21:50	06:18 21:40	05:20 22:01	05:51 21:36	06:40 20:38	07:30 19:26	16:54 (5) 17:21	08:15 16:34	08:45 16:32
28	08:24 17:17	07:27 18:14	17:14 (5) 19:03	17:30 (5) 21:51	06:16 21:41	05:20 22:01	05:52 21:35	06:41 20:35	07:32 19:24	17:21 (5) 17:19	08:17 16:33	08:45 16:33
29	08:23 17:19	07:22	17:14 (5) 19:05	17:30 (5) 21:52	06:14 21:43	05:21 22:01	05:54 21:33	06:43 20:33	07:33 19:22	17:25 (5) 17:17	08:18 16:32	08:45 16:34
30	08:21 17:21	07:19	17:13 (5) 19:06	17:30 (5) 21:53	06:12 21:44	05:21 22:00	05:55 21:32	06:45 20:31	07:35 19:19	17:27 (5) 17:15	08:20 16:32	08:45 16:34
31	08:20 17:23	07:17	17:12 (5) 19:08	17:30 (5) 21:54	06:10 21:45	05:20 22:00	05:57 21:30	06:46 20:29	07:29 17:13	17:28 (5) 17:13	08:21 16:35	08:45 16:35
Potential sun hours	259	278	367	416	485	498	502	454	381	332	267	244
Total, worst case		249	66							327		
Sun reduction		0.27	0.30							0.31		
Oper. time red.		0.95	0.95							0.95		
Wind dir. red.		0.66	0.66							0.66		
Total reduction		0.17	0.19							0.19		
Total, real		42	13							63		

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

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

Project:

19065LE slagschaduw nieuwbouwwijk

Licensed user:

Bosch & Van Rijn

Franz-Lisztplantsoen 220

NL-3533 JG Utrecht

+31 6 51 71 04 93

Schreurs / leon@boschenvanrijn.nl

Calculated:

19-Aug-21 10:59 AM/3.4.388

SHADOW - Calendar

Calculation: VKA bovengrens met kantoren 12RD 210819 Shadow receptor: AN - Shadow Receptor: 8.0 × 5.0 Azimuth: 0.0° Slope: 0.0° (10930)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [DE BILT]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec

1.48 2.65 3.60 5.24 6.59 6.28 6.20 6.12 4.48 3.32 1.87 1.32

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
385	684	574	504	436	731	797	1,164	1,146	770	577	539	8,307

January		February		March		April		May		June	
1	08:45		09:56 (3)	08:19	15:08 (2)	07:25	15:16 (2)	07:15	18:25 (1)	06:10	05:25
	16:37	7	10:03 (3)	17:25	16:17 (2)	18:16	56	16:12 (2)	20:10	43	21:46
2	08:45		09:57 (3)	08:17	15:07 (2)	07:23		15:18 (2)	07:13		06:08
	16:38	4	10:01 (3)	17:26	16:17 (2)	18:18	53	16:11 (2)	20:12	41	21:02
3	08:45			08:16	15:07 (2)	07:21		15:19 (2)	07:10		06:06
	16:39			17:28	16:18 (2)	18:20	49	16:08 (2)	20:13	39	21:04
4	08:45			08:14	15:07 (2)	07:19		15:21 (2)	07:08		06:05
	16:40			17:30	16:19 (2)	18:21	46	16:07 (2)	20:15	37	21:06
5	08:45			08:12	15:07 (2)	07:17		15:24 (2)	07:06		06:03
	16:41			17:32	16:19 (2)	18:23	41	16:05 (2)	20:17	33	21:07
6	08:44			08:11	15:06 (2)	07:14		15:27 (2)	07:04		06:01
	16:43			17:34	16:20 (2)	18:25	36	16:03 (2)	20:18	30	21:09
7	08:44		15:32 (2)	08:09	15:06 (2)	07:12		15:30 (2)	07:01		05:59
	16:44	3	15:35 (2)	17:36	16:20 (2)	18:27	29	15:59 (2)	20:20	26	21:11
8	08:44		15:28 (2)	08:07	15:05 (2)	07:10		15:34 (2)	06:59		05:57
	16:45	13	15:41 (2)	17:38	16:20 (2)	18:29	21	15:55 (2)	20:22	21	21:12
9	08:43		15:25 (2)	08:05	15:06 (2)	07:08			06:57		05:56
	16:47	19	15:44 (2)	17:39	16:21 (2)	18:30			20:24	13	21:14
10	08:43		15:23 (2)	08:04	15:06 (2)	07:05		17:47 (1)	06:54		05:54
	16:48	23	15:46 (2)	17:41	16:21 (2)	18:32	10	17:57 (1)	20:25		21:15
11	08:42		15:22 (2)	08:02	15:06 (2)	07:03		17:42 (1)	06:52		05:52
	16:49	27	15:49 (2)	17:43	16:22 (2)	18:34	20	18:02 (1)	20:27		21:17
12	08:41		15:21 (2)	08:00	15:06 (2)	07:01		17:39 (1)	06:50		05:51
	16:51	30	15:51 (2)	17:45	16:22 (2)	18:36	26	18:05 (1)	20:29		21:19
13	08:41		15:20 (2)	07:58	15:06 (2)	06:59		17:36 (1)	06:48		05:49
	16:52	32	15:52 (2)	17:47	16:22 (2)	18:37	30	18:06 (1)	20:30		21:20
14	08:40		15:19 (2)	07:56	15:06 (2)	06:56		17:35 (1)	06:46		05:47
	16:54	35	15:54 (2)	17:49	16:22 (2)	18:39	33	18:08 (1)	20:32		21:22
15	08:39		15:18 (2)	07:54	15:06 (2)	06:54		17:33 (1)	06:43		05:46
	16:55	38	15:56 (2)	17:51	16:22 (2)	18:41	37	18:10 (1)	20:34		21:23
16	08:38		15:17 (2)	07:52	15:06 (2)	06:52		17:32 (1)	06:41		05:44
	16:57	41	15:58 (2)	17:52	16:21 (2)	18:43	39	18:11 (1)	20:35		21:25
17	08:37		15:16 (2)	07:50	15:07 (2)	06:50		17:30 (1)	06:39		05:43
	16:58	44	16:00 (2)	17:54	16:21 (2)	18:44	41	18:11 (1)	20:37		21:26
18	08:36		15:15 (2)	07:48	15:07 (2)	06:47		17:29 (1)	06:37		05:41
	17:00	46	16:01 (2)	17:56	16:21 (2)	18:46	43	18:12 (1)	20:39		21:28
19	08:35		15:15 (2)	07:46	15:06 (2)	06:45		17:28 (1)	06:35		05:40
	17:02	48	16:03 (2)	17:58	16:20 (2)	18:48	45	18:13 (1)	20:41		21:29
20	08:34		15:13 (2)	07:44	15:07 (2)	06:43		17:27 (1)	06:33		05:39
	17:03	51	16:04 (2)	18:00	16:19 (2)	18:49	46	18:13 (1)	20:42		21:31
21	08:33		15:13 (2)	07:42	15:08 (2)	06:40		17:26 (1)	06:30		05:37
	17:05	52	16:05 (2)	18:02	16:19 (2)	18:51	47	18:13 (1)	20:44		21:32
22	08:32		15:12 (2)	07:40	15:08 (2)	06:38		17:26 (1)	06:28		05:36
	17:07	55	16:07 (2)	18:03	16:19 (2)	18:53	48	18:14 (1)	20:46		21:34
23	08:31		15:12 (2)	07:38	15:09 (2)	06:36		17:25 (1)	06:26		05:35
	17:08	57	16:09 (2)	18:05	16:18 (2)	18:55	48	18:13 (1)	20:47		21:35
24	08:30		15:11 (2)	07:36	15:10 (2)	06:33		17:25 (1)	06:24		05:33
	17:10	58	16:09 (2)	18:07	16:17 (2)	18:56	48	18:13 (1)	20:49		21:36
25	08:29		15:11 (2)	07:34	15:11 (2)	06:31		17:25 (1)	06:22		05:32
	17:12	60	16:11 (2)	18:09	16:17 (2)	18:58	48	18:13 (1)	20:51		21:38
26	08:27		15:10 (2)	07:32	15:11 (2)	06:29		17:24 (1)	06:20		05:31
	17:14	61	16:11 (2)	18:11	16:15 (2)	19:00	48	18:12 (1)	20:52		21:39
27	08:26		15:10 (2)	07:30	15:13 (2)	06:26		17:24 (1)	06:18		05:30
	17:16	63	16:13 (2)	18:12	16:14 (2)	19:01	48	18:12 (1)	20:54		21:40
28	08:25		15:09 (2)	07:28	15:14 (2)	06:24		17:24 (1)	06:16		05:29
	17:17	64	16:13 (2)	18:14	16:13 (2)	19:03	48	18:12 (1)	20:56		21:42
29	08:23		15:09 (2)			07:22		18:24 (1)	06:14		05:28
	17:19	66	16:15 (2)			20:05	47	19:11 (1)	20:57		21:43
30	08:22		15:08 (2)			07:20		18:24 (1)	06:12		05:27
	17:21	67	16:15 (2)			20:07	46	19:10 (1)	20:59		21:44
31	08:20		15:07 (2)			07:17		18:25 (1)			05:26
	17:23	69	16:16 (2)			20:08	44	19:09 (1)			21:45
Potential sun hours	259			278		367		416		485	498
Total, worst case	1133			2004		1221		283			
Sun reduction	0.18			0.27		0.30		0.38			
Oper. time red.	0.95			0.95		0.95		0.95			
Wind dir. red.	0.68			0.68		0.64		0.63			
Total reduction	0.11			0.17		0.19		0.23			
Total, real	129			345		226		64			

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

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

19065LE slagschaduw nieuwbouwwijk

Licensed user:

Bosch & Van Rijn

Franz-Lisztplantsoen 220

NL-3533 JG Utrecht

+31 6 51 71 04 93

Schreurs / leon@boschenvanrijn.nl

Calculated:

19-Aug-21 10:59 AM/3.4.388

SHADOW - Calendar

Calculation: VKA bovengrens met kantoren 12RD 210819 **Shadow receptor:** AN - Shadow Receptor: 8.0 × 5.0 Azimuth: 0.0° Slope: 0.0° (10930)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [DE BILT]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.48	2.65	3.60	5.24	6.59	6.28	6.20	6.12	4.48	3.32	1.87	1.32

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
385	684	574	504	436	731	797	1,164	1,146	770	577	539	8,307

	July	August	September	October	November	December
1	05:22	05:59	06:48	07:37	18:17 (1)	07:31
	22:00	21:29	20:27	19:17	18:45 (1)	17:11
2	05:23	06:00	06:50	07:39	18:20 (1)	07:32
	22:00	21:27	20:24	19:15	18:42 (1)	17:10
3	05:24	06:02	06:51	18:36 (1)	07:40	18:22 (1)
	22:00	21:25	20:22	18:49 (1)	19:13	18:38 (1)
4	05:24	06:03	06:53	18:32 (1)	07:42	18:38 (1)
	21:59	21:24	20:20	18:53 (1)	19:10	18:38 (1)
5	05:25	06:05	06:55	18:29 (1)	07:44	18:38 (1)
	21:59	21:22	20:18	18:55 (1)	19:08	18:38 (1)
6	05:26	06:06	06:56	18:27 (1)	07:45	18:38 (1)
	21:58	21:20	20:15	18:57 (1)	19:06	18:38 (1)
7	05:27	06:08	06:58	18:25 (1)	07:47	18:38 (1)
	21:58	21:18	20:13	18:58 (1)	19:04	18:38 (1)
8	05:28	06:09	06:59	18:23 (1)	07:49	18:38 (1)
	21:57	21:16	20:11	18:59 (1)	19:01	18:38 (1)
9	05:29	06:11	07:01	18:21 (1)	07:50	18:38 (1)
	21:56	21:15	20:09	19:00 (1)	18:59	18:38 (1)
10	05:30	06:13	07:03	18:19 (1)	07:52	18:38 (1)
	21:56	21:13	20:06	19:00 (1)	18:57	18:38 (1)
11	05:31	06:14	07:04	18:18 (1)	07:54	18:38 (1)
	21:55	21:11	20:04	19:01 (1)	18:55	18:38 (1)
12	05:32	06:16	07:06	18:16 (1)	07:56	18:38 (1)
	21:54	21:09	20:02	19:01 (1)	18:52	18:38 (1)
13	05:33	06:17	07:08	18:16 (1)	07:57	18:38 (1)
	21:53	21:07	19:59	19:01 (1)	18:50	18:38 (1)
14	05:34	06:19	07:09	18:14 (1)	07:59	18:38 (1)
	21:52	21:05	19:57	19:01 (1)	18:48	18:38 (1)
15	05:35	06:21	07:11	18:14 (1)	08:01	18:38 (1)
	21:51	21:03	19:55	19:01 (1)	18:46	18:38 (1)
16	05:36	06:22	07:12	18:13 (1)	08:02	18:38 (1)
	21:50	21:01	19:52	19:02 (1)	18:44	18:38 (1)
17	05:38	06:24	07:14	18:12 (1)	08:04	18:38 (1)
	21:49	20:59	19:50	19:01 (1)	18:42	18:38 (1)
18	05:39	06:25	07:16	18:12 (1)	08:06	18:38 (1)
	21:48	20:57	19:48	19:01 (1)	18:39	18:38 (1)
19	05:40	06:27	07:17	18:11 (1)	08:08	18:38 (1)
	21:47	20:55	19:45	19:00 (1)	18:37	18:38 (1)
20	05:41	06:29	07:19	18:11 (1)	08:09	18:38 (1)
	21:46	20:53	19:43	19:00 (1)	18:35	18:38 (1)
21	05:43	06:30	07:21	18:11 (1)	08:11	18:38 (1)
	21:45	20:51	19:41	18:59 (1)	18:33	18:38 (1)
22	05:44	06:32	07:22	18:11 (1)	08:13	18:38 (1)
	21:43	20:49	19:38	18:58 (1)	18:31	18:38 (1)
23	05:45	06:34	07:24	18:11 (1)	08:15	18:38 (1)
	21:42	20:46	19:36	18:58 (1)	18:29	18:38 (1)
24	05:47	06:35	07:25	18:12 (1)	08:16	18:38 (1)
	21:41	20:44	19:34	18:57 (1)	18:27	18:38 (1)
25	05:48	06:37	07:27	18:12 (1)	08:18	18:38 (1)
	21:39	20:42	19:31	18:55 (1)	17:25	18:38 (1)
26	05:50	06:38	07:29	18:12 (1)	08:20	18:38 (1)
	21:38	20:40	19:29	18:54 (1)	17:23	18:38 (1)
27	05:51	06:40	07:30	18:12 (1)	08:22	18:38 (1)
	21:36	20:38	19:27	18:52 (1)	17:21	18:38 (1)
28	05:53	06:42	07:32	18:14 (1)	08:23	18:38 (1)
	21:35	20:36	19:24	18:51 (1)	17:19	18:38 (1)
29	05:54	06:43	07:34	18:15 (1)	08:25	18:38 (1)
	21:33	20:33	19:22	18:50 (1)	17:17	18:38 (1)
30	05:56	06:45	07:35	18:15 (1)	08:27	18:38 (1)
	21:32	20:31	19:20	18:47 (1)	17:15	18:38 (1)
31	05:57	06:47	07:37	18:16 (1)	08:29	18:38 (1)
	21:30	20:29	19:19	18:13 (1)	08:31	18:38 (1)
Potential sun hours	502	454	381	332	266	244
Total, worst case			1127	1714	1766	364
Sun reduction			0.35	0.31	0.21	0.17
Oper. time red.			0.95	0.95	0.95	0.95
Wind dir. red.			0.63	0.67	0.68	0.62
Total reduction			0.21	0.20	0.14	0.10
Total, real			237	341	239	36

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

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

19065LE slagschaduw nieuwbouwwijk

Licensed user:

Bosch & Van Rijn

Franz-Lisztplantsoen 220

NL-3533 JG Utrecht

+31 6 51 71 04 93

Schreurs / leon@boschenvanrijn.nl

Calculated:

19-Aug-21 10:59 AM/3.4.388

SHADOW - Calendar

Calculation: VKA bovengrens met kantoren 12RD 210819 **Shadow receptor:** AO - Shadow Receptor: 8.0 × 5.0 Azimuth: 0.0° Slope: 0.0° (10931)
Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) [DE BILT]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1.48 2.65 3.60 5.24 6.59 6.28 6.20 6.12 4.48 3.32 1.87 1.32

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 385 684 574 504 436 731 797 1,164 1,146 770 577 539 8,307

January		February		March		April		May		June	
1	08:45	13:34 (5)	08:18	07:25	17:01 (4)	07:15	17:01 (4)	06:10	17:15	05:25	
	16:37	44 14:18 (5)	17:24	18:16	31 17:32 (4)	20:10	17:32 (4)	21:01	20:10	21:46	
2	08:45	13:35 (5)	08:17	07:23	17:01 (4)	07:12	17:01 (4)	06:08	17:12	05:24	
	16:38	44 14:19 (5)	17:26	18:18	30 17:31 (4)	20:11	17:31 (4)	21:02	20:11	21:47	
3	08:45	13:36 (5)	08:15	07:21	17:02 (4)	07:10	17:02 (4)	06:06	17:10	05:23	
	16:39	43 14:19 (5)	17:28	18:19	28 17:30 (4)	20:13	17:30 (4)	21:04	20:13	21:48	
4	08:45	13:37 (5)	08:14	07:19	17:03 (4)	07:08	17:03 (4)	06:04	17:08	05:23	
	16:40	43 14:20 (5)	17:30	18:21	26 17:29 (4)	20:15	17:29 (4)	21:06	20:15	21:49	
5	08:44	13:38 (5)	08:12	07:16	17:05 (4)	07:06	17:05 (4)	06:03	17:06	05:22	
	16:41	41 14:19 (5)	17:32	18:23	22 17:27 (4)	20:17	17:27 (4)	21:07	20:17	21:50	
6	08:44	13:39 (5)	08:10	07:14	17:06 (4)	07:03	17:06 (4)	06:01	17:03	05:21	
	16:42	40 14:19 (5)	17:34	18:25	19 17:25 (4)	20:18	17:25 (4)	21:09	20:18	21:51	
7	08:44	13:39 (5)	08:09	07:12	17:09 (4)	07:01	17:09 (4)	05:59	17:01	05:21	
	16:44	40 14:19 (5)	17:36	18:27	13 17:22 (4)	20:20	17:22 (4)	21:10	20:20	21:52	
8	08:43	13:41 (5)	08:07	07:10		06:59		05:57		05:20	
	16:45	38 14:19 (5)	17:37	18:28		20:22		21:12		21:53	
9	08:43	13:42 (5)	08:05	07:08		06:57		05:55		05:20	
	16:46	37 14:19 (5)	17:39	18:30		20:23		21:14		21:54	
10	08:42	13:43 (5)	08:03	07:05		06:54		05:54		05:19	
	16:48	35 14:18 (5)	17:41	18:32		20:25		21:15		21:55	
11	08:42	13:44 (5)	08:02	07:03		06:52		05:52		05:19	
	16:49	33 14:17 (5)	17:43	18:34		20:27		21:17		21:56	
12	08:41	13:46 (5)	08:00	07:01		06:50		05:50		05:19	
	16:51	32 14:18 (5)	17:45	18:35		20:28		21:18		21:56	
13	08:40	13:48 (5)	07:58	06:58		06:48		05:49		05:18	
	16:52	29 14:17 (5)	17:47	18:37		20:30		21:20		21:57	
14	08:40	13:49 (5)	07:56	06:56		06:45		05:47		05:18	
	16:54	27 14:16 (5)	17:49	9 17:21 (4)	18:39	2 18:13 (3)	20:32	21:22	18:13 (3)	21:58	
15	08:39	13:52 (5)	07:54	17:09 (4)	06:54		06:43	05:46	18:09 (3)	05:18	
	16:55	23 14:15 (5)	17:50	14 17:23 (4)	18:41	7 18:16 (3)	20:34	21:23	18:16 (3)	21:58	
16	08:38	13:54 (5)	07:52	17:06 (4)	06:52		06:41	05:44	18:07 (3)	05:18	
	16:57	19 14:13 (5)	17:52	18 17:24 (4)	18:42	10 18:17 (3)	20:35	21:25	18:17 (3)	21:59	
17	08:37	13:59 (5)	07:50	17:05 (4)	06:49		06:39	05:43	18:06 (3)	05:18	
	16:58	12 14:11 (5)	17:54	21 17:26 (4)	18:44	13 18:19 (3)	20:37	21:26	18:19 (3)	21:59	
18	08:36		07:48	17:04 (4)	06:47		06:37	05:41	18:06 (3)	05:18	
	17:00		17:56	24 17:28 (4)	18:46	15 18:21 (3)	20:39	21:28	18:21 (3)	21:59	
19	08:35		07:46	17:03 (4)	06:45		06:35	05:40	18:05 (3)	05:18	
	17:02		17:58	27 17:30 (4)	18:48	17 18:22 (3)	20:40	21:29	18:22 (3)	22:00	
20	08:34		07:44	17:02 (4)	06:42		06:32	05:38	18:05 (3)	05:18	
	17:03		18:00	30 17:32 (4)	18:49	19 18:24 (3)	20:42	21:31	18:24 (3)	22:00	
21	08:33		07:42	17:01 (4)	06:40		06:30	05:37	18:05 (3)	05:18	
	17:05		18:01	32 17:33 (4)	18:51	20 18:25 (3)	20:44	21:32	18:25 (3)	22:00	
22	08:32		07:40	17:01 (4)	06:38		06:28	05:36	18:05 (3)	05:18	
	17:07		18:03	32 17:33 (4)	18:53	19 18:24 (3)	20:45	21:33	18:24 (3)	22:01	
23	08:31		07:38	17:00 (4)	06:35		06:26	05:34	18:06 (3)	05:18	
	17:08		18:05	34 17:34 (4)	18:54	17 18:23 (3)	20:47	21:35	18:23 (3)	22:01	
24	08:30		07:36	17:00 (4)	06:33		06:24	05:33	18:07 (3)	05:19	
	17:10		18:07	34 17:34 (4)	18:56	15 18:22 (3)	20:49	21:36	18:22 (3)	22:01	
25	08:28		07:34	16:59 (4)	06:31		06:22	05:32	18:09 (3)	05:19	
	17:12		18:09	34 17:33 (4)	18:58	10 18:19 (3)	20:50	21:38	18:19 (3)	22:01	
26	08:27		07:32	16:59 (4)	06:29		06:20	05:31		05:19	
	17:14		18:11	34 17:33 (4)	19:00		20:52	21:39		22:01	
27	08:26		07:30	17:00 (4)	06:26		06:18	05:30		05:20	
	17:15		18:12	33 17:33 (4)	19:01		20:54	21:40		22:01	
28	08:24		07:27	17:00 (4)	06:24		06:16	05:29		05:20	
	17:17		18:14	33 17:33 (4)	19:03		20:55	21:41		22:01	
29	08:23				07:22		06:14	05:28		05:21	
	17:19				20:05		20:57	21:43		22:01	
30	08:21				07:19		06:12	05:27		05:21	
	17:21				20:06		20:59	21:44		22:00	
31	08:20				07:17			05:26			
	17:23				20:08			21:45			
Potential sun hours	259		278		367		416	485		498	
Total, worst case	580		409		333						
Sun reduction	0.18		0.27		0.30						
Oper. time red.	0.95		0.95		0.95						
Wind dir. red.	0.68		0.66		0.64						
Total reduction	0.11		0.17		0.19						
Total, real	66		69		62						

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

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

Project:

19065LE slagschaduw nieuwbouwwijk

Licensed user:

Bosch & Van Rijn

Franz-Lisztplantsoen 220

NL-3533 JG Utrecht

+31 6 51 71 04 93

Schreurs / leon@boschenvanrijn.nl

Calculated:

19-Aug-21 10:59 AM/3.4.388

SHADOW - Calendar

Calculation: VKA bovengrens met kantoren 12RD 210819Shadow receptor: AO - Shadow Receptor: 8.0 × 5.0 Azimuth: 0.0° Slope: 0.0° (10931)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [DE BILT]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.48	2.65	3.60	5.24	6.59	6.28	6.20	6.12	4.48	3.32	1.87	1.32

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
385	684	574	504	436	731	797	1,164	1,146	770	577	539	8,307

	July	August	September	October	November	December
1	05:22	05:58	06:48	07:37	07:30	08:21
	22:00	21:28	20:27	19:17	17:11	16:31
2	05:23	06:00	06:50	07:38	07:32	08:23
	22:00	21:27	20:24	19:15	17:09	16:30
3	05:23	06:01	06:51	07:40	07:34	08:24
	21:59	21:25	20:22	19:13	17:08	16:30
4	05:24	06:03	06:53	07:42	07:36	08:25
	21:59	21:23	20:20	19:10	17:06	16:29
5	05:25	06:05	06:54	07:43	07:38	08:27
	21:59	21:22	20:17	19:08	17:04	16:29
6	05:26	06:06	06:56	07:45	17:47 (4)	07:39
	21:58	21:20	20:15	19:06	17:56 (4)	17:02
7	05:27	06:08	06:58	07:47	17:43 (4)	07:41
	21:57	21:18	20:13	19:04	17:59 (4)	17:01
8	05:28	06:09	06:59	07:49	17:41 (4)	07:43
	21:57	21:16	20:11	19:01	18:02 (4)	16:59
9	05:29	06:11	07:01	07:50	17:39 (4)	07:45
	21:56	21:14	20:08	18:59	18:03 (4)	16:57
10	05:30	06:12	07:03	07:52	17:37 (4)	07:47
	21:55	21:13	20:06	18:57	18:03 (4)	16:56
11	05:31	06:14	07:04	07:54	17:35 (4)	07:48
	21:55	21:11	20:04	18:55	18:04 (4)	16:54
12	05:32	06:16	07:06	07:55	17:34 (4)	07:50
	21:54	21:09	20:01	18:52	18:05 (4)	16:53
13	05:33	06:17	07:07	07:57	17:34 (4)	07:52
	21:53	21:07	19:59	18:50	18:06 (4)	16:51
14	05:34	06:19	07:09	07:59	17:32 (4)	07:54
	21:52	21:05	19:57	18:48	18:05 (4)	16:50
15	05:35	06:20	07:11	08:00	17:32 (4)	07:55
	21:51	21:03	19:54	18:46	18:05 (4)	16:48
16	05:36	06:22	07:12	08:02	17:32 (4)	07:57
	21:50	21:01	19:52	18:44	18:05 (4)	16:47
17	05:37	06:24	07:14	08:04	17:32 (4)	07:59
	21:49	20:59	19:50	18:41	18:05 (4)	16:45
18	05:39	06:25	07:16	18:58 (3)	08:06	17:32 (4)
	21:48	20:57	19:47	18:06 (3)	18:39	18:05 (4)
19	05:40	06:27	07:17	18:54 (3)	08:07	17:32 (4)
	21:47	20:55	19:45	18:08 (3)	18:37	18:05 (4)
20	05:41	06:29	07:19	18:53 (3)	08:09	17:31 (4)
	21:46	20:53	19:43	18:09 (3)	18:35	18:04 (4)
21	05:43	06:30	07:20	18:51 (3)	08:11	17:32 (4)
	21:44	20:50	19:40	18:09 (3)	18:33	18:03 (4)
22	05:44	06:32	07:22	18:50 (3)	08:13	17:32 (4)
	21:43	20:48	19:38	18:10 (3)	18:31	18:02 (4)
23	05:45	06:33	07:24	18:50 (3)	08:14	17:33 (4)
	21:42	20:46	19:36	18:09 (3)	18:29	18:00 (4)
24	05:47	06:35	07:25	18:49 (3)	08:16	17:34 (4)
	21:40	20:44	19:33	18:06 (3)	18:27	17:58 (4)
25	05:48	06:37	07:27	18:49 (3)	07:18	16:36 (4)
	21:39	20:42	19:31	18:04 (3)	17:25	16:56 (4)
26	05:50	06:38	07:29	18:49 (3)	07:20	16:37 (4)
	21:38	20:40	19:29	18:02 (3)	17:23	16:54 (4)
27	05:51	06:40	07:30	18:49 (3)	07:21	16:39 (4)
	21:36	20:38	19:26	18:59 (3)	17:21	16:52 (4)
28	05:52	06:41	07:32	18:50 (3)	07:23	16:42 (4)
	21:35	20:35	19:24	18:57 (3)	17:19	16:49 (4)
29	05:54	06:43	07:33	18:51 (3)	07:25	16:42 (4)
	21:33	20:33	19:22	18:55 (3)	17:17	16:32 (4)
30	05:55	06:45	07:35	18:52 (3)	07:27	16:32 (4)
	21:32	20:31	19:20	18:56 (3)	17:15	16:32 (4)
31	05:57	06:46	07:37	18:57 (3)	07:29	16:32 (4)
	21:30	20:29	19:18	18:58 (3)	17:13	16:35 (4)
Potential sun hours	502	454	381	332	267	244
Total, worst case			161	588	139	1362
Sun reduction			0.35	0.31	0.21	0.17
Oper. time red.			0.95	0.95	0.95	0.95
Wind dir. red.			0.63	0.66	0.68	0.68
Total reduction			0.21	0.20	0.14	0.11
Total, real			34	115	19	148

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

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

19065LE slagschaduw nieuwbouwwijk

Licensed user:

Bosch & Van Rijn

Franz-Lisztplantsoen 220

NL-3533 JG Utrecht

+31 6 51 71 04 93

Schreurs / leon@boschenvanrijn.nl

Calculated:

19-Aug-21 10:59 AM/3.4.388

SHADOW - Calendar

Calculation: VKA bovengrens met kantoren 12RD 210819Shadow receptor: AP - Shadow Receptor: 8.0 × 5.0 Azimuth: 0.0° Slope: 0.0° (10932)
Sunshine probability S (Average daily sunshine hours) [DE BILT]

Assumptions for shadow calculations

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1.48 2.65 3.60 5.24 6.59 6.28 6.20 6.12 4.48 3.32 1.87 1.32

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
385 684 574 504 436 731 797 1,164 1,146 770 577 539 8,307

	[January	[February	[March	[April	[May	[June	[July	[August	[September	[October	[November	[December
1	08:45 16:37 15:05 (5) 17:24 15:53 (5) 08:17 15:24 (5) 07:23 17:29 (4) 20:11 21:02 21:47 22:00 21:27 20:24 19:15 18:27 (4) 17:09 18:08 (4) 07:34 18:28 (4) 17:08 18:07 (4) 07:36 18:29 (4) 17:06 18:06 (4) 07:38 18:30 (4) 17:04 18:04 (4) 07:39 18:29 (4) 17:02 18:04 (4) 07:41 18:30 (4) 17:01 19:01 18:30 (4) 16:59 23 15:20 (5) 16:27 43 15:37 (5) 14:53 (5) 08:29 14:53 (5) 16:28 44 15:36 (5) 14:52 (5) 16:29 44 15:36 (5) 14:52 (5) 16:30 44 15:35 (5) 14:51 (5) 16:31 45 15:35 (5) 14:51 (5) 16:32 45 15:34 (5) 14:51 (5) 16:33 45 15:33 (5) 14:51 (5) 16:34 45 15:32 (5) 14:51 (5) 16:35 45 15:31 (5) 14:51 (5) 16:36 45 15:30 (5) 14:51 (5) 16:37 45 15:29 (5) 14:51 (5) 16:38 45 15:28 (5) 14:51 (5) 16:39 45 15:27 (5) 14:51 (5) 16:40 45 15:26 (5) 14:51 (5) 16:41 45 15:25 (5) 14:51 (5) 16:42 45 15:24 (5) 14:51 (5) 16:43 45 15:23 (5) 14:51 (5) 16:44 45 15:22 (5) 14:51 (5) 16:45 45 15:21 (5) 14:51 (5) 16:46 45 15:20 (5) 14:51 (5) 16:47 45 15:19 (5) 14:51 (5) 16:48 45 15:18 (5) 14:51 (5) 16:49 45 15:17 (5) 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Project:

19065LE slagschaduw nieuwbouwwijk

Licensed user:

Bosch & Van Rijn

Franz-Lisztplantsoen 220

NL-3533 JG Utrecht

+31 6 51 71 04 93

Schreurs / leon@boschenvanrijn.nl

Calculated:

19-Aug-21 10:59 AM/3.4.388

SHADOW - Calendar

Calculation: VKA bovengrens met kantoren 12RD 210819 **Shadow receptor:** AQ - Shadow Receptor: 8.0 × 5.0 Azimuth: 0.0° Slope: 0.0° (10933)
Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) [DE BILT]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1.48 2.65 3.60 5.24 6.59 6.28 6.20 6.12 4.48 3.32 1.87 1.32

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 385 684 574 504 436 731 797 1,164 1,146 770 577 539 8,307

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18	08:36	07:48	17:06 (5)	06:47	06:37	05:41	05:18	05:39	06:25	07:15	08:00	08:40
	17:00	17:56	17:28 (5)	18:46	20:39	21:28	21:59	21:48	20:57	19:47	17:44 (5)	16:44
19	08:35	07:46	17:06 (5)	06:45	06:34	05:40	05:18	05:40	06:27	07:17	17:53 (5)	16:44
	17:01	17:58	17:28 (5)	18:47	20:40	21:29	22:00	21:47	20:55	19:45	17:41 (5)	16:44
20	08:34	07:44	17:07 (5)	06:42	06:32	05:38	05:18	05:41	06:28	07:19	17:55 (5)	16:43
	17:03	17:59	17:27 (5)	18:49	20:42	21:30	22:00	21:45	20:53	19:43	17:39 (5)	16:43
21	08:33	07:42	17:08 (5)	06:40	06:30	05:37	05:18	05:43	06:30	07:20	17:56 (5)	16:41
	17:05	18:01	17:26 (5)	18:51	20:44	21:32	22:00	21:44	20:50	19:40	17:38 (5)	16:40
22	08:32	07:40	17:09 (5)	06:38	06:28	05:36	05:18	05:44	06:32	07:22	17:57 (5)	16:40
	17:07	18:03	17:25 (5)	18:53	20:45	21:33	22:01	21:43	20:48	19:38	17:37 (5)	16:39
23	08:31	07:38	17:11 (5)	06:35	06:26	05:34	05:18	05:45	06:33	07:24	17:58 (5)	16:39
	17:08	18:05	17:24 (5)	18:54	20:47	21:35	22:01	21:42	20:46	19:36	17:37 (5)	16:38
24	08:29	07:36	17:14 (5)	06:33	06:24	05:33	05:19	05:47	06:35	07:25	17:58 (5)	16:38
	17:10	18:07	17:21 (5)	18:56	20:49	21:36	22:01	21:40	20:44	19:33	17:36 (5)	16:37
25	08:28	07:34		06:31	06:22	05:32	05:19	05:48	06:37	07:27	17:58 (5)	16:37
	17:12	18:09		18:58	20:50	21:37	22:01	21:39	20:42	19:31	17:35 (5)	16:36
26	08:27	07:32		06:28	06:20	05:31	05:19	05:49	06:38	07:28	16:36 (5)	16:36
	17:14	18:10		18:59	20:52	21:39	22:01	21:38	20:40	19:29	16:36 (5)	16:35
27	08:26	07:29		06:26	06:18	05:30	05:20	05:51	06:40	07:30	16:36 (5)	16:35
	17:15	18:12		19:01	20:54	21:40	22:01	21:36	20:38	19:26	16:36 (5)	16:34
28	08:24	07:27		06:24	06:16	05:29	05:20	05:52	06:41	07:32	16:36 (5)	16:34
	17:17	18:14		19:03	20:55	21:41	22:01	21:35	20:35	19:24	16:36 (5)	16:33
29	08:23			07:22	06:14	05:28	05:21	05:54	06:43	07:33	16:37 (5)	16:33
	17:19			20:05	20:57	21:43	22:01	21:33	20:33	19:22	16:37 (5)	16:32
30	08:21			07:19	06:12	05:27	05:21	05:55	06:45	07:35	16:38 (5)	16:32
	17:21			20:06	20:59	21:44	22:00	21:32	20:31	19:19	16:45 (5)	16:32
31	08:20			07:17		05:26		05:57	06:46		16:39 (5)	16:32
	17:23			20:08		21:45		21:30	20:29		16:43 (5)	16:31
Potential sun hours	259	278	367	416	485	498	502	454	381	332	267	244
Total, worst case		210								210		
Sun reduction		0.27								0.31		
Oper. time red.		0.95								0.95		
Wind dir. red.		0.66								0.66		
Total reduction		0.17								0.20		
Total, real		35								41		

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

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

Project:

19065LE slagschaduw nieuwbouwwijk

Licensed user:

Bosch & Van Rijn

Franz-Lisztplantsoen 220

NL-3533 JG Utrecht

+31 6 51 71 04 93

Schreurs / leon@boschenvanrijn.nl

Calculated:

19-Aug-21 10:59 AM/3.4.388

SHADOW - Calendar

Calculation: VKA bovengrens met kantoren 12RD 210819 **Shadow receptor:** AR - Shadow Receptor: 8.0 × 5.0 Azimuth: 0.0° Slope: 0.0° (10934)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [DE BILT]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec

1.48 2.65 3.60 5.24 6.59 6.28 6.20 6.12 4.48 3.32 1.87 1.32

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
385 684 574 504 436 731 797 1,164 1,146 770 577 539 8,307

	January	February	March	April	May	June
1	08:45	08:18	15:42 (5)	07:25	07:15	05:25
	16:37	17:24	16:30 (5)	18:16	20:10	21:46
2	08:45	08:17	15:42 (5)	07:23	07:12	05:24
	16:38	17:26	16:30 (5)	18:18	20:11	21:47
3	08:45	08:15	15:42 (5)	07:21	07:10	05:23
	16:39	17:28	16:30 (5)	18:19	20:13	21:48
4	08:45	08:14	15:42 (5)	07:19	07:08	05:23
	16:40	17:30	16:30 (5)	18:21	20:15	21:49
5	08:44	08:12	15:43 (5)	07:16	17:56 (4)	05:22
	16:41	17:32	16:31 (5)	18:23	20:17	21:50
6	08:44	08:10	15:43 (5)	07:14	17:52 (4)	05:21
	16:42	17:34	16:30 (5)	18:25	20:18	21:51
7	08:44	15:54 (5)	15:44 (5)	07:12	17:50 (4)	05:21
	16:44	16:01 (5)	17:35	18:27	20:20	21:52
8	08:43	15:52 (5)	15:44 (5)	07:10	17:48 (4)	05:20
	16:45	16:04 (5)	17:37	18:28	20:22	21:53
9	08:43	15:51 (5)	15:45 (5)	07:08	17:46 (4)	05:20
	16:46	16:07 (5)	17:39	18:30	20:23	21:54
10	08:42	15:49 (5)	15:45 (5)	07:05	17:46 (4)	05:19
	16:48	16:08 (5)	17:41	18:32	20:25	21:55
11	08:42	15:48 (5)	15:46 (5)	07:03	17:45 (4)	05:19
	16:49	16:10 (5)	17:43	18:34	20:27	21:56
12	08:41	15:48 (5)	15:47 (5)	07:01	17:45 (4)	05:19
	16:51	16:12 (5)	17:45	18:35	20:28	21:56
13	08:40	15:47 (5)	15:48 (5)	06:58	17:44 (4)	05:18
	16:52	16:14 (5)	17:47	18:37	20:30	21:57
14	08:40	15:47 (5)	15:50 (5)	06:56	17:44 (4)	05:18
	16:54	16:15 (5)	17:48	18:39	20:32	21:57
15	08:39	15:46 (5)	15:51 (5)	06:54	17:44 (4)	05:18
	16:55	16:17 (5)	17:50	18:41	20:34	21:58
16	08:38	15:45 (5)	15:53 (5)	06:52	17:44 (4)	05:18
	16:57	16:18 (5)	17:52	18:42	20:35	21:59
17	08:37	15:45 (5)	15:55 (5)	06:49	17:44 (4)	05:18
	16:58	16:19 (5)	17:54	18:44	20:37	21:59
18	08:36	15:45 (5)	15:58 (5)	06:47	17:46 (4)	05:18
	17:00	16:21 (5)	17:56	18:46	20:39	21:59
19	08:35	15:44 (5)	16:02 (5)	06:45	17:46 (4)	05:18
	17:02	16:21 (5)	17:58	18:48	20:40	22:00
20	08:34	15:43 (5)	16:04	06:42	17:48 (4)	05:18
	17:03	16:22 (5)	18:00	18:49	20:42	22:00
21	08:33	15:43 (5)	16:04	06:40	17:51 (4)	05:18
	17:05	16:23 (5)	18:01	18:51	20:44	22:00
22	08:32	15:43 (5)	16:03	06:38	18:00 (4)	05:18
	17:07	16:25 (5)	18:03	18:53	20:45	22:01
23	08:31	15:42 (5)	16:03	06:35	20:46	05:18
	17:08	16:25 (5)	18:05	18:54	20:47	22:01
24	08:30	15:43 (5)	16:03	06:33	20:49	05:19
	17:10	16:26 (5)	18:07	18:56	21:36	22:01
25	08:28	15:42 (5)	16:01	06:31	20:50	05:19
	17:12	16:26 (5)	18:09	18:58	21:38	22:01
26	08:27	15:42 (5)	16:02	06:29	20:50	05:19
	17:14	16:27 (5)	18:10	19:00	21:39	22:01
27	08:26	15:42 (5)	16:02	06:26	20:52	05:20
	17:15	16:28 (5)	18:12	19:01	21:40	22:01
28	08:24	15:42 (5)	16:04	06:24	20:54	05:20
	17:17	16:28 (5)	18:14	19:03	21:41	22:01
29	08:23	15:41 (5)	16:05	06:22	20:55	05:21
	17:19	16:29 (5)	18:15	19:05	21:43	22:01
30	08:21	15:42 (5)	16:06	06:20	20:57	05:21
	17:21	16:30 (5)	18:16	19:07	21:44	22:00
31	08:20	15:42 (5)	16:07	06:18	20:59	05:26
	17:23	16:30 (5)	18:17	19:08	21:45	22:00
Potential sun hours	259	278	367	416	485	498
Total, worst case	858	741	312			
Sun reduction	0.18	0.27	0.30			
Oper. time red.	0.95	0.95	0.95			
Wind dir. red.	0.66	0.66	0.63			
Total reduction	0.11	0.17	0.18			
Total, real	96	125	57			

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

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

Project:

19065LE slagschaduw nieuwbouwwijk

Licensed user:

Bosch & Van Rijn

Franz-Lisztplantsoen 220

NL-3533 JG Utrecht

+31 6 51 71 04 93

Schreurs / leon@boschenvanrijn.nl

Calculated:

19-Aug-21 10:59 AM/3.4.388

SHADOW - Calendar

Calculation: VKA bovengrens met kantoren 12RD 210819 **Shadow receptor:** AR - Shadow Receptor: 8.0 × 5.0 Azimuth: 0.0° Slope: 0.0° (10934)
Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) [DE BILT]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1.48 2.65 3.60 5.24 6.59 6.28 6.20 6.12 4.48 3.32 1.87 1.32

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 385 684 574 504 436 731 797 1,164 1,146 770 577 539 8,307

	July	August	September	October	November	December
1	05:22	05:58	06:48	07:37	18:24 (4)	07:30
	22:00	21:28	20:27	19:17	18:50 (4)	17:11
2	05:23	06:00	06:50	07:38	18:24 (4)	07:32
	22:00	21:27	20:24	19:15	18:48 (4)	17:09
3	05:23	06:01	06:51	07:40	18:23 (4)	07:34
	21:59	21:25	20:22	19:13	18:45 (4)	17:08
4	05:24	06:03	06:53	07:42	18:24 (4)	07:36
	21:59	21:23	20:20	19:10	18:43 (4)	17:06
5	05:25	06:05	06:54	07:43	18:25 (4)	07:38
	21:59	21:22	20:17	19:08	18:41 (4)	17:04
6	05:26	06:06	06:56	07:45	18:25 (4)	07:39
	21:58	21:20	20:15	19:06	18:38 (4)	17:02
7	05:27	06:08	06:58	07:47	18:27 (4)	07:41
	21:57	21:18	20:13	19:03	18:36 (4)	17:01
8	05:28	06:09	06:59	07:49	18:29 (4)	07:43
	21:57	21:16	20:11	19:01	18:34 (4)	16:59
9	05:29	06:11	07:01	07:50		07:45
	21:56	21:14	20:08	18:59		16:57
10	05:30	06:12	07:03	07:52		07:47
	21:55	21:12	20:06	18:57		16:56
11	05:31	06:14	07:04	07:54		07:48
	21:55	21:11	20:04	18:55		16:54
12	05:32	06:16	07:06	07:55		07:50
	21:54	21:09	20:01	18:52		16:53
13	05:33	06:17	07:07	07:57		07:52
	21:53	21:07	19:59	18:50		16:51
14	05:34	06:19	07:09	07:59		07:54
	21:52	21:05	19:57	18:48		16:50
15	05:35	06:20	07:11	08:00		07:55
	21:51	21:03	19:54	18:46		16:48
16	05:36	06:22	07:12	08:02		07:57
	21:50	21:01	19:52	18:44		16:47
17	05:37	06:24	07:14	08:04		07:59
	21:49	20:59	19:50	18:41		16:45
18	05:39	06:25	07:15	08:06		08:01
	21:48	20:57	19:47	18:39		16:44
19	05:40	06:27	07:17	08:07		08:02
	21:47	20:55	19:45	18:37		16:43
20	05:41	06:28	07:19	08:09		08:04
	21:46	20:53	19:43	18:35		16:42
21	05:43	06:30	07:20	08:11		08:06
	21:44	20:50	19:40	18:33		16:40
22	05:44	06:32	07:22	18:37 (4)		08:07
	21:43	20:48	19:38	18:31		16:39
23	05:45	06:33	07:24	18:33 (4)		08:09
	21:42	20:46	19:36	18:29	15	16:46 (5)
24	05:47	06:35	07:25	18:30 (4)		16:28 (5)
	21:40	20:44	19:33	18:27	21	16:49 (5)
25	05:48	06:37	07:27	18:29 (4)		15:25 (5)
	21:39	20:42	19:31	18:24 (4)	26	15:51 (5)
26	05:50	06:38	07:29	18:27 (4)		15:23 (5)
	21:38	20:40	19:29	18:20 (4)	30	15:53 (5)
27	05:51	06:40	07:30	18:26 (4)		15:21 (5)
	21:36	20:38	19:26	18:20 (4)	33	15:54 (5)
28	05:52	06:41	07:32	18:25 (4)		15:19 (5)
	21:35	20:35	19:24	18:15 (4)	36	15:55 (5)
29	05:54	06:43	07:33	18:25 (4)		15:17 (5)
	21:33	20:33	19:22	18:11 (4)	39	15:56 (5)
30	05:55	06:45	07:35	18:24 (4)		15:16 (5)
	21:32	20:31	19:19	18:10 (4)	41	15:57 (5)
31	05:57	06:46		07:29		15:15 (5)
	21:30	20:29		17:13	42	15:57 (5)
Potential sun hours	502	454	381	332	267	244
Total, worst case			184	417	1245	76
Sun reduction			0.35	0.31	0.21	0.17
Oper. time red.			0.95	0.95	0.95	0.95
Wind dir. red.			0.63	0.65	0.66	0.66
Total reduction			0.21	0.19	0.13	0.11
Total, real			39	80	166	8

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

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

Project:

19065LE slagschaduw nieuwbouwwijk

Licensed user:

Bosch & Van Rijn

Franz-Lisztplantsoen 220

NL-3533 JG Utrecht

+31 6 51 71 04 93

Schreurs / leon@boschenvanrijn.nl

Calculated:

19-Aug-21 10:59 AM/3.4.388

SHADOW - Calendar

Calculation: VKA bovengrens met kantoren 12RD 210819 **Shadow receptor:** AS - Shadow Receptor: 8.0×5.0 Azimuth: 0.0° Slope: 0.0° (10935)
Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) [DE BILT]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1.48 2.65 3.60 5.24 6.59 6.28 6.20 6.12 4.48 3.32 1.87 1.32

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 385 684 574 504 436 731 797 1,164 1,146 770 577 539 8,307

	January	February	March	April	May	June	July	August	September	October	November	December		
1	08:45 16:37	08:18 17:24	07:25 18:16	07:15 20:10	06:10 21:00	20:21 (4) 20:32 (4)	05:25 21:46	20:09 (5) 20:53 (5)	05:22 22:00	20:16 (5) 20:58 (5)	20:22 (5) 21:28	06:48 19:17	07:30 17:11	08:21 16:31
2	08:45 16:38	08:17 17:26	07:23 18:18	07:12 20:11	06:08 21:02	20:21 (4) 20:34 (4)	05:24 21:47	20:09 (5) 20:53 (5)	05:23 22:00	20:16 (5) 20:57 (5)	20:24 (5) 21:27	06:50 19:15	07:38 17:09	08:23 16:30
3	08:45 16:39	08:15 17:28	07:21 18:19	07:10 20:13	06:06 21:04	20:20 (4) 20:35 (4)	05:23 21:48	20:09 (5) 20:52 (5)	05:23 21:59	20:16 (5) 20:58 (5)	20:24 (5) 21:25	06:51 19:13	07:40 17:08	08:24 16:30
4	08:45 16:40	08:14 17:30	07:19 18:21	07:08 20:15	06:04 21:05	20:20 (4) 20:37 (4)	05:23 21:49	20:10 (5) 20:53 (5)	05:24 21:59	20:16 (5) 20:58 (5)	20:25 (5) 21:23	06:53 19:10	07:42 17:06	08:25 16:29
5	08:44 16:41	08:12 17:32	07:16 18:23	07:06 20:16	06:03 21:07	20:19 (4) 20:38 (4)	05:22 21:50	20:10 (5) 20:53 (5)	05:25 21:58	20:16 (5) 20:59 (5)	20:27 (5) 21:22	06:54 19:08	07:43 17:04	08:27 16:29
6	08:44 16:42	08:10 17:34	07:14 18:25	07:03 20:18	06:01 21:09	20:20 (4) 20:40 (4)	05:21 21:51	20:09 (5) 20:52 (5)	05:26 21:58	20:16 (5) 20:58 (5)	20:28 (5) 21:20	06:56 19:06	07:45 17:02	08:28 16:28
7	08:44 16:44	08:09 17:36	07:12 18:27	07:01 20:20	05:59 21:10	20:18 (5) 20:41 (4)	05:21 21:52	20:10 (5) 20:53 (5)	05:27 21:57	20:16 (5) 20:59 (5)	20:29 (4) 21:18	06:58 19:03	07:47 17:01	08:29 16:28
8	08:43 16:45	08:07 17:37	07:10 18:28	06:59 20:22	05:57 21:12	20:16 (5) 20:41 (5)	05:20 21:53	20:11 (5) 20:53 (5)	05:28 21:57	20:16 (5) 20:59 (5)	20:29 (4) 21:16	06:59 19:01	07:48 16:59	08:30 16:28
9	08:43 16:46	08:05 17:39	07:07 18:30	06:57 20:23	05:55 21:14	20:15 (5) 20:43 (5)	05:20 21:54	20:11 (5) 20:53 (5)	05:29 21:56	20:16 (5) 21:00 (5)	20:29 (4) 21:14	07:01 18:59	07:50 16:57	08:32 16:27
10	08:42 16:48	08:03 17:41	07:05 18:32	06:54 20:25	05:54 21:15	20:13 (5) 20:44 (5)	05:19 21:55	20:11 (5) 20:53 (5)	05:30 21:55	20:16 (5) 21:00 (5)	20:29 (4) 21:12	07:03 18:57	07:52 16:56	08:33 16:27
11	08:42 16:49	08:01 17:43	07:03 18:34	06:52 20:27	05:52 21:17	20:13 (5) 20:45 (5)	05:19 21:55	20:12 (5) 20:53 (5)	05:31 21:55	20:16 (5) 21:00 (5)	20:30 (4) 21:11	07:04 18:54	07:54 16:48	08:34 16:27
12	08:41 16:51	08:00 17:45	07:01 18:35	06:50 20:28	05:50 21:18	20:12 (5) 20:46 (5)	05:19 21:56	20:11 (5) 20:53 (5)	05:32 21:54	20:16 (5) 21:00 (5)	20:30 (4) 21:09	07:06 18:52	07:55 16:53	08:35 16:27
13	08:40 16:52	07:58 17:47	06:58 18:37	06:48 20:30	05:49 21:20	20:11 (5) 20:47 (5)	05:18 21:57	20:12 (5) 20:53 (5)	05:33 21:54	20:16 (5) 21:01 (5)	20:31 (4) 21:07	07:07 18:50	07:57 16:51	08:36 16:27
14	08:40 16:54	07:56 17:48	06:56 18:39	06:45 20:32	05:47 21:21	20:10 (5) 20:47 (5)	05:18 21:57	20:12 (5) 20:53 (5)	05:34 21:52	20:16 (5) 21:01 (5)	20:32 (4) 21:05	07:09 18:48	07:59 16:50	08:37 16:27
15	08:39 16:55	07:54 17:50	06:54 18:41	06:43 20:33	05:46 21:23	20:10 (5) 20:48 (5)	05:18 21:58	20:13 (5) 20:54 (5)	05:35 21:51	20:16 (5) 21:01 (5)	20:33 (4) 21:03	07:11 18:46	08:00 16:48	08:38 16:27
16	08:38 16:57	07:52 17:52	06:52 18:42	06:41 20:35	05:44 21:25	20:09 (5) 20:48 (5)	05:18 21:58	20:13 (5) 20:54 (5)	05:36 21:50	20:16 (5) 21:01 (5)	20:34 (4) 21:01	07:12 18:44	08:02 16:47	08:39 16:27
17	08:37 16:58	07:50 17:54	06:49 18:44	06:39 20:37	05:43 21:26	20:08 (5) 20:49 (5)	05:18 21:59	20:13 (5) 20:54 (5)	05:37 21:49	20:16 (5) 21:01 (5)	20:35 (4) 20:59	07:14 18:41	08:04 16:45	08:39 16:27
18	08:36 17:00	07:48 17:56	06:47 18:46	06:37 20:39	05:41 21:28	20:08 (5) 20:50 (5)	05:18 21:59	20:14 (5) 20:54 (5)	05:39 21:48	20:17 (5) 21:02 (5)	20:36 (4) 20:57	07:15 18:39	08:06 16:44	08:40 16:27
19	08:35 17:02	07:46 17:58	06:45 18:47	06:35 20:40	05:40 21:29	20:07 (5) 20:50 (5)	05:18 22:00	20:14 (5) 20:54 (5)	05:40 21:47	20:17 (5) 21:01 (5)	20:37 (4) 20:55	07:17 18:37	08:07 16:43	08:41 16:28
20	08:34 17:03	07:44 18:00	06:42 18:49	06:32 20:42	05:38 21:30	20:07 (5) 20:50 (5)	05:18 22:00	20:14 (5) 20:54 (5)	05:41 21:45	20:17 (5) 21:01 (5)	20:38 (4) 20:53	07:19 18:35	08:09 16:42	08:42 16:28
21	08:33 17:05	07:42 18:01	06:40 18:51	06:30 20:44	05:37 21:32	20:07 (5) 20:51 (5)	05:18 22:00	20:14 (5) 20:54 (5)	05:43 21:44	20:17 (5) 21:01 (5)	20:39 (4) 20:50	07:20 18:33	08:11 16:40	08:43 16:28
22	08:32 17:07	07:40 18:03	06:38 18:53	06:28 20:45	05:36 21:33	20:07 (5) 20:51 (5)	05:18 22:00	20:15 (5) 20:55 (5)	05:44 21:43	20:18 (5) 21:01 (5)	20:40 (4) 20:48	07:22 18:31	08:13 16:39	08:44 16:29
23	08:31 17:08	07:38 18:05	06:35 18:54	06:26 20:47	05:35 21:35	20:08 (5) 20:51 (5)	05:18 22:01	20:15 (5) 20:55 (5)	05:45 21:42	20:18 (5) 21:01 (5)	20:41 (4) 20:46	07:24 18:29	08:14 16:38	08:45 16:29
24	08:29 17:10	07:36 18:07	06:33 18:56	06:24 20:49	05:33 21:36	20:08 (5) 20:52 (5)	05:19 22:01	20:15 (5) 20:55 (5)	05:47 21:40	20:18 (5) 21:01 (5)	20:42 (4) 20:44	07:25 18:27	08:16 16:37	08:46 16:30
25	08:28 17:12	07:34 18:09	06:31 18:58	06:22 20:50	05:32 21:37	20:08 (5) 20:52 (5)	05:19 22:01	20:16 (5) 20:56 (5)	05:48 21:39	20:18 (5) 21:00 (5)	20:43 (4) 20:42	07:27 18:25	08:18 16:36	08:47 16:31
26	08:27 17:14	07:32 18:10	06:29 18:59	06:20 20:52	05:31 21:39	20:08 (5) 20:52 (5)	05:19 22:01	20:15 (5) 20:56 (5)	05:50 21:38	20:19 (5) 21:00 (5)	20:44 (4) 20:40	07:29 18:23	08:20 16:35	08:48 16:31
27	08:26 17:15	07:29 18:12	06:26 19:01	06:18 20:54	05:30 21:40	20:08 (5) 20:52 (5)	05:20 22:01	20:15 (5) 20:56 (5)	05:51 21:36	20:19 (5) 20:59 (5)	20:45 (4) 20:38	07:30 18:26	08:21 16:34	08:49 16:32
28	08:24 17:17	07:27 18:14	06:24 19:03	06:16 20:55	05:29 21:41	20:08 (5) 20:52 (5)	05:20 22:01	20:16 (5) 20:56 (5)	05:52 21:35	20:19 (5) 20:59 (5)	20:46 (4) 20:35	07:32 18:24	08:22 16:33	08:50 16:33
29	08:23 17:19	07:22 19:05	06:14 20:57	06:14 20:57	05:28 21:43	20:08 (5) 20:52 (5)	05:21 22:00	20:15 (5) 20:56 (5)	05:54 21:33	20:20 (5) 20:59 (5)	20:47 (4) 20:33	07:33 18:22	08:23 16:33	08:51 16:34
30	08:21 17:21	07:19 20:06	06:12 20:59	06:12 20:59	05:27 21:44	20:08 (5) 20:52 (5)	05:21 22:00	20:16 (5) 20:57 (5)	05:55 21:32	20:21 (5) 20:58 (5)	20:48 (4) 20:31	07:35 18:19	08:24 16:32	08:52 16:35
31	08:20 17:23	07:17 20:08	06:11 20:58	06:11 20:58	05:26 21:45	20:08 (5) 20:52 (5)	05:22 22:00	20:17 (5) 20:58 (5)	05:57 21:30	20:22 (5) 20:59 (5)	20:49 (4) 20:29	07:36 18:17	08:25 16:31	08:53 16:36
Potential sun hours	259	278	367	416	485	498	502	502	454	381	332	267	244	
Total, worst case				13	1070	1241	1319	1319	271					
Sun reduction				0.38	0.42	0.38	0.38	0.38	0.42					
Oper. time red.				0.95	0.95	0.95	0.95	0.95	0.95					
Wind dir. red.				0.57	0.58	0.58	0.58	0.58	0.57					
Total reduction				0.21	0.23	0.21	0.21	0.21	0.23					
Total, real				3	247	257	277	277	62					

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

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

Project:

19065LE slagschaduw nieuwbouwwijk

Licensed user:

Bosch & Van Rijn

Franz-Lisztplantsoen 220

NL-3533 JG Utrecht

+31 6 51 71 04 93

Schreurs / leon@boschenvanrijn.nl

Calculated:

19-Aug-21 10:59 AM/3.4.388

SHADOW - Calendar

Calculation: VKA bovengrens met kantoren 12RD 210819Shadow receptor: AT - Shadow Receptor: 8.0 × 5.0 Azimuth: 0.0° Slope: 0.0° (10936)
Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) [DE BILT]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1.48 2.65 3.60 5.24 6.59 6.28 6.20 6.12 4.48 3.32 1.87 1.32

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 385 684 574 504 436 731 797 1,164 1,146 770 577 539 8,307

	January		February		March	April	May	June	July	August	September	October	November	December											
1	08:45		15:20 (1)	08:19	07:25	07:15	06:10	05:25	05:22	05:58	06:48	07:37	07:31	08:22	15:08 (1)										
	16:37	31	15:51 (1)	17:25	18:16	20:10	21:01	21:46	22:00	21:29	20:27	19:17	17:11	16:31	28 15:36 (1)										
2	08:45		15:21 (1)	08:17	07:23	07:13	06:08	05:24	05:23	06:00	06:50	07:39	07:32	08:23	15:07 (1)										
	16:38	30	15:51 (1)	17:26	18:18	20:12	21:02	21:48	22:00	21:27	20:24	19:15	17:10	16:30	29 15:36 (1)										
3	08:45		15:21 (1)	08:16	07:21	07:10	06:06	05:23	05:23	06:02	06:51	07:40	07:34	08:24	15:08 (1)										
	16:39	30	15:51 (1)	17:28	18:20	20:13	21:04	21:49	22:00	21:25	20:22	19:13	17:08	16:30	29 15:37 (1)										
4	08:45		15:21 (1)	08:14	07:19	07:08	06:05	05:23	05:24	06:03	06:53	07:42	07:36	08:26	15:08 (1)										
	16:40	31	15:52 (1)	17:30	18:21	20:15	21:06	21:50	21:59	21:24	20:20	19:10	17:06	16:29	29 15:37 (1)										
5	08:45		15:21 (1)	08:12	07:17	07:06	06:03	05:22	05:25	06:05	06:55	07:44	07:38	08:27	15:09 (1)										
	16:41	31	15:52 (1)	17:32	18:23	20:17	21:07	21:51	21:59	21:22	20:18	19:08	17:04	16:29	29 15:38 (1)										
6	08:44		15:22 (1)	08:11	07:14	07:03	06:01	05:21	05:26	06:06	06:56	07:45	07:40	08:28	15:08 (1)										
	16:43	30	15:52 (1)	17:34	18:25	20:18	21:09	21:52	21:58	21:20	20:15	19:06	17:02	16:28	31 15:39 (1)										
7	08:44		15:22 (1)	08:09	07:12	07:01	05:59	05:21	05:27	06:08	06:58	07:47	07:41	08:30	15:08 (1)										
	16:44	30	15:52 (1)	17:36	18:27	20:20	21:11	21:53	21:58	21:18	20:13	19:04	17:01	16:28	31 15:39 (1)										
8	08:44		15:24 (1)	08:07	07:10	06:59	05:57	05:20	05:28	06:09	06:59	07:49	07:43	08:31	15:08 (1)										
	16:45	29	15:53 (1)	17:37	18:29	20:22	21:12	21:53	21:57	21:16	20:11	19:01	16:59	16:28	31 15:39 (1)										
9	08:43		15:24 (1)	08:05	07:08	06:57	05:56	05:20	05:29	06:11	07:01	07:50	07:45	08:32	15:10 (1)										
	16:46	29	15:53 (1)	17:39	18:30	20:24	21:14	21:54	21:56	21:15	20:09	18:59	16:57	16:27	30 15:40 (1)										
10	08:43		15:24 (1)	08:04	07:05	06:54	05:54	05:19	05:30	06:13	07:03	07:52	07:47	08:33	15:10 (1)										
	16:48	29	15:53 (1)	17:41	18:32	20:25	21:16	21:55	21:56	21:13	20:06	18:57	16:56	16:27	31 15:41 (1)										
11	08:42		15:26 (1)	08:02	07:03	06:52	05:52	05:19	05:31	06:14	07:04	07:54	07:49	08:34	15:10 (1)										
	16:49	28	15:54 (1)	17:43	18:34	20:27	21:17	21:56	21:55	21:11	20:04	18:55	16:54	16:27	31 15:41 (1)										
12	08:41		15:26 (1)	08:00	07:01	06:50	05:51	05:19	05:32	06:16	07:06	07:56	07:50	08:35	15:10 (1)										
	16:51	28	15:54 (1)	17:45	18:36	20:29	21:19	21:57	21:54	21:09	20:02	18:52	16:53	16:27	31 15:41 (1)										
13	08:41		15:27 (1)	07:58	06:59	06:48	05:49	05:18	05:33	06:17	07:08	07:57	07:52	08:36	15:11 (1)										
	16:52	26	15:53 (1)	17:47	18:37	20:30	21:20	21:57	21:53	21:07	19:59	18:50	16:51	16:27	31 15:42 (1)										
14	08:40		15:28 (1)	07:56	06:56	06:46	05:47	05:18	05:34	06:19	07:09	07:59	07:54	08:37	15:11 (1)										
	16:54	25	15:53 (1)	17:49	18:39	20:32	21:22	21:58	21:52	21:05	19:57	18:48	16:50	16:27	31 15:42 (1)										
15	08:39		15:29 (1)	07:54	06:54	06:43	05:46	05:18	05:35	06:21	07:11	08:01	07:56	08:38	15:12 (1)										
	16:55	24	15:53 (1)	17:50	18:41	20:34	21:23	21:58	21:51	21:03	19:55	18:46	16:48	16:27	31 15:43 (1)										
16	08:38		15:30 (1)	07:52	06:52	06:41	05:44	05:18	05:36	06:22	07:12	08:02	07:57	08:39	15:13 (1)										
	16:57	23	15:53 (1)	17:52	18:43	20:35	21:25	21:59	21:50	21:01	19:52	18:44	16:47	16:27	30 15:43 (1)										
17	08:37		15:31 (1)	07:50	06:50	06:39	05:43	05:18	05:38	06:24	07:14	08:04	07:59	08:40	15:13 (1)										
	16:58	22	15:53 (1)	17:54	18:44	20:37	21:26	21:59	21:49	20:59	19:50	18:42	16:46	16:27	31 15:44 (1)										
18	08:36		15:32 (1)	07:48	06:47	06:37	05:41	05:18	05:39	06:25	07:16	08:06	08:01	08:41	15:13 (1)										
	17:00	20	15:52 (1)	17:56	18:46	20:39	21:28	22:00	21:48	20:57	19:48	18:39	16:44	16:27	31 15:44 (1)										
19	08:35		15:34 (1)	07:46	06:45	06:35	05:40	05:18	05:40	06:27	07:17	08:08	08:02	08:41	15:14 (1)										
	17:02	18	15:52 (1)	17:58	18:48	20:41	21:29	22:00	21:47	20:55	19:45	18:37	16:43	16:28	31 15:45 (1)										
20	08:34		15:35 (1)	07:44	06:43	06:33	05:38	05:18	05:41	06:29	07:19	08:09	08:04	08:42	15:15 (1)										
	17:03	15	15:50 (1)	18:00	18:49	20:42	21:31	22:00	21:46	20:53	19:43	18:35	16:42	16:28	30 15:45 (1)										
21	08:33		15:38 (1)	07:42	06:40	06:30	05:37	05:18	05:43	06:30	07:21	08:11	08:06	08:42	15:15 (1)										
	17:05	10	15:48 (1)	18:02	18:51	20:44	21:32	22:01	21:45	20:51	19:41	18:33	16:40	10 15:24 (1)	16:28 30 15:45 (1)										
22	08:32			07:40	06:38	06:28	05:36	05:18	05:44	06:32	07:22	08:13	08:08	15:13 (1)	08:43 15:16 (1)										
	17:07			18:03	18:53	20:46	21:34	22:01	21:43	20:49	19:38	18:31	16:39	14 15:27 (1)	16:29 30 15:46 (1)										
23	08:31			07:38	06:36	06:26	05:35	05:18	05:45	06:34	07:24	08:15	08:09	15:10 (1)	08:44 15:16 (1)										
	17:08			18:05	18:55	20:47	21:35	22:01	21:42	20:46	19:36	18:29	16:38	18 15:28 (1)	16:29 30 15:46 (1)										
24	08:30			07:36	06:33	06:24	05:33	05:19	05:47	06:35	07:25	08:16	08:11	15:10 (1)	08:44 15:16 (1)										
	17:10			18:07	18:56	20:49	21:36	22:01	21:41	20:44	19:34	18:27	16:37	19 15:29 (1)	16:30 30 15:46 (1)										
25	08:29			07:34	06:31	06:22	05:32	05:19	05:48	06:37	07:27	08:18	08:12	15:09 (1)	08:44 15:17 (1)										
	17:12			18:09	18:58	20:51	21:38	22:01	21:39	20:42	19:31	17:25	16:36	22 15:31 (1)	16:31 31 15:48 (1)										
26	08:27			07:32	06:29	06:20	05:31	05:19	05:50	06:38	07:29	08:20	08:14	15:09 (1)	08:45 15:17 (1)										
	17:14			18:11	19:00	20:52	21:39	22:01	21:38	20:40	19:29	17:23	16:35	23 15:32 (1)	16:31 31 15:48 (1)										
27	08:26			07:30	06:26	06:18	05:30	05:20	05:51	06:40	07:30	08:22	08:16	15:08 (1)	08:45 15:17 (1)										
	17:15			18:12	19:01	20:54	21:40	22:01	21:36	20:38	19:27	17:21	16:34	24 15:32 (1)	16:32 31 15:48 (1)										
28	08:25			07:28	06:24	06:16	05:29	05:20	05:53	06:42	07:32	08:24	08:17	15:08 (1)	08:45 15:18 (1)										
	17:17			18:14	19:03	20:56	21:42	22:01	21:35	20:36	19:24	17:19	16:33	25 15:33 (1)	16:33 31 15:49 (1)										
29	08:23				07:22	06:14	05:28	05:21	05:54	06:43	07:34	08:25	08:19	15:08 (1)	08:45 15:18 (1)										
	17:19				20:05	20:57	21:43	22:01	21:33	20:33	19:22	17:17	16:33	27 15:35 (1)	16:34 31 15:49 (1)										
30	08:22				07:20	06:12	05:27	05:21	05:55	06:45	07:35	08:27	08:20	15:07 (1)	08:45 15:19 (1)										
	17:21				20:07	20:59	21:44	22:01	21:32	20:31	19:20	17:15	16:32	28 15:35 (1)	16:35 30 15:49 (1)										
31	08:20				07:17		05:26		05:57	06:46		07:29		08:45	15:19 (1)										
	17:23				20:08		21:45		21:30	20:29		17:13		16:36	31 15:50 (1)										
Potential sun hours	259		278		367		416		485		499		502		454		381		332		266		210		942
Total, worst case		539																					0.21		0.17
Sun reduction		0.18																					0.95		0.95
Oper. time red.		0.95																					0.69		0.69
Wind dir. red.		0.69																					0.14		0.11
Total reduction		0.12																					0.14		0.11
Total, real		62																					29		103

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

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

Project:

19065LE slagschaduw nieuwbouwwijk

Licensed user:

Bosch & Van Rijn

Franz-Lisztplantsoen 220

NL-3533 JG Utrecht

+31 6 51 71 04 93

Schreurs / leon@boschenvanrijn.nl

Calculated:

19-Aug-21 10:59 AM/3.4.388

SHADOW - Calendar

Calculation: VKA bovengrens met kantoren 12RD 210819Shadow receptor: AU - Shadow Receptor: 8.0 × 5.0 Azimuth: 0.0° Slope: 0.0° (10937)
Sunshine probability S (Average daily sunshine hours) [DE BILT]

Assumptions for shadow calculations

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1.48 2.65 3.60 5.24 6.59 6.28 6.20 6.12 4.48 3.32 1.87 1.32

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
385 684 574 504 436 731 797 1,164 1,146 770 577 539 8,307

	January		February		March		April		May		June		July		August		September		October		November		December			
1	08:45		14:04 (2)	08:19		16:20 (1)	07:25	07:15	06:10	05:25	05:22	05:59	06:48	07:37						07:31	15:45 (1)	08:22	13:55 (2)			
	16:37	44	14:48 (2)	17:25	32	16:52 (1)	18:16	20:10	21:01	21:46	22:00	21:29	20:27	19:17						17:11	42	16:27 (1)	16:31	35	14:30 (2)	
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	17:14	11	16:39 (1)	18:11			19:00	20:52	21:39	22:01	21:38	20:40	19:29	17:23				</								

Project:

19065LE slagschaduw nieuwbouwwijk

Licensed user:

Bosch & Van Rijn

Franz-Lisztplantsoen 220

NL-3533 JG Utrecht

+31 6 51 71 04 93

Schreurs / leon@boschenvanrijn.nl

Calculated:

19-Aug-21 10:59 AM/3.4.388

SHADOW - Calendar

Calculation: VKA bovengrens met kantoren 12RD 210819Shadow receptor: AV - Shadow Receptor: 8.0 × 5.0 Azimuth: 0.0° Slope: 0.0° (10938)
Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) [DE BILT]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1.48 2.65 3.60 5.24 6.59 6.28 6.20 6.12 4.48 3.32 1.87 1.32

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
385 684 574 504 436 731 797 1,164 1,146 770 577 539 8,307

	[January	[February	[March	[April	[May	[June	[July	[August	[September]	October	[November]	December				
1	08:45 16:37	08:18 17:24	07:25 18:16	07:15 20:10	06:10 21:00	20:16 (5) 20:32 (5)	05:25 21:46	20:13 (5) 20:40 (5)	05:22 22:00	20:26 (5) 20:40 (5)	05:58 21:28	20:16 (5) 20:53 (5)	06:48 20:26	07:37 19:17	07:30 17:11	08:21 16:31
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23	08:31 17:08	07:38 18:05	06:35 18:54	06:26 20:47	05:34 21:35	20:07 (5) 20:43 (5)	05:18 22:01	20:29 (5) 20:33 (5)	05:45 21:42	20:17 (5) 20:53 (5)	06:33 20:46	20:39 (5) 20:53 (5)	07:24 19:36	08:14 18:29	08:09 16:38	08:43 16:29
24	08:29 17:10	07:36 18:07	06:33 18:56	06:24 20:49	05:33 21:36	20:08 (5) 20:43 (5)	05:19 22:01	20:28 (5) 20:34 (5)	05:47 21:40	20:16 (5) 20:53 (5)	06:35 20:44	20:40 (5) 20:53 (5)	07:25 19:33	08:16 18:27	08:10 16:37	08:44 16:30
25	08:28 17:12	07:34 18:09	06:31 18:58	06:22 20:50	05:32 21:37	20:08 (5) 20:42 (5)	05:19 22:01	20:28 (5) 20:35 (5)	05:48 21:39	20:16 (5) 20:53 (5)	06:37 20:42	20:41 (5) 20:53 (5)	07:27 19:31	08:18 17:25	08:12 16:36	08:44 16:31
26	08:27 17:14	07:32 18:10	06:29 18:59	06:20 20:52	05:31 21:39	20:09 (5) 20:42 (5)	05:19 22:01	20:27 (5) 20:35 (5)	05:50 21:38	20:16 (5) 20:54 (5)	06:38 20:40	20:42 (5) 20:54 (5)	07:29 19:29	08:20 17:23	08:14 16:35	08:44 16:31
27	08:26 17:15	07:29 18:12	06:26 19:01	06:18 20:54	05:30 21:40	20:09 (5) 20:42 (5)	05:20 22:01	20:27 (5) 20:36 (5)	05:51 21:36	20:16 (5) 20:54 (5)	06:40 20:38	20:43 (5) 20:54 (5)	07:30 19:26	08:21 17:21	08:15 16:34	08:45 16:32
28	08:24 17:17	07:27 18:14	06:24 19:03	06:16 20:55	05:29 21:41	20:10 (5) 20:41 (5)	05:20 22:01	20:27 (5) 20:37 (5)	05:52 21:35	20:16 (5) 20:53 (5)	06:41 20:35	20:44 (5) 20:53 (5)	07:32 19:24	08:23 17:19	08:17 16:33	08:45 16:33
29	08:23 17:19	07:22 18:05	06:22 19:00	06:14 20:57	05:28 21:43	20:10 (5) 20:41 (5)	05:21 22:00	20:26 (5) 20:37 (5)	05:54 21:33	20:16 (5) 20:54 (5)	06:43 20:33	20:45 (5) 20:54 (5)	07:33 19:22	08:25 17:17	08:18 16:32	08:45 16:34
30	08:21 17:21	07:19 18:06	06:12 19:01	06:12 20:59	05:27 21:44	20:11 (5) 20:40 (5)	05:21 22:00	20:26 (5) 20:39 (5)	05:55 21:32	20:16 (5) 20:53 (5)	06:45 20:31	20:46 (5) 20:53 (5)	07:35 19:19	08:27 17:15	08:20 16:32	08:45 16:35
31	08:20 17:23	07:17 18:08	06:11 19:02	06:11 20:59	05:26 21:45	20:11 (5) 20:40 (5)	05:21 22:00	20:27 (5) 20:39 (5)	05:57 21:30	20:17 (5) 20:54 (5)	06:46 20:29	20:54 (5) 20:54 (5)	07:36 19:20	08:28 17:13	08:21 16:35	08:45 16:35
Potential sun hours	259	278	367	416	485	1017	917	502	37	454	351	381	267	244		
Total, worst case				10		0.38	0.42	0.38	0.38	0.42						
Sun reduction				0.95		0.95	0.95	0.95	0.95	0.95						
Oper. time red.				0.57		0.57	0.57	0.57	0.57	0.57						
Wind dir. red.				0.21		0.23	0.21	0.21	0.21	0.23						
Total reduction				2		0.23	0.23	0.21	0.21	0.23						
Total, real						233	80	191	80							

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

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

Project:

19065LE slagschaduw nieuwbouwwijk

Licensed user:

Bosch & Van Rijn

Franz-Lisztplantsoen 220

NL-3533 JG Utrecht

+31 6 51 71 04 93

Schreurs / leon@boschenvanrijn.nl

Calculated:

19-Aug-21 10:59 AM/3.4.388

SHADOW - Calendar

Calculation: VKA bovengrens met kantoren 12RD 210819 **Shadow receptor:** AW - Shadow Receptor: 8.0 × 5.0 Azimuth: 0.0° Slope: 0.0° (10939)
Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) [DE BILT]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1.48 2.65 3.60 5.24 6.59 6.28 6.20 6.12 4.48 3.32 1.87 1.32

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 385 684 574 504 436 731 797 1,164 1,146 770 577 539 8,307

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:45	08:18	07:25	07:15	06:10	05:25	05:22	05:58	06:48	07:37	07:30	08:21
	16:37	17:24	18:16	20:10	21:00	21:46	22:00	21:28	20:26	19:17	17:11	16:31
2	08:45	08:17	07:23	07:12	06:08	05:24	05:23	06:00	06:50	07:38	07:32	08:23
	16:38	17:26	18:18	20:11	21:02	21:47	22:00	21:27	20:24	19:15	17:09	16:30
3	08:45	08:15	07:21	07:10	06:06	05:23	05:24	06:02	06:51	07:40	07:34	08:24
	16:39	17:28	18:20	20:13	21:04	21:48	21:59	21:25	20:22	19:13	17:08	16:30
4	08:45	08:14	07:19	07:08	06:05	05:23	05:24	06:03	06:53	07:42	07:36	08:25
	16:40	17:30	18:21	20:15	21:05	21:49	21:59	21:23	20:20	19:10	17:06	16:29
5	08:44	08:12	07:16	07:06	06:03	05:22	05:25	06:05	06:54	07:43	07:38	08:27
	16:41	17:32	18:23	20:16	21:07	21:50	21:58	21:22	20:17	19:08	17:04	16:29
6	08:44	08:10	07:14	07:03	06:01	05:21	05:26	06:06	06:56	07:45	07:39	08:28
	16:43	17:34	18:25	20:18	21:09	21:51	21:58	21:20	20:15	19:06	17:02	16:28
7	08:44	08:09	07:12	07:01	05:59	05:21	05:27	06:08	06:58	07:47	07:41	08:29
	16:44	17:36	18:27	20:20	21:10	21:52	21:57	21:18	20:13	19:04	17:01	16:28
8	08:43	08:07	07:10	06:59	05:57	05:20	05:28	06:09	06:59	07:48	07:43	08:30
	16:45	17:37	18:28	20:22	21:12	21:53	21:57	21:16	20:11	19:01	16:59	16:28
9	08:43	08:05	07:07	06:57	05:56	05:20	05:29	06:11	07:01	07:50	07:45	08:32
	16:46	17:39	18:30	20:23	21:14	21:54	21:56	21:14	20:08	18:59	16:57	16:27
10	08:42	08:03	07:05	06:54	05:54	05:19	05:30	06:13	07:03	07:52	07:46	08:33
	16:48	17:41	18:32	20:25	21:15	21:55	21:55	21:12	20:06	18:57	16:56	16:27
11	08:42	08:01	07:03	06:52	05:52	05:19	05:31	06:14	07:04	07:54	07:48	08:34
	16:49	17:43	18:34	20:27	21:17	21:55	21:54	21:11	20:04	18:55	16:54	16:27
12	08:41	08:00	07:01	06:50	05:51	05:19	05:32	06:16	07:06	07:55	07:50	08:35
	16:51	17:45	18:35	20:28	21:18	21:56	21:54	21:09	20:01	18:52	16:53	16:27
13	08:40	07:58	06:58	06:48	05:49	05:18	05:33	06:17	07:07	07:57	07:52	08:36
	16:52	17:47	18:37	20:30	21:20	21:57	21:53	21:07	19:59	18:50	16:51	16:27
14	08:40	07:56	06:56	06:45	05:47	05:18	05:34	06:19	07:09	07:59	07:53	08:37
	16:54	17:49	18:39	20:32	21:21	21:57	21:52	21:05	19:57	18:48	16:50	16:27
15	08:39	07:54	06:54	06:43	05:46	05:18	05:35	06:20	07:11	08:00	07:55	08:38
	16:55	17:50	18:41	20:33	21:23	21:58	21:51	21:03	19:54	18:46	16:48	16:27
16	08:38	07:52	06:52	06:41	05:44	05:18	05:36	06:22	07:12	08:02	07:57	08:39
	16:57	17:52	18:42	20:35	21:25	21:58	21:50	21:01	19:52	18:44	16:47	16:27
17	08:37	07:50	06:49	06:39	05:43	05:18	05:38	06:24	07:14	08:04	07:59	08:39
	16:58	17:54	18:44	20:37	21:26	21:59	21:49	20:59	19:50	18:41	16:45	16:27
18	08:36	07:48	06:47	06:37	05:41	05:18	05:39	06:25	07:15	08:06	08:00	08:40
	17:00	17:56	18:46	20:39	21:28	21:59	21:48	20:57	19:47	18:39	16:44	16:27
19	08:35	07:46	06:45	06:35	05:40	05:18	05:40	06:27	07:17	08:07	08:02	08:41
	17:02	17:58	18:48	20:40	21:29	22:00	21:47	20:55	19:45	18:37	16:43	16:28
20	08:34	07:44	06:42	06:32	05:38	05:18	05:41	06:29	07:19	08:09	08:04	08:41
	17:03	18:00	18:49	20:42	21:30	22:00	21:45	20:53	19:43	18:35	16:42	16:28
21	08:33	07:42	06:40	06:30	05:37	05:18	05:43	06:30	07:20	08:11	08:05	08:42
	17:05	18:01	18:51	20:44	21:32	22:00	21:44	20:50	19:40	18:33	16:40	16:28
22	08:32	07:40	06:38	06:28	05:36	05:18	05:44	06:32	07:22	08:13	08:07	08:43
	17:07	18:03	18:53	20:45	21:33	22:00	21:43	20:48	19:38	18:31	16:39	16:29
23	08:31	07:38	06:35	06:26	05:35	05:18	05:45	06:33	07:24	08:14	08:09	08:43
	17:08	18:05	18:54	20:47	21:35	22:01	21:42	20:46	19:36	18:29	16:38	16:29
24	08:29	07:36	06:33	06:24	05:33	05:19	05:47	06:35	07:25	08:16	08:10	08:44
	17:10	18:07	18:56	20:49	21:36	22:01	21:40	20:44	19:33	18:27	16:37	16:30
25	08:28	07:34	06:31	06:22	05:32	05:19	05:48	06:37	07:27	08:18	08:12	08:44
	17:12	18:09	18:58	20:50	21:37	22:01	21:39	20:42	19:31	17:25	16:36	16:31
26	08:27	07:32	06:29	06:20	05:31	05:19	05:50	06:38	07:29	08:20	08:14	08:44
	17:14	18:11	18:59	20:52	21:39	22:01	21:38	20:40	19:29	17:23	16:35	16:31
27	08:26	07:29	06:26	06:18	05:30	05:20	05:51	06:40	07:30	08:21	08:15	08:45
	17:15	18:12	19:01	20:54	21:40	22:01	21:36	20:38	19:26	17:21	16:34	16:32
28	08:24	07:27	06:24	06:16	05:29	05:20	05:53	06:42	07:32	08:23	08:17	08:45
	17:17	18:14	19:03	20:55	21:41	22:01	21:35	20:35	19:24	17:19	16:33	16:33
29	08:23		07:22	06:14	05:28	05:21	05:54	06:43	07:33	08:25	08:18	08:45
	17:19		20:05	20:57	21:43	22:00	21:33	20:33	19:22	17:17	16:33	16:34
30	08:21		07:19	06:12	05:27	05:22	05:55	06:45	07:35	08:27	08:20	08:45
	17:21		20:06	20:59	21:44	22:00	21:31	20:31	19:19	17:15	16:32	16:35
31	08:20		07:17		05:26		05:57	06:46		07:29		08:45
	17:23		20:08		21:45		21:30	20:29		17:13		16:36
Potential sun hours	259	278	367	416	485	498	502	453	381	332	267	244
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

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

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

Project:

19065LE slagschaduw nieuwbouwwijk

Licensed user:

Bosch & Van Rijn

Franz-Lisztplantsoen 220

NL-3533 JG Utrecht

+31 6 51 71 04 93

Schreurs / leon@boschenvanrijn.nl

Calculated:

19-Aug-21 10:59 AM/3.4.388

SHADOW - Calendar

Calculation: VKA bovengrens met kantoren 12RD 210819 **Shadow receptor:** AX - Shadow Receptor: 8.0×5.0 Azimuth: 0.0° Slope: 0.0° (10940)
Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) [DE BILT]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1.48 2.65 3.60 5.24 6.59 6.28 6.20 6.12 4.48 3.32 1.87 1.32

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 385 684 574 504 436 731 797 1,164 1,146 770 577 539 8,307

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:45	08:18	07:25	07:15	06:10	05:25	05:22	05:58	06:48	07:37	07:30	08:21
	16:37	17:24	18:16	20:10	21:00	21:46	22:00	21:28	20:26	19:17	17:11	16:31
2	08:45	08:17	07:23	07:12	06:08	05:24	05:23	06:00	06:50	07:38	07:32	08:23
	16:38	17:26	18:18	20:11	21:02	21:47	22:00	21:27	20:24	19:15	17:09	16:30
3	08:45	08:15	07:21	07:10	06:06	05:23	05:24	06:02	06:51	07:40	07:34	08:24
	16:39	17:28	18:20	20:13	21:04	21:48	21:59	21:25	20:22	19:13	17:08	16:30
4	08:45	08:14	07:19	07:08	06:05	05:23	05:24	06:03	06:53	07:42	07:36	08:25
	16:40	17:30	18:21	20:15	21:05	21:49	21:59	21:23	20:20	19:10	17:06	16:29
5	08:44	08:12	07:16	07:06	06:03	05:22	05:25	06:05	06:54	07:43	07:38	08:27
	16:41	17:32	18:23	20:16	21:07	21:50	21:58	21:22	20:17	19:08	17:04	16:29
6	08:44	08:10	07:14	07:03	06:01	05:21	05:26	06:06	06:56	07:45	07:39	08:28
	16:43	17:34	18:25	20:18	21:09	21:51	21:58	21:20	20:15	19:06	17:02	16:28
7	08:44	08:09	07:12	07:01	05:59	05:21	05:27	06:08	06:58	07:47	07:41	08:29
	16:44	17:36	18:27	20:20	21:10	21:52	21:57	21:18	20:13	19:03	17:01	16:28
8	08:43	08:07	07:10	06:59	05:57	05:20	05:28	06:09	06:59	07:48	07:43	08:30
	16:45	17:37	18:28	20:22	21:12	21:53	21:57	21:16	20:11	19:01	16:59	16:28
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	16:46	17:39	18:30	20:23	21:14	21:54	21:56	21:14	20:08	18:59	16:57	16:27
10	08:42	08:03	07:05	06:54	05:54	05:19	05:30	06:12	07:03	07:52	07:46	08:33
	16:48	17:41	18:32	20:25	21:15	21:55	21:55	21:12	20:06	18:57	16:56	16:27
11	08:42	08:01	07:03	06:52	05:52	05:19	05:31	06:14	07:04	07:54	07:48	08:34
	16:49	17:43	18:34	20:27	21:17	21:55	21:54	21:11	20:04	18:55	16:54	16:27
12	08:41	08:00	07:01	06:50	05:51	05:19	05:32	06:16	07:06	07:55	07:50	08:35
	16:51	17:45	18:35	20:28	21:18	21:56	21:54	21:09	20:01	18:52	16:53	16:27
13	08:40	07:58	06:58	06:48	05:49	05:18	05:33	06:17	07:07	07:57	07:52	08:36
	16:52	17:47	18:37	20:30	21:20	21:57	21:53	21:07	19:59	18:50	16:51	16:27
14	08:40	07:56	06:56	06:45	05:47	05:18	05:34	06:19	07:09	07:59	07:53	08:37
	16:54	17:49	18:39	20:32	21:21	21:57	21:52	21:05	19:57	18:48	16:50	16:27
15	08:39	07:54	06:54	06:43	05:46	05:18	05:35	06:20	07:11	08:00	07:55	08:38
	16:55	17:50	18:41	20:33	21:23	21:58	21:51	21:03	19:54	18:46	16:48	16:27
16	08:38	07:52	06:52	06:41	05:44	05:18	05:36	06:22	07:12	08:02	07:57	08:39
	16:57	17:52	18:42	20:35	21:25	21:58	21:50	21:01	19:52	18:44	16:47	16:27
17	08:37	07:50	06:49	06:39	05:43	05:18	05:38	06:24	07:14	08:04	07:59	08:39
	16:58	17:54	18:44	20:37	21:26	21:59	21:49	20:59	19:50	18:41	16:45	16:27
18	08:36	07:48	06:47	06:37	05:41	05:18	05:39	06:25	07:15	08:06	08:00	08:40
	17:00	17:56	18:46	20:39	21:28	21:59	21:48	20:57	19:47	18:39	16:44	16:27
19	08:35	07:46	06:45	06:35	05:40	05:18	05:40	06:27	07:17	08:07	08:02	08:41
	17:02	17:58	18:48	20:40	21:29	22:00	21:47	20:55	19:45	18:37	16:43	16:28
20	08:34	07:44	06:42	06:32	05:38	05:18	05:41	06:29	07:19	08:09	08:04	08:41
	17:03	18:00	18:49	20:42	21:30	22:00	21:45	20:53	19:43	18:35	16:42	16:28
21	08:33	07:42	06:40	06:30	05:37	05:18	05:43	06:30	07:20	08:11	08:05	08:42
	17:05	18:01	18:51	20:44	21:32	22:00	21:44	20:50	19:40	18:33	16:40	16:28
22	08:32	07:40	06:38	06:28	05:36	05:18	05:44	06:32	07:22	08:13	08:07	08:43
	17:07	18:03	18:53	20:45	21:33	22:00	21:43	20:48	19:38	18:31	16:39	16:29
23	08:31	07:38	06:35	06:26	05:35	05:18	05:45	06:33	07:24	08:14	08:09	08:43
	17:08	18:05	18:54	20:47	21:35	22:01	21:42	20:46	19:36	18:29	16:38	16:29
24	08:29	07:36	06:33	06:24	05:33	05:19	05:47	06:35	07:25	08:16	08:10	08:44
	17:10	18:07	18:56	20:49	21:36	22:01	21:40	20:44	19:33	18:27	16:37	16:30
25	08:28	07:34	06:31	06:22	05:32	05:19	05:48	06:37	07:27	08:18	08:12	08:44
	17:12	18:09	18:58	20:50	21:37	22:01	21:39	20:42	19:31	17:25	16:36	16:31
26	08:27	07:32	06:29	06:20	05:31	05:19	05:50	06:38	07:29	08:20	08:14	08:44
	17:14	18:11	18:59	20:52	21:39	22:01	21:38	20:40	19:29	17:23	16:35	16:31
27	08:26	07:29	06:26	06:18	05:30	05:20	05:51	06:40	07:30	08:21	08:15	08:45
	17:15	18:12	19:01	20:54	21:40	22:01	21:36	20:38	19:26	17:21	16:34	16:32
28	08:24	07:27	06:24	06:16	05:29	05:20	05:52	06:42	07:32	08:23	08:17	08:45
	17:17	18:14	19:03	20:55	21:41	22:01	21:35	20:35	19:24	17:19	16:33	16:33
29	08:23		07:22	06:14	05:28	05:21	05:54	06:43	07:33	08:25	08:18	08:45
	17:19		20:05	20:57	21:43	22:00	21:33	20:33	19:22	17:17	16:33	16:34
30	08:21		07:19	06:12	05:27	05:22	05:55	06:45	07:35	08:27	08:20	08:45
	17:21		20:06	20:59	21:44	22:00	21:31	20:31	19:19	17:15	16:32	16:35
31	08:20		07:17		05:26		05:57	06:46		07:29		08:45
	17:23		20:08		21:45		21:30	20:29		17:13		16:36
Potential sun hours	259	278	367	416	485	498	502	453	381	332	267	244
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

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

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

Project:

19065LE slagschaduw nieuwbouwwijk

Licensed user:

Bosch & Van Rijn

Franz-Lisztplantsoen 220

NL-3533 JG Utrecht

+31 6 51 71 04 93

Schreurs / leon@boschenvanrijn.nl

Calculated:

19-Aug-21 10:59 AM/3.4.388

SHADOW - Calendar

Calculation: VKA bovengrens met kantoren 12RD 210819 **Shadow receptor:** AY - Shadow Receptor: 8.0 × 5.0 Azimuth: 0.0° Slope: 0.0° (10941)
Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) [DE BILT]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1.48 2.65 3.60 5.24 6.59 6.28 6.20 6.12 4.48 3.32 1.87 1.32

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 385 684 574 504 436 731 797 1,164 1,146 770 577 539 8,307

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:45	08:18	07:25	07:15	06:10	05:25	05:22	05:58	06:48	07:37	07:30	08:21
	16:37	17:24	18:16	20:10	21:00	21:46	22:00	21:28	20:26	19:17	17:11	16:31
2	08:45	08:17	07:23	07:12	06:08	05:24	05:23	06:00	06:50	07:38	07:32	08:23
	16:38	17:26	18:18	20:11	21:02	21:47	22:00	21:27	20:24	19:15	17:09	16:30
3	08:45	08:15	07:21	07:10	06:06	05:23	05:24	06:02	06:51	07:40	07:34	08:24
	16:39	17:28	18:20	20:13	21:04	21:48	21:59	21:25	20:22	19:13	17:08	16:30
4	08:45	08:14	07:19	07:08	06:05	05:23	05:24	06:03	06:53	07:42	07:36	08:25
	16:40	17:30	18:21	20:15	21:05	21:49	21:59	21:23	20:20	19:10	17:06	16:29
5	08:44	08:12	07:16	07:06	06:03	05:22	05:25	06:05	06:54	07:43	07:38	08:27
	16:41	17:32	18:23	20:16	21:07	21:50	21:58	21:22	20:17	19:08	17:04	16:29
6	08:44	08:10	07:14	07:03	06:01	05:21	05:26	06:06	06:56	07:45	07:39	08:28
	16:43	17:34	18:25	20:18	21:09	21:51	21:58	21:20	20:15	19:06	17:02	16:28
7	08:44	08:09	07:12	07:01	05:59	05:21	05:27	06:08	06:58	07:47	07:41	08:29
	16:44	17:36	18:27	20:20	21:10	21:52	21:57	21:18	20:13	19:04	17:01	16:28
8	08:43	08:07	07:10	06:59	05:57	05:20	05:28	06:09	06:59	07:48	07:43	08:30
	16:45	17:37	18:28	20:22	21:12	21:53	21:57	21:16	20:11	19:01	16:59	16:28
9	08:43	08:05	07:07	06:57	05:56	05:20	05:29	06:11	07:01	07:50	07:45	08:32
	16:46	17:39	18:30	20:23	21:14	21:54	21:56	21:14	20:08	18:59	16:57	16:27
10	08:42	08:03	07:05	06:54	05:54	05:19	05:30	06:13	07:03	07:52	07:46	08:33
	16:48	17:41	18:32	20:25	21:15	21:55	21:55	21:12	20:06	18:57	16:56	16:27
11	08:42	08:01	07:03	06:52	05:52	05:19	05:31	06:14	07:04	07:54	07:48	08:34
	16:49	17:43	18:34	20:27	21:17	21:55	21:54	21:11	20:04	18:55	16:54	16:27
12	08:41	08:00	07:01	06:50	05:51	05:19	05:32	06:16	07:06	07:55	07:50	08:35
	16:51	17:45	18:35	20:28	21:18	21:56	21:54	21:09	20:01	18:52	16:53	16:27
13	08:40	07:58	06:58	06:48	05:49	05:18	05:33	06:17	07:07	07:57	07:52	08:36
	16:52	17:47	18:37	20:30	21:20	21:57	21:53	21:07	19:59	18:50	16:51	16:27
14	08:40	07:56	06:56	06:45	05:47	05:18	05:34	06:19	07:09	07:59	07:53	08:37
	16:54	17:49	18:39	20:32	21:21	21:57	21:52	21:05	19:57	18:48	16:50	16:27
15	08:39	07:54	06:54	06:43	05:46	05:18	05:35	06:21	07:11	08:00	07:55	08:38
	16:55	17:50	18:41	20:33	21:23	21:58	21:51	21:03	19:54	18:46	16:48	16:27
16	08:38	07:52	06:52	06:41	05:44	05:18	05:36	06:22	07:12	08:02	07:57	08:39
	16:57	17:52	18:42	20:35	21:25	21:58	21:50	21:01	19:52	18:44	16:47	16:27
17	08:37	07:50	06:49	06:39	05:43	05:18	05:38	06:24	07:14	08:04	07:59	08:39
	16:58	17:54	18:44	20:37	21:26	21:59	21:49	20:59	19:50	18:41	16:45	16:27
18	08:36	07:48	06:47	06:37	05:41	05:18	05:39	06:25	07:15	08:06	08:00	08:40
	17:00	17:56	18:46	20:39	21:28	21:59	21:48	20:57	19:47	18:39	16:44	16:27
19	08:35	07:46	06:45	06:35	05:40	05:18	05:40	06:27	07:17	08:07	08:02	08:41
	17:02	17:58	18:48	20:40	21:29	22:00	21:47	20:55	19:45	18:37	16:43	16:28
20	08:34	07:44	06:42	06:32	05:39	05:18	05:41	06:29	07:19	08:09	08:04	08:41
	17:03	18:00	18:49	20:42	21:30	22:00	21:45	20:53	19:43	18:35	16:42	16:28
21	08:33	07:42	06:40	06:30	05:37	05:18	05:43	06:30	07:20	08:11	08:05	08:42
	17:05	18:01	18:51	20:44	21:32	22:00	21:44	20:50	19:40	18:33	16:40	16:28
22	08:32	07:40	06:38	06:28	05:36	05:18	05:44	06:32	07:22	08:13	08:07	08:43
	17:07	18:03	18:53	20:45	21:33	22:00	21:43	20:48	19:38	18:31	16:39	16:29
23	08:31	07:38	06:35	06:26	05:35	05:18	05:45	06:33	07:24	08:14	08:09	08:43
	17:08	18:05	18:54	20:47	21:35	22:01	21:42	20:46	19:36	18:29	16:38	16:29
24	08:29	07:36	06:33	06:24	05:33	05:19	05:47	06:35	07:25	08:16	08:10	08:44
	17:10	18:07	18:56	20:49	21:36	22:01	21:40	20:44	19:33	18:27	16:37	16:30
25	08:28	07:34	06:31	06:22	05:32	05:19	05:48	06:37	07:27	08:18	08:12	08:44
	17:12	18:09	18:58	20:50	21:37	22:01	21:39	20:42	19:31	17:25	16:36	16:31
26	08:27	07:32	06:29	06:20	05:31	05:19	05:50	06:38	07:29	08:20	08:14	08:44
	17:14	18:11	18:59	20:52	21:39	22:01	21:38	20:40	19:29	17:23	16:35	16:31
27	08:26	07:29	06:26	06:18	05:30	05:20	05:51	06:40	07:30	08:21	08:15	08:45
	17:15	18:12	19:01	20:54	21:40	22:01	21:36	20:38	19:26	17:21	16:34	16:32
28	08:24	07:27	06:24	06:16	05:29	05:20	05:53	06:42	07:32	08:23	08:17	08:45
	17:17	18:14	19:03	20:55	21:41	22:01	21:35	20:35	19:24	17:19	16:33	16:33
29	08:23		07:22	06:14	05:28	05:21	05:54	06:43	07:33	08:25	08:18	08:45
	17:19		20:05	20:57	21:43	22:00	21:33	20:33	19:22	17:17	16:33	16:34
30	08:21		07:19	06:12	05:27	05:22	05:55	06:45	07:35	08:27	08:20	08:45
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31	08:20		07:17		05:26		05:57	06:46		07:29		08:45
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Potential sun hours	259	278	367	416	485	498	502	453	381	332	267	244
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

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

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

Project:

19065LE slagschaduw nieuwbouwwijk

Licensed user:

Bosch & Van Rijn

Franz-Lisztplantsoen 220

NL-3533 JG Utrecht

+31 6 51 71 04 93

Schreurs / leon@boschenvanrijn.nl

Calculated:

19-Aug-21 10:59 AM/3.4.388

SHADOW - Calendar

Calculation: VKA bovengrens met kantoren 12RD 210819 **Shadow receptor:** AZ - Shadow Receptor: 8.0 × 5.0 Azimuth: 0.0° Slope: 0.0° (10942)
Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) [DE BILT]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1.48 2.65 3.60 5.24 6.59 6.28 6.20 6.12 4.48 3.32 1.87 1.32

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 385 684 574 504 436 731 797 1,164 1,146 770 577 539 8,307

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:45	08:18	07:25	07:15	06:10	05:25	05:22	05:58	06:48	07:37	07:30	08:21
	16:37	17:24	18:16	20:10	21:00	21:46	22:00	21:28	20:26	19:17	17:11	16:31
2	08:45	08:17	07:23	07:12	06:08	05:24	05:23	06:00	06:50	07:38	07:32	08:23
	16:38	17:26	18:18	20:11	21:02	21:47	22:00	21:27	20:24	19:15	17:09	16:30
3	08:45	08:15	07:21	07:10	06:06	05:23	05:24	06:02	06:51	07:40	07:34	08:24
	16:39	17:28	18:20	20:13	21:04	21:48	21:59	21:25	20:22	19:13	17:08	16:30
4	08:45	08:14	07:19	07:08	06:05	05:23	05:24	06:03	06:53	07:42	07:36	08:25
	16:40	17:30	18:21	20:15	21:05	21:49	21:59	21:23	20:20	19:10	17:06	16:29
5	08:44	08:12	07:16	07:06	06:03	05:22	05:25	06:05	06:54	07:43	07:38	08:27
	16:41	17:32	18:23	20:16	21:07	21:50	21:58	21:22	20:17	19:08	17:04	16:29
6	08:44	08:10	07:14	07:03	06:01	05:21	05:26	06:06	06:56	07:45	07:39	08:28
	16:43	17:34	18:25	20:18	21:09	21:51	21:58	21:20	20:15	19:06	17:02	16:28
7	08:44	08:09	07:12	07:01	05:59	05:21	05:27	06:08	06:58	07:47	07:41	08:29
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	16:45	17:37	18:28	20:22	21:12	21:53	21:57	21:16	20:11	19:01	16:59	16:28
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	16:46	17:39	18:30	20:23	21:14	21:54	21:56	21:14	20:08	18:59	16:57	16:27
10	08:42	08:03	07:05	06:54	05:54	05:19	05:30	06:13	07:03	07:52	07:46	08:33
	16:48	17:41	18:32	20:25	21:15	21:55	21:55	21:12	20:06	18:57	16:56	16:27
11	08:42	08:01	07:03	06:52	05:52	05:19	05:31	06:14	07:04	07:54	07:48	08:34
	16:49	17:43	18:34	20:27	21:17	21:55	21:54	21:11	20:04	18:55	16:54	16:27
12	08:41	08:00	07:01	06:50	05:51	05:19	05:32	06:16	07:06	07:55	07:50	08:35
	16:51	17:45	18:35	20:28	21:18	21:56	21:54	21:09	20:01	18:52	16:53	16:27
13	08:40	07:58	06:58	06:48	05:49	05:18	05:33	06:17	07:07	07:57	07:52	08:36
	16:52	17:47	18:37	20:30	21:20	21:57	21:53	21:07	19:59	18:50	16:51	16:27
14	08:40	07:56	06:56	06:45	05:47	05:18	05:34	06:19	07:09	07:59	07:53	08:37
	16:54	17:49	18:39	20:32	21:21	21:57	21:52	21:05	19:57	18:48	16:50	16:27
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17	08:37	07:50	06:49	06:39	05:43	05:18	05:38	06:24	07:14	08:04	07:59	08:39
	16:58	17:54	18:44	20:37	21:26	21:59	21:49	20:59	19:50	18:41	16:45	16:27
18	08:36	07:48	06:47	06:37	05:41	05:18	05:39	06:25	07:15	08:06	08:00	08:40
	17:00	17:56	18:46	20:39	21:28	21:59	21:48	20:57	19:47	18:39	16:44	16:27
19	08:35	07:46	06:45	06:35	05:40	05:18	05:40	06:27	07:17	08:07	08:02	08:41
	17:02	17:58	18:48	20:40	21:29	22:00	21:47	20:55	19:45	18:37	16:43	16:28
20	08:34	07:44	06:42	06:32	05:39	05:18	05:41	06:29	07:19	08:09	08:04	08:41
	17:03	18:00	18:49	20:42	21:30	22:00	21:45	20:53	19:43	18:35	16:42	16:28
21	08:33	07:42	06:40	06:30	05:37	05:18	05:43	06:30	07:20	08:11	08:05	08:42
	17:05	18:01	18:51	20:44	21:32	22:00	21:44	20:50	19:40	18:33	16:40	16:28
22	08:32	07:40	06:38	06:28	05:36	05:18	05:44	06:32	07:22	08:13	08:07	08:43
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	17:14	18:11	18:59	20:52	21:39	22:01	21:38	20:40	19:29	17:23	16:35	16:31
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Potential sun hours	259	278	367	416	485	498	502	453	381	332	267	244
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

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

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

Project:

19065LE slagschaduw nieuwbouwwijk

Licensed user:

Bosch & Van Rijn

Franz-Lisztplantsoen 220

NL-3533 JG Utrecht

+31 6 51 71 04 93

Schreurs / leon@boschenvanrijn.nl

Calculated:

19-Aug-21 10:59 AM/3.4.388

SHADOW - Calendar

Calculation: VKA bovengrens met kantoren 12RD 210819 **Shadow receptor:** BA - Shadow Receptor: 8.0 × 5.0 Azimuth: 0.0° Slope: 0.0° (10943)
Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) [DE BILT]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1.48 2.65 3.60 5.24 6.59 6.28 6.20 6.12 4.48 3.32 1.87 1.32

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 385 684 574 504 436 731 797 1,164 1,146 770 577 539 8,307

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:45	08:18	07:25	07:15	06:10	05:25	05:22	05:58	06:48	07:37	07:30	08:21
	16:37	17:24	18:16	20:10	21:00	21:46	22:00	21:28	20:26	19:17	17:11	16:31
2	08:45	08:17	07:23	07:12	06:08	05:24	05:23	06:00	06:50	07:38	07:32	08:23
	16:38	17:26	18:18	20:11	21:02	21:47	22:00	21:27	20:24	19:15	17:09	16:30
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	16:39	17:28	18:20	20:13	21:04	21:48	21:59	21:25	20:22	19:13	17:08	16:30
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	16:40	17:30	18:21	20:15	21:05	21:49	21:59	21:23	20:20	19:10	17:06	16:29
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	16:41	17:32	18:23	20:17	21:07	21:50	21:58	21:22	20:17	19:08	17:04	16:29
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	16:43	17:34	18:25	20:18	21:09	21:51	21:58	21:20	20:15	19:06	17:02	16:28
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	16:46	17:39	18:30	20:23	21:14	21:54	21:56	21:14	20:08	18:59	16:57	16:27
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12	08:41	08:00	07:01	06:50	05:51	05:19	05:32	06:16	07:06	07:55	07:50	08:35
	16:51	17:45	18:35	20:28	21:18	21:56	21:54	21:09	20:01	18:52	16:53	16:27
13	08:40	07:58	06:58	06:48	05:49	05:18	05:33	06:17	07:07	07:57	07:52	08:36
	16:52	17:47	18:37	20:30	21:20	21:57	21:53	21:07	19:59	18:50	16:51	16:27
14	08:40	07:56	06:56	06:45	05:47	05:18	05:34	06:19	07:09	07:59	07:53	08:37
	16:54	17:49	18:39	20:32	21:21	21:57	21:52	21:05	19:57	18:48	16:50	16:27
15	08:39	07:54	06:54	06:43	05:46	05:18	05:35	06:21	07:11	08:00	07:55	08:38
	16:55	17:50	18:41	20:33	21:23	21:58	21:51	21:03	19:54	18:46	16:48	16:27
16	08:38	07:52	06:52	06:41	05:44	05:18	05:36	06:22	07:12	08:02	07:57	08:39
	16:57	17:52	18:42	20:35	21:25	21:58	21:50	21:01	19:52	18:44	16:47	16:27
17	08:37	07:50	06:49	06:39	05:43	05:18	05:38	06:24	07:14	08:04	07:59	08:39
	16:58	17:54	18:44	20:37	21:26	21:59	21:49	20:59	19:50	18:41	16:45	16:27
18	08:36	07:48	06:47	06:37	05:41	05:18	05:39	06:25	07:15	08:06	08:00	08:40
	17:00	17:56	18:46	20:39	21:28	21:59	21:48	20:57	19:47	18:39	16:44	16:27
19	08:35	07:46	06:45	06:35	05:40	05:18	05:40	06:27	07:17	08:07	08:02	08:41
	17:02	17:58	18:48	20:40	21:29	22:00	21:47	20:55	19:45	18:37	16:43	16:28
20	08:34	07:44	06:42	06:33	05:39	05:18	05:41	06:29	07:19	08:09	08:04	08:41
	17:03	18:00	18:49	20:42	21:30	22:00	21:45	20:53	19:43	18:35	16:42	16:28
21	08:33	07:42	06:40	06:30	05:37	05:18	05:43	06:30	07:20	08:11	08:05	08:42
	17:05	18:01	18:51	20:44	21:32	22:00	21:44	20:50	19:40	18:33	16:40	16:28
22	08:32	07:40	06:38	06:28	05:36	05:18	05:44	06:32	07:22	08:13	08:07	08:43
	17:07	18:03	18:53	20:45	21:33	22:00	21:43	20:48	19:38	18:31	16:39	16:29
23	08:31	07:38	06:35	06:26	05:35	05:18	05:45	06:33	07:24	08:14	08:09	08:43
	17:08	18:05	18:54	20:47	21:35	22:01	21:42	20:46	19:36	18:29	16:38	16:29
24	08:29	07:36	06:33	06:24	05:33	05:19	05:47	06:35	07:25	08:16	08:10	08:44
	17:10	18:07	18:56	20:49	21:36	22:01	21:40	20:44	19:33	18:27	16:37	16:30
25	08:28	07:34	06:31	06:22	05:32	05:19	05:48	06:37	07:27	08:18	08:12	08:44
	17:12	18:09	18:58	20:50	21:37	22:01	21:39	20:42	19:31	17:25	16:36	16:31
26	08:27	07:32	06:29	06:20	05:31	05:19	05:50	06:38	07:29	08:20	08:14	08:44
	17:14	18:11	18:59	20:52	21:39	22:01	21:38	20:40	19:29	17:23	16:35	16:31
27	08:26	07:29	06:26	06:18	05:30	05:20	05:51	06:40	07:30	08:21	08:15	08:45
	17:15	18:12	19:01	20:54	21:40	22:01	21:36	20:38	19:26	17:21	16:34	16:32
28	08:24	07:27	06:24	06:16	05:29	05:20	05:53	06:42	07:32	08:23	08:17	08:45
	17:17	18:14	19:03	20:55	21:41	22:01	21:35	20:35	19:24	17:19	16:33	16:33
29	08:23		07:22	06:14	05:28	05:21	05:54	06:43	07:33	08:25	08:18	08:45
	17:19		20:05	20:57	21:43	22:00	21:33	20:33	19:22	17:17	16:33	16:34
30	08:21		07:19	06:12	05:27	05:22	05:55	06:45	07:35	08:27	08:20	08:45
	17:21		20:06	20:59	21:44	22:00	21:31	20:31	19:20	17:15	16:32	16:35
31	08:20		07:17		05:26		05:57	06:46		07:29		08:45
	17:23		20:08		21:45		21:30	20:29		17:13		16:36
Potential sun hours	259	278	367	416	485	498	501	453	381	332	267	244
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

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

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

Project:

19065LE slagschaduw nieuwbouwwijk

Licensed user:

Bosch & Van Rijn

Franz-Lisztplantsoen 220

NL-3533 JG Utrecht

+31 6 51 71 04 93

Schreurs / leon@boschenvanrijn.nl

Calculated:

19-Aug-21 10:59 AM/3.4.388

SHADOW - Calendar

Calculation: VKA bovengrens met kantoren 12RD 210819 **Shadow receptor:** BB - Shadow Receptor: 8.0 × 5.0 Azimuth: 0.0° Slope: 0.0° (10944)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [DE BILT]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.48	2.65	3.60	5.24	6.59	6.28	6.20	6.12	4.48	3.32	1.87	1.32

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
385	684	574	504	436	731	797	1,164	1,146	770	577	539	8,307

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:45	08:18	07:25	07:15	06:10	05:25	05:22	05:58	06:48	07:37	07:30	08:21
	16:37	17:24	18:16	20:10	21:00	21:46	22:00	21:28	20:26	19:17	17:11	16:31
2	08:45	08:17	07:23	07:12	06:08	05:24	05:23	06:00	06:50	07:38	07:32	08:23
	16:38	17:26	18:18	20:11	21:02	21:47	22:00	21:27	20:24	19:15	17:09	16:30
3	08:45	08:15	07:21	07:10	06:06	05:23	05:24	06:02	06:51	07:40	07:34	08:24
	16:39	17:28	18:20	20:13	21:04	21:48	21:59	21:25	20:22	19:13	17:08	16:30
4	08:45	08:14	07:19	07:08	06:05	05:23	05:24	06:03	06:53	07:42	07:36	08:25
	16:40	17:30	18:21	20:15	21:05	21:49	21:59	21:23	20:20	19:10	17:06	16:29
5	08:44	08:12	07:16	07:06	06:03	05:22	05:25	06:05	06:54	07:43	07:38	08:27
	16:41	17:32	18:23	20:17	21:07	21:50	21:58	21:22	20:17	19:08	17:04	16:29
6	08:44	08:10	07:14	07:03	06:01	05:21	05:26	06:06	06:56	07:45	07:39	08:28
	16:43	17:34	18:25	20:18	21:09	21:51	21:58	21:20	20:15	19:06	17:02	16:28
7	08:44	08:09	07:12	07:01	05:59	05:21	05:27	06:08	06:58	07:47	07:41	08:29
	16:44	17:36	18:27	20:20	21:10	21:52	21:57	21:18	20:13	19:04	17:01	16:28
8	08:43	08:07	07:10	06:59	05:57	05:20	05:28	06:09	06:59	07:48	07:43	08:30
	16:45	17:37	18:28	20:22	21:12	21:53	21:57	21:16	20:11	19:01	16:59	16:28
9	08:43	08:05	07:07	06:57	05:56	05:20	05:29	06:11	07:01	07:50	07:45	08:32
	16:46	17:39	18:30	20:23	21:14	21:54	21:56	21:14	20:08	18:59	16:57	16:27
10	08:42	08:03	07:05	06:54	05:54	05:19	05:30	06:13	07:03	07:52	07:46	08:33
	16:48	17:41	18:32	20:25	21:15	21:55	21:55	21:12	20:06	18:57	16:56	16:27
11	08:42	08:01	07:03	06:52	05:52	05:19	05:31	06:14	07:04	07:54	07:48	08:34
	16:49	17:43	18:34	20:27	21:17	21:55	21:54	21:11	20:04	18:55	16:54	16:27
12	08:41	08:00	07:01	06:50	05:51	05:19	05:32	06:16	07:06	07:55	07:50	08:35
	16:51	17:45	18:35	20:28	21:18	21:56	21:54	21:09	20:01	18:52	16:53	16:27
13	08:40	07:58	06:58	06:48	05:49	05:18	05:33	06:17	07:07	07:57	07:52	08:36
	16:52	17:47	18:37	20:30	21:20	21:57	21:53	21:07	19:59	18:50	16:51	16:27
14	08:40	07:56	06:56	06:45	05:47	05:18	05:34	06:19	07:09	07:59	07:53	08:37
	16:54	17:49	18:39	20:32	21:21	21:57	21:52	21:05	19:57	18:48	16:50	16:27
15	08:39	07:54	06:54	06:43	05:46	05:18	05:35	06:21	07:11	08:00	07:55	08:38
	16:55	17:50	18:41	20:33	21:23	21:58	21:51	21:03	19:54	18:46	16:48	16:27
16	08:38	07:52	06:52	06:41	05:44	05:18	05:36	06:22	07:12	08:02	07:57	08:39
	16:57	17:52	18:42	20:35	21:25	21:58	21:50	21:01	19:52	18:44	16:47	16:27
17	08:37	07:50	06:49	06:39	05:43	05:18	05:38	06:24	07:14	08:04	07:59	08:39
	16:58	17:54	18:44	20:37	21:26	21:59	21:49	20:59	19:50	18:41	16:45	16:27
18	08:36	07:48	06:47	06:37	05:41	05:18	05:39	06:25	07:15	08:06	08:00	08:40
	17:00	17:56	18:46	20:39	21:28	21:59	21:48	20:57	19:47	18:39	16:44	16:27
19	08:35	07:46	06:45	06:35	05:40	05:18	05:40	06:27	07:17	08:07	08:02	08:41
	17:02	17:58	18:48	20:40	21:29	22:00	21:47	20:55	19:45	18:37	16:43	16:28
20	08:34	07:44	06:42	06:33	05:39	05:18	05:41	06:29	07:19	08:09	08:04	08:41
	17:03	18:00	18:49	20:42	21:30	22:00	21:45	20:53	19:43	18:35	16:42	16:28
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	17:05	18:01	18:51	20:44	21:32	22:00	21:44	20:50	19:40	18:33	16:40	16:28
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	17:07	18:03	18:53	20:45	21:33	22:00	21:43	20:48	19:38	18:31	16:39	16:29
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	17:08	18:05	18:54	20:47	21:35	22:01	21:42	20:46	19:36	18:29	16:38	16:29
24	08:29	07:36	06:33	06:24	05:33	05:19	05:47	06:35	07:25	08:16	08:10	08:44
	17:10	18:07	18:56	20:49	21:36	22:01	21:40	20:44	19:33	18:27	16:37	16:30
25	08:28	07:34	06:31	06:22	05:32	05:19	05:48	06:37	07:27	08:18	08:12	08:44
	17:12	18:09	18:58	20:50	21:37	22:01	21:39	20:42	19:31	17:25	16:36	16:31
26	08:27	07:32	06:29	06:20	05:31	05:19	05:50	06:38	07:29	08:20	08:14	08:44
	17:14	18:11	18:59	20:52	21:39	22:01	21:38	20:40	19:29	17:23	16:35	16:31
27	08:26	07:29	06:26	06:18	05:30	05:20	05:51	06:40	07:30	08:21	08:15	08:45
	17:15	18:12	19:01	20:54	21:40	22:01	21:36	20:38	19:26	17:21	16:34	16:32
28	08:24	07:27	06:24	06:16	05:29	05:20	05:53	06:42	07:32	08:23	08:17	08:45
	17:17	18:14	19:03	20:55	21:41	22:01	21:35	20:35	19:24	17:19	16:33	16:33
29	08:23		07:22	06:14	05:28	05:21	05:54	06:43	07:33	08:25	08:18	08:45
	17:19		20:05	20:57	21:43	22:00	21:33	20:33	19:22	17:17	16:33	16:34
30	08:21		07:19	06:12	05:27	05:22	05:55	06:45	07:35	08:27	08:20	08:45
	17:21		20:06	20:59	21:44	22:00	21:31	20:31	19:20	17:15	16:32	16:35
31	08:20		07:17		05:26		05:57	06:46		07:29		08:45
	17:23		20:08		21:45		21:30	20:29		17:13		16:36
Potential sun hours	259	278	367	416	485	498	501	453	381	332	267	244
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

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

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

19065LE slagschaduw nieuwbouwwijk

Licensed user:

Bosch & Van Rijn

Franz-Lisztplantsoen 220

NL-3533 JG Utrecht

+31 6 51 71 04 93

Schreurs / leon@boschenvanrijn.nl

Calculated:

19-Aug-21 10:59 AM/3.4.388

SHADOW - Calendar

Calculation: VKA bovengrens met kantoren 12RD 210819 **Shadow receptor:** BC - Shadow Receptor: 8.0 × 5.0 Azimuth: 0.0° Slope: 0.0° (10945)
Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) [DE BILT]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1.48 2.65 3.60 5.24 6.59 6.28 6.20 6.12 4.48 3.32 1.87 1.32

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 385 684 574 504 436 731 797 1,164 1,146 770 577 539 8,307

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:45	08:18	07:25	07:15	06:10	05:25	05:22	05:58	06:48	07:37	07:30	08:21
	16:37	17:24	18:16	20:10	21:00	21:46	22:00	21:28	20:26	19:17	17:11	16:31
2	08:45	08:17	07:23	07:12	06:08	05:24	05:23	06:00	06:50	07:38	07:32	08:23
	16:38	17:26	18:18	20:11	21:02	21:47	22:00	21:27	20:24	19:15	17:09	16:30
3	08:45	08:15	07:21	07:10	06:06	05:23	05:24	06:02	06:51	07:40	07:34	08:24
	16:39	17:28	18:20	20:13	21:04	21:48	21:59	21:25	20:22	19:13	17:08	16:30
4	08:45	08:14	07:19	07:08	06:05	05:23	05:24	06:03	06:53	07:42	07:36	08:25
	16:40	17:30	18:21	20:15	21:05	21:49	21:59	21:23	20:20	19:10	17:06	16:29
5	08:44	08:12	07:16	07:06	06:03	05:22	05:25	06:05	06:54	07:43	07:38	08:27
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	16:43	17:34	18:25	20:18	21:09	21:51	21:58	21:20	20:15	19:06	17:02	16:28
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	16:46	17:39	18:30	20:23	21:14	21:54	21:56	21:14	20:08	18:59	16:57	16:27
10	08:42	08:03	07:05	06:54	05:54	05:19	05:30	06:12	07:03	07:52	07:46	08:33
	16:48	17:41	18:32	20:25	21:15	21:55	21:55	21:12	20:06	18:57	16:56	16:27
11	08:42	08:01	07:03	06:52	05:52	05:19	05:31	06:14	07:04	07:54	07:48	08:34
	16:49	17:43	18:34	20:27	21:17	21:55	21:54	21:11	20:04	18:55	16:54	16:27
12	08:41	08:00	07:01	06:50	05:51	05:19	05:32	06:16	07:06	07:55	07:50	08:35
	16:51	17:45	18:35	20:28	21:18	21:56	21:54	21:09	20:01	18:52	16:53	16:27
13	08:40	07:58	06:58	06:48	05:49	05:18	05:33	06:17	07:07	07:57	07:52	08:36
	16:52	17:47	18:37	20:30	21:20	21:57	21:53	21:07	19:59	18:50	16:51	16:27
14	08:40	07:56	06:56	06:45	05:47	05:18	05:34	06:19	07:09	07:59	07:53	08:37
	16:54	17:49	18:39	20:32	21:21	21:57	21:52	21:05	19:57	18:48	16:50	16:27
15	08:39	07:54	06:54	06:43	05:46	05:18	05:35	06:20	07:11	08:00	07:55	08:38
	16:55	17:50	18:41	20:33	21:23	21:58	21:51	21:03	19:54	18:46	16:48	16:27
16	08:38	07:52	06:52	06:41	05:44	05:18	05:36	06:22	07:12	08:02	07:57	08:39
	16:57	17:52	18:42	20:35	21:25	21:58	21:50	21:01	19:52	18:44	16:47	16:27
17	08:37	07:50	06:49	06:39	05:43	05:18	05:38	06:24	07:14	08:04	07:59	08:39
	16:58	17:54	18:44	20:37	21:26	21:59	21:49	20:59	19:50	18:41	16:45	16:27
18	08:36	07:48	06:47	06:37	05:41	05:18	05:39	06:25	07:15	08:06	08:00	08:40
	17:00	17:56	18:46	20:39	21:28	21:59	21:48	20:57	19:47	18:39	16:44	16:27
19	08:35	07:46	06:45	06:35	05:40	05:18	05:40	06:27	07:17	08:07	08:02	08:41
	17:02	17:58	18:48	20:40	21:29	22:00	21:47	20:55	19:45	18:37	16:43	16:28
20	08:34	07:44	06:42	06:32	05:38	05:18	05:41	06:29	07:19	08:09	08:04	08:41
	17:03	18:00	18:49	20:42	21:30	22:00	21:45	20:53	19:43	18:35	16:42	16:28
21	08:33	07:42	06:40	06:30	05:37	05:18	05:43	06:30	07:20	08:11	08:05	08:42
	17:05	18:01	18:51	20:44	21:32	22:00	21:44	20:50	19:40	18:33	16:40	16:28
22	08:32	07:40	06:38	06:28	05:36	05:18	05:44	06:32	07:22	08:13	08:07	08:43
	17:07	18:03	18:53	20:45	21:33	22:00	21:43	20:48	19:38	18:31	16:39	16:29
23	08:31	07:38	06:35	06:26	05:35	05:18	05:45	06:33	07:24	08:14	08:09	08:43
	17:08	18:05	18:54	20:47	21:35	22:01	21:42	20:46	19:36	18:29	16:38	16:29
24	08:29	07:36	06:33	06:24	05:33	05:19	05:47	06:35	07:25	08:16	08:10	08:44
	17:10	18:07	18:56	20:49	21:36	22:01	21:40	20:44	19:33	18:27	16:37	16:30
25	08:28	07:34	06:31	06:22	05:32	05:19	05:48	06:37	07:27	08:18	08:12	08:44
	17:12	18:09	18:58	20:50	21:37	22:01	21:39	20:42	19:31	17:25	16:36	16:31
26	08:27	07:32	06:29	06:20	05:31	05:19	05:50	06:38	07:29	08:20	08:14	08:44
	17:14	18:11	18:59	20:52	21:39	22:01	21:38	20:40	19:29	17:23	16:35	16:31
27	08:26	07:29	06:26	06:18	05:30	05:20	05:51	06:40	07:30	08:21	08:15	08:45
	17:15	18:12	19:01	20:54	21:40	22:01	21:36	20:38	19:26	17:21	16:34	16:32
28	08:24	07:27	06:24	06:16	05:29	05:20	05:52	06:42	07:32	08:23	08:17	08:45
	17:17	18:14	19:03	20:55	21:41	22:01	21:35	20:35	19:24	17:19	16:33	16:33
29	08:23		07:22	06:14	05:28	05:21	05:54	06:43	07:33	08:25	08:18	08:45
	17:19		20:05	20:57	21:43	22:00	21:33	20:33	19:22	17:17	16:33	16:34
30	08:21		07:19	06:12	05:27	05:22	05:55	06:45	07:35	08:27	08:20	08:45
	17:21		20:06	20:59	21:44	22:00	21:31	20:31	19:19	17:15	16:32	16:35
31	08:20		07:17		05:26		05:57	06:46		07:29		08:45
	17:23		20:08		21:45		21:30	20:29		17:13		16:36
Potential sun hours	259	278	367	416	485	498	502	453	381	332	267	244
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

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

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

Project:

19065LE slagschaduw nieuwbouwwijk

Licensed user:

Bosch & Van Rijn

Franz-Lisztplantsoen 220

NL-3533 JG Utrecht

+31 6 51 71 04 93

Schreurs / leon@boschenvanrijn.nl

Calculated:

19-Aug-21 10:59 AM/3.4.388

SHADOW - Calendar

Calculation: VKA bovengrens met kantoren 12RD 210819 **Shadow receptor:** BD - Shadow Receptor: 8.0 × 5.0 Azimuth: 0.0° Slope: 0.0° (10946)
Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) [DE BILT]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1.48 2.65 3.60 5.24 6.59 6.28 6.20 6.12 4.48 3.32 1.87 1.32

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 385 684 574 504 436 731 797 1,164 1,146 770 577 539 8,307

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:45	08:18	07:25	07:15	06:10	05:25	05:22	05:58	06:48	07:37	07:30	08:21
	16:37	17:24	18:16	20:10	21:00	21:46	22:00	21:28	20:26	19:17	17:11	16:31
2	08:45	08:17	07:23	07:12	06:08	05:24	05:23	06:00	06:50	07:38	07:32	08:23
	16:38	17:26	18:18	20:11	21:02	21:47	22:00	21:27	20:24	19:15	17:09	16:30
3	08:45	08:15	07:21	07:10	06:06	05:23	05:24	06:02	06:51	07:40	07:34	08:24
	16:39	17:28	18:20	20:13	21:04	21:48	21:59	21:25	20:22	19:13	17:08	16:30
4	08:45	08:14	07:19	07:08	06:05	05:23	05:24	06:03	06:53	07:42	07:36	08:25
	16:40	17:30	18:21	20:15	21:05	21:49	21:59	21:23	20:20	19:10	17:06	16:29
5	08:44	08:12	07:16	07:06	06:03	05:22	05:25	06:05	06:54	07:43	07:38	08:27
	16:41	17:32	18:23	20:17	21:07	21:50	21:58	21:22	20:17	19:08	17:04	16:29
6	08:44	08:10	07:14	07:03	06:01	05:21	05:26	06:06	06:56	07:45	07:39	08:28
	16:43	17:34	18:25	20:18	21:09	21:51	21:58	21:20	20:15	19:06	17:02	16:28
7	08:44	08:09	07:12	07:01	05:59	05:21	05:27	06:08	06:58	07:47	07:41	08:29
	16:44	17:36	18:27	20:20	21:10	21:52	21:57	21:18	20:13	19:04	17:01	16:28
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	16:45	17:37	18:28	20:22	21:12	21:53	21:57	21:16	20:11	19:01	16:59	16:28
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	16:46	17:39	18:30	20:23	21:14	21:54	21:56	21:14	20:08	18:59	16:57	16:27
10	08:42	08:03	07:05	06:54	05:54	05:19	05:30	06:13	07:03	07:52	07:46	08:33
	16:48	17:41	18:32	20:25	21:15	21:55	21:55	21:12	20:06	18:57	16:56	16:27
11	08:42	08:01	07:03	06:52	05:52	05:19	05:31	06:14	07:04	07:54	07:48	08:34
	16:49	17:43	18:34	20:27	21:17	21:55	21:54	21:11	20:04	18:55	16:54	16:27
12	08:41	08:00	07:01	06:50	05:51	05:19	05:32	06:16	07:06	07:55	07:50	08:35
	16:51	17:45	18:35	20:28	21:18	21:56	21:54	21:09	20:01	18:52	16:53	16:27
13	08:40	07:58	06:58	06:48	05:49	05:18	05:33	06:17	07:07	07:57	07:52	08:36
	16:52	17:47	18:37	20:30	21:20	21:57	21:53	21:07	19:59	18:50	16:51	16:27
14	08:40	07:56	06:56	06:45	05:47	05:18	05:34	06:19	07:09	07:59	07:53	08:37
	16:54	17:49	18:39	20:32	21:21	21:57	21:52	21:05	19:57	18:48	16:50	16:27
15	08:39	07:54	06:54	06:43	05:46	05:18	05:35	06:21	07:11	08:00	07:55	08:38
	16:55	17:50	18:41	20:33	21:23	21:58	21:51	21:03	19:54	18:46	16:48	16:27
16	08:38	07:52	06:52	06:41	05:44	05:18	05:36	06:22	07:12	08:02	07:57	08:39
	16:57	17:52	18:42	20:35	21:25	21:58	21:50	21:01	19:52	18:44	16:47	16:27
17	08:37	07:50	06:49	06:39	05:43	05:18	05:38	06:24	07:14	08:04	07:59	08:39
	16:58	17:54	18:44	20:37	21:26	21:59	21:49	20:59	19:50	18:41	16:45	16:27
18	08:36	07:48	06:47	06:37	05:41	05:18	05:39	06:25	07:15	08:06	08:00	08:40
	17:00	17:56	18:46	20:39	21:28	21:59	21:48	20:57	19:47	18:39	16:44	16:27
19	08:35	07:46	06:45	06:35	05:40	05:18	05:40	06:27	07:17	08:07	08:02	08:41
	17:02	17:58	18:48	20:40	21:29	22:00	21:47	20:55	19:45	18:37	16:43	16:28
20	08:34	07:44	06:42	06:32	05:39	05:18	05:41	06:29	07:19	08:09	08:04	08:41
	17:03	18:00	18:49	20:42	21:30	22:00	21:45	20:53	19:43	18:35	16:42	16:28
21	08:33	07:42	06:40	06:30	05:37	05:18	05:43	06:30	07:20	08:11	08:05	08:42
	17:05	18:01	18:51	20:44	21:32	22:00	21:44	20:50	19:40	18:33	16:40	16:28
22	08:32	07:40	06:38	06:28	05:36	05:18	05:44	06:32	07:22	08:13	08:07	08:43
	17:07	18:03	18:53	20:45	21:33	22:00	21:43	20:48	19:38	18:31	16:39	16:29
23	08:31	07:38	06:35	06:26	05:35	05:18	05:45	06:33	07:24	08:14	08:09	08:43
	17:08	18:05	18:54	20:47	21:35	22:01	21:42	20:46	19:36	18:29	16:38	16:29
24	08:29	07:36	06:33	06:24	05:33	05:19	05:47	06:35	07:25	08:16	08:10	08:44
	17:10	18:07	18:56	20:49	21:36	22:01	21:40	20:44	19:33	18:27	16:37	16:30
25	08:28	07:34	06:31	06:22	05:32	05:19	05:48	06:37	07:27	08:18	08:12	08:44
	17:12	18:09	18:58	20:50	21:37	22:01	21:39	20:42	19:31	17:25	16:36	16:31
26	08:27	07:32	06:29	06:20	05:31	05:19	05:50	06:38	07:29	08:20	08:14	08:44
	17:14	18:11	18:59	20:52	21:39	22:01	21:38	20:40	19:29	17:23	16:35	16:31
27	08:26	07:29	06:26	06:18	05:30	05:20	05:51	06:40	07:30	08:21	08:15	08:45
	17:15	18:12	19:01	20:54	21:40	22:01	21:36	20:38	19:26	17:21	16:34	16:32
28	08:24	07:27	06:24	06:16	05:29	05:20	05:53	06:42	07:32	08:23	08:17	08:45
	17:17	18:14	19:03	20:55	21:41	22:01	21:35	20:35	19:24	17:19	16:33	16:33
29	08:23		07:22	06:14	05:28	05:21	05:54	06:43	07:33	08:25	08:18	08:45
	17:19		20:05	20:57	21:43	22:00	21:33	20:33	19:22	17:17	16:33	16:34
30	08:21		07:19	06:12	05:27	05:22	05:55	06:45	07:35	08:27	08:20	08:45
	17:21		20:06	20:59	21:44	22:00	21:31	20:31	19:20	17:15	16:32	16:35
31	08:20		07:17		05:26		05:57	06:46		07:29		08:45
	17:23		20:08		21:45		21:30	20:29		17:13		16:36
Potential sun hours	259	278	367	416	485	498	501	453	381	332	267	244
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

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

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

Project:

19065LE slagschaduw nieuwbouwwijk

Licensed user:

Bosch & Van Rijn

Franz-Lisztplantsoen 220

NL-3533 JG Utrecht

+31 6 51 71 04 93

Schreurs / leon@boschenvanrijn.nl

Calculated:

19-Aug-21 10:59 AM/3.4.388

SHADOW - Calendar

Calculation: VKA bovengrens met kantoren 12RD 210819 **Shadow receptor:** BE - Shadow Receptor: 8.0×5.0 Azimuth: 0.0° Slope: 0.0° (10947)
Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) [DE BILT]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1.48 2.65 3.60 5.24 6.59 6.28 6.20 6.12 4.48 3.32 1.87 1.32

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 385 684 574 504 436 731 797 1,164 1,146 770 577 539 8,307

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:45	08:18	07:25	07:15	06:10	05:25	05:22	05:58	06:48	07:37	07:30	08:21
	16:37	17:24	18:16	20:10	21:00	21:46	22:00	21:28	20:26	19:17	17:11	16:31
2	08:45	08:17	07:23	07:12	06:08	05:24	05:23	06:00	06:50	07:38	07:32	08:23
	16:38	17:26	18:18	20:11	21:02	21:47	22:00	21:27	20:24	19:15	17:09	16:30
3	08:45	08:15	07:21	07:10	06:06	05:23	05:23	06:02	06:51	07:40	07:34	08:24
	16:39	17:28	18:19	20:13	21:04	21:48	21:59	21:25	20:22	19:13	17:08	16:30
4	08:45	08:14	07:19	07:08	06:04	05:23	05:24	06:03	06:53	07:42	07:36	08:25
	16:40	17:30	18:21	20:15	21:05	21:49	21:59	21:23	20:20	19:10	17:06	16:29
5	08:44	08:12	07:16	07:06	06:03	05:22	05:25	06:05	06:54	07:43	07:37	08:27
	16:41	17:32	18:23	20:16	21:07	21:50	21:58	21:21	20:17	19:08	17:04	16:29
6	08:44	08:10	07:14	07:03	06:01	05:21	05:26	06:06	06:56	07:45	07:39	08:28
	16:43	17:34	18:25	20:18	21:09	21:51	21:58	21:20	20:15	19:06	17:02	16:28
7	08:44	08:09	07:12	07:01	05:59	05:21	05:27	06:08	06:58	07:47	07:41	08:29
	16:44	17:36	18:27	20:20	21:10	21:52	21:57	21:18	20:13	19:03	17:01	16:28
8	08:43	08:07	07:10	06:59	05:57	05:20	05:28	06:09	06:59	07:48	07:43	08:30
	16:45	17:37	18:28	20:22	21:12	21:53	21:57	21:16	20:11	19:01	16:59	16:28
9	08:43	08:05	07:07	06:57	05:56	05:20	05:29	06:11	07:01	07:50	07:45	08:32
	16:46	17:39	18:30	20:23	21:14	21:54	21:56	21:14	20:08	18:59	16:57	16:27
10	08:42	08:03	07:05	06:54	05:54	05:19	05:30	06:12	07:03	07:52	07:46	08:33
	16:48	17:41	18:32	20:25	21:15	21:55	21:55	21:12	20:06	18:57	16:56	16:27
11	08:42	08:01	07:03	06:52	05:52	05:19	05:31	06:14	07:04	07:54	07:48	08:34
	16:49	17:43	18:34	20:27	21:17	21:55	21:54	21:10	20:04	18:55	16:54	16:27
12	08:41	08:00	07:01	06:50	05:50	05:19	05:32	06:16	07:06	07:55	07:50	08:35
	16:51	17:45	18:35	20:28	21:18	21:56	21:54	21:09	20:01	18:52	16:53	16:27
13	08:40	07:58	06:58	06:48	05:49	05:18	05:33	06:17	07:07	07:57	07:52	08:36
	16:52	17:47	18:37	20:30	21:20	21:57	21:53	21:07	19:59	18:50	16:51	16:27
14	08:40	07:56	06:56	06:45	05:47	05:18	05:34	06:19	07:09	07:59	07:53	08:37
	16:54	17:49	18:39	20:32	21:21	21:57	21:52	21:05	19:57	18:48	16:50	16:27
15	08:39	07:54	06:54	06:43	05:46	05:18	05:35	06:20	07:11	08:00	07:55	08:38
	16:55	17:50	18:41	20:33	21:23	21:58	21:51	21:03	19:54	18:46	16:48	16:27
16	08:38	07:52	06:52	06:41	05:44	05:18	05:36	06:22	07:12	08:02	07:57	08:39
	16:57	17:52	18:42	20:35	21:25	21:58	21:50	21:01	19:52	18:44	16:47	16:27
17	08:37	07:50	06:49	06:39	05:43	05:18	05:38	06:24	07:14	08:04	07:59	08:39
	16:58	17:54	18:44	20:37	21:26	21:59	21:49	20:59	19:50	18:41	16:45	16:27
18	08:36	07:48	06:47	06:37	05:41	05:18	05:39	06:25	07:15	08:06	08:00	08:40
	17:00	17:56	18:46	20:39	21:28	21:59	21:48	20:57	19:47	18:39	16:44	16:27
19	08:35	07:46	06:45	06:35	05:40	05:18	05:40	06:27	07:17	08:07	08:02	08:41
	17:02	17:58	18:47	20:40	21:29	22:00	21:47	20:55	19:45	18:37	16:43	16:28
20	08:34	07:44	06:42	06:32	05:38	05:18	05:41	06:29	07:19	08:09	08:04	08:41
	17:03	18:00	18:49	20:42	21:30	22:00	21:45	20:52	19:43	18:35	16:42	16:28
21	08:33	07:42	06:40	06:30	05:37	05:18	05:43	06:30	07:20	08:11	08:05	08:42
	17:05	18:01	18:51	20:44	21:32	22:00	21:44	20:50	19:40	18:33	16:40	16:28
22	08:32	07:40	06:38	06:28	05:36	05:18	05:44	06:32	07:22	08:13	08:07	08:43
	17:07	18:03	18:53	20:45	21:33	22:00	21:43	20:48	19:38	18:31	16:39	16:29
23	08:31	07:38	06:35	06:26	05:35	05:18	05:45	06:33	07:24	08:14	08:09	08:43
	17:08	18:05	18:54	20:47	21:35	22:01	21:42	20:46	19:36	18:29	16:38	16:29
24	08:29	07:36	06:33	06:24	05:33	05:19	05:47	06:35	07:25	08:16	08:10	08:44
	17:10	18:07	18:56	20:49	21:36	22:01	21:40	20:44	19:33	18:27	16:37	16:30
25	08:28	07:34	06:31	06:22	05:32	05:19	05:48	06:37	07:27	08:18	08:12	08:44
	17:12	18:09	18:58	20:50	21:37	22:01	21:39	20:42	19:31	17:25	16:36	16:31
26	08:27	07:32	06:29	06:20	05:31	05:19	05:50	06:38	07:29	08:20	08:14	08:44
	17:14	18:10	18:59	20:52	21:39	22:01	21:37	20:40	19:29	17:23	16:35	16:31
27	08:26	07:29	06:26	06:18	05:30	05:20	05:51	06:40	07:30	08:21	08:15	08:44
	17:15	18:12	19:01	20:54	21:40	22:01	21:36	20:38	19:26	17:21	16:34	16:32
28	08:24	07:27	06:24	06:16	05:29	05:20	05:52	06:41	07:32	08:23	08:17	08:45
	17:17	18:14	19:03	20:55	21:41	22:01	21:35	20:35	19:24	17:19	16:33	16:33
29	08:23		07:22	06:14	05:28	05:21	05:54	06:43	07:33	08:25	08:18	08:45
	17:19		20:05	20:57	21:42	22:00	21:33	20:33	19:22	17:17	16:33	16:34
30	08:21		07:19	06:12	05:27	05:21	05:55	06:45	07:35	08:27	08:20	08:45
	17:21		20:06	20:59	21:44	22:00	21:31	20:31	19:19	17:15	16:32	16:35
31	08:20		07:17		05:26		05:57	06:46		07:29		08:45
	17:23		20:08		21:45		21:30	20:29		17:13		16:36
Potential sun hours	259	278	367	416	485	498	502	453	381	332	267	244
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

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

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

Project:

19065LE slagschaduw nieuwbouwwijk

Licensed user:

Bosch & Van Rijn

Franz-Lisztplantsoen 220

NL-3533 JG Utrecht

+31 6 51 71 04 93

Schreurs / leon@boschenvanrijn.nl

Calculated:

19-Aug-21 10:59 AM/3.4.388

SHADOW - Calendar

Calculation: VKA bovengrens met kantoren 12RD 210819 **Shadow receptor:** BF - Shadow Receptor: 8.0 × 5.0 Azimuth: 0.0° Slope: 0.0° (10948)
Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) [DE BILT]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1.48 2.65 3.60 5.24 6.59 6.28 6.20 6.12 4.48 3.32 1.87 1.32

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 385 684 574 504 436 731 797 1,164 1,146 770 577 539 8,307

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:45	08:19	07:26	07:15	06:10	05:25	05:22	05:59	06:48	07:37	07:31	08:22
	16:37	17:25	18:16	20:10	21:01	21:46	22:00	21:29	20:27	19:18	17:12	16:31
2	08:45	08:17	07:23	07:13	06:09	05:24	05:23	06:00	06:50	07:39	07:33	08:23
	16:38	17:27	18:18	20:12	21:02	21:48	22:00	21:27	20:25	19:15	17:10	16:31
3	08:45	08:16	07:21	07:10	06:07	05:24	05:24	06:02	06:52	07:40	07:34	08:24
	16:39	17:28	18:20	20:13	21:04	21:49	22:00	21:25	20:22	19:13	17:08	16:30
4	08:45	08:14	07:19	07:08	06:05	05:23	05:24	06:03	06:53	07:42	07:36	08:26
	16:40	17:30	18:22	20:15	21:06	21:50	21:59	21:24	20:20	19:11	17:06	16:29
5	08:45	08:12	07:17	07:06	06:03	05:22	05:25	06:05	06:55	07:44	07:38	08:27
	16:42	17:32	18:23	20:17	21:07	21:51	21:59	21:22	20:18	19:08	17:04	16:29
6	08:44	08:11	07:15	07:04	06:01	05:22	05:26	06:06	06:56	07:45	07:40	08:28
	16:43	17:34	18:25	20:19	21:09	21:52	21:58	21:20	20:15	19:06	17:03	16:29
7	08:44	08:09	07:12	07:01	05:59	05:21	05:27	06:08	06:58	07:47	07:41	08:30
	16:44	17:36	18:27	20:20	21:11	21:53	21:58	21:18	20:13	19:04	17:01	16:28
8	08:44	08:07	07:10	06:59	05:58	05:21	05:28	06:10	07:00	07:49	07:43	08:31
	16:45	17:38	18:29	20:22	21:12	21:53	21:57	21:17	20:11	19:02	16:59	16:28
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	16:47	17:40	18:30	20:24	21:14	21:54	21:56	21:15	20:09	18:59	16:58	16:28
10	08:43	08:04	07:06	06:55	05:54	05:20	05:30	06:13	07:03	07:52	07:47	08:33
	16:48	17:41	18:32	20:25	21:16	21:55	21:56	21:13	20:06	18:57	16:56	16:27
11	08:42	08:02	07:03	06:52	05:52	05:19	05:31	06:14	07:04	07:54	07:49	08:34
	16:50	17:43	18:34	20:27	21:17	21:56	21:55	21:11	20:04	18:55	16:54	16:27
12	08:41	08:00	07:01	06:50	05:51	05:19	05:32	06:16	07:06	07:56	07:50	08:35
	16:51	17:45	18:36	20:29	21:19	21:57	21:54	21:09	20:02	18:53	16:53	16:27
13	08:41	07:58	06:59	06:48	05:49	05:19	05:33	06:18	07:08	07:57	07:52	08:36
	16:52	17:47	18:37	20:30	21:20	21:57	21:53	21:07	19:59	18:50	16:51	16:27
14	08:40	07:56	06:56	06:46	05:48	05:18	05:34	06:19	07:09	07:59	07:54	08:37
	16:54	17:49	18:39	20:32	21:22	21:58	21:52	21:05	19:57	18:48	16:50	16:27
15	08:39	07:54	06:54	06:44	05:46	05:18	05:35	06:21	07:11	08:01	07:56	08:38
	16:55	17:51	18:41	20:34	21:23	21:58	21:51	21:03	19:55	18:46	16:48	16:27
16	08:38	07:52	06:52	06:41	05:44	05:18	05:37	06:22	07:13	08:02	07:57	08:39
	16:57	17:53	18:43	20:36	21:25	21:59	21:50	21:01	19:52	18:44	16:47	16:27
17	08:37	07:50	06:50	06:39	05:43	05:18	05:38	06:24	07:14	08:04	07:59	08:40
	16:59	17:54	18:44	20:37	21:26	21:59	21:49	20:59	19:50	18:42	16:46	16:27
18	08:36	07:48	06:47	06:37	05:42	05:18	05:39	06:26	07:16	08:06	08:01	08:41
	17:00	17:56	18:46	20:39	21:28	22:00	21:48	20:57	19:48	18:40	16:44	16:28
19	08:35	07:46	06:45	06:35	05:40	05:18	05:40	06:27	07:17	08:08	08:03	08:41
	17:02	17:58	18:48	20:41	21:29	22:00	21:47	20:55	19:45	18:37	16:43	16:28
20	08:34	07:44	06:43	06:33	05:39	05:18	05:42	06:29	07:19	08:09	08:04	08:42
	17:04	18:00	18:50	20:42	21:31	22:00	21:46	20:53	19:43	18:35	16:42	16:28
21	08:33	07:42	06:40	06:31	05:37	05:18	05:43	06:30	07:21	08:11	08:06	08:42
	17:05	18:02	18:51	20:44	21:32	22:01	21:45	20:51	19:41	18:33	16:41	16:29
22	08:32	07:40	06:38	06:29	05:36	05:18	05:44	06:32	07:22	08:13	08:08	08:43
	17:07	18:04	18:53	20:46	21:34	22:01	21:43	20:49	19:38	18:31	16:40	16:29
23	08:31	07:38	06:36	06:26	05:35	05:19	05:46	06:34	07:24	08:15	08:09	08:44
	17:09	18:05	18:55	20:47	21:35	22:01	21:42	20:47	19:36	18:29	16:38	16:30
24	08:30	07:36	06:33	06:24	05:34	05:19	05:47	06:35	07:26	08:16	08:11	08:44
	17:10	18:07	18:56	20:49	21:36	22:01	21:41	20:44	19:34	18:27	16:37	16:30
25	08:29	07:34	06:31	06:22	05:32	05:19	05:48	06:37	07:27	08:18	08:12	08:44
	17:12	18:09	18:58	20:51	21:38	22:01	21:39	20:42	19:31	17:25	16:36	16:31
26	08:27	07:32	06:29	06:20	05:31	05:20	05:50	06:39	07:29	08:20	08:14	08:45
	17:14	18:11	19:00	20:52	21:39	22:01	21:38	20:40	19:29	17:23	16:35	16:32
27	08:26	07:30	06:27	06:18	05:30	05:20	05:51	06:40	07:30	08:22	08:16	08:45
	17:16	18:13	19:02	20:54	21:40	22:01	21:36	20:38	19:27	17:21	16:34	16:32
28	08:25	07:28	06:24	06:16	05:29	05:21	05:53	06:42	07:32	08:24	08:17	08:45
	17:17	18:14	19:03	20:56	21:42	22:01	21:35	20:36	19:24	17:19	16:34	16:33
29	08:23		07:22	06:14	05:28	05:21	05:54	06:43	07:34	08:25	08:19	08:45
	17:19		20:05	20:57	21:43	22:01	21:33	20:33	19:22	17:17	16:33	16:34
30	08:22		07:20	06:12	05:27	05:22	05:56	06:45	07:35	08:27	08:20	08:45
	17:21		20:07	20:59	21:44	22:01	21:32	20:31	19:20	17:15	16:32	16:35
31	08:20		07:17		05:26		05:57	06:47		07:29		08:45
	17:23		20:08		21:45		21:30	20:29		17:13		16:36
Potential sun hours	259	278	367	416	485	498	502	454	381	332	267	244
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

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

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

Project:

19065LE slagschaduw nieuwbouwwijk

Licensed user:

Bosch & Van Rijn

Franz-Lisztplantsoen 220

NL-3533 JG Utrecht

+31 6 51 71 04 93

Schreurs / leon@boschenvanrijn.nl

Calculated:

19-Aug-21 10:59 AM/3.4.388

SHADOW - Calendar

Calculation: VKA bovengrens met kantoren 12RD 210819 **Shadow receptor:** BG - Shadow Receptor: 8.0 × 5.0 Azimuth: 0.0° Slope: 0.0° (10949)
Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) [DE BILT]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1.48 2.65 3.60 5.24 6.59 6.28 6.20 6.12 4.48 3.32 1.87 1.32

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 385 684 574 504 436 731 797 1,164 1,146 770 577 539 8,307

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:45	08:18	07:25	07:15	06:10	05:25	05:22	05:58	06:48	07:37	07:30	08:21
	16:37	17:24	18:16	20:10	21:00	21:46	22:00	21:28	20:26	19:17	17:11	16:31
2	08:45	08:17	07:23	07:12	06:08	05:24	05:23	06:00	06:50	07:38	07:32	08:23
	16:38	17:26	18:18	20:11	21:02	21:47	22:00	21:27	20:24	19:15	17:09	16:30
3	08:45	08:15	07:21	07:10	06:06	05:23	05:24	06:02	06:51	07:40	07:34	08:24
	16:39	17:28	18:19	20:13	21:04	21:48	21:59	21:25	20:22	19:13	17:08	16:30
4	08:45	08:14	07:19	07:08	06:04	05:23	05:24	06:03	06:53	07:42	07:36	08:25
	16:40	17:30	18:21	20:15	21:05	21:49	21:59	21:23	20:20	19:10	17:06	16:29
5	08:44	08:12	07:16	07:06	06:03	05:22	05:25	06:05	06:54	07:43	07:38	08:27
	16:41	17:32	18:23	20:16	21:07	21:50	21:58	21:21	20:17	19:08	17:04	16:29
6	08:44	08:10	07:14	07:03	06:01	05:21	05:26	06:06	06:56	07:45	07:39	08:28
	16:43	17:34	18:25	20:18	21:09	21:51	21:58	21:20	20:15	19:06	17:02	16:28
7	08:44	08:09	07:12	07:01	05:59	05:21	05:27	06:08	06:58	07:47	07:41	08:29
	16:44	17:36	18:27	20:20	21:10	21:52	21:57	21:18	20:13	19:03	17:01	16:28
8	08:43	08:07	07:10	06:59	05:57	05:20	05:28	06:09	06:59	07:48	07:43	08:30
	16:45	17:37	18:28	20:22	21:12	21:53	21:57	21:16	20:11	19:01	16:59	16:28
9	08:43	08:05	07:07	06:57	05:56	05:20	05:29	06:11	07:01	07:50	07:45	08:32
	16:46	17:39	18:30	20:23	21:14	21:54	21:56	21:14	20:08	18:59	16:57	16:27
10	08:42	08:03	07:05	06:54	05:54	05:19	05:30	06:12	07:03	07:52	07:46	08:33
	16:48	17:41	18:32	20:25	21:15	21:55	21:55	21:12	20:06	18:57	16:56	16:27
11	08:42	08:01	07:03	06:52	05:52	05:19	05:31	06:14	07:04	07:54	07:48	08:34
	16:49	17:43	18:34	20:27	21:17	21:55	21:54	21:11	20:04	18:55	16:54	16:27
12	08:41	08:00	07:01	06:50	05:51	05:19	05:32	06:16	07:06	07:55	07:50	08:35
	16:51	17:45	18:35	20:28	21:18	21:56	21:54	21:09	20:01	18:52	16:53	16:27
13	08:40	07:58	06:58	06:48	05:49	05:18	05:33	06:17	07:07	07:57	07:52	08:36
	16:52	17:47	18:37	20:30	21:20	21:57	21:53	21:07	19:59	18:50	16:51	16:27
14	08:40	07:56	06:56	06:45	05:47	05:18	05:34	06:19	07:09	07:59	07:53	08:37
	16:54	17:49	18:39	20:32	21:21	21:57	21:52	21:05	19:57	18:48	16:50	16:27
15	08:39	07:54	06:54	06:43	05:46	05:18	05:35	06:20	07:11	08:00	07:55	08:38
	16:55	17:50	18:41	20:33	21:23	21:58	21:51	21:03	19:54	18:46	16:48	16:27
16	08:38	07:52	06:52	06:41	05:44	05:18	05:36	06:22	07:12	08:02	07:57	08:39
	16:57	17:52	18:42	20:35	21:25	21:58	21:50	21:01	19:52	18:44	16:47	16:27
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	16:58	17:54	18:44	20:37	21:26	21:59	21:49	20:59	19:50	18:41	16:45	16:27
18	08:36	07:48	06:47	06:37	05:41	05:18	05:39	06:25	07:15	08:06	08:00	08:40
	17:00	17:56	18:46	20:39	21:28	21:59	21:48	20:57	19:47	18:39	16:44	16:27
19	08:35	07:46	06:45	06:35	05:40	05:18	05:40	06:27	07:17	08:07	08:02	08:41
	17:02	17:58	18:48	20:40	21:29	22:00	21:47	20:55	19:45	18:37	16:43	16:28
20	08:34	07:44	06:42	06:32	05:38	05:18	05:41	06:29	07:19	08:09	08:04	08:41
	17:03	18:00	18:49	20:42	21:30	22:00	21:45	20:52	19:43	18:35	16:42	16:28
21	08:33	07:42	06:40	06:30	05:37	05:18	05:43	06:30	07:20	08:11	08:05	08:42
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25	08:28	07:34	06:31	06:22	05:32	05:19	05:48	06:37	07:27	08:18	08:12	08:44
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27	08:26	07:29	06:26	06:18	05:30	05:20	05:51	06:40	07:30	08:21	08:15	08:45
	17:15	18:12	19:01	20:54	21:40	22:01	21:36	20:38	19:26	17:21	16:34	16:32
28	08:24	07:27	06:24	06:16	05:29	05:20	05:52	06:41	07:32	08:23	08:17	08:45
	17:17	18:14	19:03	20:55	21:41	22:01	21:35	20:35	19:24	17:19	16:33	16:33
29	08:23		07:22	06:14	05:28	05:21	05:54	06:43	07:33	08:25	08:18	08:45
	17:19		20:05	20:57	21:43	22:00	21:33	20:33	19:22	17:17	16:33	16:34
30	08:21		07:19	06:12	05:27	05:21	05:55	06:45	07:35	08:27	08:20	08:45
	17:21		20:06	20:59	21:44	22:00	21:31	20:31	19:19	17:15	16:32	16:35
31	08:20		07:17		05:26		05:57	06:46		07:29		08:45
	17:23		20:08		21:45		21:30	20:29		17:13		16:36
Potential sun hours	259	278	367	416	485	498	502	453	381	332	267	244
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

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

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

Project:

19065LE slagschaduw nieuwbouwwijk

Licensed user:

Bosch & Van Rijn

Franz-Lisztplantsoen 220

NL-3533 JG Utrecht

+31 6 51 71 04 93

Schreurs / leon@boschenvanrijn.nl

Calculated:

19-Aug-21 10:59 AM/3.4.388

SHADOW - Calendar

Calculation: VKA bovengrens met kantoren 12RD 210819 **Shadow receptor:** BH - Shadow Receptor: 8.0 × 5.0 Azimuth: 0.0° Slope: 0.0° (10950)
Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) [DE BILT]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1.48 2.65 3.60 5.24 6.59 6.28 6.20 6.12 4.48 3.32 1.87 1.32

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 385 684 574 504 436 731 797 1,164 1,146 770 577 539 8,307

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:45	08:19	07:26	07:15	06:10	05:25	05:22	05:59	06:48	07:37	07:31	08:22
	16:37	17:25	18:16	20:10	21:01	21:46	22:00	21:29	20:27	19:18	17:12	16:31
2	08:45	08:17	07:23	07:13	06:09	05:24	05:23	06:00	06:50	07:39	07:33	08:23
	16:38	17:27	18:18	20:12	21:02	21:48	22:00	21:27	20:25	19:15	17:10	16:31
3	08:45	08:16	07:21	07:10	06:07	05:24	05:24	06:02	06:52	07:40	07:34	08:24
	16:39	17:28	18:20	20:13	21:04	21:49	22:00	21:25	20:22	19:13	17:08	16:30
4	08:45	08:14	07:19	07:08	06:05	05:23	05:24	06:03	06:53	07:42	07:36	08:26
	16:40	17:30	18:22	20:15	21:06	21:50	21:59	21:24	20:20	19:11	17:06	16:30
5	08:45	08:12	07:17	07:06	06:03	05:22	05:25	06:05	06:55	07:44	07:38	08:27
	16:42	17:32	18:23	20:17	21:07	21:51	21:59	21:22	20:18	19:08	17:04	16:29
6	08:44	08:11	07:15	07:04	06:01	05:22	05:26	06:06	06:56	07:45	07:40	08:28
	16:43	17:34	18:25	20:19	21:09	21:52	21:58	21:20	20:15	19:06	17:03	16:29
7	08:44	08:09	07:12	07:01	05:59	05:21	05:27	06:08	06:58	07:47	07:41	08:30
	16:44	17:36	18:27	20:20	21:11	21:53	21:58	21:18	20:13	19:04	17:01	16:28
8	08:44	08:07	07:10	06:59	05:58	05:21	05:28	06:10	07:00	07:49	07:43	08:31
	16:45	17:38	18:29	20:22	21:12	21:53	21:57	21:17	20:11	19:02	16:59	16:28
9	08:43	08:05	07:08	06:57	05:56	05:20	05:29	06:11	07:01	07:51	07:45	08:32
	16:47	17:40	18:30	20:24	21:14	21:54	21:56	21:15	20:09	18:59	16:58	16:28
10	08:43	08:04	07:06	06:55	05:54	05:20	05:30	06:13	07:03	07:52	07:47	08:33
	16:48	17:41	18:32	20:25	21:16	21:55	21:56	21:13	20:06	18:57	16:56	16:27
11	08:42	08:02	07:03	06:52	05:52	05:19	05:31	06:14	07:04	07:54	07:49	08:34
	16:50	17:43	18:34	20:27	21:17	21:56	21:55	21:11	20:04	18:55	16:54	16:27
12	08:41	08:00	07:01	06:50	05:51	05:19	05:32	06:16	07:06	07:56	07:50	08:35
	16:51	17:45	18:36	20:29	21:19	21:57	21:54	21:09	20:02	18:53	16:53	16:27
13	08:41	07:58	06:59	06:48	05:49	05:19	05:33	06:18	07:08	07:57	07:52	08:36
	16:52	17:47	18:37	20:30	21:20	21:57	21:53	21:07	19:59	18:50	16:51	16:27
14	08:40	07:56	06:56	06:46	05:48	05:18	05:34	06:19	07:09	07:59	07:54	08:37
	16:54	17:49	18:39	20:32	21:22	21:58	21:52	21:05	19:57	18:48	16:50	16:27
15	08:39	07:54	06:54	06:44	05:46	05:18	05:35	06:21	07:11	08:01	07:56	08:38
	16:55	17:51	18:41	20:34	21:23	21:58	21:51	21:03	19:55	18:46	16:48	16:27
16	08:38	07:52	06:52	06:41	05:44	05:18	05:37	06:22	07:13	08:02	07:57	08:39
	16:57	17:53	18:43	20:36	21:25	21:59	21:50	21:01	19:52	18:44	16:47	16:27
17	08:37	07:50	06:50	06:39	05:43	05:18	05:38	06:24	07:14	08:04	07:59	08:40
	16:59	17:54	18:44	20:37	21:26	21:59	21:49	20:59	19:50	18:42	16:46	16:27
18	08:36	07:48	06:47	06:37	05:42	05:18	05:39	06:26	07:16	08:06	08:01	08:41
	17:00	17:56	18:46	20:39	21:28	22:00	21:48	20:57	19:48	18:40	16:44	16:28
19	08:35	07:46	06:45	06:35	05:40	05:18	05:40	06:27	07:17	08:08	08:03	08:41
	17:02	17:58	18:48	20:41	21:29	22:00	21:47	20:55	19:45	18:37	16:43	16:28
20	08:34	07:44	06:43	06:33	05:39	05:18	05:42	06:29	07:19	08:09	08:04	08:42
	17:04	18:00	18:50	20:42	21:31	22:00	21:46	20:53	19:43	18:35	16:42	16:28
21	08:33	07:42	06:40	06:31	05:37	05:18	05:43	06:30	07:21	08:11	08:06	08:42
	17:05	18:02	18:51	20:44	21:32	22:01	21:45	20:51	19:41	18:33	16:41	16:29
22	08:32	07:40	06:38	06:29	05:36	05:18	05:44	06:32	07:22	08:13	08:08	08:43
	17:07	18:04	18:53	20:46	21:34	22:01	21:43	20:49	19:38	18:31	16:40	16:29
23	08:31	07:38	06:36	06:26	05:35	05:19	05:46	06:34	07:24	08:15	08:09	08:44
	17:09	18:05	18:55	20:47	21:35	22:01	21:42	20:47	19:36	18:29	16:38	16:30
24	08:30	07:36	06:33	06:24	05:34	05:19	05:47	06:35	07:26	08:16	08:11	08:44
	17:10	18:07	18:56	20:49	21:36	22:01	21:41	20:44	19:34	18:27	16:37	16:30
25	08:29	07:34	06:31	06:22	05:32	05:19	05:48	06:37	07:27	08:18	08:12	08:44
	17:12	18:09	18:58	20:51	21:38	22:01	21:39	20:42	19:31	17:25	16:36	16:31
26	08:27	07:32	06:29	06:20	05:31	05:20	05:50	06:39	07:29	08:20	08:14	08:45
	17:14	18:11	19:00	20:52	21:39	22:01	21:38	20:40	19:29	17:23	16:35	16:32
27	08:26	07:30	06:27	06:18	05:30	05:20	05:51	06:40	07:30	08:22	08:16	08:45
	17:16	18:13	19:02	20:54	21:40	22:01	21:36	20:38	19:27	17:21	16:35	16:32
28	08:25	07:28	06:24	06:16	05:29	05:21	05:53	06:42	07:32	08:24	08:17	08:45
	17:17	18:14	19:03	20:56	21:42	22:01	21:35	20:36	19:24	17:19	16:34	16:33
29	08:23		07:22	06:14	05:28	05:21	05:54	06:43	07:34	08:25	08:19	08:45
	17:19		20:05	20:57	21:43	22:01	21:33	20:34	19:22	17:17	16:33	16:34
30	08:22		07:20	06:12	05:27	05:22	05:56	06:45	07:35	08:27	08:20	08:45
	17:21		20:07	20:59	21:44	22:01	21:32	20:31	19:20	17:15	16:32	16:35
31	08:20		07:17		05:26		05:57	06:47		07:29		08:45
	17:23		20:08		21:45		21:30	20:29		17:13		16:36
Potential sun hours	259	278	367	416	485	498	502	454	381	332	267	244
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

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

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

Project:

19065LE slagschaduw nieuwbouwwijk

Licensed user:

Bosch & Van Rijn

Franz-Lisztplantsoen 220

NL-3533 JG Utrecht

+31 6 51 71 04 93

Schreurs / leon@boschenvanrijn.nl

Calculated:

19-Aug-21 10:59 AM/3.4.388

SHADOW - Calendar

Calculation: VKA bovengrens met kantoren 12RD 210819 **Shadow receptor:** BI - Shadow Receptor: 8.0 × 5.0 Azimuth: 0.0° Slope: 0.0° (10951)
Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) [DE BILT]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1.48 2.65 3.60 5.24 6.59 6.28 6.20 6.12 4.48 3.32 1.87 1.32

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 385 684 574 504 436 731 797 1,164 1,146 770 577 539 8,307

	January		February		March	April	May	June	July	August	September	October	November	December	
1	08:45		15:56 (2)	08:19	07:25	07:15	06:10	05:25	05:22	05:58	06:48	07:37	07:31	08:21	15:41 (2)
	16:37	6	16:02 (2)	17:24	18:16	20:10	21:01	21:46	22:00	21:29	20:27	19:17	17:11	16:31	17 15:58 (2)
2	08:45		15:56 (2)	08:17	07:23	07:13	06:08	05:24	05:23	06:00	06:50	07:39	07:32	08:23	15:41 (2)
	16:38	7	16:03 (2)	17:26	18:18	20:12	21:02	21:48	22:00	21:27	20:24	19:15	17:09	16:30	16 15:57 (2)
3	08:45		15:56 (2)	08:16	07:21	07:10	06:06	05:23	05:23	06:01	06:51	07:40	07:34	08:24	15:42 (2)
	16:39	8	16:04 (2)	17:28	18:20	20:13	21:04	21:49	22:00	21:25	20:22	19:13	17:08	16:30	14 15:56 (2)
4	08:45		15:57 (2)	08:14	07:19	07:08	06:04	05:23	05:24	06:03	06:53	07:42	07:36	08:26	15:42 (2)
	16:40	9	16:06 (2)	17:30	18:21	20:15	21:06	21:50	21:59	21:24	20:20	19:10	17:06	16:29	13 15:55 (2)
5	08:45		15:56 (2)	08:12	07:17	07:06	06:03	05:22	05:25	06:05	06:55	07:44	07:38	08:27	15:42 (2)
	16:41	10	16:06 (2)	17:32	18:23	20:17	21:07	21:51	21:59	21:22	20:18	19:08	17:04	16:29	12 15:54 (2)
6	08:44		15:57 (2)	08:11	07:14	07:03	06:01	05:21	05:26	06:06	06:56	07:45	07:40	08:28	15:43 (2)
	16:42	11	16:08 (2)	17:34	18:25	20:18	21:09	21:52	21:58	21:20	20:15	19:06	17:02	16:28	11 15:54 (2)
7	08:44		15:57 (2)	08:09	07:12	07:01	05:59	05:21	05:27	06:08	06:58	07:47	07:41	08:30	15:43 (2)
	16:44	12	16:09 (2)	17:36	18:27	20:20	21:11	21:53	21:58	21:18	20:13	19:04	17:01	16:28	11 15:54 (2)
8	08:44		15:58 (2)	08:07	07:10	06:59	05:57	05:20	05:28	06:09	06:59	07:49	07:43	08:31	15:44 (2)
	16:45	13	16:11 (2)	17:37	18:28	20:22	21:12	21:53	21:57	21:16	20:11	19:01	16:59	16:28	9 15:53 (2)
9	08:43		15:58 (2)	08:05	07:08	06:57	05:56	05:20	05:29	06:11	07:01	07:50	07:45	08:32	15:45 (2)
	16:46	14	16:12 (2)	17:39	18:30	20:23	21:14	21:54	21:56	21:15	20:08	18:59	16:57	16:27	8 15:53 (2)
10	08:43		15:58 (2)	08:04	07:05	06:54	05:54	05:19	05:30	06:12	07:03	07:52	07:47	08:33	15:46 (2)
	16:48	16	16:14 (2)	17:41	18:32	20:25	21:15	21:55	21:56	21:13	20:06	18:57	16:56	16:27	7 15:53 (2)
11	08:42		15:59 (2)	08:02	07:03	06:52	05:52	05:19	05:31	06:14	07:04	07:54	07:49	08:34	15:46 (2)
	16:49	17	16:16 (2)	17:43	18:34	20:27	21:17	21:56	21:55	21:11	20:04	18:55	16:54	16:27	6 15:52 (2)
12	08:41		15:59 (2)	08:00	07:01	06:50	05:50	05:19	05:32	06:16	07:06	07:55	07:50	08:35	15:47 (2)
	16:51	18	16:17 (2)	17:45	18:36	20:29	21:19	21:56	21:54	21:09	20:02	18:52	16:53	16:27	5 15:52 (2)
13	08:41		15:59 (2)	07:58	06:59	06:48	05:49	05:18	05:33	06:17	07:07	07:57	07:52	08:36	15:48 (2)
	16:52	20	16:19 (2)	17:47	18:37	20:30	21:20	21:57	21:53	21:07	19:59	18:50	16:51	16:27	4 15:52 (2)
14	08:40		15:59 (2)	07:56	06:56	06:46	05:47	05:18	05:34	06:19	07:09	07:59	07:54	08:37	15:48 (2)
	16:54	21	16:20 (2)	17:49	18:39	20:32	21:22	21:58	21:52	21:05	19:57	18:48	16:50	16:27	4 15:52 (2)
15	08:39		16:00 (2)	07:54	06:54	06:43	05:46	05:18	05:35	06:20	07:11	08:01	07:56	08:38	15:49 (2)
	16:55	21	16:21 (2)	17:50	18:41	20:34	21:23	21:58	21:51	21:03	19:55	18:46	16:48	16:27	3 15:52 (2)
16	08:38		16:00 (2)	07:52	06:52	06:41	05:44	05:18	05:36	06:22	07:12	08:02	07:57	08:39	15:50 (2)
	16:57	21	16:21 (2)	17:52	18:42	20:35	21:25	21:59	21:50	21:01	19:52	18:44	16:47	16:27	2 15:52 (2)
17	08:37		16:01 (2)	07:50	06:49	06:39	05:43	05:18	05:37	06:24	07:14	08:04	07:59	08:40	15:50 (2)
	16:58	21	16:22 (2)	17:54	18:44	20:37	21:26	21:59	21:49	20:59	19:50	18:41	16:45	16:27	2 15:52 (2)
18	08:36		16:02 (2)	07:48	06:47	06:37	05:41	05:18	05:39	06:25	07:16	08:06	08:01	08:40	15:51 (2)
	17:00	20	16:22 (2)	17:56	18:46	20:39	21:28	22:00	21:48	20:57	19:48	18:39	16:44	9 15:52 (2)	16:27 1 15:52 (2)
19	08:35		16:03 (2)	07:46	06:45	06:35	05:40	05:18	05:40	06:27	07:17	08:08	08:02	15:42 (2)	08:41 15:52 (2)
	17:02	19	16:22 (2)	17:58	18:48	20:40	21:29	22:00	21:47	20:55	19:45	18:37	16:43	12 15:54 (2)	16:28 1 15:53 (2)
20	08:34		16:03 (2)	07:44	06:43	06:33	05:38	05:18	05:41	06:29	07:19	08:09	08:04	15:41 (2)	08:42 15:52 (2)
	17:03	18	16:21 (2)	18:00	18:49	20:42	21:31	22:00	21:46	20:53	19:43	18:35	16:42	14 15:55 (2)	16:28 15:52 (2)
21	08:33		16:04 (2)	07:42	06:40	06:30	05:37	05:18	05:43	06:30	07:20	08:11	08:06	15:40 (2)	08:42 15:52 (2)
	17:05	17	16:21 (2)	18:01	18:51	20:44	21:32	22:01	21:45	20:51	19:41	18:33	16:40	17 15:57 (2)	16:28 15:52 (2)
22	08:32		16:06 (2)	07:40	06:38	06:28	05:36	05:18	05:44	06:32	07:22	08:13	08:07	15:39 (2)	08:43 15:52 (2)
	17:07	14	16:20 (2)	18:03	18:53	20:46	21:34	22:01	21:43	20:49	19:38	18:31	16:39	18 15:57 (2)	16:29 15:52 (2)
23	08:31		16:08 (2)	07:38	06:36	06:26	05:35	05:18	05:45	06:33	07:24	08:15	08:09	15:39 (2)	08:43 15:52 (2)
	17:08	12	16:20 (2)	18:05	18:55	20:47	21:35	22:01	21:42	20:46	19:36	18:29	16:38	19 15:58 (2)	16:29 15:52 (2)
24	08:30		16:09 (2)	07:36	06:33	06:24	05:33	05:19	05:47	06:35	07:25	08:16	08:11	15:39 (2)	08:44 15:54 (2)
	17:10	8	16:17 (2)	18:07	18:56	20:49	21:36	22:01	21:41	20:44	19:34	18:27	16:37	20 15:59 (2)	16:30 1 15:55 (2)
25	08:29			07:34	06:31	06:22	05:32	05:19	05:48	06:37	07:27	08:18	08:12	15:39 (2)	08:44 15:55 (2)
	17:12		18:09	18:58	20:51	21:38	22:01	21:39	20:42	19:31	17:25	16:36	21 16:00 (2)	16:31 1 15:56 (2)	
26	08:27		07:32	06:29	06:20	05:31	05:19	05:50	06:38	07:29	08:20	08:14	15:38 (2)	08:45 15:55 (2)	
	17:14		18:11	19:00	20:52	21:39	22:01	21:38	20:40	19:29	17:23	16:35	21 15:59 (2)	16:31 1 15:56 (2)	
27	08:26		07:30	06:26	06:18	05:30	05:20	05:51	06:40	07:30	08:22	08:16	15:39 (2)	08:45 15:55 (2)	
	17:15		18:12	19:01	20:54	21:40	22:01	21:36	20:38	19:27	17:21	16:34	21 16:00 (2)	16:32 2 15:57 (2)	
28	08:25		07:28	06:24	06:16	05:29	05:20	05:52	06:42	07:32	08:23	08:17	15:39 (2)	08:45 15:55 (2)	
	17:17		18:14	19:03	20:56	21:42	22:01	21:35	20:36	19:24	17:19	16:33	22 16:01 (2)	16:33 3 15:58 (2)	
29	08:23			07:22	06:14	05:28	05:21	05:54	06:43	07:34	08:25	08:19	15:39 (2)	08:45 15:55 (2)	
	17:19			20:05	20:57	21:43	22:01	21:33	20:33	19:22	17:17	16:33	20 15:59 (2)	16:34 4 15:59 (2)	
30	08:22			07:19	06:12	05:27	05:21	05:55	06:45	07:35	08:27	08:20	15:40 (2)	08:45 15:56 (2)	
	17:21			20:06	20:59	21:44	22:01	21:32	20:31	19:20	17:15	16:32	18 15:58 (2)	16:35 4 16:00 (2)	
31	08:20			07:17		05:26		05:57	06:46		07:29		08:45	16:35 5 15:56 (2)	
	17:23			20:08		21:45		21:30	20:29		17:13		16:35	5 16:01 (2)	
Potential sun hours	259		278	367	416	485	499	502	454	381	332	266		244	
Total, worst case	353											232		167	
Sun reduction	0.18											0.21		0.17	
Oper. time red.	0.95											0.95		0.95	
Wind dir. red.	0.67											0.67		0.67	
Total reduction	0.11											0.13		0.11	
Total, real	39											31		18	

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

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

Project:

19065LE slagschaduw nieuwbouwwijk

Licensed user:

Bosch & Van Rijn

Franz-Lisztplantsoen 220

NL-3533 JG Utrecht

+31 6 51 71 04 93

Schreurs / leon@boschenvanrijn.nl

Calculated:

19-Aug-21 10:59 AM/3.4.388

SHADOW - Calendar

Calculation: VKA bovengrens met kantoren 12RD 210819Shadow receptor: BJ - Shadow Receptor: 8.0 × 5.0 Azimuth: 0.0° Slope: 0.0° (10952)
Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) [DE BILT]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1.48 2.65 3.60 5.24 6.59 6.28 6.20 6.12 4.48 3.32 1.87 1.32

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
385 684 574 504 436 731 797 1,164 1,146 770 577 539 8,307

	January		February		March		April		May		June		July		August		September		October		November		December			
1	08:45		15:21 (4)	08:18		07:25	07:15	06:10		05:25	05:22	05:58		06:48	07:37					07:30		08:21		15:09 (4)		
	16:37	31	15:52 (4)	17:24		18:16	20:10	21:01		21:46	22:00	21:28		20:27	19:17					17:11		16:31	28	15:37 (4)		
2	08:45		15:22 (4)	08:17		07:23	07:12	06:08		05:24	05:23	06:00		06:50	07:38					07:32		08:23		15:10 (4)		
	16:38	30	15:52 (4)	17:26		18:18	20:11	21:02		21:47	22:00	21:27		20:24	19:15					17:09		16:30	28	15:38 (4)		
3	08:45		15:23 (4)	08:15		07:21	07:10	06:06		05:23	05:23	06:01		06:51	07:40					07:34		08:24		15:09 (4)		
	16:39	30	15:53 (4)	17:28		18:20	20:13	21:04		21:48	21:59	21:25		20:22	19:13					17:08		16:30	29	15:38 (4)		
4	08:45		15:24 (4)	08:14		07:19	07:08	06:04		05:23	05:24	06:03		06:53	07:42					07:36		08:26		15:10 (4)		
	16:40	30	15:54 (4)	17:30		18:21	20:15	21:06		21:49	21:59	21:23		20:20	19:10					17:06		16:29	29	15:39 (4)		
5	08:45		15:24 (4)	08:12		07:16	07:06	06:03		05:22	05:25	06:05		06:54	07:43					07:38		08:27		15:10 (4)		
	16:41	30	15:54 (4)	17:32		18:23	20:17	21:07		21:50	21:59	21:22		20:18	19:08					17:04		16:29	29	15:39 (4)		
6	08:44		15:25 (4)	08:10		07:14	07:03	06:01		05:21	05:26	06:06		06:56	07:45					07:39		08:28		15:11 (4)		
	16:42	29	15:54 (4)	17:34		18:25	20:18	21:09		21:51	21:58	21:20		20:15	19:06					17:02		16:28	29	15:40 (4)		
7	08:44		15:25 (4)	08:09		07:12	07:01	05:59		05:21	05:27	06:08		06:58	07:47					07:41		08:29		15:11 (4)		
	16:44	29	15:54 (4)	17:36		18:27	20:20	21:10		21:52	21:57	21:18		20:13	19:04					17:01		16:28	30	15:41 (4)		
8	08:43		15:26 (4)	08:07		07:10	06:59	05:57		05:20	05:28	06:09		06:59	07:49					07:43		08:31		15:11 (4)		
	16:45	29	15:55 (4)	17:37		18:28	20:22	21:12		21:53	21:57	21:16		20:11	19:01					16:59		16:27	30	15:41 (4)		
9	08:43		15:26 (4)	08:05		07:08	06:57	05:55		05:20	05:29	06:11		07:01	07:50					07:45		08:32		15:11 (4)		
	16:46	29	15:55 (4)	17:39		18:30	20:23	21:14		21:54	21:56	21:14		20:08	18:59					16:57		16:27	30	15:41 (4)		
10	08:42		15:26 (4)	08:03		07:05	06:54	05:54		05:19	05:30	06:12		07:03	07:52					07:47		08:33		15:12 (4)		
	16:48	29	15:55 (4)	17:41		18:32	20:25	21:15		21:55	21:55	21:13		20:06	18:57					16:56		16:27	30	15:42 (4)		
11	08:42		15:27 (4)	08:02		07:03	06:52	05:52		05:19	05:31	06:14		07:04	07:54					07:48		08:34		15:12 (4)		
	16:49	28	15:55 (4)	17:43		18:34	20:27	21:17		21:56	21:55	21:11		20:04	18:55					16:54		16:27	31	15:43 (4)		
12	08:41		15:28 (4)	08:00		07:01	06:50	05:50		05:19	05:32	06:16		07:06	07:55					07:50		08:35		15:13 (4)		
	16:51	28	15:56 (4)	17:45	2	17:17 (3)	18:35	20:28	21:18	21:56	21:54	21:09	20:01	18:52						16:53		16:27	30	15:43 (4)		
13	08:40		15:29 (4)	07:58		07:14	06:58	06:48	05:49	05:18	05:33	06:17	07:07	07:57						07:52		08:36		15:13 (4)		
	16:52	27	15:56 (4)	17:47	5	17:19 (3)	18:37	20:30	21:20	21:57	21:53	21:07	19:59	18:50						16:51		16:27	31	15:44 (4)		
14	08:40		15:30 (4)	07:56		07:13	06:56	06:45	05:47	05:18	05:34	06:19	07:09	07:59						07:54		08:37		15:14 (4)		
	16:54	25	15:55 (4)	17:49	8	17:21 (3)	18:39	20:32	21:22	21:58	21:52	21:05	19:57	18:48						16:50		16:27	30	15:44 (4)		
15	08:39		15:31 (4)	07:54		07:12	06:54	06:43	05:46	05:18	05:35	06:20	07:11	08:00						07:55		08:38		15:14 (4)		
	16:55	24	15:55 (4)	17:50	11	17:23 (3)	18:41	20:34	21:23	21:58	21:51	21:03	19:54	18:46						16:48		16:27	31	15:45 (4)		
16	08:38		15:32 (4)	07:52		07:11	06:52	06:41	05:44	05:18	05:36	06:22	07:12	08:02						07:57		08:39		15:14 (4)		
	16:57	23	15:55 (4)	17:52	14	17:25 (3)	18:42	20:35	21:25	21:59	21:50	21:01	19:52	18:44						16:47		16:27	30	15:44 (4)		
17	08:37		15:33 (4)	07:50		07:10	06:49	06:39	05:43	05:18	05:37	06:24	07:14	08:04						07:59		08:40		15:15 (4)		
	16:58	22	15:55 (4)	17:54	16	17:26 (3)	18:44	20:37	21:26	21:59	21:49	20:59	19:50	18:41	7	17:56 (3)	16:45			17:56 (3)	16:45		16:27	30	15:45 (4)	
18	08:36		15:34 (4)	07:48		07:10	06:47	06:37	05:41	05:18	05:39	06:25	07:16	08:06						17:46 (3)	08:01		08:40		15:15 (4)	
	17:00	20	15:54 (4)	17:56	18	17:28 (3)	18:46	20:39	21:28	21:59	21:48	20:57	19:47	18:39	13	17:59 (3)	16:44			17:59 (3)	16:44		16:27	31	15:46 (4)	
19	08:35		15:35 (4)	07:46		07:10	06:45	06:35	05:40	05:18	05:40	06:27	07:17	08:07						17:44 (3)	08:02		08:41		15:16 (4)	
	17:02	18	15:53 (4)	17:58	20	17:30 (3)	18:48	20:40	21:29	22:00	21:47	20:55	19:45	18:37	16	18:00 (3)	16:43			17:42 (3)	08:04		16:28	30	15:46 (4)	
20	08:34		15:37 (4)	07:44		07:11	06:42	06:32	05:38	05:18	05:41	06:29	07:19	08:09						17:42 (3)	08:04		16:28	30	15:16 (4)	
	17:03	15	15:52 (4)	18:00	20	17:31 (3)	18:49	20:42	21:31	22:00	21:46	20:53	19:43	18:35	18	18:00 (3)	16:42	3	15:19 (4)	17:41 (3)	08:06		15:15 (4)	16:28	30	15:46 (4)
21	08:33		15:40 (4)	07:42		07:11	06:40	06:30	05:37	05:18	05:43	06:30	07:20	08:11						17:41 (3)	08:06		15:15 (4)	16:28	30	15:17 (4)
	17:05	11	15:51 (4)	18:01	19	17:30 (3)	18:51	20:44	21:32	22:00	21:44	20:51	19:40	18:33	20	18:01 (3)	16:40	11	15:26 (4)	17:41 (3)	08:07		15:13 (4)	16:28	30	15:47 (4)
22	08:32		15:44 (4)	07:40		07:12	06:38	06:28	05:36	05:18	05:44	06:32	07:22	08:13						17:41 (3)	08:07		15:13 (4)	16:28	30	15:17 (4)
	17:07	3	15:47 (4)	18:03	17	17:29 (3)	18:53	20:45	21:33	22:01	21:43	20:48	19:38	18:31	20	18:01 (3)	16:39	15	15:28 (4)	17:41 (3)	08:09		15:12 (4)	16:29	30	15:47 (4)
23	08:31		07:38			07:13	06:36	06:26	05:34	05:18	05:45	06:33	07:24	08:14						17:41 (3)	08:09		15:12 (4)	16:29	30	15:18 (4)
	17:08		18:05	15		17:28 (3)	18:54	20:47	21:35	22:01	21:42	20:46	19:36	18:29	19	18:00 (3)	16:38	18	15:30 (4)	17:40 (3)	08:11		15:11 (4)	16:30	30	15:48 (4)
24	08:30		07:36			07:16	06:33	06:24	05:33	05:19	05:47	06:35	07:25	08:16						17:40 (3)	08:11		15:11 (4)	16:30	30	15:18 (4)
	17:10		18:07	11		17:27 (3)	18:56	20:49	21:36	22:01	21:40	20:44	19:33	18:27	18	17:58 (3)	16:37	20	15:31 (4)	17:40 (3)	08:12		15:11 (4)	16:30	30	15:48 (4)
25	08:28		07:34			07:18	06:31	06:22	05:32	05:19	05:48	06:37	07:27	08:18						16:41 (3)	08:12		15:10 (4)	16:30	30	15:18 (4)
	17:12		18:09	4		17:22 (3)	18:58	20:50	21:38	22:01	21:39	20:42	19:31	17:25	15	16:56 (3)	16:36	22	15:33 (4)	17:40 (3)	08:14		15:10 (4)	16:30	30	15:48 (4)
26	08:27		07:32			06:29	06:20	05:31	05:19	05:50	06:38	07:29	08:20							16:41 (3)	08:14		15:10 (4)	16:30	30	15:20 (4)
	17:14		18:11			19:00	20:52	21:39	22:01	21:38	20:40	19:29	17:23	13	16:54 (3)	16:35	23	15:33 (4)		16:54 (3)	16:35	23	15:33 (4)	16:31	30	15:50 (4)
27	08:26		07:30			06:26	06:18	05:30	05:20	05:51	06:40	07:30	08:22							16:42 (3)	08:15		15:10 (4)	16:30	30	15:20 (4)
	17:15		18:12			19:01	20:54	21:40	22:01	21:36	20:38	19:26	17:21	10	16:52 (3)	16:34	24	15:34 (4)		16:42 (3)	08:15					

Project:

19065LE slagschaduw nieuwbouwwijk

Licensed user:

Bosch & Van Rijn

Franz-Lisztplantsoen 220

NL-3533 JG Utrecht

+31 6 51 71 04 93

Schreurs / leon@boschenvanrijn.nl

Calculated:

19-Aug-21 10:59 AM/3.4.388

SHADOW - Calendar

Calculation: VKA bovengrens met kantoren 12RD 210819Shadow receptor: BK - Shadow Receptor: 8.0 × 5.0 Azimuth: 0.0° Slope: 0.0° (10953)
Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) [DE BILT]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1.48 2.65 3.60 5.24 6.59 6.28 6.20 6.12 4.48 3.32 1.87 1.32

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
385 684 574 504 436 731 797 1,164 1,146 770 577 539 8,307

	[January	[February	[March	[April	[May	[June	[July	[August	[September	[October	[November	[December												
1	08:45	15:26 (5)	08:18	15:36 (5)	07:25	17:34 (4)	07:15	06:10	05:25	05:22	05:58	06:48	07:37	18:18 (4)	07:30	08:21	15:09 (5)							
2	16:37	32	15:58 (5)	17:24	34	16:10 (5)	18:16	16	17:50 (4)	20:10	21:00	21:46	22:00	21:28	20:26	19:17	7	18:25 (4)	17:11	16:31	39	15:48 (5)		
3	08:45	15:26 (5)	08:17	15:37 (5)	07:23	17:32 (4)	07:12	06:08	05:24	05:23	06:00	06:50	07:38	18:15 (4)	07:32	08:23	15:10 (5)							
4	16:38	33	15:59 (5)	17:26	32	16:09 (5)	18:18	19	17:51 (4)	20:11	21:02	21:47	22:00	21:27	20:24	19:15	13	18:28 (4)	17:09	16:30	38	15:48 (5)		
5	08:45	15:26 (5)	08:15	15:38 (5)	07:21	17:32 (4)	07:10	06:06	05:23	05:23	06:01	06:51	07:40	18:12 (4)	07:34	08:24	15:10 (5)							
6	16:39	34	16:00 (5)	17:28	30	16:08 (5)	18:19	21	17:53 (4)	20:13	21:04	21:48	21:59	21:25	20:22	19:13	17	18:29 (4)	17:08	16:30	38	15:48 (5)		
7	08:45	15:27 (5)	08:14	15:40 (5)	07:19	17:31 (4)	07:08	06:04	05:23	05:24	06:03	06:53	07:42	18:10 (4)	07:36	08:25	15:11 (5)							
8	16:40	34	16:01 (5)	17:30	26	16:06 (5)	18:21	24	17:55 (4)	20:15	21:05	21:49	21:59	21:23	20:20	19:10	20	18:30 (4)	17:06	14	15:31 (5)	16:29	37	15:48 (5)
9	08:44	15:26 (5)	08:12	15:43 (5)	07:16	17:31 (4)	07:06	06:03	05:22	05:25	06:05	06:54	07:43	18:09 (4)	07:38	08:27	15:12 (5)							
10	16:41	35	16:01 (5)	17:32	23	16:06 (5)	18:23	26	17:57 (4)	20:17	21:07	21:50	21:59	21:22	20:17	19:08	22	18:31 (4)	17:04	20	15:34 (5)	16:29	36	15:48 (5)
11	08:44	15:27 (5)	08:10	15:45 (5)	07:14	17:31 (4)	07:03	06:01	05:21	05:26	06:06	06:56	07:45	18:07 (4)	07:39	08:28	15:13 (5)							
12	16:42	36	16:03 (5)	17:34	19	16:04 (5)	18:25	25	17:56 (4)	20:18	21:09	21:51	21:58	21:20	20:15	19:06	24	18:31 (4)	17:02	24	15:36 (5)	16:28	36	15:49 (5)
13	08:44	15:27 (5)	08:09	15:48 (5)	07:12	17:31 (4)	07:01	05:59	05:21	05:27	06:08	06:58	07:47	18:07 (4)	07:41	08:29	15:13 (5)							
14	16:44	36	16:03 (5)	17:35	13	16:01 (5)	18:27	24	17:55 (4)	20:20	21:10	21:52	21:57	21:18	20:13	19:03	24	18:31 (4)	17:01	27	15:37 (5)	16:28	35	15:48 (5)
15	08:43	15:26 (5)	08:07	15:49 (5)	07:10	17:32 (4)	06:59	05:57	05:20	05:28	06:09	06:59	07:49	18:07 (4)	07:43	08:31	15:14 (5)							
16	16:45	37	16:03 (5)	17:37	18:28	23	17:55 (4)	20:22	21:12	21:53	21:57	21:16	20:11	19:01	25	18:32 (4)	16:59	30	15:39 (5)	16:27	34	15:48 (5)		
17	08:43	15:27 (5)	08:05	15:50 (5)	07:07	17:32 (4)	06:57	05:55	05:20	05:29	06:11	07:01	07:50	18:06 (4)	07:45	08:32	15:14 (5)							
18	16:46	38	16:05 (5)	17:39	18:30	21	17:53 (4)	20:23	21:14	21:54	21:56	21:14	20:08	18:59	26	18:32 (4)	16:57	32	15:40 (5)	16:27	34	15:48 (5)		
19	08:42	15:27 (5)	08:03	15:51 (5)	07:05	17:33 (4)	06:54	05:54	05:19	05:30	06:12	07:03	07:52	18:06 (4)	07:47	08:33	15:15 (5)							
20	16:48	38	16:05 (5)	17:41	18:32	19	17:52 (4)	20:25	21:15	21:55	21:55	21:12	20:06	18:57	23	18:29 (4)	16:56	34	15:41 (5)	16:27	33	15:49 (5)		
21	08:42	15:27 (5)	08:02	15:52 (5)	07:03	17:35 (4)	06:52	05:52	05:19	05:31	06:14	07:04	07:54	18:06 (4)	07:48	08:34	15:16 (5)							
22	16:49	39	16:06 (5)	17:43	18:34	15	17:50 (4)	20:27	21:17	21:56	21:55	21:11	20:04	18:55	21	18:27 (4)	16:54	36	15:42 (5)	16:27	32	15:49 (5)		
23	08:41	15:28 (5)	08:00	15:53 (5)	07:01	17:38 (4)	06:50	05:50	05:19	05:32	06:16	07:06	07:55	18:06 (4)	07:50	08:35	15:17 (5)							
24	16:51	39	16:07 (5)	17:45	18:35	10	17:48 (4)	20:28	21:18	21:56	21:54	21:09	20:01	18:52	18	18:24 (4)	16:53	37	15:42 (5)	16:27	32	15:49 (5)		
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25	17:10	42	16:17 (5)	18:07	18:56	20	18:12 (4)	20																

Project:

19065LE slagschaduw nieuwbouwwijk

Licensed user:

Bosch & Van Rijn

Franz-Lisztplantsoen 220

NL-3533 JG Utrecht

+31 6 51 71 04 93

Schreurs / leon@boschenvanrijn.nl

Calculated:

19-Aug-21 10:59 AM/3.4.388

SHADOW - Calendar

Calculation: VKA bovengrens met kantoren 12RD 210819Shadow receptor: BL - Shadow Receptor: 8.0 × 5.0 Azimuth: 0.0° Slope: 0.0° (10954)
Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) [DE BILT]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1.48 2.65 3.60 5.24 6.59 6.28 6.20 6.12 4.48 3.32 1.87 1.32

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
385 684 574 504 436 731 797 1,164 1,146 770 577 539 8,307

	January	February	March	April	May	June	July	August	September	October	November	December										
1	08:45	08:18	16:36 (5)	07:25	16:20 (5)	07:15	06:10	05:25	05:58	06:48	07:37	07:30	15:49 (5)	08:21								
2	16:37	17:24	8	16:44 (5)	18:16	41	17:01 (5)	20:10	21:00	21:46	22:00	21:28	20:26	19:17	17:11	42	16:31 (5)	16:31				
3	08:45	08:17	16:31 (5)	07:23	16:20 (5)	07:12	06:08	05:24	05:23	06:00	06:50	07:38	07:32	15:50 (5)	08:23							
4	16:38	17:26	17	16:48 (5)	18:18	39	16:59 (5)	20:11	21:02	21:47	22:00	21:27	20:24	19:15	17:09	41	16:31 (5)	16:30				
5	08:45	08:15	16:28 (5)	07:21	16:22 (5)	07:10	06:06	05:23	05:23	06:01	06:51	07:40	07:34	15:51 (5)	08:24							
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9	08:44	08:12	16:25 (5)	07:16	16:26 (5)	07:06	06:03	05:22	05:25	06:05	06:54	07:43	07:38	15:54 (5)	08:27							
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53	08:26	07:29	16:18 (5)	06:26	18:02 (4)	06:18	05:30	05:20	05:51	06:40	07:30	18:49 (4)	07:21	15:47 (5)	08:15				16:07 (5)	08:33		
54	17:15	18:12	45	17:03 (5)	19:01	22	18:24 (4)	20:54	21:40	22:01	21:36	20:38	19:26	10	18:59 (4)	17:21	49	16:36 (5)	16:34		16:07 (5)	08:33
55	08:24	07:27	16:19 (5)	06:24	18:02 (4)	06:16	05:29	05:20	05:52	06:41	07:32	18:51 (4)	07:23	15:46 (5)	08:17				16:07 (5)	08:33		
56	17:17	18:14	43	17:02 (5)	19:03	20	18:22 (4)	20:55	21:41	22:01	21:35	20:35	19:24	6	18:57 (4)	17:19	48	16:3				

Project:

19065LE slagschaduw nieuwbouwwijk

Licensed user:

Bosch & Van Rijn

Franz-Lisztplantsoen 220

NL-3533 JG Utrecht

+31 6 51 71 04 93

Schreurs / leon@boschenvanrijn.nl

Calculated:

19-Aug-21 10:59 AM/3.4.388

SHADOW - Calendar

Calculation: VKA bovengrens met kantoren 12RD 210819 **Shadow receptor:** BM - Shadow Receptor: 8.0 × 5.0 Azimuth: 0.0° Slope: 0.0° (10955)
Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) [DE BILT]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1.48 2.65 3.60 5.24 6.59 6.28 6.20 6.12 4.48 3.32 1.87 1.32

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 385 684 574 504 436 731 797 1,164 1,146 770 577 539 8,307

	January	February	March	April	May	June	July	August	September	October	November	December	
1	08:45	08:19	07:25	07:15	06:10	05:25	05:22	05:58	06:48	07:37	07:31	08:22	
	16:37	17:25	18:16	20:10	21:01	21:46	22:00	21:29	20:27	19:17	17:11	16:31	
2	08:45	08:17	07:23	07:13	06:08	05:24	05:23	06:00	06:50	07:39	07:32	08:23	
	16:38	17:26	18:18	20:12	21:02	21:48	22:00	21:27	20:24	19:15	17:09	16:30	
3	08:45	08:16	07:21	07:10	06:06	05:23	05:23	06:02	06:51	07:40	07:34	08:24	
	16:39	17:28	18:20	20:13	21:04	21:49	22:00	21:25	20:22	19:13	17:08	16:30	
4	08:45	08:14	07:19	07:08	06:05	05:23	05:24	06:03	06:53	07:42	07:36	08:26	
	16:40	17:30	18:21	20:15	21:06	21:50	21:59	21:24	20:20	19:10	17:06	16:29	
5	08:45	08:12	07:17	07:06	06:03	05:22	05:25	06:05	06:55	07:44	07:38	08:27	
	16:41	17:32	18:23	20:17	21:07	21:51	21:59	21:22	20:18	19:08	17:04	16:29	
6	08:44	08:11	07:14	07:03	06:01	05:21	05:26	06:06	06:56	07:45	07:40	08:28	
	16:43	17:34	18:25	20:18	21:09	21:52	21:58	21:20	20:15	19:06	17:02	16:28	
7	08:44	08:09	07:12	07:01	05:59	05:21	05:27	06:08	06:58	07:47	07:41	08:30	
	16:44	17:36	18:27	20:20	21:11	21:53	21:58	21:18	20:13	19:04	17:01	16:28	
8	08:44	08:07	07:10	06:59	05:57	05:20	05:28	06:09	06:59	07:49	07:43	08:31	
	16:45	17:37	18:29	20:22	21:12	21:53	21:57	21:16	20:11	19:01	16:59	16:28	
9	08:43	08:05	07:08	06:57	05:56	05:20	05:29	06:11	07:01	07:50	07:45	08:32	
	16:46	17:39	18:30	20:24	21:14	21:54	21:56	21:15	20:09	18:59	16:57	16:27	
10	08:43	08:04	07:05	06:54	05:54	05:19	05:30	06:13	07:03	07:52	07:47	08:33	
	16:48	17:41	18:32	20:25	21:16	21:55	21:56	21:13	20:06	18:57	16:56	16:27	
11	08:42	08:02	07:03	06:52	05:52	05:19	05:31	06:14	07:04	07:54	07:49	08:34	
	16:49	17:43	18:34	20:27	21:17	21:56	21:55	21:11	20:04	18:55	16:54	16:27	
12	08:41	08:00	07:01	06:50	05:51	05:19	05:32	06:16	07:06	07:56	07:50	08:35	
	16:51	17:45	18:36	20:29	21:19	21:57	21:54	21:09	20:02	18:52	16:53	16:27	
13	08:41	07:58	06:59	06:48	05:49	05:18	05:33	06:17	07:08	07:57	07:52	08:36	
	16:52	17:47	18:37	20:30	21:20	21:57	21:53	21:07	19:59	18:50	16:51	16:27	
14	08:40	07:56	06:56	06:46	05:47	05:18	05:34	06:19	07:09	07:59	07:54	08:37	
	16:54	17:49	18:39	20:32	21:22	21:58	21:52	21:05	19:57	18:48	16:50	16:27	
15	08:39	07:54	06:54	06:43	05:46	05:18	05:35	06:21	07:11	08:01	07:56	08:38	
	16:55	17:50	18:41	20:34	21:23	21:58	21:51	21:03	19:55	18:46	16:48	16:27	
16	08:38	07:52	06:52	06:41	05:44	05:18	05:36	06:22	07:12	08:02	07:57	08:39	
	16:57	17:52	18:43	20:35	21:25	21:59	21:50	21:01	19:52	18:44	16:47	16:27	2 15:11 (1)
17	08:37	07:50	06:49	06:39	05:43	05:18	05:38	06:24	07:14	08:04	07:59	08:40	15:10 (1)
	16:58	17:54	18:44	20:37	21:26	21:59	21:49	20:59	19:50	18:42	16:45	16:27	5 15:15 (1)
18	08:36	07:48	06:47	06:37	05:41	05:18	05:39	06:25	07:16	08:06	08:01	08:41	15:09 (1)
	17:00	17:56	18:46	20:39	21:28	22:00	21:48	20:57	19:48	18:39	16:44	16:27	6 15:15 (1)
19	08:35	07:46	06:45	06:35	05:40	05:18	05:40	06:27	07:17	08:08	08:03	08:41	15:10 (1)
	17:02	17:58	18:48	20:41	21:29	22:00	21:47	20:55	19:45	18:37	16:43	16:28	6 15:16 (1)
20	08:34	07:44	06:43	06:33	05:38	05:18	05:41	06:29	07:19	08:09	08:04	08:42	15:10 (1)
	17:03	18:00	18:49	20:42	21:31	22:00	21:46	20:53	19:43	18:35	16:42	16:28	8 15:18 (1)
21	08:33	07:42	06:40	06:30	05:37	05:18	05:43	06:30	07:21	08:11	08:06	08:43	15:10 (1)
	17:05	18:02	18:51	20:44	21:32	22:01	21:45	20:51	19:41	18:33	16:40	16:28	8 15:18 (1)
22	08:32	07:40	06:38	06:28	05:36	05:18	05:44	06:32	07:22	08:13	08:08	08:43	15:11 (1)
	17:07	18:03	18:53	20:46	21:34	22:01	21:43	20:49	19:38	18:31	16:39	16:29	8 15:19 (1)
23	08:31	07:38	06:36	06:26	05:35	05:18	05:45	06:33	07:24	08:15	08:09	08:44	15:11 (1)
	17:08	18:05	18:55	20:47	21:35	22:01	21:42	20:46	19:36	18:29	16:38	16:29	8 15:19 (1)
24	08:30	07:36	06:33	06:24	05:33	05:19	05:47	06:35	07:25	08:16	08:11	08:44	15:12 (1)
	17:10	18:07	18:56	20:49	21:36	22:01	21:41	20:44	19:34	18:27	16:37	16:30	7 15:19 (1)
25	08:29	07:34	06:31	06:22	05:32	05:19	05:48	06:37	07:27	08:18	08:12	08:44	15:13 (1)
	17:12	18:09	18:58	20:51	21:38	22:01	21:39	20:42	19:31	17:25	16:36	16:31	6 15:19 (1)
26	08:27	07:32	06:29	06:20	05:31	05:19	05:50	06:38	07:29	08:20	08:14	08:45	15:14 (1)
	17:14	18:11	19:00	20:52	21:39	22:01	21:38	20:40	19:29	17:23	16:35	16:31	5 15:19 (1)
27	08:26	07:30	06:26	06:18	05:30	05:20	05:51	06:40	07:30	07:22	08:16	08:45	15:15 (1)
	17:15	18:12	19:01	20:54	21:40	22:01	21:36	20:38	19:27	17:21	16:34	16:32	3 15:18 (1)
28	08:25	07:28	06:24	06:16	05:29	05:20	05:52	06:42	07:32	07:24	08:17	08:45	
	17:17	18:14	19:03	20:56	21:42	22:01	21:35	20:36	19:24	17:19	16:33	16:33	
29	08:23		07:22	06:14	05:28	05:21	05:54	06:43	07:34	07:25	08:19	08:45	
	17:19		20:05	20:57	21:43	22:01	21:33	20:33	19:22	17:17	16:33	16:34	
30	08:22		07:19	06:12	05:27	05:21	05:55	06:45	07:35	07:27	08:20	08:45	
	17:21		20:07	20:59	21:44	22:01	21:32	20:31	19:20	17:15	16:32	16:35	
31	08:20		07:17		05:26		05:57	06:46		07:29		08:45	
	17:23		20:08		21:45		21:30	20:29		17:13		16:35	
Potential sun hours	259	278	367	416	485	499	502	454	381	332	266	244	
Total, worst case													72
Sun reduction													0.17
Oper. time red.													0.95
Wind dir. red.													0.69
Total reduction													0.11
Total, real													8

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

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

Project:

19065LE slagschaduw nieuwbouwwijk

Licensed user:

Bosch & Van Rijn

Franz-Lisztplantsoen 220

NL-3533 JG Utrecht

+31 6 51 71 04 93

Schreurs / leon@boschenvanrijn.nl

Calculated:

19-Aug-21 10:59 AM/3.4.388

SHADOW - Calendar

Calculation: VKA bovengrens met kantoren 12RD 210819 **Shadow receptor:** BN - Shadow Receptor: 8.0 × 5.0 Azimuth: 0.0° Slope: 0.0° (10956)
Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) [DE BILT]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1.48 2.65 3.60 5.24 6.59 6.28 6.20 6.12 4.48 3.32 1.87 1.32

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 385 684 574 504 436 731 797 1,164 1,146 770 577 539 8,307

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:45	08:18	07:25	07:15	06:10	05:25	05:22	05:58	06:48	07:37	07:30	08:21
	16:37	17:24	18:16	20:10	21:00	21:46	22:00	21:28	20:26	19:17	17:11	16:31
2	08:45	08:17	07:23	07:12	06:08	05:24	05:23	06:00	06:50	07:38	07:32	08:23
	16:38	17:26	18:18	20:11	21:02	21:47	22:00	21:27	20:24	19:15	17:09	16:30
3	08:45	08:15	07:21	07:10	06:06	05:23	05:24	06:02	06:51	07:40	07:34	08:24
	16:39	17:28	18:19	20:13	21:04	21:48	21:59	21:25	20:22	19:13	17:08	16:30
4	08:45	08:14	07:19	07:08	06:04	05:23	05:24	06:03	06:53	07:42	07:36	08:25
	16:40	17:30	18:21	20:15	21:05	21:49	21:59	21:23	20:20	19:10	17:06	16:29
5	08:44	08:12	07:16	07:06	06:03	05:22	05:25	06:05	06:54	07:43	07:38	08:27
	16:41	17:32	18:23	20:16	21:07	21:50	21:58	21:22	20:17	19:08	17:04	16:29
6	08:44	08:10	07:14	07:03	06:01	05:21	05:26	06:06	06:56	07:45	07:39	08:28
	16:43	17:34	18:25	20:18	21:09	21:51	21:58	21:20	20:15	19:06	17:02	16:28
7	08:44	08:09	07:12	07:01	05:59	05:21	05:27	06:08	06:58	07:47	07:41	08:29
	16:44	17:36	18:27	20:20	21:10	21:52	21:57	21:18	20:13	19:03	17:01	16:28
8	08:43	08:07	07:10	06:59	05:57	05:20	05:28	06:09	06:59	07:48	07:43	08:30
	16:45	17:37	18:28	20:22	21:12	21:53	21:57	21:16	20:11	19:01	16:59	16:28
9	08:43	08:05	07:07	06:57	05:56	05:20	05:29	06:11	07:01	07:50	07:45	08:32
	16:46	17:39	18:30	20:23	21:14	21:54	21:56	21:14	20:08	18:59	16:57	16:27
10	08:42	08:03	07:05	06:54	05:54	05:19	05:30	06:12	07:03	07:52	07:46	08:33
	16:48	17:41	18:32	20:25	21:15	21:55	21:55	21:12	20:06	18:57	16:56	16:27
11	08:42	08:01	07:03	06:52	05:52	05:19	05:31	06:14	07:04	07:54	07:48	08:34
	16:49	17:43	18:34	20:27	21:17	21:55	21:54	21:11	20:04	18:55	16:54	16:27
12	08:41	08:00	07:01	06:50	05:51	05:19	05:32	06:16	07:06	07:55	07:50	08:35
	16:51	17:45	18:35	20:28	21:18	21:56	21:54	21:09	20:01	18:52	16:53	16:27
13	08:40	07:58	06:58	06:48	05:49	05:18	05:33	06:17	07:07	07:57	07:52	08:36
	16:52	17:47	18:37	20:30	21:20	21:57	21:53	21:07	19:59	18:50	16:51	16:27
14	08:40	07:56	06:56	06:45	05:47	05:18	05:34	06:19	07:09	07:59	07:53	08:37
	16:54	17:49	18:39	20:32	21:21	21:57	21:52	21:05	19:57	18:48	16:50	16:27
15	08:39	07:54	06:54	06:43	05:46	05:18	05:35	06:20	07:11	08:00	07:55	08:38
	16:55	17:50	18:41	20:33	21:23	21:58	21:51	21:03	19:54	18:46	16:48	16:27
16	08:38	07:52	06:52	06:41	05:44	05:18	05:36	06:22	07:12	08:02	07:57	08:39
	16:57	17:52	18:42	20:35	21:25	21:58	21:50	21:01	19:52	18:44	16:47	16:27
17	08:37	07:50	06:49	06:39	05:43	05:18	05:38	06:24	07:14	08:04	07:59	08:39
	16:58	17:54	18:44	20:37	21:26	21:59	21:49	20:59	19:50	18:41	16:45	16:27
18	08:36	07:48	06:47	06:37	05:41	05:18	05:39	06:25	07:15	08:06	08:00	08:40
	17:00	17:56	18:46	20:39	21:28	21:59	21:48	20:57	19:47	18:39	16:44	16:27
19	08:35	07:46	06:45	06:35	05:40	05:18	05:40	06:27	07:17	08:07	08:02	08:41
	17:02	17:58	18:48	20:40	21:29	22:00	21:47	20:55	19:45	18:37	16:43	16:28
20	08:34	07:44	06:42	06:32	05:38	05:18	05:41	06:29	07:19	08:09	08:04	08:41
	17:03	18:00	18:49	20:42	21:30	22:00	21:45	20:52	19:43	18:35	16:42	16:28
21	08:33	07:42	06:40	06:30	05:37	05:18	05:43	06:30	07:20	08:11	08:05	08:42
	17:05	18:01	18:51	20:44	21:32	22:00	21:44	20:50	19:40	18:33	16:40	16:28
22	08:32	07:40	06:38	06:28	05:36	05:18	05:44	06:32	07:22	08:13	08:07	08:43
	17:07	18:03	18:53	20:45	21:33	22:00	21:43	20:48	19:38	18:31	16:39	16:29
23	08:31	07:38	06:35	06:26	05:35	05:18	05:45	06:33	07:24	08:14	08:09	08:43
	17:08	18:05	18:54	20:47	21:35	22:01	21:42	20:46	19:36	18:29	16:38	16:29
24	08:29	07:36	06:33	06:24	05:33	05:19	05:47	06:35	07:25	08:16	08:10	08:44
	17:10	18:07	18:56	20:49	21:36	22:01	21:40	20:44	19:33	18:27	16:37	16:30
25	08:28	07:34	06:31	06:22	05:32	05:19	05:48	06:37	07:27	08:18	08:12	08:44
	17:12	18:09	18:58	20:50	21:37	22:01	21:39	20:42	19:31	17:25	16:36	16:31
26	08:27	07:32	06:29	06:20	05:31	05:19	05:50	06:38	07:29	08:20	08:14	08:44
	17:14	18:11	18:59	20:52	21:39	22:01	21:38	20:40	19:29	17:23	16:35	16:31
27	08:26	07:29	06:26	06:18	05:30	05:20	05:51	06:40	07:30	08:21	08:15	08:45
	17:15	18:12	19:01	20:54	21:40	22:01	21:36	20:38	19:26	17:21	16:34	16:32
28	08:24	07:27	06:24	06:16	05:29	05:20	05:52	06:42	07:32	08:23	08:17	08:45
	17:17	18:14	19:03	20:55	21:41	22:01	21:35	20:35	19:24	17:19	16:33	16:33
29	08:23		07:22	06:14	05:28	05:21	05:54	06:43	07:33	08:25	08:18	08:45
	17:19		20:05	20:57	21:43	22:00	21:33	20:33	19:22	17:17	16:33	16:34
30	08:21		07:19	06:12	05:27	05:21	05:55	06:45	07:35	08:27	08:20	08:45
	17:21		20:06	20:59	21:44	22:00	21:31	20:31	19:19	17:15	16:32	16:35
31	08:20		07:17		05:26		05:57	06:46		07:29		08:45
	17:23		20:08		21:45		21:30	20:29		17:13		16:36
Potential sun hours	259	278	367	416	485	498	502	453	381	332	267	244
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

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

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