Notitie

Datum:	24 februari 2020	Project:	Windpark Karolinapolder in Steenbergen
Uw kenmerk:	-	Locatie:	Dinteloord Steenbergen
Ons kenmerk:	V068475aa.202LIOP.pt	Betreft:	Actualisatie Aanmeldingsnotitie MER
Versie:	01_001		

1 Samenvatting en conclusie

Er is in de omgevingsvergunning een uitvoeringsalternatief vergund dat binnen de range van de in de aanvraag voor de omgevingsvergunning onderzochte alternatieven valt.
De omvang (dimensies) van het project en van het effectgebied zijn afgenomen ten opzichte van de worst case alternatieven die in de Aanmeldingsnotitie zijn beoordeeld. Er is nog maar één alternatief in beeld met een tiphoogte van 215 meter. De locatie van het project is gelijk gebleven. De cumulatie van effecten is niet significant. De beoordeling leidt tot dezelfde conclusie als het collegebesluit van 30 januari 2018. Er is geen sprake van belangrijke nadelige gevolgen voor het milieu. Daarom is er geen noodzaak voor het op stellen van een milieueffectrapport.

2 Inleiding

De Aanmeldingsnotitie voor het windpark Karolinapolder is uitgebracht op 24 januari 2018. Op 30 januari 2018 is door het college van burgemeester en wethouders van de gemeente Steenbergen vastgesteld “dat er geen sprake is van bijzondere omstandigheden waardoor een milieueffectrapportage in het kader van de besluitvorming om een omgevingsvergunning nodig zou zijn. Alle relevante milieuaspecten kunnen voldoende aan de orde komen bij de behandeling van de nog in te dienen aanvraag om een omgevingsvergunning en worden getoetst aan de hierop van toepassing zijnde wet- en regelgeving. Indien noodzakelijk worden mitigerende maatregelen voorgeschreven in de omgevingsvergunning”. Dit besluit was gebaseerd op de Aanmeldingsnotitie en de eigen beoordeling van het college.
Gedeputeerde Staten van Brabant overwegen om ook een besluit te nemen of er sprake is van zodanige bijzondere omstandigheden dat een milieueffectrapportage noodzakelijk is, nu het uitvoeringsalternatief bekend is en er ruim twee jaar verstreken is sinds het besluit van het college van burgemeester en wethouders van de gemeente Steenbergen.

De vraag of er in de huidige situatie mogelijk aanleiding is om een milieueffectrapport op te stellen wordt in deze notitie beantwoord.

3 Ontwikkelingen sinds 24 januari 2018

3.1 Ontwikkeling van het project

Kenmerken en omvang project
Nu er gekozen is voor 215 meter tiphoogte, is het project kleiner - namelijk lager dan 234 meter - geworden in omvang en effecten dan de maximale variant uit de Aanmeldingsnotitie.

Kenmerken van de effecten
Ook de kenmerken van de effecten zijn enigszins afgenomen in omvang van effectgebied en grootte van het effect, ten opzichte van de maximale variant in de Aanmeldingsnotitie.

Alternatieven
Gezien het standpunt en beleid van de gemeente en de voorgestelde maar onrealistisch gebleken en niet uitgewerkte alternatieven, zijn er wel alternatieven uit de Aanmeldingsnotitie afgevallen (die met 234 meter tiphoogte en de lijnopstelling) maar geen redelijkerwijs in beschouwing te nemen alternatieven bijgekomen.

3.2 Ontwikkelingen met betrekking tot de omgeving van het project

Beleid: de Verordening Ruimte is inmiddels vervangen door de Interim Omgevingsverordening van de provincie, maar dat leidt niet tot andere conclusies. Er is geen sprake van strijdigheid met het beleid van de provincie.

Het windpark Piet de Wit is inmiddels definitief vergund, waardoor de cumulatie van effecten van dit windpark met het project nu ook in beschouwing genomen moet worden.

De natuurtoets is inmiddels afgerond en getoetst in diverse procedures. De conclusie dat er geen significante effecten zijn op de instandhoudingsdoelstellingen van het Natura 2000-gebied Volkerak Krammer is onverminderd valide. Per heden (per 01-01-2020) is er daarmee zelfs geen sprake meer van een vergunningplicht Wnb.

4 Verandering van de kenmerken van de milieueffecten sinds 30 januari 2018

4.1 Inleiding

In dit hoofdstuk worden de gevolgen van de veranderingen in het project en de omgeving voor de effecten op het milieu beoordeeld, voor zover deze in enige mate gewijzigd zijn. Voor de hier niet genoemde aspecten is er geen sprake van gewijzigde effecten.

4.2 Geluid en slagschaduw

De effecten van cumulatie met alle omliggende bronnen, waaronder windparken en inclusief de toekomstige situatie van Piet de Wit (VKA Boven), is reeds in beeld gebracht voor de alternatieven in het rapport Geluid en slagschaduw, kenmerk R068475aa.17HF1XP.dv versie 03_001, van 30 januari 2019. De conclusie inzake cumulatie was dat:

- De gecumuleerde geluidbelasting met bestaande windparken ter plaatse van de beschouwde woningen maximaal 47 dB Lden en 41 dB Lnight bedraagt.
- Voor de gecumuleerde geluidbelasting met bestaande andere geluidbronnen geldt dat 14 van de 25 beschouwde woningen binnen dezelfde classificatie blijven als in de bestaande situatie. Woningen die gelegen zijn binnen de directe invloed van wegverkeer en het industrieterrein hebben al een hogere gecumuleerde geluidbelasting. Hier is het effect van het nieuwe windpark minimaal (bijvoorbeeld de woningen aan de Sasdijk). De grootste wijziging vindt plaats bij woningen die gelegen zijn buiten de invloedssfeer van andere geluidbronnen zoals wegverkeer en industrie (woningen Schenkeldijk). Ter plaatse van deze woningen is de nieuw berekende gecumuleerde geluidbelasting echter vergelijkbaar met de gecumuleerde geluidbelasting van de woningen die al in de buurt van bestaande geluidbronnen liggen. Een toename van de cumulatieve geluidbelasting is inherent aan het realiseren van een windpark in een relatief stille agrarische omgeving.

Nu de locatie en tiphoogte van de nieuwe turbines is bepaald in de omgevingsvergunning, is er door LBP|SIGHT een Notitie Aanvulling geluid en slagschaduw Tiphoogte 215 meter (11 februari 2020) opgesteld om de geluid- en slagschaduweffecten van de twee nu op de markt beschikbare turbines met 4,2 resp. 4,5 MW vermogen en 215 meter tiphoogte te berekenen. Dit rapport is toegevoegd als bijlage I van deze notitie.

Uit de rekenresultaten blijkt het volgende:

- De turbines voldoen aan de grenswaarden Lden 47 dB en Lnight 41 dB uit het Activiteitenbesluit. Voor de Lagerwey L136 turbines zijn hiervoor mitigerende maatregelen nodig zoals opgenomen in tabel 4.
- De cumulatieve jaargemiddelde geluidbelasting met bestaande windturbines in de omgeving is niet hoger dan 47 dB Lden en 41 dB Lnight.
- Na cumulatieve geluidbelasting met andere geluidbronnen blijkt dat de twee beschouwde turbines een nagenoeg gelijk effect hebben op de cumulatieve geluidbelasting. 14 van de 25 beschouwde woningen blijven binnen dezelfde classificatie als in de bestaande situatie.
- Voor alle beschouwde turbinetypes geldt dat de slagschaduwnorm wordt overschreden wanneer geen mitigerende maatregelen (stilstandsvoorziening) worden getroffen. Een stilstandvoorziening is noodzakelijk.

De conclusie is dat het uitvoeringsalternatief van het windpark niet leidt tot een toename van geluidbelasting of van hinder door slagschaduw, de effecten blijven gelijk of zijn iets minder. De verandering in effecten leidt daarom niet tot de noodzaak om een milieueffectrapport op te stellen.

4.3 Externe veiligheid

Er is een Notitie Aanvulling externe veiligheid tiphoogte 215 meter (bijlage II) waarin de effecten op de externe veiligheid van het voorkeursalternatief worden beoordeeld. De conclusies wijzigen niet ten opzichte van de Aanmeldingsnotitie, de effecten op externe veiligheid zijn nagenoeg identiek. De verandering in effecten leidt niet tot de noodzaak om een milieueffectrapport op te stellen.

4.4 Landschap

De turbines van het uitvoeringsalternatief zijn lager (215 meter tiphoogte) dan het hoogste alternatief (234 meter) dat is onderzocht in de Aanmeldingsnotitie. De locatie is nagenoeg gelijk. Dit betekent dat het effect op het landschap van het uitvoeringsalternatief kleiner is dan die van het hoogste alternatief.

4.5 Natuur

Anders dan een nieuwe beoordeling van cumulatie (zie paragraaf 5) zijn er voor het aspect natuur geen nieuwe feiten te beschouwen.

5 Cumulatie van milieueffecten

Voor de aspecten geluid is hierboven al geconcludeerd dat de effecten van cumulatie niet wezenlijk anders zijn en niet tot andere conclusies leiden. Er is geen sprake van cumulatieve effecten van slagschaduw, gezien de afstanden tot nabijgelegen windparken.

Voor het aspect natuur is de cumulatie opnieuw beoordeeld. In de natuurtoets (22 augustus 2018) is het windpark Piet de Wit (toekomstige situatie) nog niet meegenomen in de beoordeling van de cumulatie van effecten op de natuur. Dit is alsnog beoordeeld door de ecologen van Bureau Waardenburg. Voor het voorkeursalternatief van Windpark Piet de Wit wordt voor zowel Grauwe Gans als Zwartkopmeeuw een aantal slachtoffers van 0-1 op jaarbasis voor het gehele windpark berekend. Wanneer deze aantallen worden vergeleken met tabel 11.1 van de natuurtoets voor Windpark Karolinapolder dan blijkt dat het cumulatief aantal slachtoffers voor beide soorten ook in dit geval beneden de 1%-mortaliteitsnorm ligt. Hiermee wordt voor deze soorten ook in cumulatie met alle onderzochte windparken, inclusief Windpark Piet de Wit, een effect op het behalen van de instandhoudingsdoelstelling (de regiodoelstelling van de Delta voor Zwartkopmeeuw respectievelijk de instandhoudingsdoelstelling van het Krammer-Volkerak voor Grauwe Gans) met zekerheid uitgesloten.

De realisatie van vier nieuwe windturbines kan leiden tot cumulatieve effecten. Deze effecten zijn echter dusdanig gering dat belangrijke nadelige gevolgen voor de omgeving kunnen worden uitgesloten.

6 Conclusie

Op basis van voorgaande beoordeling is de conclusie dat de beoogde uitvoeringsalternatief voor de vervanging van het bestaande windpark Karolinapolder geen belangrijke negatieve milieu-effecten veroorzaakt die het uitvoeren van een m.e.r.-procedure noodzakelijk maken.

LBP|SIGHT BV

drs. P.D. (Peter) Thoenes

Bijlage I Notitie Aanvulling geluid en slagschaduw tiphoogte 215 meter

Notitie

Datum:	11 februari 2020	Project:	Windpark Karolinapolder
Uw kenmerk:	-	Locatie:	Steenbergen
Ons kenmerk:	V068475aa.201GTPL.dv	Betreft:	Aanvulling geluid en slagschaduw
Versie:	02_002		Tiphoogte 215 m

Inleiding

Door LBP|SIGHT is onderzoek[1] gedaan naar de geluidimmissie en slagschaduwuren vanwege windpark Karolinapolder te Steenbergen. Dit onderzoek vond plaats in het kader van de aanvraag omgevingsvergunning. Hierin is een worst-case turbine onderzocht met een tiphoogte van 234 m. In het besluit omgevingsvergunning van de provincie Noord-Brabant van 29 oktober is een maximale tiphoogte van 215 opgenomen. Om die reden heeft innogy opdracht gegeven om nieuwe berekeningen uit te voeren met deze lagere maximale tiphoogte. In onderhavig onderzoek is een tweetal turbines onderzocht met een maximale tiphoogte van 215 m. Het betreft een aanvulling op het voornoemde onderzoek.

Voor alle informatie rondom het windpark, invoergegevens en rekenmethodiek verwijzen we naar het voornoemde onderzoek.

In dit onderzoek is het volgende opgenomen:
- onderzochte turbines
- resultaten turbinegeluid
- resultaten cumulatie met bestaande windparken
- resultaten cumulatie met andere geluidbronnen
- resultaten slagschaduw

Onderzochte turbines

In tabel 1 zijn de twee onderzochte turbinetypes opgenomen die zich aan de bovenkant van de afmetingbandbreedte bevinden. In de tabel zijn de afmetingen gegeven en de jaargemiddelde geluidemissie. Het betreft potentiele turbines op deze locatie. Deze lijst is niet limitatief.

Tabel 1

Beschouwde turbines

Turbinetype	Rotor [m]	Ashoogte [m]	MW	Max Lw [dB(A)]	L_{den} [dB]	LE dag [dB]	LE avond [dB]	LE nacht [dB]
Vestas V136	136	147	4.2	103,9	108,3	101,2	101,6	102,1
Lagerwey L136	136	147	4.5	106,9	110,7	103,5	104,0	104,4

Een maximale tiphoogte is aangehouden. Met een rotordiameter van 136 m betekent dit een maximale ashoogte van 147 m boven maaiveld. Dit is inclusief eventuele funderingshoogte.

1 1 R068475aa.17hf1xp.dv_03_001_onderzoek geluid en slagschaduw d.d. 30 januari 2019

Voor alle beschouwde turbines is uitgegaan van Serrated Trailing Edge. De berekening van de jaargemiddelde bronsterkte is opgenomen in bijlage II. De invoergegevens van de beschouwde windturbines zijn opgenomen in bijlage IV.

Locatie turbines
Voor de locatie van de turbines is situaties uitgegaan van de clusteropstelling B[2], zoals opgenomen in het besluit omgevingsvergunning van 29 oktober 2019. Voor de volledigheid zijn in onderstaande tabel de gehanteerde coördinaten opgenomen van de vier turbines.

Tabel 2

Coördinaten Windturines

Variant	Clusteropstelling Ø140 m	
WT1	X=83.369,806	Y=407.032,051
WT2	X=83.773,206	Y=406.911,647
WT3	X=84.210,430	Y=407.322,352
WT4	X=83.826,533	Y=407.360,725

Bovenstaande nummering van turbines is aangehouden in dit onderzoek. Deze wijkt af van de nummering zoals aangehouden in het voornoemde onderzoek. De posities zijn hetzelfde.

Resultaten turbinegeluid
De jaargemiddelde geluidbelasting van de genoemde turbinetypes is berekend. Hieruit blijkt het volgende:
- De opstelling met de Vestas V136 4.2 MW opstelling voldoet aan de grenswaarden ter plaatse van alle woningen van derden.
- De opstelling met de Lagerwey L136 turbines overschrijdt zonder mitigerende maatregelen de grenswaarden van L_{den} 47 dB en L_{night} 41 dB met 1 dB ter plaatse van twee woningen van derden.

In tabel 3, alsmede bijlage III, is voor beide turbinetypes de jaargemiddelde geluidbelasting gegeven ter plaatse van de omliggende woningen. Voor de Lagerwey turbine is ook aangegeven wat de jaargemiddelde geluidbelasting bedraagt inclusief mitigerende maatregelen. Deze maatregelen zijn opgenomen in tabel 4.

2 70233717_001A_situatie variant rood Karolinapolder met WT coördinaten 30-09-2019 (2).pdf

Tabel 3

Samenvatting rekenresultaten windturbinegeluid [dB(A)]

			V136 @147 m		L136 @147 m		L136 @147 m Maatregelen	
Naam	Omschrijving	Hoogte	Lnight	Lden	Lnight	Lden	Lnight	Lden
4671BT53_A	Havenweg 53	5	30	36	32	39	32	38
4671BT65_A	Havenweg 65	5	29	36	32	38	31	38
4671CS64_A	Stoofdijk 64	5	33	40	36	42	35	41
4671RB66_A	Stoofdijk 66	5	35	42	38	44	37	43
4671RB94_A	Stoofdijk 94	5	35	41	37	43	36	43
4671RB96_A	Stoofdijk 96	5	36	42	39	45	38	44
4671RB98_A	Stoofdijk 98	5	36	42	39	45	37	44
4671RC100_	Stoofdijk 100	5	35	42	38	44	37	43
4671RC110_	Stoofdijk 110	5	35	41	37	44	36	43
4671RC122_	Stoofdijk 122	5	34	41	37	43	36	42
4671RD5_A	Schenkeldijk 5	5	35	41	37	43	36	43
4671RL5_A	Postbaan 5	5	30	37	33	39	32	39
4671RN1_A	Sasdijk 1	5	35	41	38	44	37	44
4671RN10_A	Sasdijk 10	5	34	40	36	42	36	42
4671RN14_A	Sasdijk 14	5	33	39	35	41	35	41
4671RN2_A	Sasdijk 2	5	30	36	32	38	32	38
4671RN3_A	Sasdijk 3	5	35	41	37	44	37	43
4671RN4_A	Sasdijk 4	5	33	39	36	42	35	42
4671RN6_A	Sasdijk 6	5	33	40	36	42	35	42
4671RN8_A	Sasdijk 8	5	33	40	36	42	36	42
4671TG2_A	Oudlandsedijk 2	5	33	39	36	42	34	41
4671TH2_A	Schenkeldijk 2	5	40	46	**42**	**48**	41	47
4671TH6_A	BW - Schenkeldijk 6	5	42	48	44	51	43	50
4671TH7_A	Schenkeldijk 7	5	39	45	41	47	40	46
4671TH9_A	Schenkeldijk 9	5	39	45	**42**	**48**	40	47

Tabel 4

Benodigde mitigerende maatregelen Lagerwey V136 turbine op 147 m ashoogte (noise-modes)

Turbinetype	Turbine	Dag (07:00 – 19:00 uur)	Avond (19:00 – 23:00 uur)	Nacht (23:00 – 07:00 uur)
Lagerwey V136	1	--	--	Mode 2
	2	--	--	Mode 2
	3	--	--	--
	4	--	--	--

In de figuren in bijlage I zijn de L_{den} 47 dB contouren opgenomen.

Resultaten cumulatie met bestaande windparken

In tabel 5 zijn de rekenresultaten opgenomen van de cumulatie met het bestaande windturbine-geluid, exclusief het bestaande windpark dat wordt vervangen. In de figuren in bijlage I zijn de L_{den} 47 dB contouren gegeven van alle turbines samen in de nieuwe situatie.

Tabel 5

Berekende jaargemiddelde geluidbelasting L_{den} en L_{night} ter plaatse van de omliggende woningen [dB] door de bestaande parken met nieuwe opstellingen voor windpark Karolinapolder (inclusief maatregelen L136 turbine).

	Bestaande windparken met:		V136 @147m		L136 @147m incl maatregelen	
Naam	Omschrijving	Hoogte	Lnight	Lden	Lnight	Lden
4671BT53_A	Havenweg 53	5	34	40	35	41
4671BT65_A	Havenweg 65	5	34	41	35	41
4671CS64_A	Stoofdijk 64	5	35	41	36	42
4671RB66_A	Stoofdijk 66	5	36	42	37	44
4671RB94_A	Stoofdijk 94	5	36	42	37	43
4671RB96_A	Stoofdijk 96	5	37	43	38	44
4671RB98_A	Stoofdijk 98	5	37	43	38	44
4671RC100_	Stoofdijk 100	5	36	42	37	43
4671RC110_	Stoofdijk 110	5	35	42	37	43
4671RC122_	Stoofdijk 122	5	35	41	36	42
4671RD5_A	Schenkeldijk 5	5	35	42	36	43
4671RL5_A	Postbaan 5	5	35	41	36	42
4671RN1_A	Sasdijk 1	5	37	44	39	45
4671RN10_A	Sasdijk 10	5	36	42	37	44
4671RN14_A	Sasdijk 14	5	36	42	37	43
4671RN2_A	Sasdijk 2	5	36	42	36	43
4671RN3_A	Sasdijk 3	5	37	44	39	45
4671RN4_A	Sasdijk 4	5	36	42	37	43
4671RN6_A	Sasdijk 6	5	36	42	37	43
4671RN8_A	Sasdijk 8	5	36	42	37	44
4671TG2_A	Oudlandsedijk 2	5	34	40	35	41
4671TH2_A	Schenkeldijk 2	5	40	46	41	47
4671TH6_A	BW - Schenkeldijk 6	5	42	48	43	50
4671TH7_A	Schenkeldijk 7	5	39	45	40	47
4671TH9_A	Schenkeldijk 9	5	39	46	40	47

Uit de rekenresultaten en geluidcontouren blijkt dat de hoogst berekende jaargemiddelde geluidbelasting, inclusief de bijdrage van de omliggende bestaande parken, 47 dB L_{den} en 41 dB L_{night} bedraagt ter plaatse van de omliggende woningen van derden.

Resultaten cumulatie met andere geluidbronnen

De berekende, gecumuleerde, geluidbelasting is gegeven in tabel 6 en 7. De (Miedema) classificering van de akoestische kwaliteit van de omgeving, met kleurcodes zoals opgenomen in tabel 6, is hierbij toegepast. Voor industriegeluid is het ten oosten gelegen gezoneerde industrieterrein aangehouden[3]. Voor wegverkeer is rekening gehouden met de omliggende bepalende plaatselijke wegen en de A4.

De nieuwe turbines en bestaande turbines in de omgeving zijn meegenomen in de cumulatieberekeningen, waarbij de Lagerwey L136 turbine rekening is gehouden met de opgegeven maatregelen.

3 Door zonebeheerder berekende geluidbelasting ter plaatse van de woningen

Tabel 6

Classificering van de kwaliteit van de akoestische omgeving, inclusief kleurcodering.

Lcum	Classificatie	Kleurcode
<50	goed	
50-55	redelijk	
55-60	matig	
60-65	tamelijk slecht	
65-70	slecht	
>70	zeer slecht	

Tabel 7

De geluidbelasting[4] van de individuele geluidbronnen en de gecumuleerde geluidbelasting [dB en dB(A)]

Toetspunt	Industriegeluid Bestaand	Wegverkeer Bestaand	WP Bestaand Bestaand	Overige WP Bestaand	V136 Nieuw	L136 Nieuw	Lcum Bestaand	Lcum V136	Lcum L136
4671BT53_A - Havenweg 53	44	55	25	38	36	38	56	56	56
4671BT65_A - Havenweg 65	45	62	25	39	36	38	63	63	63
4671CS64_A - Stoofdijk 64	42	52	29	35	40	41	52	53	54
4671RB66_A - Stoofdijk 66	43	43	31	35	42	43	47	51	53
4671RB94_A - Stoofdijk 94	41	51	30	34	41	43	52	53	54
4671RB96_A - Stoofdijk 96	41	41	32	33	42	44	45	51	53
4671RB98_A - Stoofdijk 98	41	42	32	33	42	44	45	51	53
4671RC100_ - Stoofdijk 100	40	48	31	32	42	43	49	52	53
4671RC110_ - Stoofdijk 110	39	50	31	32	41	43	51	52	54
4671RC122_ - Stoofdijk 122	38	47	30	32	41	42	48	51	52
4671RD5_A - Schenkeldijk 5	38	50	31	32	41	42	50	52	53
4671RL5_A - Postbaan 5	50	48	27	40	37	39	54	54	54
4671RN1_A - Sasdijk 1	54	58	34	40	41	44	60	61	61
4671RN10_A - Sasdijk 10	53	60	31	38	40	42	61	61	62
4671RN14_A - Sasdijk 14	56	48	30	39	39	41	58	58	58
4671RN2_A - Sasdijk 2	56	65	26	41	36	38	65	65	65
4671RN3_A - Sasdijk 3	56	61	34	40	41	43	63	63	63
4671RN4_A - Sasdijk 4	53	60	31	38	39	42	61	61	61
4671RN6_A - Sasdijk 6	53	60	31	38	40	42	61	61	61
4671RN8_A - Sasdijk 8	53	60	31	38	40	42	61	61	61
4671TG2_A - Oudlandsedijk 2	37	40	29	31	39	41	43	47	48
4671TH2_A - Schenkeldijk 2	39	40	38	33	46	47	46	56	58
4671TH6_A - BW - Schenkeldijk 6	40	38	40	33	48	50	48	60	62
4671TH7_A - Schenkeldijk 7	37	35	40	34	45	46	47	54	56
4671TH9_A - Schenkeldijk 9	37	35	40	34	45	47	47	55	57

Uit tabel 7 blijkt het volgende voor de Vestas V136 4.2 MW turbine:

- 14 woningen van de 25 woningen blijven binnen dezelfde classificatie als in de bestaande situatie;
- 8 woningen veranderen van de classificatie goed naar redelijk;
- 1 woning verandert van classificatie matig naar tamelijk slecht;
- 2 woningen veranderen van classificatie goed naar matig.

Voor de Lagerwey L136 4.5 MW turbine geldt het volgende:

- 14 woningen van de 25 woningen blijven binnen dezelfde classificatie als in de bestaande situatie;
- 6 woningen veranderen van de classificatie goed naar redelijk;
- 1 woning verandert van classificatie matig naar tamelijk slecht;
- 3 woningen veranderen van classificatie goed naar matig;
- 1 woning verandert van classificatie goed naar tamelijk slecht, dit betreft een bedrijfswoning bij het windpark;

4 Voor Stoofdijk 122 is de geluidbelasting vanwege industrie niet opgegeven door de zonebeheerder. Voor deze woning is dezelfde geluidbelasting voor industrie aangehouden als Schenkeldijk 5. Dit gezien de relatief gelijke ligging ten opzichte van de industrie bronnen.

- woningen die gelegen zijn binnen de directe invloed van wegverkeer en het industrieterrein hebben al een hogere gecumuleerde geluidbelasting. Hier is het effect van het nieuwe windpark minimaal (bijvoorbeeld de woningen aan de Sasdijk);
- woningen die verderaf gelegen zijn van het industrieterrein en wegverkeer en die nabij het nieuwe windpark gelegen zijn, is het effect het grootst (woningen Schenkeldijk). Ter plaatse van deze woningen is de nieuw berekende gecumuleerde geluidbelasting vergelijkbaar met de gecumuleerde geluidbelasting van de woningen die al in de buurt van bestaande geluid-bronnen liggen.

Resultaten slagschaduw

In de figuren in bijlage I is de verwachte 6 uur slagschaduwcontour gegeven van de twee beschouwde turbines, exclusief stilstandvoorziening.

Binnen de slagschaduwcontouren zijn woningen gelegen. Voor deze woningen is berekend of daadwerkelijk sprake is van meer dan 17 dagen met meer dan 20 minuten verwachte slagschaduw. In tabel 8 en 9 zijn de resultaten opgenomen. Voor de hoofdresultaten en invoer van de turbines in het rekenmodel wordt verwezen naar bijlage V.

Tabel 8

Rekenresultaten verwachte slagschaduw ter plaatse van de omliggende woningen – V136 op 147 m

Beoordelingspunt	Verwachte uren per jaar [hh:mm]	Verwacht dagen per jaar >20 min slagschaduw
4671RN6: Sasdijk 6	10:43	15
4671RN2: Sasdijk 2	6:23	9
4671TH9: Schenkeldijk 9	43:58	**42**
4671RL5: Postbaan 5	10:26	**20**
4671RN14: Sasdijk 14	7:23	10
4671RN3: Sasdijk 3	16:06	**19**
4671RN4: Sasdijk 4	10:26	15
4671RN8: Sasdijk 8	10:59	15
4671RN1: Sasdijk 1	16:06	**19**
4671RN10: Sasdijk 10	11:24	16
4671TH7: Schenkeldijk 7	44:48	**42**
4794SM15: 1-Februariweg 15	6:24	14

Tabel 9

Rekenresultaten verwachte slagschaduw ter plaatse van de omliggende woningen – L136 op 147 m

Beoordelingspunt	Verwachte uren per jaar [hh:mm]	Verwacht dagen per jaar >20 min slagschaduw
4671RN6: Sasdijk 6	9:28	14
4671RN2: Sasdijk 2	6:23	9
4671TH9: Schenkeldijk 9	43:58	**42**
4671RL5: Postbaan 5	10:26	**20**
4671RN14: Sasdijk 14	7:23	10
4671RN3: Sasdijk 3	16:06	**19**
4671RN4: Sasdijk 4	9:12	13
4671RN8: Sasdijk 8	9:44	14
4671RN1: Sasdijk 1	16:06	**19**
4671RN10: Sasdijk 10	10:08	15
4671TH7: Schenkeldijk 7	44:48	**42**
4794SM15: 1-Februariweg 15	6:24	14

Uit bovenstaande tabellen blijkt dat de slagschaduwnorm van 17 dagen met meer dan 20 minuten slagschaduw bij meerdere woningen wordt overschreden. De turbines moeten voorzien worden van een stilstandvoorziening zodat voldaan wordt aan de slagschaduwnorm. Door innogy is aangegeven dat in de 'overeenkomst sociale randvoorwaarden' afspraken zijn gemaakt voor extra mitigatie van slagschaduw waarmee slagschaduwhinder nog verder wordt teruggebracht dan de wettelijke norm voorschrijft

Conclusie

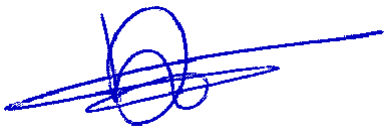
In aanvulling op het LBP|SIGHT-rapport R068475aa.17hf1xp.dv_03_001 van 30 januari 2019 zijn twee aanvullende turbines onderzocht om aan te sluiten bij de vergunde maximale tiphoogte. Dit betreffen de volgende turbinetypes:

- De Vestas V136 4.2 MW turbine met een ashoogte van 147 m.
- De Lagerwey L136 4.5 MW turbine met een ashoogte van 147 m.

Uit de rekenresultaten blijkt het volgende:

- De turbines voldoen aan de grenswaarden L_{den} 47 dB en L_{night} 41 dB uit het Activiteitenbesluit. Voor de Lagerwey L136 turbines zijn hiervoor mitigerende maatregelen nodig zoals opgenomen in tabel 4.
- De cumulatieve jaargemiddelde geluidbelasting met bestaande windturbines in de omgeving is niet hoger dan 47 dB L_{den} en 41 dB L_{night}.
- Na cumulatieve geluidbelasting met andere geluidbronnen blijkt dat de twee beschouwde turbines een nagenoeg gelijk effect hebben op de cumulatieve geluidbelasting. 14 van de 25 beschouwde woningen blijven binnen dezelfde classificatie als in de bestaande situatie.
- Voor alle beschouwde turbinetypes geldt dat de slagschaduwnorm wordt overschreden wanneer geen mitigerende maatregelen (stilstandsvoorziening) worden getroffen. Een stilstandvoorziening is noodzakelijk.

LBP|SIGHT BV

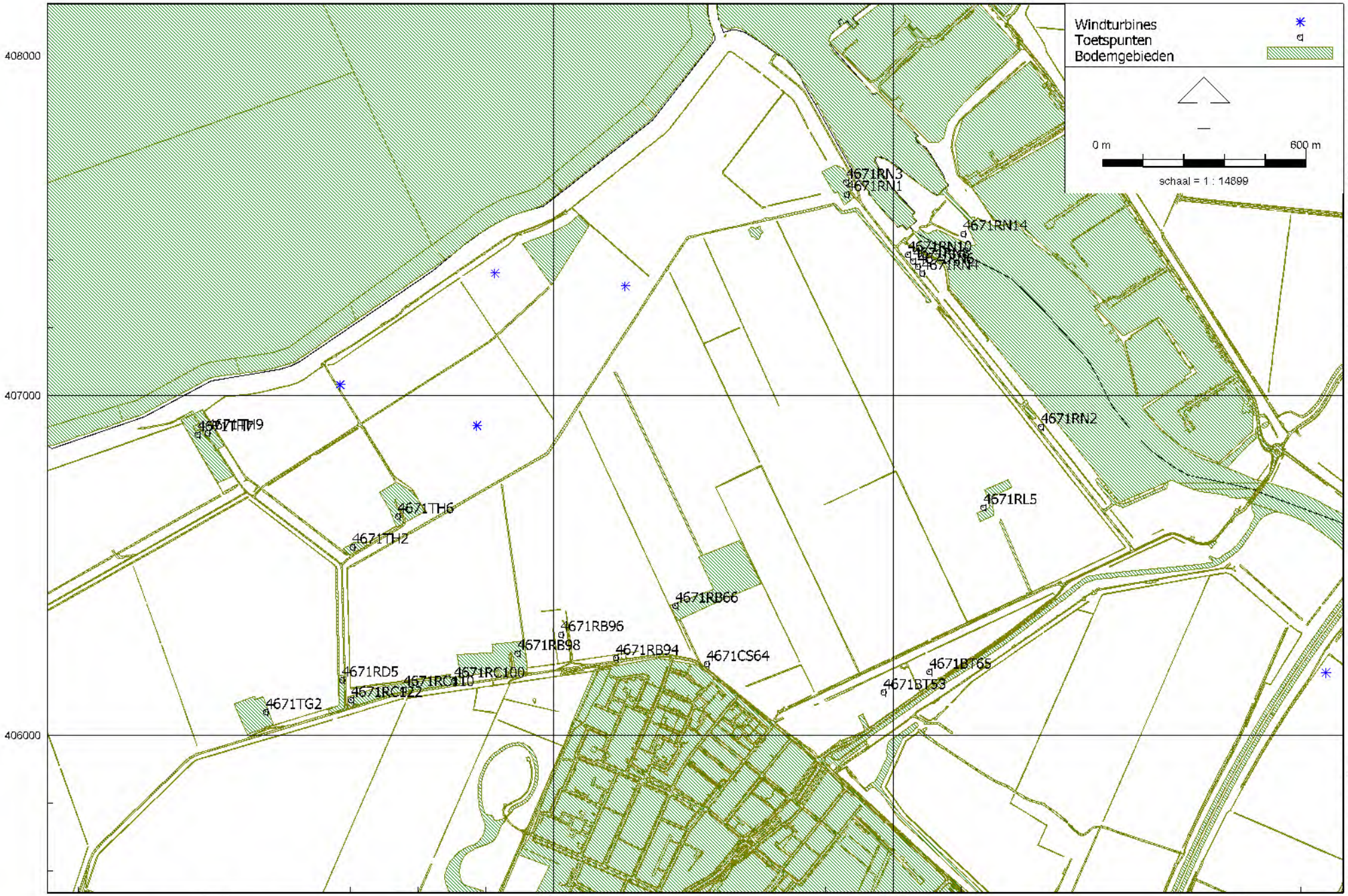


ing. D. (David) Vrolijk

Bijlage I Figuren

Rekenmodel met alle turbines

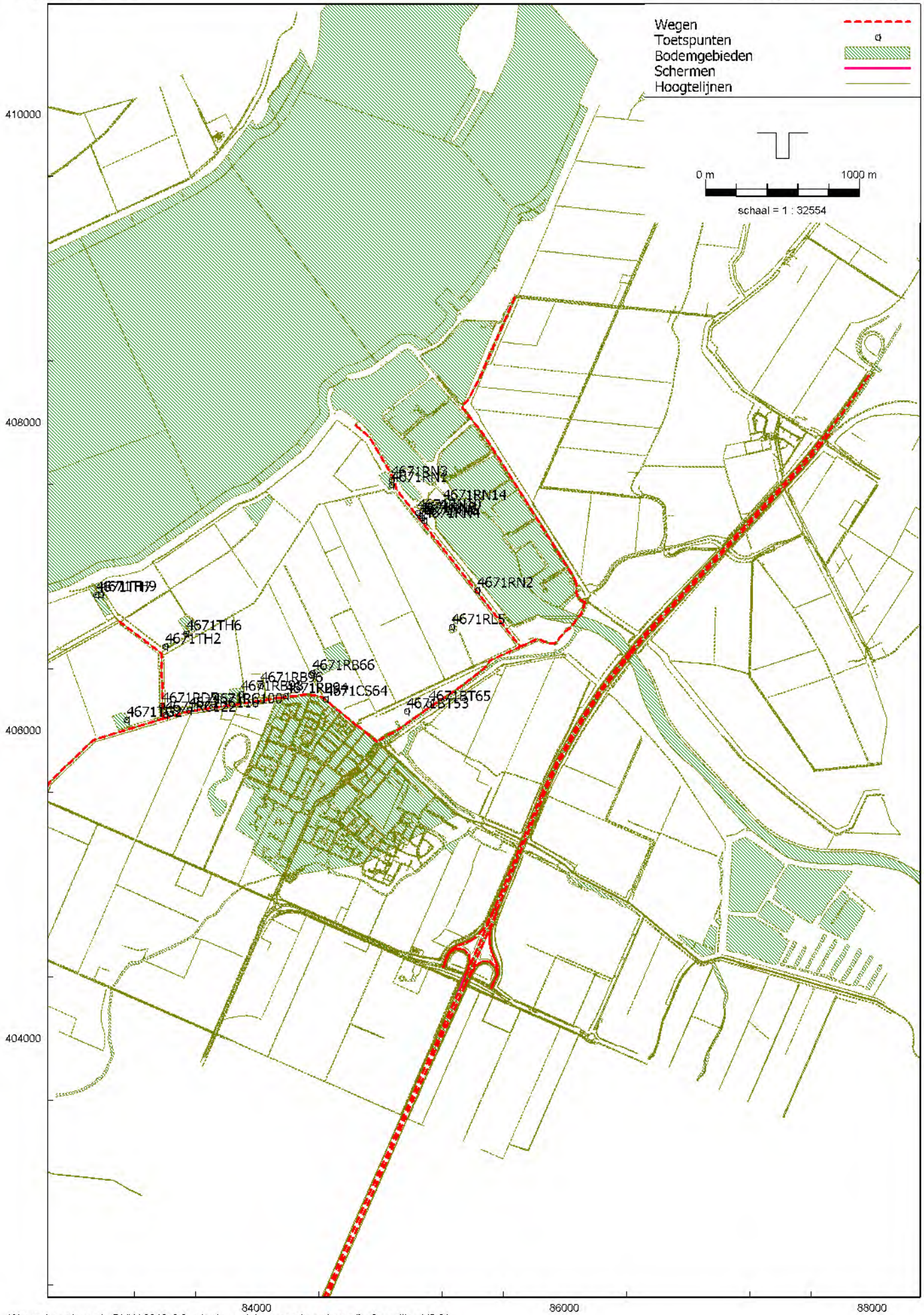
LBP|SIGHT - Nieuwegein

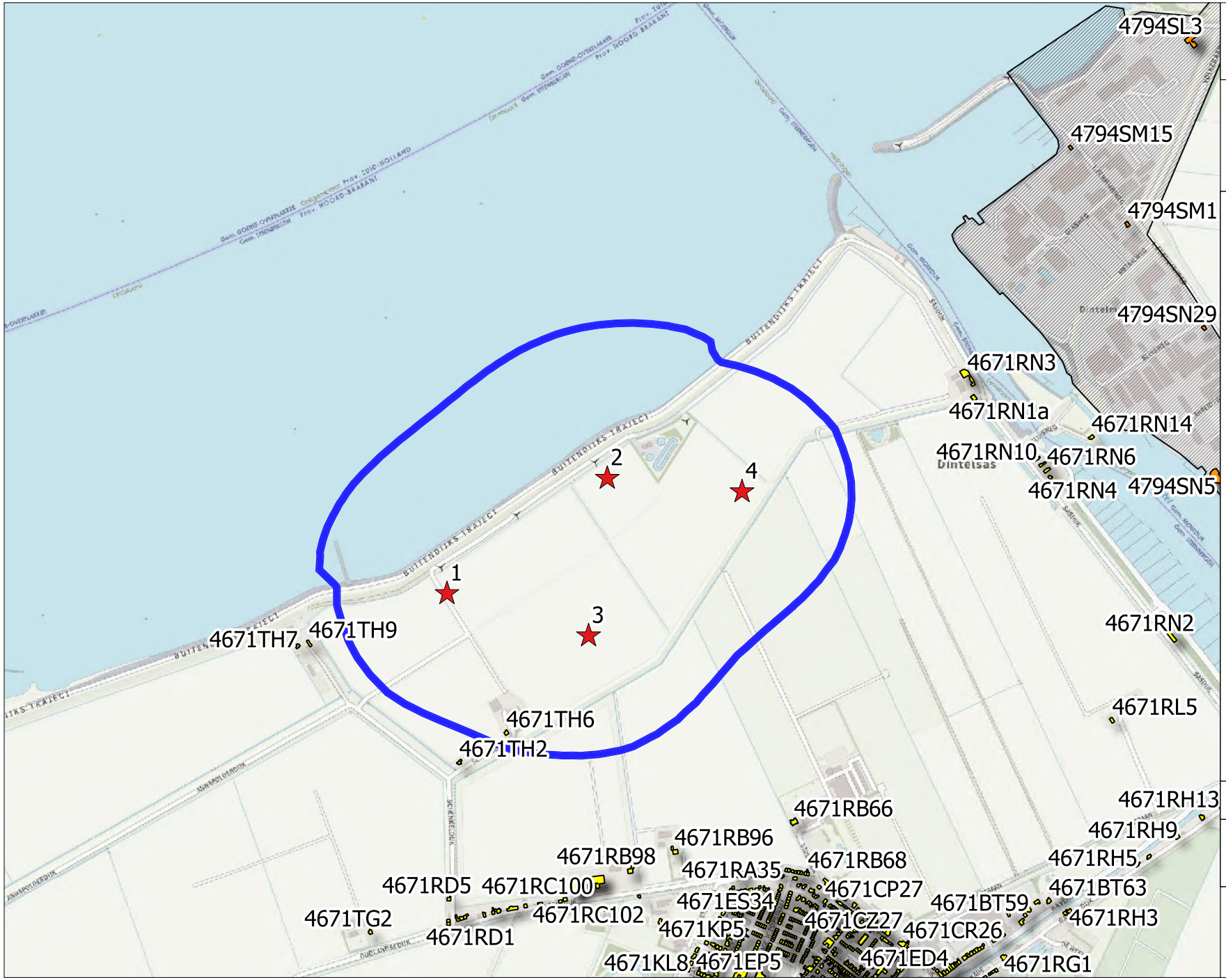


Industrielawaai - WT, [V1 - Kopie van Tweede model - V136 @147m] , Geomilieu V5.21

Turbineslocaties, omliggende woningen en bodemgebieden

LBP|SIGHT - Nieuwegein


Wegen
Toetspunten
Bodemgebieden
Schermen
Hoogtelijnen
0 m
1000 m
schaal = 1 : 32554
410000
408000
406000
404000
84000
86000
88000
4671RN2
4671RL5
4671TH6
4671TH2
4671RB66
4671CS64
4671LT65
4671LT53



LBP SIGHT

Bouw | Ruimte | Milieu

WP Karolinadijk

Lden contouren
Vestas V136 op 147 m as

Legenda

- Windturbine
- Gevoelige verblijfsobjecten
- Verblijfsobjecten op IT
- grenzen IT - zonebeheer

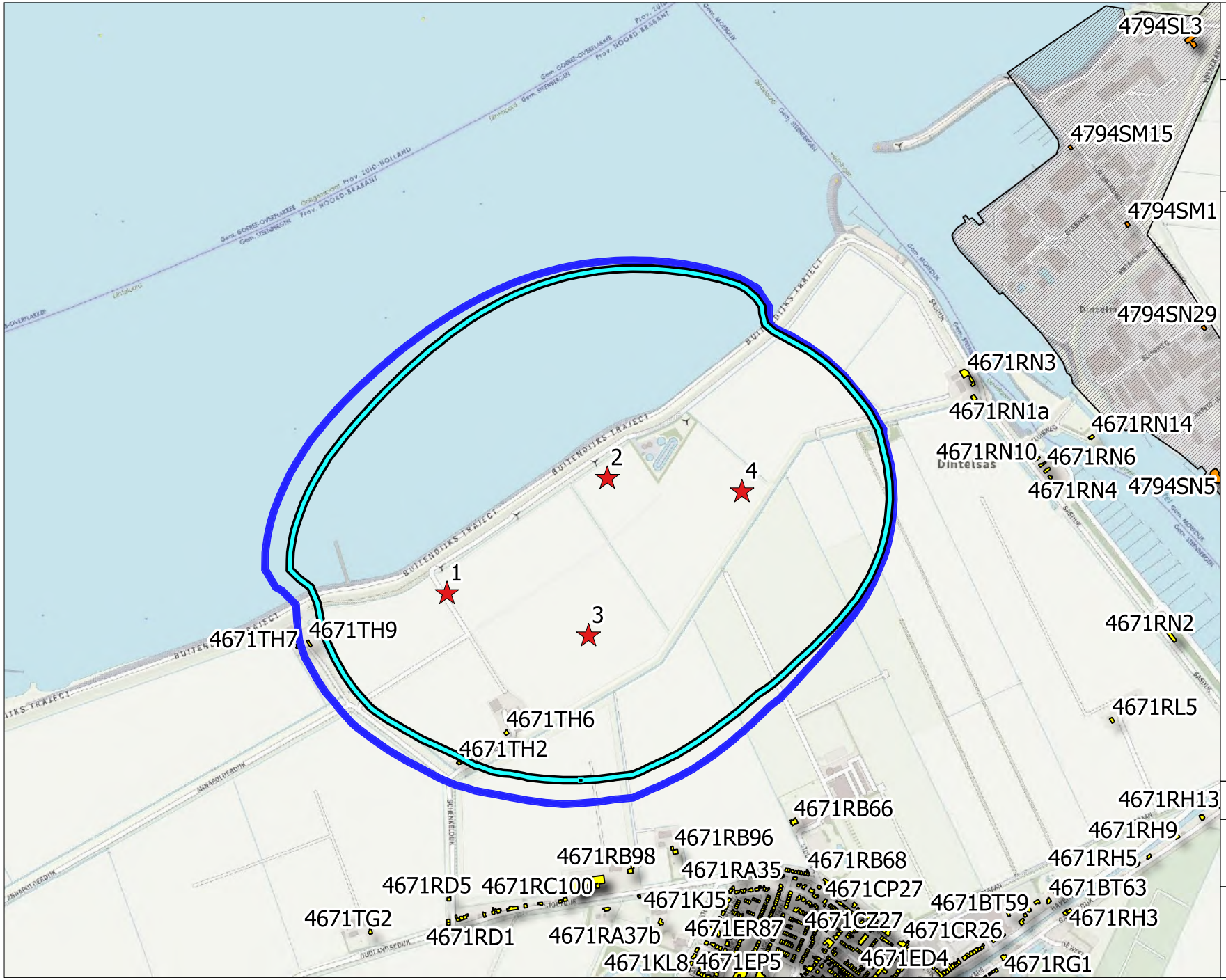
Lden contouren - exclusief maatregelen

- 47 dB

Bron: BRT achtergond PDOK, BAG

0 400 m

Referentie:	Datum figuur:	Versie figuur:
R068475aa. 201GTPL.dv	04-02-2020	01
Auteur:	**Reviewer:**	**Opdrachtgever**
David Vrolijk		Innogy



LBP SIGHT

Bouw | Ruimte | Milieu

WP Karolinadijk

Lden contouren
Lagerwey L136 op 147 m as

Legenda

- Windturbine
- Gevoelige verblijfsobjecten
- Verblijfsobjecten op IT
- grenzen IT - zonebeheer

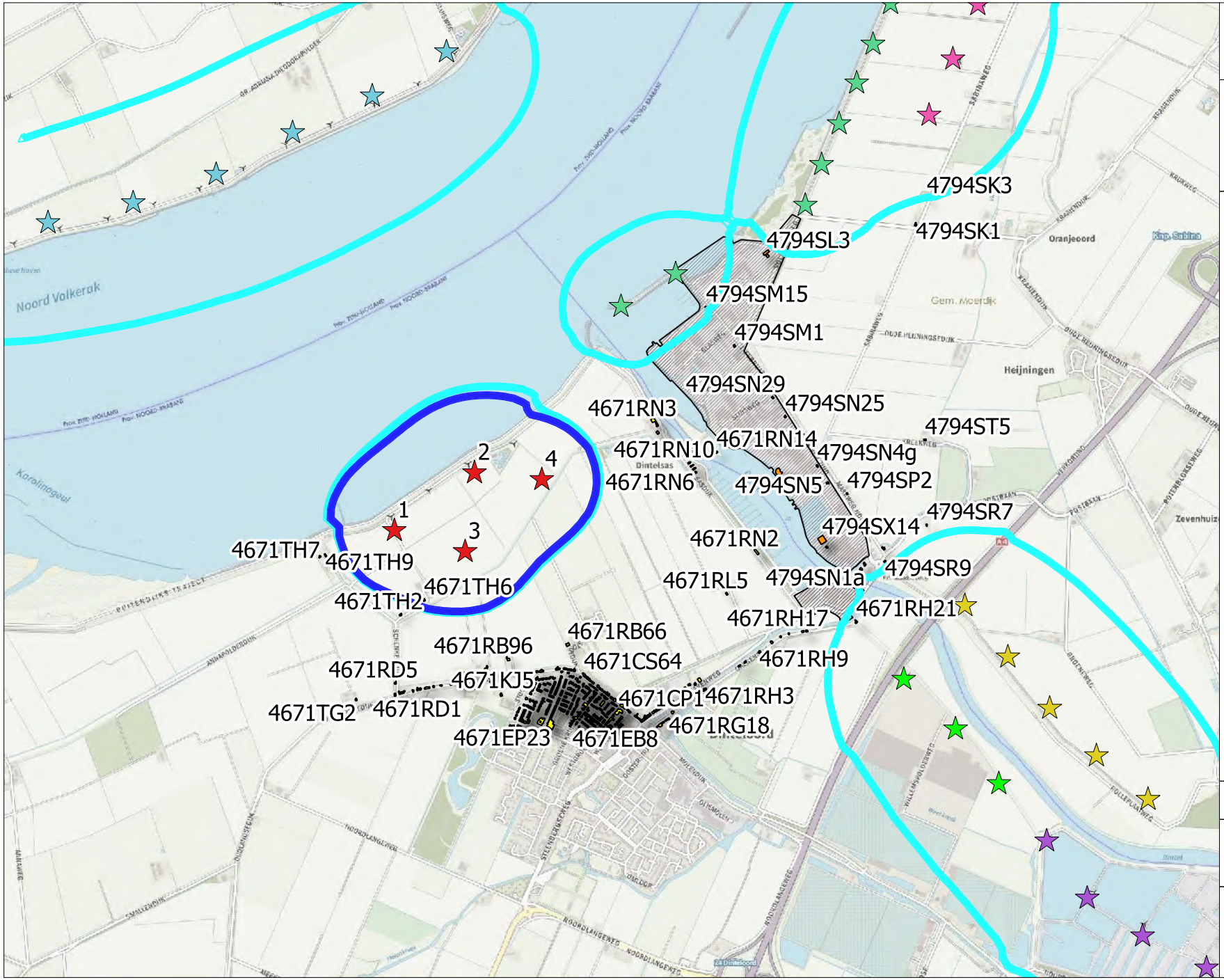
Lden contouren - exclusief maatregelen
- 47 dB

Lden contouren - inclusief maatregelen
- 47 dB

Bron: BRT achtergond PDOK, BAG

0 400 m

Referentie:	Datum figuur:	Versie figuur:
R068475aa.201GTPL.dv	04-02-2020	01
Auteur: David Vrolijk	Reviewer:	Opdrachtgever Innogy



LBP SIGHT

Bouw | Ruimte | Milieu

WP Karolinadijk

Cumulatie bestaande turbines
Vestas V136 op 147 m

Legenda

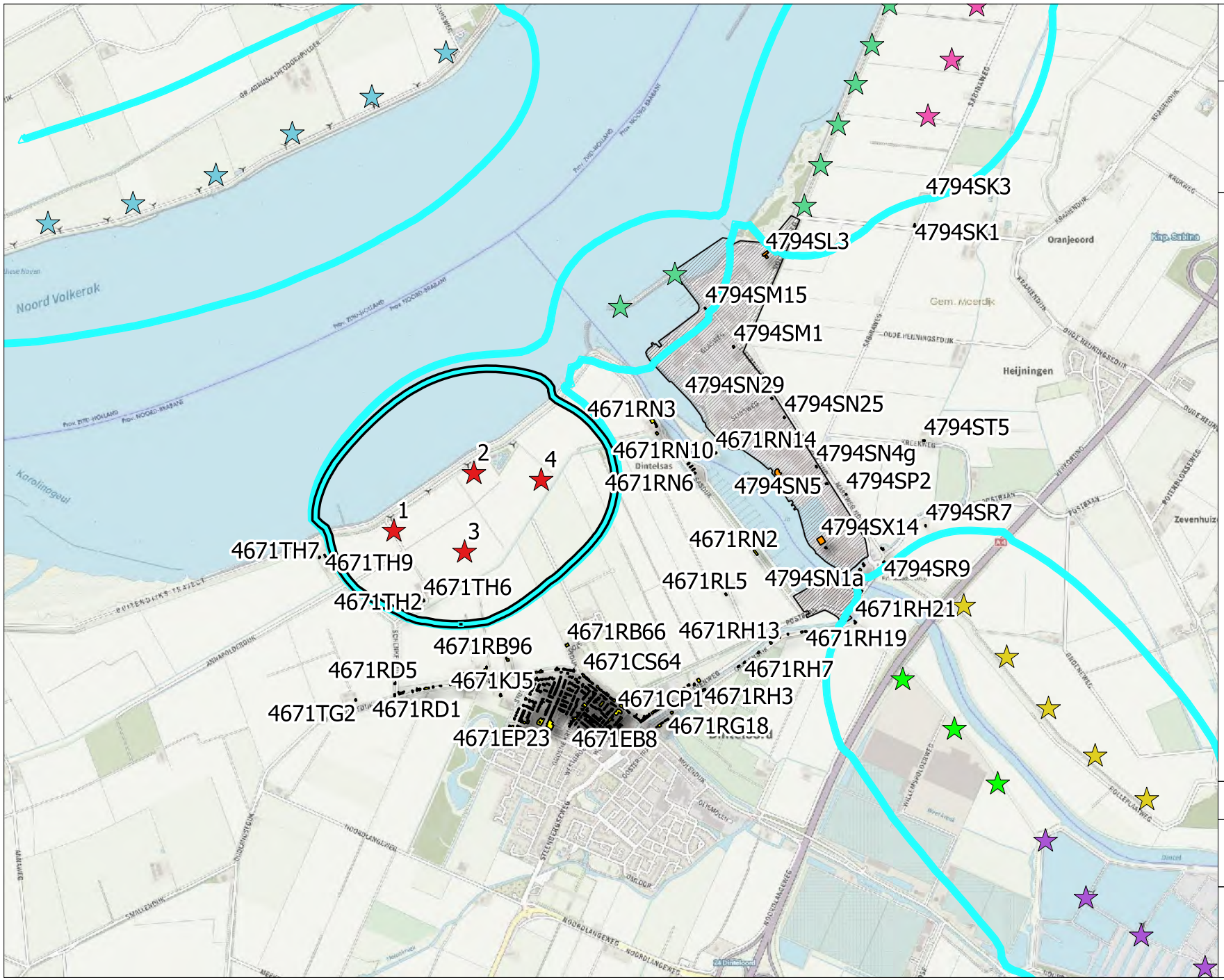
Lden 47 dB contouren
- Windpark Karolinapolder
- Cumulatief
- Nieuwe turbines

bestaande turbines
- Dintel SurveyCom
- Nieuw-Prinsenland
- Oud Dintel
- Piet de Wit
- Sabina polder
- Sabinapolder

Bron: BRT achtergond PDOK

0 — 900 m

Referentie:	Datum figuur:	Versie figuur:
R068475aa.191RPWL.dv	04-02-2020	01
Auteur: David Vrolijk	Reviewer:	Opdrachtgever Innogy



LBP SIGHT

Bouw | Ruimte | Milieu

WP Karolinadijk

Cumulatie bestaande turbines
Lagerwey L136 op 147m

Legenda

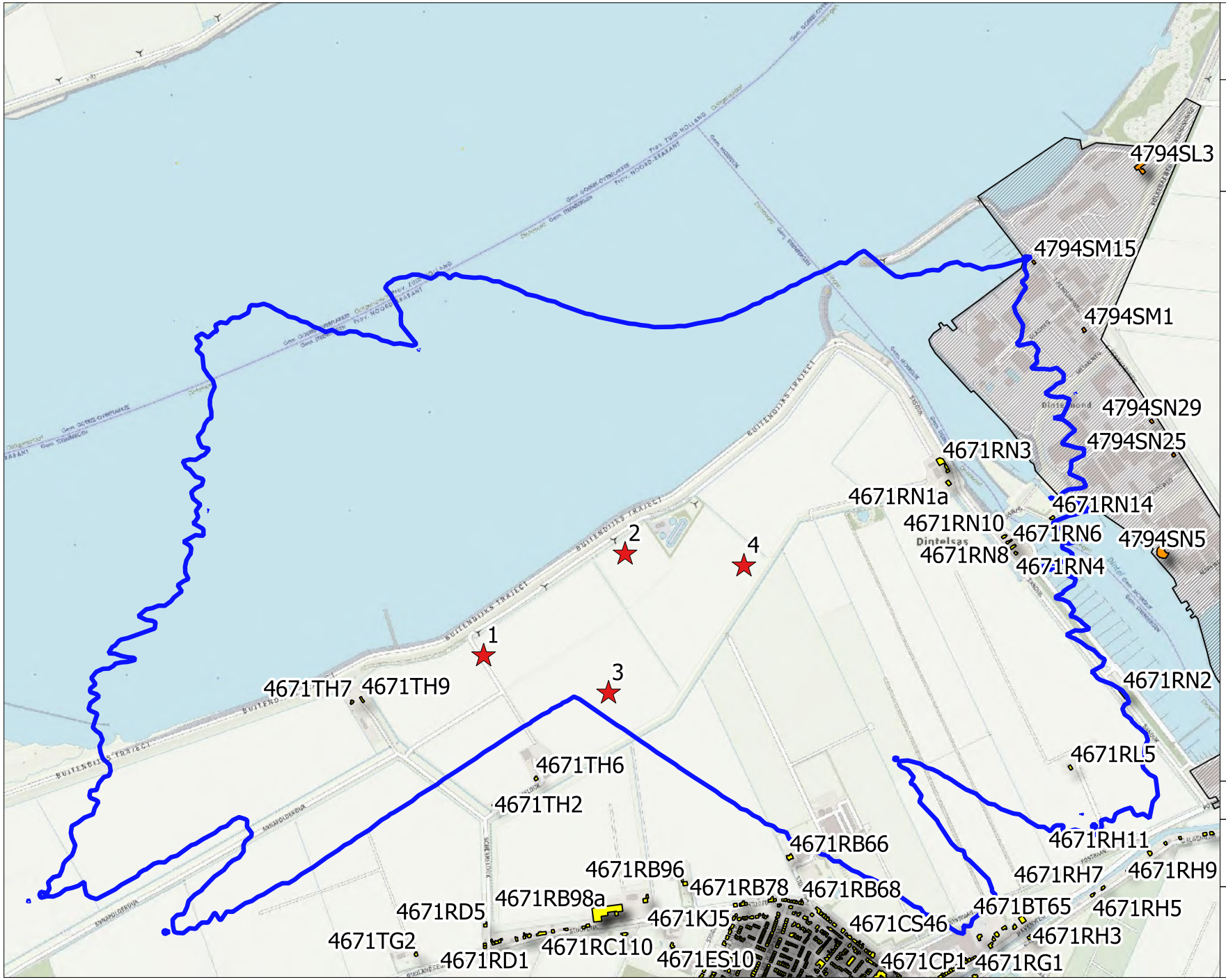
Lden 47 dB contouren
- Windpark karolinapolder inc. mtrl
- Cumulatief
- Nieuwe turbines

bestaande turbines
- Dintel SurveyCom
- Nieuw-Prinsenland
- Oud Dintel
- Piet de Wit
- Sabina polder
- Sabinapolder

Bron: BRT achtergond PDOK

0 900 m

Referentie:	Datum figuur:	Versie figuur:
R068475aa.191RPWL.dv	04-02-2020	01
Auteur: David Vrolijk	Reviewer:	Opdrachtgever Innogy



LBP SIGHT

Bouw | Ruimte | Milieu

WP Karolinadijk

Vestas V136 op 147 m
6 uur slagschaduwcontour

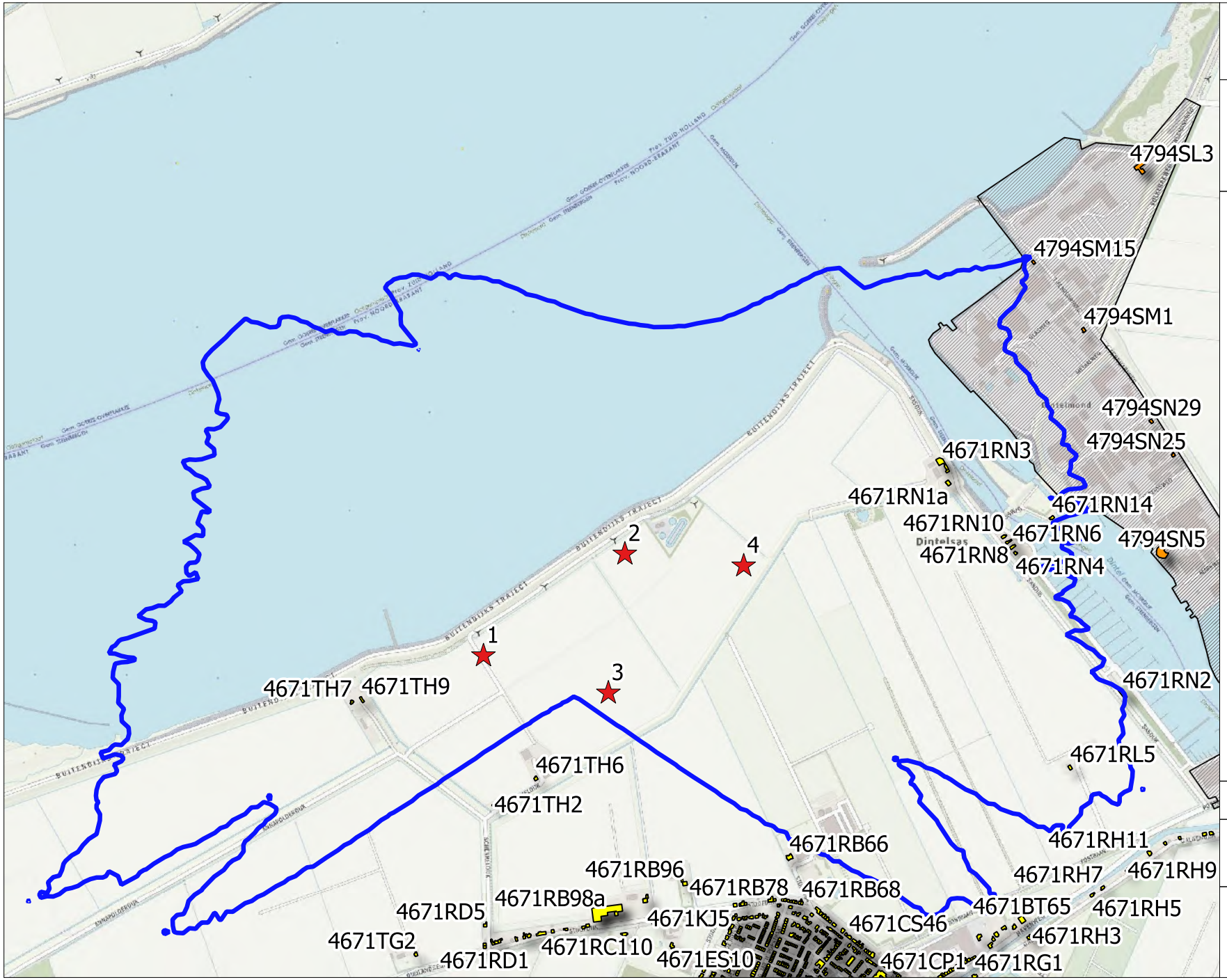
Legenda

- Windturbine
- Gevoelige verblijfsobjecten
- Gevoelige verblijfsobjecten op IT
- grenzen IT - zonebeheer
- 6 uur slagschaduwcontour

Bron: BRT achtergond PDOK, BAG

0 500 m

Referentie:	Datum figuur:	Versie figuur:
V068475aa. 201GTPL.dv	04-02-2020	01
Auteur: David Vrolijk	Reviewer:	Opdrachtgever Innogy



LBP SIGHT

Bouw | Ruimte | Milieu

WP Karolinadijk

Lagerwey L136 op 147 m
6 uur slagschaduwcontour

Legenda

- Windturbine
- Gevoelige verblijfsobjecten
- Gevoelige verblijfsobjecten op IT
- grenzen IT - zonebeheer
- 6 uur slagschaduwcontour

Bron: BRT achtergond PDOK, BAG

0 500 m

Referentie:	Datum figuur:	Versie figuur:
V068475aa. 201GTPL.dv	04-02-2020	01
Auteur: David Vrolijk	Reviewer:	Opdrachtgever Innogy

Bijlage II Berekende jaargemiddelde bronsterkte

RD x:	84004							
RD y:	407224							
Windprofiel:	147 [m]							
Turbinetype:	Vestas V136 4.2 MW			Ashoogte	147	[m] Lw+Cb		
wind (ashoogte) m/s	dag %	avond %	nacht %		Lw as [dB(A)]	LE dag [db(A)]	LE avond [db(A)]	LE nacht [db(A)]
1	2,44	1,72	1,83					
2	4,30	2,99	2,65					
3	6,50	4,59	3,79		90,9	79,0	77,5	76,7
4	8,01	6,55	5,32		91,1	80,1	79,3	78,4
5	9,25	8,49	6,54		92,9	82,6	82,2	81,1
6	10,39	10,30	8,25		96,0	86,2	86,1	85,2
7	10,98	11,00	9,60		99,6	90,0	90,0	89,4
8	11,08	11,31	11,15		102,9	93,3	93,4	93,4
9	9,38	10,58	13,10		103,9	93,6	94,1	95,1
10	7,69	9,55	11,87		103,9	92,8	93,7	94,6
11	5,70	7,35	8,96		103,9	91,5	92,6	93,4
12	4,22	4,86	5,89		103,9	90,2	90,8	91,6
13	2,85	3,53	3,81		103,9	88,4	89,4	89,7
14	2,17	2,38	2,33		103,9	87,3	87,7	87,6
15	1,59	1,48	1,59		103,9	85,9	85,6	85,9
16	1,21	1,17	1,25		103,9	84,7	84,6	84,9
17	0,74	0,83	0,81		103,9	82,6	83,1	83,0
18	0,50	0,53	0,52		103,9	80,9	81,2	81,1
19	0,35	0,33	0,31		103,9	79,4	79,0	78,8
20	0,27	0,17	0,17		103,9	78,2	76,2	76,2
21	0,13	0,10	0,09		103,9	74,9	73,9	73,5
22	0,08	0,06	0,06		103,9	73,1	71,8	71,9
23	0,08	0,06	0,05		103,9	72,7	71,4	71,2
24	0,05	0,03	0,03		103,9	70,7	68,7	68,9
25	0,05	0,04	0,02		103,9	70,9	70,3	67,8
				Lden [dB]	**108,3**	**101,2**	**101,6**	**102,1**

8.3 Sound Curves, Power Optimized Mode PO1/PO1-0S

Sound Power Level at Hub Height		
Conditions for Sound Power Level:	**Measurement standard IEC 61400-11 ed. 3** **Maximum turbulence at hub height: 30%** **Inflow angle (vertical): 0 ±2°** **Air density: 1.225 kg/m³**	
Wind speed at hub height [m/s]	**Sound Power Level at Hub Height [dBA] Power Optimized Mode PO1 (Blades with serrated trailing edge)**	**Sound Power Level at Hub Height [dBA] Power Optimized Mode PO1-0S (Blades without serrated trailing edge)**
3	90.9	93.2
4	91.1	93.6
5	92.9	96.5
6	96.0	100.0
7	99.6	103.2
8	102.9	106.0
9	103.9	106.9
10	103.9	106.9
11	103.9	106.9
12	103.9	106.9
13	103.9	106.9
14	103.9	106.9
15	103.9	106.9
16	103.9	106.9
17	103.9	106.9
18	103.9	106.9
19	103.9	106.9
20	103.9	106.9

Table 8-3: Sound curves, Power Optimized Mode PO1/PO1-0S

Voor het geluidspectrum is uitgegaan van de V136 – 4.0 turbine.

3. Results

Frequency	Hub height wind speeds [m/s]																	
	3 m/s	4 m/s	5 m/s	6 m/s	7 m/s	8 m/s	9 m/s	10 m/s	11 m/s	12 m/s	13 m/s	14 m/s	15 m/s	16 m/s	17 m/s	18 m/s	19 m/s	20 m/s
6.3 Hz	18.4	16.4	17.8	20.4	23.6	26.4	27.1	27.3	28.1	29.4	30.4	31.0	31.7	32.2	32.7	33.1	33.5	33.8
8 Hz	19.4	18.7	21.7	25.7	30.0	33.7	34.7	34.8	35.3	36.1	36.7	37.1	37.4	37.7	38.0	38.2	38.4	38.6
10 Hz	25.7	24.9	27.9	31.9	36.2	39.9	40.9	41.0	41.5	42.3	42.9	43.3	43.7	44.0	44.2	44.5	44.7	44.9
12.5 Hz	34.0	33.1	35.9	39.7	43.8	47.3	48.3	48.5	48.0	49.9	50.5	50.9	51.4	51.7	52.0	52.3	52.5	52.7
16 Hz	41.0	40.3	42.8	46.3	50.1	53.5	54.4	54.6	55.0	55.7	56.3	56.6	57.0	57.3	57.5	57.7	57.9	58.1
20 Hz	45.5	44.9	47.7	51.5	55.5	59.1	60.1	60.2	60.7	61.3	61.9	62.2	62.5	62.8	63.0	63.2	63.4	63.6
25 Hz	52.6	52.0	54.4	57.9	61.7	65.1	66.0	66.2	66.6	67.2	67.7	68.1	68.4	68.6	68.9	69.0	69.2	69.4
31.5 Hz	55.5	54.1	56.6	60.2	64.1	67.6	68.5	68.7	69.4	70.5	71.3	71.9	72.4	72.9	73.3	73.7	74.0	74.3
40 Hz	58.9	59.3	61.9	65.5	69.4	72.9	73.8	73.9	74.0	74.2	74.3	74.4	74.4	74.5	74.5	74.5	74.5	74.5
50 Hz	64.3	64.2	66.6	70.0	73.7	77.0	77.9	78.0	78.2	78.6	78.9	79.0	79.2	79.3	79.4	79.5	79.5	79.6
63 Hz	73.1	72.2	72.8	74.9	77.4	79.8	80.5	80.6	81.0	81.7	82.2	82.5	82.8	83.1	83.3	83.5	83.7	83.8
80 Hz	76.2	77.0	77.5	79.4	81.8	84.1	84.7	84.7	84.6	84.4	84.3	84.1	84.0	83.9	83.7	83.6	83.5	83.3
100 Hz	73.7	73.3	75.1	78.0	81.3	84.3	85.1	85.2	85.6	86.1	86.4	86.6	86.9	87.0	87.2	87.3	87.4	87.5
125 Hz	79.3	77.5	78.0	79.9	82.5	84.8	85.4	85.6	86.3	87.3	88.1	88.7	89.2	89.7	90.1	90.4	90.7	91.0
160 Hz	77.4	79.1	80.5	83.1	86.1	88.8	89.6	89.5	89.2	88.6	88.1	87.8	87.4	87.1	86.8	86.5	86.2	86.0
200 Hz	76.5	77.3	79.4	82.6	86.1	89.3	90.1	90.1	90.1	90.0	89.9	89.9	89.8	89.7	89.6	89.5	89.4	89.3
250 Hz	79.3	78.3	80.2	83.4	86.9	90.0	90.8	91.0	91.5	92.3	93.0	93.4	93.8	94.1	94.4	94.7	94.9	95.1
315 Hz	82.4	81.4	82.3	84.6	87.4	89.9	90.6	90.7	91.2	91.9	92.4	92.8	93.1	93.4	93.7	93.9	94.1	94.2
400 Hz	74.8	76.4	79.4	83.2	87.3	90.9	91.9	91.8	91.6	91.3	90.9	90.7	90.4	90.2	89.9	89.7	89.5	89.3
500 Hz	74.4	76.1	79.5	83.7	88.1	92.0	93.0	93.0	92.8	92.4	92.1	91.9	91.6	91.4	91.2	91.0	90.8	90.6
630 Hz	77.0	77.4	80.2	83.9	87.9	91.4	92.4	92.4	92.5	92.7	92.9	92.9	93.0	93.0	93.1	93.1	93.1	93.1
800 Hz	77.1	78.6	81.2	84.7	88.5	91.9	92.9	92.8	92.6	92.3	91.9	91.7	91.5	91.2	91.0	90.8	90.6	90.4
1 kHz	83.1	82.9	84.3	86.9	89.9	92.6	93.4	93.5	93.7	94.0	94.3	94.4	94.6	94.7	94.8	94.8	94.9	94.9
1.25 kHz	78.9	80.6	83.2	86.7	90.5	94.0	94.9	94.9	94.6	94.2	93.8	93.5	93.2	92.9	92.6	92.4	92.1	91.9
1.6 kHz	77.9	79.3	82.0	85.7	89.6	93.1	94.1	94.0	93.9	93.6	93.3	93.1	92.9	92.7	92.5	92.4	92.2	92.0
2 kHz	76.6	77.7	80.4	84.1	88.1	91.6	92.6	92.6	92.6	92.5	92.3	92.2	92.1	92.0	91.9	91.8	91.7	91.6
2.5 kHz	74.7	75.8	78.7	82.6	86.6	90.3	91.2	91.2	91.2	91.0	90.9	90.8	90.6	90.5	90.4	90.3	90.1	90.0
3.15 kHz	72.6	73.3	75.9	79.6	83.5	87.0	87.9	87.9	88.0	88.1	88.1	88.1	88.1	88.0	88.0	88.0	87.9	87.9
4 kHz	70.9	70.5	72.5	75.6	79.0	82.1	83.0	83.1	83.4	83.9	84.3	84.6	84.8	85.0	85.2	85.3	85.4	85.5
5 kHz	62.3	62.2	64.9	68.5	72.5	76.0	76.9	77.0	77.3	77.8	78.1	78.3	78.5	78.6	78.8	78.9	78.9	79.0
6.3 kHz	60.2	57.9	59.1	61.6	64.7	67.4	68.1	68.3	69.2	70.6	71.6	72.4	73.1	73.7	74.2	74.7	75.1	75.5
8 kHz	60.9	59.3	57.8	58.0	59.1	60.3	60.6	60.7	61.2	62.0	62.6	62.9	63.3	63.6	63.9	64.1	64.3	64.5
10 kHz	59.3	59.6	57.2	56.5	56.8	57.4	57.5	57.5	57.4	57.1	56.9	56.7	56.5	56.3	56.2	56.0	55.8	55.7
A-wgt	90.6	90.9	92.9	96.1	99.7	103.0	103.9	103.9	103.9	103.9	103.9	103.9	103.9	103.9	103.9	103.9	103.9	103.9

Table 1: V136-4.0MW Mode 0, expected 1/3 octave band performance, (Blades with serrated trailing edge)

RD x: 84004
RD y: 407224
Windprofiel: 147 [m]
Turbinetype: L136 Ashoogte 147 [m]
Lw+Cb

wind (ashoogte) m/s	dag %	avond %	nacht %		Lw as [dB(A)]	LE dag [db(A)]	LE avond [db(A)]	LE nacht [db(A)]
1	2,44	1,72	1,83					
2	4,30	2,99	2,65					
3	6,50	4,59	3,79		91,6	79,7	78,2	77,4
4	8,01	6,55	5,32		91,6	80,6	79,8	78,9
5	9,25	8,49	6,54		93,8	83,5	83,1	82,0
6	10,39	10,30	8,25		98,5	88,6	88,6	87,6
7	10,98	11,00	9,60		101,9	92,3	92,3	91,7
8	11,08	11,31	11,15		104,3	94,7	94,8	94,7
9	9,38	10,58	13,10		105,4	95,2	95,7	96,6
10	7,69	9,55	11,87		106,4	95,2	96,2	97,1
11	5,70	7,35	8,96		106,9	94,5	95,6	96,4
12	4,22	4,86	5,89		106,9	93,2	93,8	94,6
13	2,85	3,53	3,81		106,9	91,4	92,4	92,7
14	2,17	2,38	2,33		106,9	90,3	90,7	90,6
15	1,59	1,48	1,59		106,9	88,9	88,6	88,9
16	1,21	1,17	1,25		106,9	87,7	87,6	87,9
17	0,74	0,83	0,81		106,9	85,6	86,1	86,0
18	0,50	0,53	0,52		106,9	83,9	84,2	84,1
19	0,35	0,33	0,31		106,9	82,4	82,0	81,8
20	0,27	0,17	0,17		106,9	81,2	79,2	79,2
21	0,13	0,10	0,09		106,9	77,9	76,9	76,5
22	0,08	0,06	0,06		106,9	76,1	74,8	74,9
23	0,08	0,06	0,05		106,9	75,7	74,4	74,2
24	0,05	0,03	0,03		106,9	73,7	71,7	71,9
25	0,05	0,04	0,02		106,9	73,9	73,3	70,8
				Lden [dB]	**110,7**	**103,5**	**104,0**	**104,4**

RD x:	84004							
RD y:	407224							
Windprofiel:	147	[m]						
Turbinetype:	L136 mode 2			Ashoogte	147	[m]		
						Lw+Cb		
wind (ashoogte)	dag	avond	nacht		Lw as	LE dag	LE avond	LE nacht
m/s	%	%	%		[dB(A)]	[db(A)]	[db(A)]	[db(A)]
1	2,44	1,72	1,83					
2	4,30	2,99	2,65					
3	6,50	4,59	3,79		91,6	79,7	78,2	77,4
4	8,01	6,55	5,32		91,6	80,6	79,8	78,9
5	9,25	8,49	6,54		93,8	83,5	83,1	82,0
6	10,39	10,30	8,25		98,5	88,6	88,6	87,6
7	10,98	11,00	9,60		100,8	91,2	91,2	90,6
8	11,08	11,31	11,15		102,5	92,9	93,0	93,0
9	9,38	10,58	13,10		103,6	93,3	93,8	94,7
10	7,69	9,55	11,87		104,3	93,2	94,1	95,0
11	5,70	7,35	8,96		104,8	92,4	93,5	94,3
12	4,22	4,86	5,89		105,0	91,2	91,9	92,7
13	2,85	3,53	3,81		105,0	89,5	90,5	90,8
14	2,17	2,38	2,33		105,0	88,4	88,8	88,7
15	1,59	1,48	1,59		105,0	87,0	86,7	87,0
16	1,21	1,17	1,25		105,0	85,8	85,7	86,0
17	0,74	0,83	0,81		105,0	83,7	84,2	84,1
18	0,50	0,53	0,52		105,0	82,0	82,3	82,2
19	0,35	0,33	0,31		105,0	80,5	80,1	79,9
20	0,27	0,17	0,17		105,0	79,3	77,3	77,3
21	0,13	0,10	0,09		105,0	76,0	75,0	74,6
22	0,08	0,06	0,06		105,0	74,2	72,9	73,0
23	0,08	0,06	0,05		105,0	73,8	72,5	72,3
24	0,05	0,03	0,03		105,0	71,8	69,8	70,0
25	0,05	0,04	0,02		105,0	72,0	71,4	68,9
				Lden [dB]	**108,9**	**101,7**	**102,2**	**102,6**

Bron: SD202ENR2 Data Curves L136-4.5MW d.d. 4-7-2017

Standard Mode		Sound power levels for reduced noise modes [dB(A)]				
Wind speed at 10m height [m/s]	Mode 0 dB(A)	Mode 1 -1 dB(A)	Mode 2 -2 dB(A)	Mode 3 -3 dB(A)	Mode 4 -4 dB(A)	Mode 5 -5 dB(A)
3.0	91.6	91.6	91.6	91.6	91.6	91.6
4.0	98.6	98.6	98.6	98.6	98.1	97.0
5.0	103.7	103.1	102.0	100.8	99.7	98.4
6.0	105.5	104.6	103.6	102.4	101.2	99.8
7.0	106.9	105.8	104.7	103.6	102.5	101.0
8.0	106.9	105.8	105.0	103.9	102.8	101.8
9.0	106.9	105.8	105.0	103.9	102.8	101.8

L136-4.5MW, Sound Power Levels [dB(A)], Standard Mode

Frequency [Hz]	Standardized wind speed at 10m height					
	3.0m/s	4.0m/s	5.0m/s	6.0m/s	7.0m/s	8.0m/s
25	44.4	52.1	58.0	60.7	63.1	65.0
32	49.0	56.5	62.3	65.0	67.4	69.3
40	53.3	60.5	66.2	68.8	71.2	73.0
50	57.5	64.3	69.8	72.4	74.7	76.4
63	61.7	68.0	73.2	75.7	77.9	79.4
80	66.0	71.8	76.6	79.0	81.0	82.2
100	70.2	75.8	80.1	82.4	84.3	85.0
125	74.0	79.5	83.7	85.8	87.5	87.5
160	77.2	83.0	87.1	89.1	90.6	89.8
200	79.5	86.0	90.2	92.1	93.5	92.1
250	80.8	88.1	92.8	94.6	96.0	94.2
315	81.2	89.0	94.3	96.2	97.6	95.7
400	81.2	88.9	94.6	96.6	98.1	96.6
500	81.3	88.6	94.3	96.3	97.8	96.9
630	81.2	88.1	93.5	95.4	96.9	96.8
800	81.2	87.7	92.8	94.4	95.9	96.5
1000	80.8	87.3	92.2	93.7	95.1	96.2
1250	80.2	86.9	91.6	93.0	94.4	95.8
1600	79.0	85.9	90.8	92.2	93.6	94.8
2000	77.5	84.7	89.7	91.2	92.6	93.5
2500	75.9	83.1	88.3	89.9	91.3	91.9
3150	73.9	81.3	86.5	88.1	89.6	90.0
4000	71.7	79.2	84.5	86.1	87.6	87.9
5000	69.3	76.8	82.2	83.9	85.3	85.6
6300	66.5	74.2	79.7	81.4	82.9	83.0
8000	63.2	71.0	76.6	78.3	79.8	79.9
10000	59.4	67.4	73.1	74.9	76.4	76.4
12500	55.1	63.3	69.1	70.9	72.5	72.5
16000	49.9	58.3	64.2	66.1	67.7	67.6
20000	44.4	53.0	59.1	61.0	62.7	62.5
Total sound power level	**91.6**	**98.6**	**103.7**	**105.5**	**106.9**	**106.9**

Bijlage III Rekenresultaten windturbinegeluid

Rapport: Resultatentabel
Model: Tweede model - Alle windturbines
LAeq totaalresultaten voor toetspunten
Groep: Vestas V136 @147m
Groepsreductie: Nee

Naam Toetspunt	Omschrijving	Hoogte	Dag	Avond	Nacht	Lden
4671BT53_A	Havenweg 53	5,00	29,0	29,5	30,0	36,2
4671BT65_A	Havenweg 65	5,00	28,6	29,0	29,5	35,7
4671CS64_A	Stoofdijk 64	5,00	32,5	32,9	33,4	39,6
4671RB66_A	Stoofdijk 66	5,00	34,3	34,8	35,3	41,5
4671RB94_A	Stoofdijk 94	5,00	33,9	34,3	34,8	41,0
4671RB96_A	Stoofdijk 96	5,00	35,3	35,8	36,2	42,5
4671RB98_A	Stoofdijk 98	5,00	35,2	35,6	36,1	42,3
4671RC100_	Stoofdijk 100	5,00	34,4	34,8	35,3	41,5
4671RC110_	Stoofdijk 110	5,00	34,0	34,5	34,9	41,2
4671RC122_	Stoofdijk 122	5,00	33,4	33,9	34,4	40,6
4671RD5_A	Schenkeldijk 5	5,00	33,9	34,4	34,8	41,1
4671RL5_A	Postbaan 5	5,00	29,5	29,9	30,4	36,6
4671RN1_A	Sasdijk 1	5,00	34,3	34,7	35,2	41,4
4671RN10_A	Sasdijk 10	5,00	32,6	33,1	33,6	39,8
4671RN14_A	Sasdijk 14	5,00	31,7	32,1	32,6	38,8
4671RN2_A	Sasdijk 2	5,00	28,8	29,2	29,7	35,9
4671RN3_A	Sasdijk 3	5,00	34,0	34,5	34,9	41,2
4671RN4_A	Sasdijk 4	5,00	32,3	32,7	33,2	39,4
4671RN6_A	Sasdijk 6	5,00	32,4	32,9	33,3	39,6
4671RN8_A	Sasdijk 8	5,00	32,5	33,0	33,4	39,7
4671TG2_A	Oudlandsedijk 2	5,00	32,1	32,6	33,0	39,3
4671TH2_A	Schenkeldijk 2	5,00	38,8	39,3	39,7	46,0
4671TH6_A	BW - Schenkeldijk 6	5,00	41,2	41,6	42,1	48,3
4671TH7_A	Schenkeldijk 7	5,00	37,8	38,3	38,8	45,0
4671TH9_A	Schenkeldijk 9	5,00	38,3	38,7	39,2	45,4

Alle getoonde dB-waarden zijn A-gewogen

Rapport: Resultatentabel
Model: Tweede model - Alle windturbines
LAeq totaalresultaten voor toetspunten
Groep: Lagerwey L136 @147m
Groepsreductie: Nee

Naam Toetspunt	Omschrijving	Hoogte	Dag	Avond	Nacht	Lden
4671BT53_A	Havenweg 53	5,00	31,5	32,0	32,5	38,7
4671BT65_A	Havenweg 65	5,00	31,0	31,5	32,0	38,2
4671CS64_A	Stoofdijk 64	5,00	34,9	35,4	35,9	42,1
4671RB66_A	Stoofdijk 66	5,00	36,7	37,2	37,7	43,9
4671RB94_A	Stoofdijk 94	5,00	36,3	36,8	37,2	43,5
4671RB96_A	Stoofdijk 96	5,00	37,7	38,2	38,6	44,9
4671RB98_A	Stoofdijk 98	5,00	37,6	38,0	38,5	44,8
4671RC100_	Stoofdijk 100	5,00	36,8	37,3	37,7	44,0
4671RC110_	Stoofdijk 110	5,00	36,4	36,9	37,4	43,6
4671RC122_	Stoofdijk 122	5,00	35,9	36,4	36,8	43,1
4671RD5_A	Schenkeldijk 5	5,00	36,3	36,8	37,3	43,5
4671RL5_A	Postbaan 5	5,00	31,9	32,4	32,9	39,1
4671RN1_A	Sasdijk 1	5,00	36,7	37,2	37,6	43,9
4671RN10_A	Sasdijk 10	5,00	35,1	35,5	36,0	42,3
4671RN14_A	Sasdijk 14	5,00	34,1	34,6	35,1	41,3
4671RN2_A	Sasdijk 2	5,00	31,2	31,7	32,2	38,4
4671RN3_A	Sasdijk 3	5,00	36,4	36,9	37,4	43,6
4671RN4_A	Sasdijk 4	5,00	34,7	35,2	35,7	41,9
4671RN6_A	Sasdijk 6	5,00	34,8	35,3	35,8	42,0
4671RN8_A	Sasdijk 8	5,00	34,9	35,4	35,9	42,1
4671TG2_A	Oudlandsedijk 2	5,00	34,6	35,0	35,5	41,8
4671TH2_A	Schenkeldijk 2	5,00	41,1	41,6	42,1	48,3
4671TH6_A	BW - Schenkeldijk 6	5,00	43,4	43,9	44,4	50,6
4671TH7_A	Schenkeldijk 7	5,00	40,2	40,6	41,1	47,4
4671TH9_A	Schenkeldijk 9	5,00	40,6	41,0	41,5	47,8

Alle getoonde dB-waarden zijn A-gewogen

Rapport: Resultatentabel
Model: Tweede model - Alle windturbines
LAeq totaalresultaten voor toetspunten
Groep: Lagerwey L136 @147m
Groepsreductie: Ja

Naam Toetspunt	Omschrijving	Hoogte	Dag	Avond	Nacht	Lden
4671BT53_A	Havenweg 53	5,00	31,5	32,0	31,7	38,1
4671BT65_A	Havenweg 65	5,00	31,0	31,5	31,3	37,7
4671CS64_A	Stoofdijk 64	5,00	34,9	35,4	35,0	41,4
4671RB66_A	Stoofdijk 66	5,00	36,7	37,2	36,8	43,2
4671RB94_A	Stoofdijk 94	5,00	36,3	36,8	36,2	42,7
4671RB96_A	Stoofdijk 96	5,00	37,7	38,2	37,5	44,0
4671RB98_A	Stoofdijk 98	5,00	37,6	38,0	37,3	43,8
4671RC100_	Stoofdijk 100	5,00	36,8	37,3	36,5	43,1
4671RC110_	Stoofdijk 110	5,00	36,4	36,9	36,1	42,7
4671RC122_	Stoofdijk 122	5,00	35,9	36,4	35,6	42,1
4671RD5_A	Schenkeldijk 5	5,00	36,3	36,8	36,0	42,5
4671RL5_A	Postbaan 5	5,00	31,9	32,4	32,3	38,7
4671RN1_A	Sasdijk 1	5,00	36,7	37,2	37,3	43,6
4671RN10_A	Sasdijk 10	5,00	35,1	35,6	35,6	42,0
4671RN14_A	Sasdijk 14	5,00	34,1	34,6	34,7	41,0
4671RN2_A	Sasdijk 2	5,00	31,2	31,7	31,7	38,0
4671RN3_A	Sasdijk 3	5,00	36,4	36,9	37,0	43,4
4671RN4_A	Sasdijk 4	5,00	34,7	35,2	35,3	41,6
4671RN6_A	Sasdijk 6	5,00	34,8	35,3	35,4	41,7
4671RN8_A	Sasdijk 8	5,00	34,9	35,4	35,5	41,8
4671TG2_A	Oudlandsedijk 2	5,00	34,6	35,0	34,3	40,8
4671TH2_A	Schenkeldijk 2	5,00	41,1	41,6	40,6	47,2
4671TH6_A	BW - Schenkeldijk 6	5,00	43,4	43,9	42,9	49,5
4671TH7_A	Schenkeldijk 7	5,00	40,2	40,6	39,7	46,3
4671TH9_A	Schenkeldijk 9	5,00	40,6	41,0	40,1	46,6

Alle getoonde dB-waarden zijn A-gewogen

Rapport: Resultatentabel
Model: Kopie van Tweede model - V136 @147m
LAeq totaalresultaten voor toetspunten
Groep: (hoofdgroep)
Groepsreductie: Nee

Naam Toetspunt	Omschrijving	Hoogte	Dag	Avond	Nacht	Lden
4671BT53_A	Havenweg 53	5,00	33,1	33,3	33,7	40,0
4671BT65_A	Havenweg 65	5,00	33,7	33,9	34,3	40,6
4671CS64_A	Stoofdijk 64	5,00	33,8	34,1	34,6	40,8
4671RB66_A	Stoofdijk 66	5,00	35,2	35,6	36,1	42,3
4671RB94_A	Stoofdijk 94	5,00	34,7	35,1	35,5	41,8
4671RB96_A	Stoofdijk 96	5,00	35,8	36,3	36,7	43,0
4671RB98_A	Stoofdijk 98	5,00	35,7	36,1	36,6	42,8
4671RC100_	Stoofdijk 100	5,00	34,9	35,4	35,8	42,1
4671RC110_	Stoofdijk 110	5,00	34,6	35,0	35,4	41,7
4671RC122_	Stoofdijk 122	5,00	34,1	34,5	34,9	41,2
4671RD5_A	Schenkeldijk 5	5,00	34,4	34,9	35,3	41,6
4671RL5_A	Postbaan 5	5,00	34,5	34,7	35,1	41,4
4671RN1_A	Sasdijk 1	5,00	36,8	36,9	37,3	43,6
4671RN10_A	Sasdijk 10	5,00	35,4	35,6	35,9	42,2
4671RN14_A	Sasdijk 14	5,00	35,2	35,4	35,7	42,0
4671RN2_A	Sasdijk 2	5,00	35,1	35,2	35,6	41,9
4671RN3_A	Sasdijk 3	5,00	36,8	37,0	37,3	43,6
4671RN4_A	Sasdijk 4	5,00	35,1	35,3	35,7	42,0
4671RN6_A	Sasdijk 6	5,00	35,2	35,4	35,8	42,1
4671RN8_A	Sasdijk 8	5,00	35,3	35,5	35,9	42,1
4671TG2_A	Oudlandsedijk 2	5,00	32,8	33,3	33,7	39,9
4671TH2_A	Schenkeldijk 2	5,00	39,0	39,5	39,9	46,2
4671TH6_A	BW - Schenkeldijk 6	5,00	41,3	41,8	42,2	48,5
4671TH7_A	Schenkeldijk 7	5,00	38,2	38,7	39,1	45,3
4671TH9_A	Schenkeldijk 9	5,00	38,6	39,0	39,5	45,7

Alle getoonde dB-waarden zijn A-gewogen

Rapport: Resultatentabel
Model: Kopie van Tweede model - L136@147m
LAeq totaalresultaten voor toetspunten
Groep: (hoofdgroep)
Groepsreductie: Ja

Naam Toetspunt	Omschrijving	Hoogte	Dag	Avond	Nacht	Lden
4671BT53_A	Havenweg 53	5,00	34,3	34,5	34,5	40,9
4671BT65_A	Havenweg 65	5,00	34,7	34,9	35,0	41,3
4671CS64_A	Stoofdijk 64	5,00	35,7	36,1	35,8	42,2
4671RB66_A	Stoofdijk 66	5,00	37,3	37,7	37,4	43,8
4671RB94_A	Stoofdijk 94	5,00	36,8	37,2	36,8	43,2
4671RB96_A	Stoofdijk 96	5,00	38,0	38,5	37,9	44,4
4671RB98_A	Stoofdijk 98	5,00	37,9	38,3	37,7	44,2
4671RC100_	Stoofdijk 100	5,00	37,1	37,6	36,9	43,4
4671RC110_	Stoofdijk 110	5,00	36,8	37,2	36,5	43,0
4671RC122_	Stoofdijk 122	5,00	36,2	36,7	36,0	42,5
4671RD5_A	Schenkeldijk 5	5,00	36,6	37,1	36,4	42,9
4671RL5_A	Postbaan 5	5,00	35,5	35,7	35,8	42,2
4671RN1_A	Sasdijk 1	5,00	38,3	38,5	38,7	45,0
4671RN10_A	Sasdijk 10	5,00	36,8	37,1	37,3	43,6
4671RN14_A	Sasdijk 14	5,00	36,5	36,7	36,9	43,2
4671RN2_A	Sasdijk 2	5,00	35,8	36,0	36,2	42,5
4671RN3_A	Sasdijk 3	5,00	38,2	38,5	38,7	45,0
4671RN4_A	Sasdijk 4	5,00	36,6	36,9	37,0	43,3
4671RN6_A	Sasdijk 6	5,00	36,6	36,9	37,1	43,4
4671RN8_A	Sasdijk 8	5,00	36,7	37,0	37,2	43,5
4671TG2_A	Oudlandsedijk 2	5,00	35,0	35,4	34,8	41,3
4671TH2_A	Schenkeldijk 2	5,00	41,2	41,7	40,8	47,4
4671TH6_A	BW - Schenkeldijk 6	5,00	43,5	44,0	43,0	49,6
4671TH7_A	Schenkeldijk 7	5,00	40,4	40,9	40,0	46,5
4671TH9_A	Schenkeldijk 9	5,00	40,8	41,2	40,3	46,9

Alle getoonde dB-waarden zijn A-gewogen

Bijlage IV Invoergegevens windturbines

Model: Tweede model - Alle windturbines
V1 - V068475aa.201GTPL.dv - aanvulling geluid en slagschaduw 215 tip - WP Karolinadijk
Groep: (hoofdgroep)
Lijst van Toetspunten, voor rekenmethode Industrielawaai - WT

Naam	Omschr.	X	Y	Maaiveld	Hoogte A	Hoogte B	Hoogte C	Hoogte D
4671RN10	Sasdijk 10	85042,36	407414,65	0,00	5,00	--	--	--
4671TH9	Schenkeldijk 9	82979,48	406890,36	0,00	5,00	--	--	--
4671TH7	Schenkeldijk 7	82950,43	406885,25	0,00	5,00	--	--	--
4671RN1	Sasdijk 1	84861,76	407592,47	0,00	5,00	--	--	--
4671RN3	Sasdijk 3	84860,46	407628,71	0,00	5,00	--	--	--
4671TH6	BW - Schenkeldijk 6	83540,20	406644,07	0,00	5,00	--	--	--
4671TH2	Schenkeldijk 2	83407,02	406554,12	0,00	5,00	--	--	--
4671RB66	Stoofdijk 66	84358,54	406381,15	0,00	5,00	--	--	--
4671RC100	Stoofdijk 100	83706,60	406160,20	0,00	5,00	--	--	--
4671RB96	Stoofdijk 96	84021,25	406296,45	0,00	5,00	--	--	--
4671TG2	Oudlandsedijk 2	83151,63	406067,71	0,00	5,00	--	--	--
4671RB98	Stoofdijk 98	83892,88	406241,34	0,00	5,00	--	--	--
4671RL5	Postbaan 5	85264,84	406670,76	0,00	5,00	--	--	--
4671RC110	Stoofdijk 110	83556,70	406134,34	0,00	5,00	--	--	--
4671BT53	Havenweg 53	84970,93	406125,43	0,00	5,00	--	--	--
4671BT65	Havenweg 65	85105,82	406187,04	0,00	5,00	--	--	--
4671RN2	Sasdijk 2	85434,62	406908,10	0,00	5,00	--	--	--
4671RN4	Sasdijk 4	85085,20	407360,96	0,00	5,00	--	--	--
4671CS64	Stoofdijk 64	84450,50	406209,50	0,00	5,00	--	--	--
4671RN8	Sasdijk 8	85058,37	407396,19	0,00	5,00	--	--	--
4671RD5	Schenkeldijk 5	83375,93	406162,16	0,00	5,00	--	--	--
4671RB94	Stoofdijk 94	84182,74	406226,46	0,00	5,00	--	--	--
4671RN14	Sasdijk 14	85205,73	407476,99	0,00	5,00	--	--	--
4671RN6	Sasdijk 6	85071,66	407379,44	0,00	5,00	--	--	--
4671RC122	Stoofdijk 122	83403,04	406102,79	0,00	5,00	--	--	--

Model: Tweede model - Alle windturbines
V1 - V068475aa.201GTPL.dv - aanvulling geluid en slagschaduw 215 tip - WP Karolinadijk
Groep: (hoofdgroep)
Lijst van Toetspunten, voor rekenmethode Industrielawaai - WT

Naam	Hoogte E	Hoogte F	Gevel
4671RN10	--	--	Ja
4671TH9	--	--	Ja
4671TH7	--	--	Ja
4671RN1	--	--	Ja
4671RN3	--	--	Ja
4671TH6	--	--	Ja
4671TH2	--	--	Ja
4671RB66	--	--	Ja
4671RC100	--	--	Ja
4671RB96	--	--	Ja
4671TG2	--	--	Ja
4671RB98	--	--	Ja
4671RL5	--	--	Ja
4671RC110	--	--	Ja
4671BT53	--	--	Ja
4671BT65	--	--	Ja
4671RN2	--	--	Ja
4671RN4	--	--	Ja
4671CS64	--	--	Ja
4671RN8	--	--	Ja
4671RD5	--	--	Ja
4671RB94	--	--	Ja
4671RN14	--	--	Ja
4671RN6	--	--	Ja
4671RC122	--	--	Ja

Invoer rekenmodel windturbinegeluid

Model: Tweede model - Alle windturbines
V1 - V068475aa.201GTPL.dv - aanvulling geluid en slagschaduw 215 tip - WP Karolinadijk
Groep: Vestas V136 @147m
Lijst van Windturbines, voor rekenmethode Industrielawaai - WT

Naam	Omschr.	X	Y	Maaiveld	Hoogte	LE (D) Totaal	LE (A) Totaal
2	Vestas V136 @147m	83773,21	406911,65	0,00	147,00	101,16	101,62
3	Vestas V136 @147m	84210,43	407322,35	0,00	147,00	101,16	101,62
4	Vestas V136 @147m	83826,53	407360,73	0,00	147,00	101,16	101,62
1	Vestas V136 @147m	83369,81	407032,05	0,00	147,00	101,16	101,62

Model: Tweede model - Alle windturbines
V1 - V068475aa.201GTPL.dv - aanvulling geluid en slagschaduw 215 tip - WP Karolinadijk
Groep: Vestas V136 @147m
Lijst van Windturbines, voor rekenmethode Industrielawaai - WT

Naam	LE (N) Totaal
2	102,08
3	102,08
4	102,08
1	102,08

Invoer rekenmodel windturbinegeluid

Model: Tweede model - Alle windturbines
V1 - V068475aa.201GTPL.dv - aanvulling geluid en slagschaduw 215 tip - WP Karolinadijk
Groep: Lagerwey L136 @147m
Lijst van Windturbines, voor rekenmethode Industrielawaai - WT

Naam	Omschr.	X	Y	Maaiveld	Hoogte	LE (D) Totaal	LE (A) Totaal
2	Lagerwey L136 @147m	83773,21	406911,65	0,00	147,00	103,47	103,96
3	Lagerwey L136 @147m	84210,43	407322,35	0,00	147,00	103,47	103,96
4	Lagerwey L136 @147m	83826,53	407360,73	0,00	147,00	103,47	103,96
1	Lagerwey L136 @147m	83369,81	407032,05	0,00	147,00	103,47	103,96

Model: Tweede model - Alle windturbines
V1 - V068475aa.201GTPL.dv - aanvulling geluid en slagschaduw 215 tip - WP Karolinadijk
Groep: Lagerwey L136 @147m
Lijst van Windturbines, voor rekenmethode Industrielawaai - WT

Naam	LE (N) Totaal
2	104,44
3	104,44
4	104,44
1	104,44

Invoer rekenmodel windturbinegeluid

Model: Tweede model - Alle windturbines
V1 - V068475aa.201GTPL.dv - aanvulling geluid en slagschaduw 215 tip - WP Karolinadijk
Groep: Vestas V136 @147m
Lijst van Windturbines, voor rekenmethode Industrielawaai - WT

Naam	Omschr.	LE (D) 63	LE (D) 125	LE (D) 250	LE (D) 500	LE (D) 1k	LE (D) 2k	LE (D) 4k
2	Vestas V136 @147m	84,16	89,38	92,75	94,38	95,83	94,74	86,67
3	Vestas V136 @147m	84,16	89,38	92,75	94,38	95,83	94,74	86,67
4	Vestas V136 @147m	84,16	89,38	92,75	94,38	95,83	94,74	86,67
1	Vestas V136 @147m	84,16	89,38	92,75	94,38	95,83	94,74	86,67

Invoer rekenmodel windturbinegeluid

Model: Tweede model - Alle windturbines
V1 - V068475aa.201GTPL.dv - aanvulling geluid en slagschaduw 215 tip - WP Karolinadijk
Groep: Vestas V136 @147m
Lijst van Windturbines, voor rekenmethode Industrielawaai - WT

Naam	LE (D) 8k	LE (A) 63	LE (A) 125	LE (A) 250	LE (A) 500	LE (A) 1k	LE (A) 2k	LE (A) 4k	LE (A) 8k
2	66,85	84,62	89,84	93,21	94,85	96,29	95,21	87,13	67,31
3	66,85	84,62	89,84	93,21	94,85	96,29	95,21	87,13	67,31
4	66,85	84,62	89,84	93,21	94,85	96,29	95,21	87,13	67,31
1	66,85	84,62	89,84	93,21	94,85	96,29	95,21	87,13	67,31

Invoer rekenmodel windturbinegeluid

Model: Tweede model - Alle windturbines
V1 - V068475aa.201GTPL.dv - aanvulling geluid en slagschaduw 215 tip - WP Karolinadijk
Groep: Vestas V136 @147m
Lijst van Windturbines, voor rekenmethode Industrielawaai - WT

Naam	LE (N) 63	LE (N) 125	LE (N) 250	LE (N) 500	LE (N) 1k	LE (N) 2k	LE (N) 4k	LE (N) 8k
2	85,08	90,30	93,67	95,30	96,75	95,66	87,59	67,77
3	85,08	90,30	93,67	95,30	96,75	95,66	87,59	67,77
4	85,08	90,30	93,67	95,30	96,75	95,66	87,59	67,77
1	85,08	90,30	93,67	95,30	96,75	95,66	87,59	67,77

Invoer rekenmodel windturbinegeluid

Model: Tweede model - Alle windturbines
V1 - V068475aa.201GTPL.dv - aanvulling geluid en slagschaduw 215 tip - WP Karolinadijk
Groep: Lagerwey L136 @147m
Lijst van Windturbines, voor rekenmethode Industrielawaai - WT

Naam	Omschr.	LE (D) 63	LE (D) 125	LE (D) 250	LE (D) 500	LE (D) 1k	LE (D) 2k	LE (D) 4k
2	Lagerwey L136 @147m	80,15	89,47	96,99	98,73	96,99	94,41	89,38
3	Lagerwey L136 @147m	80,15	89,47	96,99	98,73	96,99	94,41	89,38
4	Lagerwey L136 @147m	80,15	89,47	96,99	98,73	96,99	94,41	89,38
1	Lagerwey L136 @147m	80,15	89,47	96,99	98,73	96,99	94,41	89,38

Model: Tweede model - Alle windturbines
V1 - V068475aa.201GTPL.dv - aanvulling geluid en slagschaduw 215 tip - WP Karolinadijk
Groep: Lagerwey L136 @147m
Lijst van Windturbines, voor rekenmethode Industrielawaai - WT

Naam	LE (D) 8k	LE (A) 63	LE (A) 125	LE (A) 250	LE (A) 500	LE (A) 1k	LE (A) 2k	LE (A) 4k	LE (A) 8k
2	81,88	80,64	89,96	97,48	99,22	97,48	94,90	89,87	82,37
3	81,88	80,64	89,96	97,48	99,22	97,48	94,90	89,87	82,37
4	81,88	80,64	89,96	97,48	99,22	97,48	94,90	89,87	82,37
1	81,88	80,64	89,96	97,48	99,22	97,48	94,90	89,87	82,37

Invoer rekenmodel windturbinegeluid

Model: Tweede model - Alle windturbines
V1 - V068475aa.201GTPL.dv - aanvulling geluid en slagschaduw 215 tip - WP Karolinadijk
Groep: Lagerwey L136 @147m
Lijst van Windturbines, voor rekenmethode Industrielawaai - WT

Naam	LE (N) 63	LE (N) 125	LE (N) 250	LE (N) 500	LE (N) 1k	LE (N) 2k	LE (N) 4k	LE (N) 8k
2	81,12	90,44	97,96	99,69	97,95	95,37	90,35	82,85
3	81,12	90,44	97,96	99,69	97,95	95,37	90,35	82,85
4	81,12	90,44	97,96	99,69	97,95	95,37	90,35	82,85
1	81,12	90,44	97,96	99,69	97,95	95,37	90,35	82,85

Invoer rekenmodel windturbinegeluid

Model: Tweede model - Alle windturbines
V1 - V068475aa.201GTPL.dv - aanvulling geluid en slagschaduw 215 tip - WP Karolinadijk
Groep: WP Dinteloord
Lijst van Windturbines, voor rekenmethode Industrielawaai - WT

Naam	Omschr.	X	Y	Maaiveld	Hoogte	LE (D) Totaal	LE (A) Totaal
1	Bestaand V44	83355,11	407105,36	0,00	55,00	98,48	98,56
4	Bestaand V44	84053,12	407518,30	0,00	55,00	98,48	98,56
2	Bestaand V44	83571,70	407246,93	0,00	55,00	98,48	98,56
3	Bestaand V44	83795,35	407399,54	0,00	55,00	98,48	98,56

Invoer rekenmodel windturbinegeluid

Model: Tweede model - Alle windturbines
V1 - V068475aa.201GTPL.dv - aanvulling geluid en slagschaduw 215 tip - WP Karolinadijk
Groep: WP Dinteloord
Lijst van Windturbines, voor rekenmethode Industrielawaai - WT

Naam	LE (N) Totaal
1	98,60
4	98,60
2	98,60
3	98,60

Invoer rekenmodel windturbinegeluid

Model: Tweede model - Alle windturbines
V1 - V068475aa.201GTPL.dv - aanvulling geluid en slagschaduw 215 tip - WP Karolinadijk
Groep: WP Dintel SurveyCom
Lijst van Windturbines, voor rekenmethode Industrielawaai - WT

Naam	Omschr.	X	Y	Maaiveld	Hoogte	LE (D) Totaal	LE (A) Totaal
1	Siemens SWT3.2-108	86816,00	405589,00	0,00	90,00	102,16	102,20
2	Siemens SWT3.2-108	86569,00	405901,00	0,00	90,00	102,16	102,20
3	Siemens SWT3.2-108	86274,00	406184,00	0,00	90,00	102,16	102,20

Model: Tweede model - Alle windturbines
V1 - V068475aa.201GTPL.dv - aanvulling geluid en slagschaduw 215 tip - WP Karolinadijk
Groep: WP Dintel SurveyCom
Lijst van Windturbines, voor rekenmethode Industrielawaai - WT

Naam	LE (N) Totaal
1	102,56
2	102,56
3	102,56

Model: Tweede model - Alle windturbines
V1 - V068475aa.201GTPL.dv - aanvulling geluid en slagschaduw 215 tip - WP Karolinadijk
Groep: WP Nieuw-Prinnsenland
Lijst van Windturbines, voor rekenmethode Industrielawaai - WT

Naam	Omschr.	X	Y	Maaiveld	Hoogte	LE (D) Totaal	LE (A) Totaal
2239	Siemens SWT3.2-108	88000,16	404537,98	0,00	90,00	102,16	102,20
2238	Siemens SWT3.2-108	87635,56	404720,87	0,00	90,00	102,16	102,20
2237	Siemens SWT3.2-108	87319,90	404936,50	0,00	90,00	102,16	102,20
2236	Siemens SWT3.2-108	87088,85	405262,28	0,00	90,00	102,16	102,20

Model: Tweede model - Alle windturbines
V1 - V068475aa.201GTPL.dv - aanvulling geluid en slagschaduw 215 tip - WP Karolinadijk
Groep: WP Nieuw-Prinnsenland
Lijst van Windturbines, voor rekenmethode Industrielawaai - WT

Naam	LE (N) Totaal
2239	102,56
2238	102,56
2237	102,56
2236	102,56

Model: Tweede model - Alle windturbines
V1 - V068475aa.201GTPL.dv - aanvulling geluid en slagschaduw 215 tip - WP Karolinadijk
Groep: WP Oud Dintel
Lijst van Windturbines, voor rekenmethode Industrielawaai - WT

Naam	Omschr.	X	Y	Maaiveld	Hoogte	LE (D) Totaal	LE (A) Totaal
2275	Siemens SWT3.2-108	86622,35	406603,78	0,00	90,00	102,16	102,20
2277	Siemens SWT3.2-108	87105,96	406018,65	0,00	90,00	102,16	102,20
2276	Siemens SWT3.2-108	86867,60	406311,16	0,00	90,00	102,16	102,20
2279	Siemens SWT3.2-108	87666,73	405499,31	0,00	90,00	102,16	102,20
2278	Siemens SWT3.2-108	87372,34	405748,04	0,00	90,00	102,16	102,20

Model: Tweede model - Alle windturbines
V1 - V068475aa.201GTPL.dv - aanvulling geluid en slagschaduw 215 tip - WP Karolinadijk
Groep: WP Oud Dintel
Lijst van Windturbines, voor rekenmethode Industrielawaai - WT

Naam	LE (N) Totaal
2275	102,56
2277	102,56
2276	102,56
2279	102,56
2278	102,56

Invoer rekenmodel windturbinegeluid

Model: Tweede model - Alle windturbines
V1 - V068475aa.201GTPL.dv - aanvulling geluid en slagschaduw 215 tip - WP Karolinadijk
Groep: WP Piet de Wit
Lijst van Windturbines, voor rekenmethode Industrielawaai - WT

Naam	Omschr.	X	Y	Maaiveld	Hoogte	LE (D) Totaal	LE (A) Totaal
7	VKA boven Piet de Wit	83666,85	409760,72	0,00	92,50	103,49	103,68
6	VKA boven Piet de Wit	83243,63	409509,02	0,00	92,50	103,49	103,68
5	VKA boven Piet de Wit	82789,49	409299,88	0,00	92,50	103,49	103,68
4	VKA boven Piet de Wit	82353,71	409062,30	0,00	92,50	103,49	103,68
3	VKA boven Piet de Wit	81880,47	408900,29	0,00	92,50	103,49	103,68
1	VKA boven Piet de Wit	80919,53	408630,88	0,00	92,50	103,49	103,68
2	VKA boven Piet de Wit	81395,12	408786,77	0,00	92,50	103,49	103,68

Model: Tweede model - Alle windturbines
V1 - V068475aa.201GTPL.dv - aanvulling geluid en slagschaduw 215 tip - WP Karolinadijk
Groep: WP Piet de Wit
Lijst van Windturbines, voor rekenmethode Industrielawaai - WT

Naam	LE (N) Totaal
7	104,00
6	104,00
5	104,00
4	104,00
3	104,00
1	104,00
2	104,00

Invoer rekenmodel windturbinegeluid

Model: Tweede model - Alle windturbines
V1 - V068475aa.201GTPL.dv - aanvulling geluid en slagschaduw 215 tip - WP Karolinadijk
Groep: WP Sabina Polder
Lijst van Windturbines, voor rekenmethode Industrielawaai - WT

Naam	Omschr.	X	Y	Maaiveld	Hoogte	LE (D) Totaal	LE (A) Totaal	LE (N) Totaal
2110	Vestas V90	86418,13	409399,34	0,00	105,00	103,03	103,18	103,52
2111	Vestas V90	86553,94	409720,16	0,00	105,00	103,03	103,18	103,52
2112	Vestas V90	86696,51	410029,78	0,00	105,00	103,03	103,18	103,52

Invoer rekenmodel windturbinegeluid

Model: Tweede model - Alle windturbines
V1 - V068475aa.201GTPL.dv - aanvulling geluid en slagschaduw 215 tip - WP Karolinadijk
Groep: WP Sabinapolder
Lijst van Windturbines, voor rekenmethode Industrielawaai - WT

Naam	Omschr.	X	Y	Maaiveld	Hoogte	LE (D) Totaal	LE (A) Totaal	LE (N) Totaal
1600	Vestas V52	85712,28	408886,05	0,00	49,00	99,16	98,67	98,77
1599	Vestas V52	84973,40	408495,70	0,00	49,00	99,16	98,67	98,77
1601	Vestas V52	85805,42	409118,43	0,00	49,00	99,16	98,67	98,77
1602	Vestas V52	85905,48	409350,71	0,00	49,00	99,16	98,67	98,77
1603	Vestas V52	86005,52	409583,00	0,00	49,00	99,16	98,67	98,77
1605	Vestas V52	86198,52	410036,56	0,00	49,00	99,16	98,67	98,77
1604	Vestas V52	86098,49	409804,26	0,00	49,00	99,16	98,67	98,77
1599	Vestas V52	84662,00	408309,00	0,00	49,00	99,16	98,67	98,77

Model: Tweede model - Alle windturbines
V1 - V068475aa.201GTPL.dv - aanvulling geluid en slagschaduw 215 tip - WP Karolinadijk
Groep: WP Dinteloord
Lijst van Windturbines, voor rekenmethode Industrielawaai - WT

Naam	Omschr.	LE (D) 63	LE (D) 125	LE (D) 250	LE (D) 500	LE (D) 1k	LE (D) 2k	LE (D) 4k	LE (D) 8k
1	Bestaand V44	72,68	81,68	83,24	88,96	92,79	92,34	91,34	89,53
4	Bestaand V44	72,68	81,68	83,24	88,96	92,79	92,34	91,34	89,53
2	Bestaand V44	72,68	81,68	83,24	88,96	92,79	92,34	91,34	89,53
3	Bestaand V44	72,68	81,68	83,24	88,96	92,79	92,34	91,34	89,53

Model: Tweede model - Alle windturbines
V1 - V068475aa.201GTPL.dv - aanvulling geluid en slagschaduw 215 tip - WP Karolinadijk
Groep: WP Dinteloord
Lijst van Windturbines, voor rekenmethode Industrielawaai - WT

Naam	LE (A) 63	LE (A) 125	LE (A) 250	LE (A) 500	LE (A) 1k	LE (A) 2k	LE (A) 4k	LE (A) 8k	LE (N) 63
1	72,75	81,75	83,32	89,04	92,86	92,42	91,42	89,60	72,79
4	72,75	81,75	83,32	89,04	92,86	92,42	91,42	89,60	72,79
2	72,75	81,75	83,32	89,04	92,86	92,42	91,42	89,60	72,79
3	72,75	81,75	83,32	89,04	92,86	92,42	91,42	89,60	72,79

Model: Tweede model - Alle windturbines
V1 - V068475aa.201GTPL.dv - aanvulling geluid en slagschaduw 215 tip - WP Karolinadijk
Groep: WP Dinteloord
Lijst van Windturbines, voor rekenmethode Industrielawaai - WT

Naam	LE (N) 125	LE (N) 250	LE (N) 500	LE (N) 1k	LE (N) 2k	LE (N) 4k	LE (N) 8k
1	81,79	83,36	89,08	92,90	92,46	91,46	89,64
4	81,79	83,36	89,08	92,90	92,46	91,46	89,64
2	81,79	83,36	89,08	92,90	92,46	91,46	89,64
3	81,79	83,36	89,08	92,90	92,46	91,46	89,64

Invoer rekenmodel windturbinegeluid

Model: Tweede model - Alle windturbines
V1 - V068475aa.201GTPL.dv - aanvulling geluid en slagschaduw 215 tip - WP Karolinadijk
Groep: WP Dintel SurveyCom
Lijst van Windturbines, voor rekenmethode Industrielawaai - WT

Naam	Omschr.	LE (D) 63	LE (D) 125	LE (D) 250	LE (D) 500	LE (D) 1k	LE (D) 2k	LE (D) 4k
1	Siemens SWT3.2-108	80,69	88,19	95,59	98,89	95,59	87,69	76,79
2	Siemens SWT3.2-108	80,69	88,19	95,59	98,89	95,59	87,69	76,79
3	Siemens SWT3.2-108	80,69	88,19	95,59	98,89	95,59	87,69	76,79

Model: Tweede model - Alle windturbines
V1 - V068475aa.201GTPL.dv - aanvulling geluid en slagschaduw 215 tip - WP Karolinadijk
Groep: WP Dintel SurveyCom
Lijst van Windturbines, voor rekenmethode Industrielawaai - WT

Naam	LE (D) 8k	LE (A) 63	LE (A) 125	LE (A) 250	LE (A) 500	LE (A) 1k	LE (A) 2k	LE (A) 4k	LE (A) 8k
1	73,49	80,73	88,23	95,63	98,93	95,63	87,73	76,83	73,53
2	73,49	80,73	88,23	95,63	98,93	95,63	87,73	76,83	73,53
3	73,49	80,73	88,23	95,63	98,93	95,63	87,73	76,83	73,53

Model: Tweede model - Alle windturbines
V1 - V068475aa.201GTPL.dv - aanvulling geluid en slagschaduw 215 tip - WP Karolinadijk
Groep: WP Dintel SurveyCom
Lijst van Windturbines, voor rekenmethode Industrielawaai - WT

Naam	LE (N) 63	LE (N) 125	LE (N) 250	LE (N) 500	LE (N) 1k	LE (N) 2k	LE (N) 4k	LE (N) 8k
1	81,09	88,59	95,99	99,29	95,99	88,09	77,19	73,89
2	81,09	88,59	95,99	99,29	95,99	88,09	77,19	73,89
3	81,09	88,59	95,99	99,29	95,99	88,09	77,19	73,89

Model: Tweede model - Alle windturbines
V1 - V068475aa.201GTPL.dv - aanvulling geluid en slagschaduw 215 tip - WP Karolinadijk
Groep: WP Nieuw-Prinnsenland
Lijst van Windturbines, voor rekenmethode Industrielawaai - WT

Naam	Omschr.	LE (D) 63	LE (D) 125	LE (D) 250	LE (D) 500	LE (D) 1k	LE (D) 2k	LE (D) 4k
2239	Siemens SWT3.2-108	80,69	88,19	95,59	98,89	95,59	87,69	76,79
2238	Siemens SWT3.2-108	80,69	88,19	95,59	98,89	95,59	87,69	76,79
2237	Siemens SWT3.2-108	80,69	88,19	95,59	98,89	95,59	87,69	76,79
2236	Siemens SWT3.2-108	80,69	88,19	95,59	98,89	95,59	87,69	76,79

Model: Tweede model - Alle windturbines
V1 - V068475aa.201GTPL.dv - aanvulling geluid en slagschaduw 215 tip - WP Karolinadijk
Groep: WP Nieuw-Prinnsenland
Lijst van Windturbines, voor rekenmethode Industrielawaai - WT

Naam	LE (D) 8k	LE (A) 63	LE (A) 125	LE (A) 250	LE (A) 500	LE (A) 1k	LE (A) 2k	LE (A) 4k	LE (A) 8k
2239	73,49	80,73	88,23	95,63	98,93	95,63	87,73	76,83	73,53
2238	73,49	80,73	88,23	95,63	98,93	95,63	87,73	76,83	73,53
2237	73,49	80,73	88,23	95,63	98,93	95,63	87,73	76,83	73,53
2236	73,49	80,73	88,23	95,63	98,93	95,63	87,73	76,83	73,53

Model: Tweede model - Alle windturbines
V1 - V068475aa.201GTPL.dv - aanvulling geluid en slagschaduw 215 tip - WP Karolinadijk
Groep: WP Nieuw-Prinnsenland
Lijst van Windturbines, voor rekenmethode Industrielawaai - WT

Naam	LE (N) 63	LE (N) 125	LE (N) 250	LE (N) 500	LE (N) 1k	LE (N) 2k	LE (N) 4k	LE (N) 8k
2239	81,09	88,59	95,99	99,29	95,99	88,09	77,19	73,89
2238	81,09	88,59	95,99	99,29	95,99	88,09	77,19	73,89
2237	81,09	88,59	95,99	99,29	95,99	88,09	77,19	73,89
2236	81,09	88,59	95,99	99,29	95,99	88,09	77,19	73,89

Invoer rekenmodel windturbinegeluid

Model: Tweede model - Alle windturbines
V1 - V068475aa.201GTPL.dv - aanvulling geluid en slagschaduw 215 tip - WP Karolinadijk
Groep: WP Oud Dintel
Lijst van Windturbines, voor rekenmethode Industrielawaai - WT

Naam	Omschr.	LE (D) 63	LE (D) 125	LE (D) 250	LE (D) 500	LE (D) 1k	LE (D) 2k	LE (D) 4k
2275	Siemens SWT3.2-108	80,69	88,19	95,59	98,89	95,59	87,69	76,79
2277	Siemens SWT3.2-108	80,69	88,19	95,59	98,89	95,59	87,69	76,79
2276	Siemens SWT3.2-108	80,69	88,19	95,59	98,89	95,59	87,69	76,79
2279	Siemens SWT3.2-108	80,69	88,19	95,59	98,89	95,59	87,69	76,79
2278	Siemens SWT3.2-108	80,69	88,19	95,59	98,89	95,59	87,69	76,79

Model: Tweede model - Alle windturbines
V1 - V068475aa.201GTPL.dv - aanvulling geluid en slagschaduw 215 tip - WP Karolinadijk
Groep: WP Oud Dintel
Lijst van Windturbines, voor rekenmethode Industrielawaai - WT

Naam	LE (D) 8k	LE (A) 63	LE (A) 125	LE (A) 250	LE (A) 500	LE (A) 1k	LE (A) 2k	LE (A) 4k	LE (A) 8k
2275	73,49	80,73	88,23	95,63	98,93	95,63	87,73	76,83	73,53
2277	73,49	80,73	88,23	95,63	98,93	95,63	87,73	76,83	73,53
2276	73,49	80,73	88,23	95,63	98,93	95,63	87,73	76,83	73,53
2279	73,49	80,73	88,23	95,63	98,93	95,63	87,73	76,83	73,53
2278	73,49	80,73	88,23	95,63	98,93	95,63	87,73	76,83	73,53

Model: Tweede model - Alle windturbines
V1 - V068475aa.201GTPL.dv - aanvulling geluid en slagschaduw 215 tip - WP Karolinadijk
Groep: WP Oud Dintel
Lijst van Windturbines, voor rekenmethode Industrielawaai - WT

Naam	LE (N) 63	LE (N) 125	LE (N) 250	LE (N) 500	LE (N) 1k	LE (N) 2k	LE (N) 4k	LE (N) 8k
2275	81,09	88,59	95,99	99,29	95,99	88,09	77,19	73,89
2277	81,09	88,59	95,99	99,29	95,99	88,09	77,19	73,89
2276	81,09	88,59	95,99	99,29	95,99	88,09	77,19	73,89
2279	81,09	88,59	95,99	99,29	95,99	88,09	77,19	73,89
2278	81,09	88,59	95,99	99,29	95,99	88,09	77,19	73,89

Model: Tweede model - Alle windturbines
V1 - V068475aa.201GTPL.dv - aanvulling geluid en slagschaduw 215 tip - WP Karolinadijk
Groep: WP Piet de Wit
Lijst van Windturbines, voor rekenmethode Industrielawaai - WT

Naam	Omschr.	LE (D) 63	LE (D) 125	LE (D) 250	LE (D) 500	LE (D) 1k	LE (D) 2k	LE (D) 4k
7	VKA boven Piet de Wit	82,40	91,60	96,00	98,00	98,20	95,20	86,70
6	VKA boven Piet de Wit	82,40	91,60	96,00	98,00	98,20	95,20	86,70
5	VKA boven Piet de Wit	82,40	91,60	96,00	98,00	98,20	95,20	86,70
4	VKA boven Piet de Wit	82,40	91,60	96,00	98,00	98,20	95,20	86,70
3	VKA boven Piet de Wit	82,40	91,60	96,00	98,00	98,20	95,20	86,70
1	VKA boven Piet de Wit	82,40	91,60	96,00	98,00	98,20	95,20	86,70
2	VKA boven Piet de Wit	82,40	91,60	96,00	98,00	98,20	95,20	86,70

Model: Tweede model - Alle windturbines
V1 - V068475aa.201GTPL.dv - aanvulling geluid en slagschaduw 215 tip - WP Karolinadijk
Groep: WP Piet de Wit
Lijst van Windturbines, voor rekenmethode Industrielawaai - WT

Naam	LE (D) 8k	LE (A) 63	LE (A) 125	LE (A) 250	LE (A) 500	LE (A) 1k	LE (A) 2k	LE (A) 4k	LE (A) 8k
7	69,60	82,59	91,79	96,19	98,19	98,39	95,39	86,89	69,79
6	69,60	82,59	91,79	96,19	98,19	98,39	95,39	86,89	69,79
5	69,60	82,59	91,79	96,19	98,19	98,39	95,39	86,89	69,79
4	69,60	82,59	91,79	96,19	98,19	98,39	95,39	86,89	69,79
3	69,60	82,59	91,79	96,19	98,19	98,39	95,39	86,89	69,79
1	69,60	82,59	91,79	96,19	98,19	98,39	95,39	86,89	69,79
2	69,60	82,59	91,79	96,19	98,19	98,39	95,39	86,89	69,79

Model: Tweede model - Alle windturbines
V1 - V068475aa.201GTPL.dv - aanvulling geluid en slagschaduw 215 tip - WP Karolinadijk
Groep: WP Piet de Wit
Lijst van Windturbines, voor rekenmethode Industrielawaai - WT

Naam	LE (N) 63	LE (N) 125	LE (N) 250	LE (N) 500	LE (N) 1k	LE (N) 2k	LE (N) 4k	LE (N) 8k
7	82,91	92,11	96,51	98,51	98,71	95,71	87,21	70,11
6	82,91	92,11	96,51	98,51	98,71	95,71	87,21	70,11
5	82,91	92,11	96,51	98,51	98,71	95,71	87,21	70,11
4	82,91	92,11	96,51	98,51	98,71	95,71	87,21	70,11
3	82,91	92,11	96,51	98,51	98,71	95,71	87,21	70,11
1	82,91	92,11	96,51	98,51	98,71	95,71	87,21	70,11
2	82,91	92,11	96,51	98,51	98,71	95,71	87,21	70,11

Model: Tweede model - Alle windturbines
V1 - V068475aa.201GTPL.dv - aanvulling geluid en slagschaduw 215 tip - WP Karolinadijk
Groep: WP Sabina Polder
Lijst van Windturbines, voor rekenmethode Industrielawaai - WT

Naam	Omschr.	LE (D) 63	LE (D) 125	LE (D) 250	LE (D) 500	LE (D) 1k	LE (D) 2k	LE (D) 4k	LE (D) 8k
2110	Vestas V90	87,15	90,12	92,76	95,15	97,81	97,05	93,16	82,64
2111	Vestas V90	87,15	90,12	92,76	95,15	97,81	97,05	93,16	82,64
2112	Vestas V90	87,15	90,12	92,76	95,15	97,81	97,05	93,16	82,64

Model: Tweede model - Alle windturbines
V1 - V068475aa.201GTPL.dv - aanvulling geluid en slagschaduw 215 tip - WP Karolinadijk
Groep: WP Sabina Polder
Lijst van Windturbines, voor rekenmethode Industrielawaai - WT

Naam	LE (A) 63	LE (A) 125	LE (A) 250	LE (A) 500	LE (A) 1k	LE (A) 2k	LE (A) 4k	LE (A) 8k	LE (N) 63
2110	87,30	90,27	92,91	95,30	97,96	97,20	93,31	82,79	87,64
2111	87,30	90,27	92,91	95,30	97,96	97,20	93,31	82,79	87,64
2112	87,30	90,27	92,91	95,30	97,96	97,20	93,31	82,79	87,64

Model: Tweede model - Alle windturbines
V1 - V068475aa.201GTPL.dv - aanvulling geluid en slagschaduw 215 tip - WP Karolinadijk
Groep: WP Sabina Polder
Lijst van Windturbines, voor rekenmethode Industrielawaai - WT

Naam	LE (N) 125	LE (N) 250	LE (N) 500	LE (N) 1k	LE (N) 2k	LE (N) 4k	LE (N) 8k
2110	90,61	93,25	95,64	98,30	97,54	93,65	83,13
2111	90,61	93,25	95,64	98,30	97,54	93,65	83,13
2112	90,61	93,25	95,64	98,30	97,54	93,65	83,13

Model: Tweede model - Alle windturbines
V1 - V068475aa.201GTPL.dv - aanvulling geluid en slagschaduw 215 tip - WP Karolinadijk
Groep: WP Sabinapolder
Lijst van Windturbines, voor rekenmethode Industrielawaai - WT

Naam	Omschr.	LE (D) 63	LE (D) 125	LE (D) 250	LE (D) 500	LE (D) 1k	LE (D) 2k	LE (D) 4k	LE (D) 8k
1600	Vestas V52	77,91	84,91	91,91	94,91	92,91	89,91	83,91	74,91
1599	Vestas V52	77,91	84,91	91,91	94,91	92,91	89,91	83,91	74,91
1601	Vestas V52	77,91	84,91	91,91	94,91	92,91	89,91	83,91	74,91
1602	Vestas V52	77,91	84,91	91,91	94,91	92,91	89,91	83,91	74,91
1603	Vestas V52	77,91	84,91	91,91	94,91	92,91	89,91	83,91	74,91
1605	Vestas V52	77,91	84,91	91,91	94,91	92,91	89,91	83,91	74,91
1604	Vestas V52	77,91	84,91	91,91	94,91	92,91	89,91	83,91	74,91
1599	Vestas V52	77,91	84,91	91,91	94,91	92,91	89,91	83,91	74,91

Model: Tweede model - Alle windturbines
V1 - V068475aa.201GTPL.dv - aanvulling geluid en slagschaduw 215 tip - WP Karolinadijk
Groep: WP Sabinapolder
Lijst van Windturbines, voor rekenmethode Industrielawaai - WT

Naam	LE (A) 63	LE (A) 125	LE (A) 250	LE (A) 500	LE (A) 1k	LE (A) 2k	LE (A) 4k	LE (A) 8k	LE (N) 63
1600	77,42	84,42	91,42	94,42	92,42	89,42	83,42	74,42	77,52
1599	77,42	84,42	91,42	94,42	92,42	89,42	83,42	74,42	77,52
1601	77,42	84,42	91,42	94,42	92,42	89,42	83,42	74,42	77,52
1602	77,42	84,42	91,42	94,42	92,42	89,42	83,42	74,42	77,52
1603	77,42	84,42	91,42	94,42	92,42	89,42	83,42	74,42	77,52
1605	77,42	84,42	91,42	94,42	92,42	89,42	83,42	74,42	77,52
1604	77,42	84,42	91,42	94,42	92,42	89,42	83,42	74,42	77,52
1599	77,42	84,42	91,42	94,42	92,42	89,42	83,42	74,42	77,52

Invoer rekenmodel windturbinegeluid

Model: Tweede model - Alle windturbines
V1 - V068475aa.201GTPL.dv - aanvulling geluid en slagschaduw 215 tip - WP Karolinadijk
Groep: WP Sabinapolder
Lijst van Windturbines, voor rekenmethode Industrielawaai - WT

Naam	LE (N) 125	LE (N) 250	LE (N) 500	LE (N) 1k	LE (N) 2k	LE (N) 4k	LE (N) 8k
1600	84,52	91,52	94,52	92,52	89,52	83,52	74,52
1599	84,52	91,52	94,52	92,52	89,52	83,52	74,52
1601	84,52	91,52	94,52	92,52	89,52	83,52	74,52
1602	84,52	91,52	94,52	92,52	89,52	83,52	74,52
1603	84,52	91,52	94,52	92,52	89,52	83,52	74,52
1605	84,52	91,52	94,52	92,52	89,52	83,52	74,52
1604	84,52	91,52	94,52	92,52	89,52	83,52	74,52
1599	84,52	91,52	94,52	92,52	89,52	83,52	74,52

Bijlage V Invoer en hoofdresultaten slagschaduw

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David Vrolijk / dv@lbpsight.nl
Calculated:
3-2-2020 14:38/3.1.633

SHADOW - Main Result

Calculation: V136@147m

Assumptions for shadow calculations

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

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

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2,20	3,20	4,40	6,30	7,10	7,20	7,20	6,60	5,00	3,90	2,30	1,70

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
563	673	737	507	350	394	853	1.312	1.152	974	554	619	8.688

Idle start wind speed: Cut in wind speed from power curve

A ZVI (Zones of Visual Influence) calculation is performed before flicker calculation so non visible WTG do not contribute to calculated flicker values. A WTG will be visible if it is visible from any part of the receiver window. The ZVI calculation is based on the following assumptions:
Height contours used: Height Contours: CONTOURLINE_ONLINEDATA_0.wpo
Obstacles used in calculation
Eye height: 1,5 m
Grid resolution: 10,0 m

All coordinates are in
Dutch Stereo-RD/NAP 2008

Scale 1:40.000
New WTG Shadow receptor

WTGs

	X (east)	Y (north)	Z	Row data/Description	WTG type Valid	Manufact.	Type-generator	Power, rated	Rotor diameter	Hub height	Shadow data Calculation distance	RPM
			[m]					[kW]	[m]	[m]	[m]	[RPM]
1	83.370	407.032	0,0	VESTAS V136-4.2 4200 136.0 !O! hub: 147...	Yes	VESTAS	V136-4.2-4.200	4.200	136,0	147,0	1.800	10,4
2	83.773	406.912	0,0	VESTAS V136-4.2 4200 136.0 !O! hub: 147...	Yes	VESTAS	V136-4.2-4.200	4.200	136,0	147,0	1.800	10,4
3	84.210	407.322	0,0	VESTAS V136-4.2 4200 136.0 !O! hub: 147...	Yes	VESTAS	V136-4.2-4.200	4.200	136,0	147,0	1.800	10,4
4	83.827	407.361	0,0	VESTAS V136-4.2 4200 136.0 !O! hub: 147...	Yes	VESTAS	V136-4.2-4.200	4.200	136,0	147,0	1.800	10,4

Shadow receptor-Input

No.	Name	X (east)	Y (north)	Z	Width	Height	Height a.g.l.	Degrees from south cw	Slope of window	Direction mode
				[m]	[m]	[m]	[m]	[°]	[°]	
4671RL5	Postbaan 5	85.262	406.654	0,0	8,0	4,0	1,0	0,0	90,0	"Green house mode"
4671RN1	Sasdijk 1	84.868	407.588	0,0	8,0	4,0	1,0	0,0	90,0	"Green house mode"
4671RN10	Sasdijk 10	85.046	407.415	0,0	8,0	4,0	1,0	0,0	90,0	"Green house mode"
4671RN14	Sasdijk 14	85.201	407.476	0,0	8,0	4,0	1,0	0,0	90,0	"Green house mode"
4671RN2	Sasdijk 2	85.431	406.903	0,0	8,0	4,0	1,0	0,0	90,0	"Green house mode"
4671RN3	Sasdijk 3	84.864	407.624	0,0	8,0	4,0	1,0	0,0	90,0	"Green house mode"
4671RN4	Sasdijk 4	85.089	407.362	0,0	8,0	4,0	1,0	0,0	90,0	"Green house mode"
4671RN6	Sasdijk 6	85.076	407.379	0,0	8,0	4,0	1,0	0,0	90,0	"Green house mode"
4671RN8	Sasdijk 8	85.061	407.397	0,0	8,0	4,0	1,0	0,0	90,0	"Green house mode"
4671TH7	Schenkeldijk 7	82.948	406.883	0,0	8,0	4,0	1,0	0,0	90,0	"Green house mode"
4671TH9	Schenkeldijk 9	82.978	406.891	0,0	8,0	4,0	1,0	0,0	90,0	"Green house mode"
4794SM15	1-Februariweg 15	85.139	408.288	0,0	8,0	4,0	1,0	0,0	90,0	"Green house mode"

Calculation Results

Shadow receptor

No.	Name	Shadow, worst case: Shadow hours per year [h/year]	Shadow, worst case: Shadow days per year [days/year]	Shadow, worst case: Max shadow hours per day [h/day]	Shadow, expected values: Shadow hours per year [h/year]
4671RL5	Postbaan 5	41:51	121	0:28	10:26
4671RN1	Sasdijk 1	68:47	106	1:13	16:06

To be continued on next page...

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David Vrolijk / dv@lbpsight.nl
Calculated:
3-2-2020 14:38/3.1.633

SHADOW - Main Result

Calculation: V136@147m

...continued from previous page

No.	Name	Shadow, worst case Shadow hours per year [h/year]	Shadow days per year [days/year]	Max shadow hours per day [h/day]	Shadow, expected values Shadow hours per year [h/year]
4671RN10	Sasdijk 10	47:49	101	0:52	11:24
4671RN14	Sasdijk 14	31:41	70	0:46	7:23
4671RN2	Sasdijk 2	26:04	85	0:27	6:23
4671RN3	Sasdijk 3	69:23	106	1:12	16:06
4671RN4	Sasdijk 4	43:04	98	0:47	10:26
4671RN6	Sasdijk 6	44:27	98	0:48	10:43
4671RN8	Sasdijk 8	45:50	97	0:50	10:59
4671TH7	Schenkeldijk 7	156:38	163	1:48	44:48
4671TH9	Schenkeldijk 9	153:51	164	1:49	43:58
4794SM15	1-Februariweg 15	36:45	100	0:27	6:24

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

No.	Name	Worst case [h/year]	Expected [h/year]
1	VESTAS V136-4.2 4200 136.0 !O! hub: 147,0 m (TOT: 215,0 m) (26)	103:21	28:37
2	VESTAS V136-4.2 4200 136.0 !O! hub: 147,0 m (TOT: 215,0 m) (27)	79:32	19:30
3	VESTAS V136-4.2 4200 136.0 !O! hub: 147,0 m (TOT: 215,0 m) (28)	165:18	39:07
4	VESTAS V136-4.2 4200 136.0 !O! hub: 147,0 m (TOT: 215,0 m) (29)	101:51	25:47

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

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LBP SIGHT
Kelvinbaan 40, PO box 1475
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David Vrolijk / dv@lbpsight.nl
Calculated:
3-2-2020 14:38/3.1.633

SHADOW - Calendar

Calculation: V136@147mShadow receptor: 4671RL5 - Postbaan 5

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2,20	3,20	4,40	6,30	7,10	7,20	7,20	6,60	5,00	3,90	2,30	1,70

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
563	673	737	507	350	394	853	1.312	1.152	974	554	619	8.688

Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April		May		June		July		August		September		October	November	December
1	08:50	08:23	07:30	07:20		06:16		05:32		20:46 (4)	05:29	20:59 (3)	06:05	20:49 (4)	06:54	19:49 (2)	07:42	07:35	08:26
	16:43	17:31	18:22	20:15		21:05		21:51	25	21:16 (3)	22:04	27	21:26 (3)	21:33	14	21:03 (4)	20:32	16	20:05 (2)	19:23	17:17	16:37
2	08:49	08:22	07:28	07:18		06:14		05:31		20:56 (3)	05:29		21:00 (3)	06:06		20:50 (4)	06:55		19:49 (2)	07:44	07:37	08:27
	16:44	17:32	18:23	20:17		21:07		21:52	21	21:17 (3)	22:04	26	21:26 (3)	21:31	12	21:02 (4)	20:29	13	20:02 (2)	19:20	17:15	16:37
3	08:49	08:20	07:26	07:16		06:12		05:30		20:55 (3)	05:30		21:00 (3)	06:08		20:51 (4)	06:57		19:51 (2)	07:45	07:39	08:29
	16:45	17:34	18:25	20:18		21:09		21:53	22	21:17 (3)	22:04	25	21:25 (3)	21:30	9	21:00 (4)	20:27	9	20:00 (2)	19:18	17:14	16:36
4	08:49	08:18	07:24	07:14		06:11		05:29		20:56 (3)	05:31		21:00 (3)	06:09		20:53 (4)	06:59		19:54 (2)	07:47	07:41	08:30
	16:47	17:36	18:27	20:20		21:10		21:54	22	21:18 (3)	22:03	25	21:25 (3)	21:28	6	20:59 (4)	20:25	4	19:58 (2)	19:16	17:12	16:36
5	08:49	08:17	07:22	07:11		06:09		05:29		20:55 (3)	05:32		21:01 (3)	06:11			07:00			07:49	07:42	08:31
	16:48	17:38	18:29	20:22		21:12		21:55	23	21:18 (3)	22:03	25	21:26 (3)	21:26			20:23			19:14	17:10	16:35
6	08:49	08:15	07:19	07:09		06:07		05:28		20:55 (3)	05:32		21:01 (3)	06:12			07:02			07:50	07:44	08:33
	16:49	17:40	18:30	20:23		21:13		21:56	24	21:19 (3)	22:02	25	21:26 (3)	21:25			20:20			19:11	17:08	16:35
7	08:48	08:13	07:17	07:07		06:05		05:27		20:55 (3)	05:33		21:02 (3)	06:14			07:03			07:52	07:46	08:34
	16:50	17:42	18:32	20:25		21:15		21:57	24	21:19 (3)	22:02	24	21:26 (3)	21:23			20:18			19:09	17:07	16:34
8	08:48	08:12	07:15	07:05	19:57 (2)	06:03	20:45 (4)	05:27		20:55 (3)	05:34		21:02 (3)	06:15			07:05			07:54	07:48	08:35
	16:51	17:43	18:34	20:27	3 20:00 (2)	21:17	2 20:47 (4)	21:57	25	21:20 (3)	22:01	23	21:25 (3)	21:21			20:16			19:07	17:05	16:34
9	08:47	08:10	07:13	07:02	19:53 (2)	06:02	20:42 (4)	05:26		20:55 (3)	05:35		21:02 (3)	06:17			07:07			07:55	07:50	08:36
	16:53	17:45	18:36	20:28	9 20:02 (2)	21:18	7 20:49 (4)	21:58	26	21:21 (3)	22:00	22	21:24 (3)	21:19			20:14			19:05	17:03	16:34
10	08:47	08:08	07:11	07:00	19:51 (2)	06:00	20:40 (4)	05:26		20:55 (3)	05:36		21:03 (3)	06:19			07:08			07:57	07:51	08:37
	16:54	17:47	18:37	20:30	13 20:04 (2)	21:20	10 20:50 (4)	21:59	26	21:21 (3)	22:00	21	21:24 (3)	21:17			20:11			19:02	17:02	16:33
11	08:46	08:06	07:08	06:58	19:50 (2)	05:58	20:39 (4)	05:26		20:55 (3)	05:37		20:54 (4)	06:20			07:10			07:59	07:53	08:38
	16:56	17:49	18:39	20:32	16 20:06 (2)	21:21	13 20:52 (4)	22:00	26	21:21 (3)	21:59	25	21:24 (3)	21:15			20:09			19:00	17:00	16:33
12	08:46	08:05	07:06	06:56	19:48 (2)	05:57	20:38 (4)	05:25		20:55 (3)	05:38		20:53 (4)	06:22			07:11			08:01	07:55	08:39
	16:57	17:51	18:41	20:34	19 20:07 (2)	21:23	15 20:53 (4)	22:00	27	21:22 (3)	21:58	27	21:23 (3)	21:13			20:07			18:58	16:59	16:33
13	08:45	08:03	07:04	06:53	19:47 (2)	05:55	20:38 (4)	05:25		20:56 (3)	05:39		20:51 (4)	06:23			07:13			08:02	07:57	08:40
	16:59	17:53	18:43	20:35	21 20:08 (2)	21:25	17 20:55 (4)	22:01	26	21:22 (3)	21:57	28	21:22 (3)	21:12			20:04			18:56	16:57	16:33
14	08:44	08:01	07:02	06:51	19:46 (2)	05:54	20:37 (4)	05:25		20:55 (3)	05:40		20:51 (4)	06:25			07:15			08:04	07:58	08:41
	17:00	17:54	18:44	20:37	22 20:08 (2)	21:26	19 20:56 (4)	22:02	27	21:22 (3)	21:56	28	21:22 (3)	21:10			20:02			18:54	16:56	16:33
15	08:43	07:59	06:59	06:49	19:46 (2)	05:52	20:37 (4)	05:25		20:55 (3)	05:42		20:50 (4)	06:27			07:16			08:06	08:00	08:42
	17:02	17:56	18:46	20:39	22 20:08 (2)	21:28	21 20:58 (4)	22:02	27	21:22 (3)	21:55	27	21:20 (3)	21:08			20:00			18:51	16:54	16:33
16	08:43	07:57	06:57	06:47	19:46 (2)	05:50	20:37 (4)	05:24		20:55 (3)	05:43		20:50 (4)	06:28			07:18			08:07	08:02	08:43
	17:03	17:58	18:48	20:40	22 20:08 (2)	21:29	21 20:58 (4)	22:03	28	21:23 (3)	21:54	25	21:20 (3)	21:06			19:57			18:49	16:53	16:33
17	08:42	07:55	06:55	06:45	19:46 (2)	05:49	20:36 (4)	05:24		20:55 (3)	05:44		20:49 (4)	06:30			07:19			08:09	08:03	08:44
	17:05	18:00	18:50	20:42	22 20:08 (2)	21:31	22 20:58 (4)	22:03	28	21:23 (3)	21:53	23	21:18 (3)	21:04			19:55			18:47	16:52	16:34
18	08:41	07:53	06:52	06:43	19:46 (2)	05:48	20:36 (4)	05:24		20:56 (3)	05:45		20:48 (4)	06:31			07:21			08:11	08:05	08:45
	17:06	18:02	18:51	20:44	21 20:07 (2)	21:32	22 20:58 (4)	22:04	27	21:23 (3)	21:52	18	21:06 (4)	21:02			19:53			18:45	16:50	16:34
19	08:40	07:51	06:50	06:40	19:47 (2)	05:46	20:37 (4)	05:24		20:56 (3)	05:46		20:48 (4)	06:33			07:23			08:12	08:07	08:45
	17:08	18:04	18:53	20:45	19 20:06 (2)	21:34	22 20:59 (4)	22:04	27	21:23 (3)	21:51	19	21:07 (4)	21:00			19:50			18:43	16:49	16:34
20	08:39	07:49	06:48	06:38	19:48 (2)	05:45	20:36 (4)	05:24		20:57 (3)	05:48		20:47 (4)	06:35		19:58 (2)	07:24			08:14	08:09	08:46
	17:10	18:05	18:55	20:47	17 20:05 (2)	21:35	22 20:58 (4)	22:04	27	21:24 (3)	21:50	20	21:07 (4)	20:57	6	20:04 (2)	19:48			18:41	16:48	16:34
21	08:38	07:47	06:46	06:36	19:49 (2)	05:43	20:36 (4)	05:25		20:57 (3)	05:49		20:48 (4)	06:36		19:55 (2)	07:26			08:16	08:10	08:47
	17:11	18:07	18:56	20:49	15 20:04 (2)	21:37	22 20:58 (4)	22:05	27	21:24 (3)	21:49	20	21:08 (4)	20:55	12	20:07 (2)	19:46			18:39	16:47	16:35
22	08:37	07:45	06:43	06:34	19:51 (2)	05:42	20:37 (4)	05:25		20:57 (3)	05:50		20:47 (4)	06:38		19:53 (2)	07:28			08:18	08:12	08:47
	17:13	18:09	18:58	20:50	11 20:02 (2)	21:38	21 20:58 (4)	22:05	27	21:24 (3)	21:48	21	21:08 (4)	20:53	15	20:08 (2)	19:43			18:37	16:46	16:35
23	08:35	07:43	06:41	06:32	19:54 (2)	05:41	20:37 (4)	05:25		20:57 (3)	05:52		20:47 (4)	06:39		19:51 (2)	07:29			08:19	08:13	08:48
	17:15	18:11	19:00	20:52	4 19:58 (2)	21:39	21 20:58 (4)	22:05	27	21:24 (3)	21:46	21	21:08 (4)	20:51	18	20:09 (2)	19:41			18:35	16:44	16:36
24	08:34	07:41	06:39	06:30		05:40	20:38 (4)	05:25		20:58 (3)	05:53		20:46 (4)	06:41		19:50 (2)	07:31			08:21	08:15	08:48
	17:16	18:13	19:01	20:54		21:41	19 20:57 (4)	22:05	27	21:25 (3)	21:45	22	21:08 (4)	20:49	19	20:09 (2)	19:39			18:33	16:43	16:36
25	08:33	07:39	06:36	06:28		05:39	20:39 (4)	05:26		20:58 (3)	05:54		20:47 (4)	06:43		19:49 (2)	07:32			07:23	08:17	08:48
	17:18	18:14	19:03	20:55		21:42	18 20:57 (4)	22:05	27	21:25 (3)	21:44	22	21:09 (4)	20:47	21	20:10 (2)	19:37			17:31	16:42	16:37
26	08:32	07:37	06:34	06:26		05:37	20:39 (4)	05:26		20:57 (3)	05:56		20:47 (4)	06:44		19:48 (2)	07:34			07:25	08:18	08:49
	17:20	18:16	19:05	20:57		21:43	18 20:57 (4)	22:05	28	21:25 (3)	21:42	22	21:09 (4)	20:45	21	20:09 (2)	19:34			17:29	16:41	16:38
27	08:30	07:35	06:32	06:24		05:36	20:40 (4)	05:26		20:58 (3)	05:57		20:47 (4)	06:46		19:48 (2)	07:36			07:26	08:20	08:49
	17:22	18:18	19:07	20:59		21:45	25 21:10 (3)	22:05	27	21:25 (3)	21:41	21	21:08 (4)	20:43	22	20:10 (2)	19:32			17:27	16:41	16:38
28	08:29	07:33	06:30	06:22		05:35	20:41 (4)	05:27		20:58 (3)	05:59		20:47 (4)	06:47		19:48 (2)	07:37			07:28	08:21	08:49
	17:23	18:20	19:08	21:00		21:46	26 21:11 (3)	22:05	27	21:25 (3)	21:39	22	21:09 (4)	20:40	22	20:10 (2)	19:30			17:25	16:40	16:39
29	08:28		07:27	06:20		05:34	20:42 (4)	05:27		20:59 (3)	06:00		20:47 (4)	06:49		19:47 (2)	07:39			07:30	08:23	08:49
	17:25		20:10	21:02		21:47	28 21:13 (3)	22:05	27	21:26 (3)	21:38	21	21:08 (4)	20:38	22	20:09 (2)	19:27			17:23	16:39	16:40
30	08:26		07:25	06:18		05:33	20:43 (4)	05:28		20:58 (3)	06:02		20:47 (4)	06:51		19:48 (2)	07:41			07:32	08:24	08:49
	17:27		20:12	21:04		21:48	27 21:13 (3)	22:05	27	21:25 (3)	21:36	19	21:06 (4)	20:36	21	20:09 (2)	19:25			17:21	16:38	16:41
31	08:25		07:23			05:32	20:45 (4)				06:03		20:49 (4)	06:52		19:48 (2)				07:34		08:50
	17:29		20:13			21:49	27 21:15 (3)				21:35	16	21:05 (4)	20:34	19	20:07 (2)				17:19		16:42
Potential sun hours	260	278	367	415		484		497			501			453			381			332	267	245
Total, worst case					256		465		779			710			259			42				
Sun reduction					0,45		0,45		0,43			0,45			0,45			0,39				
Oper. time red.					0,99		0,99		0,99			0,99			0,99			0,99				
Wind dir. red.					0,58		0,56		0,56			0,56			0,57			0,58				
Total reduction					0,26		0,25		0,24			0,25			0,26			0,23				
Total, real					67		118		189			177			67			9				

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)

Licensed user:
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David Vrolijk / dv@lbpsight.nl
Calculated:
3-2-2020 14:38/3.1.633

SHADOW - Calendar

Calculation: V136@147mShadow receptor: 4671RN1 - Sasdijk 1

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2,20	3,20	4,40	6,30	7,10	7,20	7,20	6,60	5,00	3,90	2,30	1,70

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
563	673	737	507	350	394	853	1.312	1.152	974	554	619	8.688

Idle start wind speed: Cut in wind speed from power curve

	January	February		March		April	May	June	July	August	September		October		November		December
1	08:50	08:23		16:49 (2)	07:30	16:56 (3)	07:20	06:16	05:31	05:29	06:05	06:54		07:42		17:30 (3)	07:35	16:12 (2)	08:26
	16:43	17:31	9	16:58 (2)	18:22	49	17:45 (1)	20:15	21:05	21:51	22:04	21:33	20:32		19:23	73	18:46 (4)	17:17	26	16:38 (2)	16:37
2	08:50	08:22		16:48 (2)	07:28	16:54 (3)	07:18	06:14	05:31	05:29	06:06	06:55		07:44		17:29 (3)	07:37	16:12 (2)	08:27
	16:44	17:32	13	17:01 (2)	18:23	49	17:43 (1)	20:17	21:07	21:52	22:04	21:31	20:29		19:20	73	18:45 (4)	17:15	26	16:38 (2)	16:37
3	08:49	08:20		16:46 (2)	07:26	16:53 (3)	07:16	06:12	05:30	05:30	06:08	06:57		07:46		17:28 (3)	07:39	16:12 (2)	08:29
	16:45	17:34	17	17:03 (2)	18:25	48	17:41 (1)	20:18	21:09	21:53	22:04	21:30	20:27		19:18	71	18:43 (4)	17:14	26	16:38 (2)	16:36
4	08:49	08:19		16:45 (2)	07:24	16:53 (3)	07:14	06:11	05:29	05:31	06:09	06:59		07:47		17:28 (3)	07:41	16:13 (2)	08:30
	16:47	17:36	19	17:04 (2)	18:27	46	17:39 (1)	20:20	21:10	21:54	22:03	21:28	20:25		19:16	69	18:42 (4)	17:12	24	16:37 (2)	16:36
5	08:49	08:17		16:44 (2)	07:22	16:52 (3)	07:11	06:09	05:29	05:32	06:11	07:00		07:49		17:28 (3)	07:42	16:14 (2)	08:31
	16:48	17:38	21	17:05 (2)	18:29	44	17:36 (3)	20:22	21:12	21:55	22:03	21:26	20:23		19:14	66	18:40 (4)	17:10	23	16:37 (2)	16:35
6	08:49	08:15		16:44 (2)	07:19	16:52 (3)	07:09	06:07	05:28	05:32	06:12	07:02		07:50		17:28 (3)	07:44	16:15 (2)	08:33
	16:49	17:40	23	17:07 (2)	18:31	53	17:58 (4)	20:23	21:14	21:56	22:02	21:25	20:20		19:11	62	18:38 (4)	17:08	21	16:36 (2)	16:35
7	08:48	08:14		16:43 (2)	07:17	16:51 (3)	07:07	06:05	05:27	05:33	06:14	07:03		07:52		17:27 (3)	07:46	16:16 (2)	08:34
	16:50	17:42	25	17:08 (2)	18:32	60	18:00 (4)	20:25	21:15	21:57	22:02	21:23	20:18		19:09	57	18:35 (4)	17:07	19	16:35 (2)	16:34
8	08:48	08:12		16:43 (2)	07:15	16:51 (3)	07:05	06:03	05:27	05:34	06:15	07:05		07:54		17:27 (3)	07:48	16:16 (2)	08:35
	16:51	17:43	25	17:08 (2)	18:34	65	18:03 (4)	20:27	21:17	21:58	22:01	21:21	20:16		19:07	45	18:12 (3)	17:05	17	16:33 (2)	16:34
9	08:47	08:10		16:42 (2)	07:13	16:51 (3)	07:02	06:02	05:26	05:35	06:17	07:07		07:55		17:27 (3)	07:50	16:18 (2)	08:36
	16:53	17:45	26	17:08 (2)	18:36	68	18:04 (4)	20:29	21:18	21:58	22:01	21:19	20:14		19:05	44	18:11 (3)	17:03	13	16:31 (2)	16:34
10	08:47	08:08		16:42 (2)	07:11	16:50 (3)	07:00	06:00	05:26	05:36	06:19	07:08		07:57		17:27 (3)	07:51	16:20 (2)	08:37
	16:54	17:47	26	17:08 (2)	18:38	70	18:05 (4)	20:30	21:20	21:59	22:00	21:17	20:11		19:02	47	18:14 (1)	17:02	9	16:29 (2)	16:33
11	08:46	08:06		16:42 (2)	07:08	16:50 (3)	06:58	05:58	05:25	05:37	06:20	07:10		07:59		17:28 (3)	07:53			08:38
	16:56	17:49	26	17:08 (2)	18:39	72	18:06 (4)	20:32	21:22	22:00	21:59	21:15	20:09		19:00	48	18:16 (1)	17:00			16:33
12	08:46	08:05		16:42 (2)	07:06	16:51 (3)	06:56	05:57	05:25	05:38	06:22	07:11		08:01		17:28 (3)	07:55			08:39
	16:57	17:51	26	17:08 (2)	18:41	73	18:07 (4)	20:34	21:23	22:01	21:58	21:14	20:07		18:58	49	18:17 (1)	16:59			16:33
13	08:45	08:03		16:42 (2)	07:04	16:51 (3)	06:53	05:55	05:25	05:39	06:23	07:13		08:02		17:29 (3)	07:57			08:40
	16:59	17:53	26	17:08 (2)	18:43	73	18:07 (4)	20:35	21:25	22:01	21:57	21:12	20:04		18:56	49	18:18 (1)	16:57			16:33
14	08:44	08:01		16:43 (2)	07:02	16:51 (3)	06:51	05:54	05:25	05:40	06:25	07:15		08:04		17:30 (3)	07:58			08:41
	17:00	17:54	24	17:07 (2)	18:44	73	18:07 (4)	20:37	21:26	22:02	21:56	21:10	20:02		18:54	49	18:19 (1)	16:56			16:33
15	08:43	07:59		16:44 (2)	06:59	16:52 (3)	06:49	05:52	05:24	05:42	06:27	07:16		08:06		17:31 (3)	08:00			08:42
	17:02	17:56	23	17:07 (2)	18:46	72	18:07 (4)	20:39	21:28	22:02	21:56	21:08	20:00		18:51	47	18:18 (1)	16:54			16:33
16	08:43	07:57		16:45 (2)	06:57	16:53 (3)	06:47	05:50	05:24	05:43	06:28	07:18		08:07		17:32 (3)	08:02			08:43
	17:03	17:58	21	17:06 (2)	18:48	70	18:07 (4)	20:40	21:29	22:03	21:55	21:06	19:57		18:49	46	18:18 (1)	16:53			16:33
17	08:42	07:55		16:46 (2)	06:55	16:53 (3)	06:45	05:49	05:24	05:44	06:30	07:19		08:09		17:34 (3)	08:04			08:44
	17:05	18:00	19	17:05 (2)	18:50	67	18:06 (4)	20:42	21:31	22:03	21:53	21:04	19:55		18:47	44	18:18 (1)	16:52			16:34
18	08:41	07:53		16:48 (2)	06:52	16:55 (3)	06:43	05:48	05:24	05:45	06:31	07:21		08:11		17:36 (3)	08:05			08:45
	17:06	18:02	15	17:03 (2)	18:51	64	18:06 (4)	20:44	21:32	22:04	21:52	21:02	19:53		18:45	41	18:17 (1)	16:50			16:34
19	08:40	07:51		16:50 (2)	06:50	16:57 (3)	06:40	05:46	05:24	05:46	06:33	07:23		18:31 (4)	08:13		17:40 (3)	08:07			08:45
	17:08	18:04	13	17:36 (1)	18:53	58	18:05 (4)	20:45	21:34	22:04	21:51	21:00	19:50	12	18:43 (4)	30	18:43	18:15 (1)		16:49	16:34
20	08:39	07:49		17:30 (1)	06:48	16:58 (3)	06:38	05:45	05:24	05:48	06:35	07:24		18:27 (4)	08:14		17:58 (1)	08:09			08:46
	17:10	18:05	8	17:38 (1)	18:55	54	18:03 (4)	20:47	21:35	22:04	21:50	20:58	19:48	17	18:44 (4)	14	18:41	18:12 (1)		16:48	16:34
21	08:38	07:47		17:29 (1)	06:46	17:00 (3)	06:36	05:43	05:25	05:49	06:36	07:26		17:50 (3)	08:16		17:59 (1)	08:10			08:47
	17:11	18:07	11	17:40 (1)	18:56	46	18:02 (4)	20:49	21:37	22:05	21:49	20:55	19:46	35	18:46 (4)	18:39	11	18:10 (1)		16:47	16:35
22	08:37	07:45		17:13 (3)	06:43	17:03 (3)	06:34	05:42	05:25	05:50	06:38	07:28		17:45 (3)	08:18		17:24 (2)	08:12			08:47
	17:13	18:09	19	17:42 (1)	18:58	38	18:01 (4)	20:50	21:38	22:05	21:48	20:53	19:44	44	18:46 (4)	18:37	12	18:08 (1)		16:46	16:35
23	08:35	07:43		17:07 (3)	06:41	17:10 (3)	06:32	05:41	05:25	05:52	06:39	07:29		17:43 (3)	08:19		17:20 (2)	08:14			08:48
	17:15	18:11	34	17:45 (1)	19:00	19	17:58 (4)	20:52	21:39	22:05	21:46	20:51	19:41	53	18:48 (4)	18:35	12	17:32 (2)		16:44	16:36
24	08:34	07:41		17:04 (3)	06:39	17:43 (4)	06:30	05:40	05:25	05:53	06:41	07:31		17:41 (3)	08:21		17:18 (2)	08:15			08:48
	17:16	18:13	42	17:46 (1)	19:02	13	17:56 (4)	20:54	21:41	22:05	21:45	20:49	19:39	57	18:48 (4)	18:33	16	17:34 (2)		16:43	16:36
25	08:33	07:39		17:01 (3)	06:36	17:47 (4)	06:28	05:39	05:26	05:54	06:43	07:32		17:38 (3)	07:23		16:16 (2)	08:17			08:48
	17:18	18:14	45	17:46 (1)	19:03	4	17:51 (4)	20:55	21:42	22:05	21:44	20:47	19:37	62	18:48 (4)	17:31	20	16:36 (2)		16:42	16:37
26	08:32	07:37		16:59 (3)	06:34		06:26	05:37	05:26	05:56	06:44	07:34		17:36 (3)	07:25		16:15 (2)	08:18			08:49
	17:20	18:16	47	17:46 (1)	19:05		20:57	21:43	22:05	21:42	20:45	19:34	66	18:48 (4)	17:29	22	16:37 (2)	16:41			16:38
27	08:30	07:35		16:58 (3)	06:32		06:24	05:36	05:26	05:57	06:46	07:36		17:35 (3)	07:27		16:13 (2)	08:20			08:49
	17:22	18:18	48	17:46 (1)	19:07		20:59	21:45	22:05	21:41	20:43	19:32	69	18:49 (4)	17:27	24	16:37 (2)	16:41			16:38
28	08:29	07:33		16:57 (3)	06:30		06:22	05:35	05:27	05:59	06:47	07:37		17:33 (3)	07:28		16:12 (2)	08:21			08:49
	17:23	18:20	48	17:45 (1)	19:08		21:00	21:46	22:05	21:39	20:40	19:30	71	18:48 (4)	17:25	25	16:37 (2)	16:40			16:39
29	08:28				07:27		06:20	05:34	05:27	06:00	06:49	07:39		17:32 (3)	07:30		16:12 (2)	08:23			08:49
	17:25				20:10		21:02	21:47	22:05	21:38	20:38	19:27	73	18:48 (4)	17:23	26	16:38 (2)	16:39			16:40
30	08:26				07:25		06:18	05:33	05:28	06:02	06:51	07:41		17:30 (3)	07:32		16:12 (2)	08:24			08:50
	17:27				20:12		21:04	21:48	22:05	21:36	20:36	19:25	73	18:46 (4)	17:21	26	16:38 (2)	16:38			16:41
31	08:25				07:23			05:32		06:03	06:52				07:34		16:12 (2)				08:50
	17:29				20:13			21:49		21:35	20:34				17:19	26	16:38 (2)				16:42
Potential sun hours	260	278		367		415	484	497	501	453	381		332		267			245	
Total, worst case			699		1348							632		1244		204			
Sun reduction			0,32		0,37							0,39		0,36		0,26			
Oper. time red.			0,99		0,99							0,99		0,99		0,99			
Wind dir. red.			0,68		0,65							0,64		0,66		0,69			
Total reduction			0,22		0,24							0,25		0,24		0,18			
Total, real			151		322							159		298		36			

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

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

Licensed user:
LBP SIGHT
Kelvinbaan 40, PO box 1475
NL-3430BL Nieuwegein
+31 3023 11377
David Vrolijk / dv@lbpsight.nl
Calculated:
3-2-2020 14:38/3.1.633

SHADOW - Calendar

Calculation: V136@147mShadow receptor: 4671RN10 - Sasdijk 10

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2,20	3,20	4,40	6,30	7,10	7,20	7,20	6,60	5,00	3,90	2,30	1,70

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
563	673	737	507	350	394	853	1.312	1.152	974	554	619	8.688

Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:50	08:23	07:30	17:18 (2)	07:20	18:42 (3)	06:16	05:31	05:29	06:05	06:54	07:42
	16:43	17:31	18:22 23	17:41 (2) 50	20:15	19:32 (4)	21:05	21:51	22:04	21:33	20:32	19:23 15
2	08:50	08:22	07:28	17:18 (2)	07:18	18:42 (3)	06:14	05:31	05:29	06:06	06:55	18:53 (3) 07:44
	16:44	17:32	18:23 21	17:39 (2) 49	20:17	19:31 (4)	21:07	21:52	22:04	21:31	20:29 7	19:00 (3) 19:20 17
3	08:49	08:20	07:26	17:20 (2)	07:16	18:42 (3)	06:12	05:30	05:30	06:08	06:57	18:49 (3) 07:45
	16:45	17:34	18:25 21	17:59 (1) 47	20:18	19:29 (4)	21:09	21:53	22:04	21:30	20:27 16	19:05 (3) 19:18 19
4	08:49	08:19	07:24	17:22 (2)	07:14	18:43 (3)	06:11	05:29	05:31	06:09	06:59	18:45 (3) 07:47
	16:47	17:36	18:27 22	18:01 (1) 44	20:20	19:27 (4)	21:10	21:54	22:03	21:28	20:25 21	19:06 (3) 19:16 19
5	08:49	08:17	07:22	17:24 (2)	07:11	18:44 (3)	06:09	05:28	05:32	06:11	07:00	18:44 (3) 07:49
	16:48	17:38	18:29 21	18:03 (1) 41	20:22	19:25 (4)	21:12	21:55	22:03	21:26	20:23 24	19:08 (3) 19:14 19
6	08:49	08:15	07:19	17:51 (1)	07:09	18:46 (3)	06:07	05:28	05:32	06:12	07:02	18:41 (3) 07:50
	16:49	17:40	18:30 14	18:05 (1) 35	20:23	19:22 (4)	21:14	21:56	22:02	21:25	20:20 34	19:17 (4) 19:11 18
7	08:48	08:14	07:17	17:49 (1)	07:07	18:46 (3)	06:05	05:27	05:33	06:14	07:03	18:39 (3) 07:52
	16:50	17:42	18:32 17	18:06 (1) 25	20:25	19:11 (3)	21:15	21:57	22:02	21:23	20:18 41	19:20 (4) 19:09 15
8	08:48	08:12	07:15	17:49 (1)	07:05	18:48 (3)	06:03	05:27	05:34	06:15	07:05	18:37 (3) 07:54
	16:51	17:43	18:34 19	18:08 (1) 21	20:27	19:09 (3)	21:17	21:57	22:01	21:21	20:16 44	19:21 (4) 19:07 17
9	08:47	08:10	07:13	17:49 (1)	07:02	18:51 (3)	06:02	05:26	05:35	06:17	07:07	18:36 (3) 07:55
	16:53	17:45	18:36 19	18:08 (1) 16	20:28	19:07 (3)	21:18	21:58	22:01	21:19	20:14 47	19:23 (4) 19:05 22
10	08:47	08:08	07:11	17:48 (1)	07:00	18:55 (3)	06:00	05:26	05:36	06:19	07:08	18:36 (3) 07:57
	16:54	17:47	18:38 19	18:07 (1) 7	20:30	19:02 (3)	21:20	21:59	22:00	21:17	20:11 48	19:24 (4) 19:02 22
11	08:46	08:06	07:08	17:49 (1)	06:58		05:58	05:25	05:37	06:20	07:10	18:34 (3) 07:59
	16:56	17:49	18:39 18	18:07 (1)	20:32		21:22	22:00	21:59	21:15	20:09 50	19:24 (4) 19:00 19
12	08:46	08:05	07:06	17:50 (1)	06:56		05:57	05:25	05:38	06:22	07:11	18:34 (3) 08:01
	16:57	17:51	18:41 16	18:06 (1)	20:34		21:23	22:01	21:58	21:13	20:07 51	19:25 (4) 18:58 21
13	08:45	08:03	07:04	17:51 (1)	06:53		05:55	05:25	05:39	06:23	07:13	18:33 (3) 08:02
	16:59	17:53	18:43 14	18:05 (1)	20:35		21:25	22:01	21:57	21:12	20:04 51	19:24 (4) 18:56 23
14	08:44	08:01	07:02	17:53 (1)	06:51		05:54	05:25	05:40	06:25	07:15	18:32 (3) 08:04
	17:00	17:54	18:44 9	18:02 (1)	20:37		21:26	22:02	21:56	21:10	20:02 52	19:24 (4) 18:54 23
15	08:43	07:59	06:59		06:49		05:52	05:24	05:42	06:27	07:16	18:31 (3) 08:06
	17:02	17:56	18:46		20:39		21:28	22:02	21:55	21:08	20:00 52	19:23 (4) 18:51 25
16	08:43	07:57	06:57		06:47		05:50	05:24	05:43	06:28	07:18	18:32 (3) 08:07
	17:03	17:58	18:48		20:40		21:29	22:03	21:54	21:06	19:57 51	19:23 (4) 18:49 25
17	08:42	07:55	06:55	17:58 (3)	06:45		05:49	05:24	05:44	06:30	07:19	18:32 (3) 08:09
	17:05	18:00	18:50 11	18:09 (3)	20:42		21:31	22:03	21:53	21:04	19:55 51	19:23 (4) 18:47 24
18	08:41	07:53	17:26 (2) 06:52	17:55 (3)	06:43		05:48	05:24	05:45	06:31	07:21	18:31 (3) 08:11
	17:06	18:02 7	17:33 (2) 18:51	18:13 (3) 18	20:44		21:32	22:04	21:52	21:02	19:53 50	19:21 (4) 18:45 23
19	08:40	07:51	17:23 (2) 06:50	17:52 (3)	06:40		05:46	05:24	05:46	06:33	07:23	18:32 (3) 08:13
	17:08	18:04 13	17:36 (2) 18:53	18:15 (3) 23	20:45		21:34	22:04	21:51	21:00	19:50 48	19:20 (4) 18:43 23
20	08:39	07:49	17:21 (2) 06:48	17:50 (3)	06:38		05:45	05:24	05:48	06:35	07:24	18:31 (3) 08:14
	17:10	18:05 17	17:38 (2) 18:55	18:16 (3) 26	20:47		21:35	22:04	21:50	20:58	19:48 47	19:18 (4) 18:41 21
21	08:38	07:47	17:20 (2) 06:46	17:48 (3)	06:36		05:43	05:25	05:49	06:36	07:26	18:32 (3) 08:16
	17:11	18:07 20	17:40 (2) 18:56	18:28 (4) 40	20:49		21:37	22:05	21:49	20:55	19:46 45	19:17 (4) 18:39 19
22	08:37	07:45	17:19 (2) 06:43	17:47 (3)	06:34		05:42	05:25	05:50	06:38	07:28	18:33 (3) 08:18
	17:13	18:09 22	17:41 (2) 18:58	18:31 (4) 44	20:50		21:38	22:05	21:48	20:53	19:43 41	19:14 (4) 18:37 16
23	08:35	07:43	17:19 (2) 06:41	17:45 (3)	06:32		05:41	05:25	05:52	06:39	07:29	18:34 (3) 08:19
	17:15	18:11 22	17:41 (2) 19:00	18:31 (4) 46	20:52		21:39	22:05	21:46	20:51	19:41 33	19:10 (4) 18:35 12
24	08:34	07:41	17:18 (2) 06:39	17:44 (3)	06:30		05:40	05:25	05:53	06:41	07:31	18:35 (3) 08:21
	17:16	18:13 24	17:42 (2) 19:01	18:33 (4) 49	20:54		21:41	22:05	21:45	20:49	19:39 25	19:00 (3) 18:33 4
25	08:33	07:39	17:17 (2) 06:36	17:44 (3)	06:28		05:39	05:26	05:54	06:43	07:32	18:36 (3) 07:23
	17:18	18:14 24	17:41 (2) 19:03	18:34 (4) 50	20:55		21:42	22:05	21:44	20:47	19:37 21	18:57 (3) 17:31
26	08:32	07:37	17:17 (2) 06:34	17:43 (3)	06:26		05:37	05:26	05:56	06:44	07:34	18:39 (3) 07:25
	17:20	18:16 24	17:41 (2) 19:05	18:34 (4) 51	20:57		21:43	22:05	21:42	20:45	19:34 15	18:54 (3) 17:29
27	08:30	07:35	17:17 (2) 06:32	17:42 (3)	06:24		05:36	05:26	05:57	06:46	07:36	17:26
	17:22	18:18 24	17:41 (2) 19:07	18:34 (4) 52	20:59		21:45	22:05	21:41	20:43	19:32	17:27
28	08:29	07:33	17:18 (2) 06:30	17:42 (3)	06:22		05:35	05:27	05:59	06:47	07:37	17:28
	17:23	18:20 23	17:41 (2) 19:08	18:34 (4) 52	21:00		21:46	22:05	21:39	20:40	19:30	17:25
29	08:28		07:27	18:42 (3)	06:20		05:34	05:27	06:00	06:49	07:39	18:35 (1) 07:30
	17:25		20:10 52	19:34 (4)	21:02		21:47	22:05	21:38	20:38	19:27 6	18:41 (1) 17:23
30	08:26		07:25	18:41 (3)	06:18		05:33	05:28	06:02	06:51	07:41	18:31 (1) 07:32
	17:27		20:12 52	19:33 (4)	21:04		21:48	22:05	21:36	20:36	19:25 12	18:43 (1) 17:21
31	08:25		07:23	18:41 (3)			05:32		06:03	06:52		07:34
	17:29		20:13 51	19:32 (4)			21:49		21:35	20:34		17:19
Potential sun hours	260	278	367	415	484	497	501	453	381	332	267	245
Total, worst case		220	870	335					983	461		
Sun reduction		0,32	0,37	0,45					0,39	0,36		
Oper. time red.		0,99	0,99	0,99					0,99	0,99		
Wind dir. red.		0,66	0,62	0,62					0,62	0,65		
Total reduction		0,21	0,23	0,28					0,24	0,23		
Total, real		47	199	93					237	108		

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

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

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Calculated:
3-2-2020 14:38/3.1.633

SHADOW - Calendar

Calculation: V136@147mShadow receptor: 4671RN14 - Sasdijk 14

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2,20	3,20	4,40	6,30	7,10	7,20	7,20	6,60	5,00	3,90	2,30	1,70

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
563	673	737	507	350	394	853	1.312	1.152	974	554	619	8.688

Idle start wind speed: Cut in wind speed from power curve

	January	February		March		April		May	June	July	August	September		October		November	December
1	08:50	08:23		07:30		17:23 (2)	07:20	18:56 (3)	06:16	05:31	05:29	06:05	06:54		07:42		18:34 (3)	07:35	08:26
	16:43	17:31		18:22	16	17:39 (2)	20:15	2 18:58 (3)	21:05	21:51	22:04	21:33	20:32		19:23	13	18:47 (3)	17:17	16:37
2	08:50	08:22		07:28		17:24 (2)	07:18		06:14	05:31	05:29	06:06	06:55		07:44		18:40 (3)	07:37	08:27
	16:44	17:32		18:23	13	17:37 (2)	20:17		21:07	21:52	22:04	21:31	20:29		19:20	2	18:42 (3)	17:15	16:37
3	08:49	08:20		07:26		17:27 (2)	07:16		06:12	05:30	05:30	06:08	06:57		07:45			07:39	08:29
	16:45	17:34		18:25	7	17:34 (2)	20:18		21:09	21:53	22:04	21:30	20:27		19:18			17:14	16:36
4	08:49	08:19		07:24			07:14		06:11	05:29	05:31	06:09	06:59		07:47			07:41	08:30
	16:47	17:36		18:27			20:20		21:10	21:54	22:03	21:28	20:25		19:16			17:12	16:36
5	08:49	08:17		07:22			07:11		06:09	05:28	05:32	06:11	07:00		07:49			07:42	08:31
	16:48	17:38		18:29			20:22		21:12	21:55	22:03	21:26	20:23		19:14			17:10	16:35
6	08:49	08:15		07:19			07:09		06:07	05:28	05:32	06:12	07:02		07:50			07:44	08:33
	16:49	17:40		18:30			20:23		21:14	21:56	22:02	21:25	20:20		19:11			17:08	16:35
7	08:48	08:14		07:17			07:07		06:05	05:27	05:33	06:14	07:03		07:52			07:46	08:34
	16:50	17:42		18:32			20:25		21:15	21:57	22:02	21:23	20:18		19:09			17:07	16:34
8	08:48	08:12		07:15			07:05		06:03	05:27	05:34	06:15	07:05		07:54			07:48	08:35
	16:51	17:43		18:34			20:27		21:17	21:57	22:01	21:21	20:16		19:07			17:05	16:34
9	08:47	08:10		07:13			07:02		06:02	05:26	05:35	06:17	07:07		07:55			07:50	08:36
	16:53	17:45		18:36			20:28		21:18	21:58	22:01	21:19	20:14		19:05			17:03	16:34
10	08:47	08:08		07:11			07:00		06:00	05:26	05:36	06:19	07:08		07:57			07:51	08:37
	16:54	17:47		18:37			20:30		21:20	21:59	22:00	21:17	20:11		19:02			17:02	16:33
11	08:46	08:06		07:08			06:58		05:58	05:25	05:37	06:20	07:10		07:59		17:59 (2)	07:53	08:38
	16:56	17:49		18:39			20:32		21:22	22:00	21:59	21:15	20:09		19:00	11	18:10 (2)	17:00	16:33
12	08:46	08:05		07:06		17:56 (3)	06:56		05:57	05:25	05:38	06:22	07:11		18:43 (3)		08:01	17:57 (2)	07:55	08:39
	16:57	17:51		18:41	11	18:07 (3)	20:34		21:23	22:01	21:58	21:13	20:07	13	18:56 (3)		18:58	18:12 (2)	16:59	16:33
13	08:45	08:03		07:04		17:53 (3)	06:53		05:55	05:25	05:39	06:23	07:13		18:39 (3)		08:02	17:55 (2)	07:57	08:40
	16:58	17:53		18:43	17	18:10 (3)	20:35		21:25	22:01	21:57	21:12	20:04	29	19:12 (4)		18:56	18:13 (2)	16:57	16:33
14	08:44	08:01		07:02		17:50 (3)	06:51		05:54	05:25	05:40	06:25	07:15		18:37 (3)		08:04	17:53 (2)	07:58	08:41
	17:00	17:54		18:44	21	18:11 (3)	20:37		21:26	22:02	21:56	21:10	20:02	37	19:14 (4)		18:54	18:13 (2)	16:56	16:33
15	08:43	07:59		06:59		17:49 (3)	06:49		05:52	05:24	05:42	06:27	07:16		18:35 (3)		08:06	17:53 (2)	08:00	08:42
	17:02	17:56		18:46	24	18:13 (3)	20:39		21:28	22:02	21:55	21:08	20:00	39	19:14 (4)		18:51	18:13 (2)	16:54	16:33
16	08:43	07:57		06:57		17:48 (3)	06:47		05:50	05:24	05:43	06:28	07:18		18:33 (3)		08:07	17:52 (2)	08:02	08:43
	17:03	17:58		18:48	29	18:20 (4)	20:40		21:29	22:03	21:54	21:06	19:57	42	19:15 (4)		18:49	18:14 (2)	16:53	16:33
17	08:42	07:55		06:55		17:46 (3)	06:45		05:49	05:24	05:44	06:30	07:19		18:32 (3)		08:09	17:52 (2)	08:04	08:44
	17:05	18:00		18:50	38	18:24 (4)	20:42		21:31	22:03	21:53	21:04	19:55	44	19:16 (4)		18:47	18:14 (2)	16:52	16:34
18	08:41	07:53	17:26 (2)	06:52		17:45 (3)	06:43		05:48	05:24	05:45	06:31	07:21		18:31 (3)		08:11	17:52 (2)	08:05	08:45
	17:06	18:02	8 17:34 (2)	18:51	41	18:26 (4)	20:44		21:32	22:04	21:52	21:02	19:53	45	19:16 (4)		18:45	18:14 (2)	16:50	16:34
19	08:40	07:51	17:24 (2)	06:50		17:45 (3)	06:40		05:46	05:24	05:46	06:33	07:23		18:30 (3)		08:12	17:52 (2)	08:07	08:45
	17:08	18:04	12 17:36 (2)	18:53	43	18:28 (4)	20:45		21:34	22:04	21:51	21:00	19:50	46	19:16 (4)		18:43	18:13 (2)	16:49	16:34
20	08:39	07:49	17:23 (2)	06:48		17:43 (3)	06:38		05:45	05:24	05:48	06:35	07:24		18:29 (3)		08:14	17:52 (2)	08:09	08:46
	17:10	18:05	15 17:38 (2)	18:55	45	18:28 (4)	20:47		21:35	22:04	21:50	20:58	19:48	46	19:15 (4)		18:41	18:12 (2)	16:48	16:34
21	08:38	07:47	17:22 (2)	06:46		17:43 (3)	06:36		05:43	05:25	05:49	06:36	07:26		18:29 (3)		08:16	17:53 (2)	08:10	08:47
	17:11	18:07	18 17:40 (2)	18:56	46	18:29 (4)	20:49		21:37	22:05	21:49	20:55	19:46	46	19:15 (4)		18:39	18:10 (2)	16:47	16:35
22	08:37	07:45	17:21 (2)	06:43		17:43 (3)	06:34		05:42	05:25	05:50	06:38	07:28		18:28 (3)		08:18	17:54 (2)	08:12	08:47
	17:13	18:09	21 17:42 (2)	18:58	46	18:29 (4)	20:50		21:38	22:05	21:48	20:53	19:43	45	19:13 (4)		18:37	18:08 (2)	16:46	16:35
23	08:35	07:43	17:21 (2)	06:41		17:42 (3)	06:32		05:41	05:25	05:52	06:39	07:29		18:28 (3)		08:19	17:55 (2)	08:14	08:48
	17:15	18:11	21 17:42 (2)	19:00	46	18:28 (4)	20:52		21:39	22:05	21:46	20:51	19:41	45	19:13 (4)		18:35	18:06 (2)	16:44	16:36
24	08:34	07:41	17:21 (2)	06:39		17:43 (3)	06:30		05:40	05:25	05:53	06:41	07:31		18:28 (3)		08:21	17:57 (2)	08:15	08:48
	17:16	18:13	22 17:43 (2)	19:01	45	18:28 (4)	20:54		21:41	22:05	21:45	20:49	19:39	44	19:12 (4)		18:33	18:04 (2)	16:43	16:36
25	08:33	07:39	17:20 (2)	06:36		17:43 (3)	06:28		05:38	05:26	05:54	06:43	07:32		18:28 (3)		07:23		08:17	08:48
	17:18	18:14	22 17:42 (2)	19:03	45	18:28 (4)	20:55		21:42	22:05	21:44	20:47	19:37	41	19:09 (4)		17:31		16:42	16:37
26	08:32	07:37	17:20 (2)	06:34		17:44 (3)	06:26		05:37	05:26	05:56	06:44	07:34		18:28 (3)		07:25		08:18	08:49
	17:20	18:16	21 17:41 (2)	19:05	44	18:28 (4)	20:57		21:43	22:05	21:42	20:45	19:34	39	19:07 (4)		17:29		16:41	16:38
27	08:30	07:35	17:21 (2)	06:32		17:44 (3)	06:24		05:36	05:26	05:57	06:46	07:36		18:29 (3)		07:26		08:20	08:49
	17:22	18:18	20 17:41 (2)	19:07	42	18:26 (4)	20:59		21:45	22:05	21:41	20:43	19:32	35	19:04 (4)		17:27		16:41	16:38
28	08:29	07:33	17:22 (2)	06:30		17:45 (3)	06:22		05:35	05:27	05:59	06:47	07:37		18:29 (3)		07:28		08:21	08:49
	17:23	18:20	18 17:40 (2)	19:08	40	18:25 (4)	21:00		21:46	22:05	21:39	20:40	19:30	25	18:54 (3)		17:25		16:40	16:39
29	08:28			07:27		18:47 (3)	06:20		05:34	05:27	06:00	06:49	07:39		18:30 (3)		07:30		08:23	08:49
	17:25			20:10	37	19:24 (4)	21:02		21:47	22:05	21:38	20:38	19:27	23	18:53 (3)		17:23		16:39	16:40
30	08:26			07:25		18:48 (3)	06:18		05:33	05:28	06:02	06:51	07:41		18:31 (3)		07:32		08:24	08:50
	17:27			20:12	30	19:21 (4)	21:04		21:48	22:05	21:36	20:36	19:25	19	18:50 (3)		17:21		16:38	16:41
31	08:25			07:23		18:50 (3)			05:32		06:03	06:52					07:34			08:50
	17:29			20:13	17	19:16 (4)			21:49		21:35	20:34					17:19			16:42
Potential sun hours	260	278		367			415		484	497	501	453	381		332			267		245
Total, worst case			198		743		2							703		255				
Sun reduction			0,32		0,37		0,45							0,39		0,36				
Oper. time red.			0,99		0,99		0,99							0,99		0,99				
Wind dir. red.			0,66		0,62		0,62							0,62		0,66				
Total reduction			0,21		0,23		0,28							0,24		0,24				
Total, real			42		170		1							170		61				

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

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

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Calculated:
3-2-2020 14:38/3.1.633

SHADOW - Calendar

Calculation: V136@147mShadow receptor: 4671RN2 - Sasdijk 2

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2,20	3,20	4,40	6,30	7,10	7,20	7,20	6,60	5,00	3,90	2,30	1,70

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
563	673	737	507	350	394	853	1.312	1.152	974	554	619	8.688

Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:50	08:23	07:30	07:20	19:24 (2)	06:16	20:08 (4)	05:31	05:29	06:05	20:20 (3)	06:54	07:42	07:35	08:26
	16:43	17:31	18:22	20:15 18	19:42 (2)	21:05 25	20:33 (3)	21:51	22:04	21:33 21	20:41 (3)	20:32	19:23	17:17	16:37
2	08:49	08:22	07:28	07:18	19:24 (2)	06:14	20:08 (3)	05:31	05:29	06:06	20:19 (3)	06:55	07:44	07:37	08:27
	16:44	17:32	18:23	20:17 17	19:41 (2)	21:07 26	20:34 (3)	21:52	22:04	21:31 23	20:42 (3)	20:29	19:20	17:15	16:37
3	08:49	08:20	07:26	07:16	19:25 (2)	06:12	20:08 (3)	05:30	05:30	06:08	20:18 (3)	06:57	07:45	07:39	08:29
	16:45	17:34	18:25	20:18 14	19:39 (2)	21:09 26	20:34 (3)	21:53	22:04	21:30 24	20:42 (3)	20:27	19:18	17:14	16:36
4	08:49	08:18	07:24	07:14	19:27 (2)	06:11	20:07 (3)	05:29	05:31	06:09	20:17 (3)	06:59	07:47	07:41	08:30
	16:47	17:36	18:27	20:20 10	19:37 (2)	21:10 27	20:34 (3)	21:54	22:03	21:28 25	20:42 (3)	20:25	19:16	17:12	16:36
5	08:49	08:17	07:22	07:11		06:09	20:07 (3)	05:28	05:32	06:11	20:17 (3)	07:00	07:49	07:42	08:31
	16:48	17:38	18:29	20:22		21:12 26	20:33 (3)	21:55	22:03	21:26 26	20:43 (3)	20:23	19:14	17:10	16:35
6	08:49	08:15	07:19	07:09		06:07	20:07 (3)	05:28	05:32	06:12	20:16 (3)	07:02	07:50	07:44	08:33
	16:49	17:40	18:30	20:23		21:13 27	20:34 (3)	21:56	22:02	21:25 27	20:43 (3)	20:20	19:11	17:08	16:35
7	08:48	08:13	07:17	07:07		06:05	20:07 (3)	05:27	05:33	06:14	20:17 (3)	07:03	07:52	07:46	08:34
	16:50	17:42	18:32	20:25		21:15 26	20:33 (3)	21:57	22:02	21:23 26	20:43 (3)	20:18	19:09	17:07	16:34
8	08:48	08:12	07:15	07:05		06:03	20:07 (3)	05:27	05:34	06:15	20:16 (3)	07:05	19:21 (2)	07:54	07:48	08:35
	16:51	17:43	18:34	20:27		21:17 25	20:32 (3)	21:57	22:01	21:21 27	20:43 (3)	20:16 10	19:31 (2)	19:07	17:05	16:34
9	08:47	08:10	07:13	07:02		06:02	20:08 (3)	05:26	05:35	06:17	20:17 (3)	07:07	19:19 (2)	07:55	07:50	08:36
	16:53	17:45	18:36	20:28		21:18 25	20:33 (3)	21:58	22:00	21:19 26	20:43 (3)	20:14 14	19:33 (2)	19:05	17:03	16:34
10	08:47	08:08	07:11	07:00		06:00	20:08 (3)	05:26	05:36	06:19	20:16 (3)	07:08	19:18 (2)	07:57	07:51	08:37
	16:54	17:47	18:37	20:30		21:20 24	20:32 (3)	21:59	22:00	21:17 26	20:42 (3)	20:11 16	19:34 (2)	19:02	17:02	16:33
11	08:46	08:06	07:08	06:58		05:58	20:09 (3)	05:25	05:37	06:20	20:17 (3)	07:10	19:16 (2)	07:59	07:53	08:38
	16:56	17:49	18:39	20:32		21:21 23	20:32 (3)	22:00	21:59	21:15 25	20:42 (3)	20:09 18	19:34 (2)	19:00	17:00	16:33
12	08:46	08:05	07:06	06:56		05:57	20:09 (3)	05:25	05:38	06:22	20:16 (4)	07:11	19:15 (2)	08:01	07:55	08:39
	16:57	17:51	18:41	20:34		21:23 21	20:30 (3)	22:01	21:58	21:13 25	20:41 (3)	20:07 20	19:35 (2)	18:58	16:59	16:33
13	08:45	08:03	07:04	06:53		05:55	20:11 (3)	05:25	05:39	06:23	20:15 (4)	07:13	19:14 (2)	08:02	07:57	08:40
	16:59	17:53	18:43	20:35		21:25 19	20:30 (3)	22:01	21:57	21:12 26	20:41 (3)	20:04 20	19:34 (2)	18:56	16:57	16:33
14	08:44	08:01	07:02	06:51		05:54	20:12 (3)	05:25	05:40	06:25	20:14 (4)	07:15	19:14 (2)	08:04	07:58	08:41
	17:00	17:54	18:44	20:37		21:26 16	20:28 (3)	22:02	21:56	21:10 25	20:39 (3)	20:02 20	19:34 (2)	18:54	16:56	16:33
15	08:43	07:59	06:59	06:49		05:52	20:13 (3)	05:24	05:42	06:27	20:13 (4)	07:16	19:13 (2)	08:06	08:00	08:42
	17:02	17:56	18:46	20:39		21:28 14	20:27 (3)	22:02	21:55	21:08 25	20:38 (3)	20:00 20	19:33 (2)	18:51	16:54	16:33
16	08:43	07:57	06:57	06:47		05:50	20:16 (3)	05:24	05:43	06:28	20:12 (4)	07:18	19:14 (2)	08:07	08:02	08:43
	17:03	17:58	18:48	20:40		21:29 10	20:26 (3)	22:03	21:54	21:06 24	20:36 (3)	19:57 17	19:31 (2)	18:49	16:53	16:33
17	08:42	07:55	06:55	06:45		05:49	20:18 (3)	05:24	05:44	06:30	20:12 (4)	07:19	19:14 (2)	08:09	08:03	08:44
	17:05	18:00	18:50	20:42		21:31 4	20:22 (3)	22:03	21:53	21:04 22	20:34 (3)	19:55 14	19:28 (2)	18:47	16:52	16:34
18	08:41	07:53	06:52	06:43	20:15 (4)	05:48		05:24	05:45	06:31	20:11 (4)	07:21	19:15 (2)	08:11	08:05	08:45
	17:06	18:02	18:51	20:44 2	20:17 (4)	21:32		22:04	21:52	21:02 21	20:32 (4)	19:53 11	19:26 (2)	18:45	16:50	16:34
19	08:40	07:51	06:50	06:40	20:11 (4)	05:46		05:24	05:46	06:33	20:12 (4)	07:23	19:17 (2)	08:12	08:07	08:45
	17:08	18:04	18:53	20:45 8	20:19 (4)	21:34		22:04	21:51	21:00 20	20:32 (4)	19:50 7	19:24 (2)	18:43	16:49	16:34
20	08:39	07:49	06:48	06:38	20:10 (4)	05:45		05:24	05:48	06:35	20:11 (4)	07:24	19:20 (2)	08:14	08:09	08:46
	17:10	18:05	18:55	20:47 10	20:20 (4)	21:35		22:04	21:50	20:57 18	20:29 (4)	19:48 1	19:21 (2)	18:41	16:48	16:34
21	08:38	07:47	06:46	06:36	20:08 (4)	05:43		05:25	05:49	06:36	20:12 (4)	07:26		08:16	08:10	08:47
	17:11	18:07	18:56	20:49 14	20:22 (4)	21:37		22:05	21:49	20:55 16	20:28 (4)	19:46		18:39	16:47	16:35
22	08:37	07:45	06:43	06:34	20:07 (4)	05:42		05:25	05:50	06:38	20:12 (4)	07:27		08:18	08:12	08:47
	17:13	18:09	18:58	20:50 17	20:24 (4)	21:38		22:05	21:48	20:53 13	20:25 (4)	19:43		18:37	16:46	16:35
23	08:35	07:43	06:41	06:32	20:07 (4)	05:41		05:25	05:52	06:39	20:14 (4)	07:29		08:19	08:13	08:48
	17:15	18:11	19:00	20:52 18	20:25 (4)	21:39		22:05	21:46	20:51 10	20:24 (4)	19:41		18:35	16:44	16:36
24	08:34	07:41	06:39	18:30 (2)	06:30	20:06 (4)	05:40	05:25	05:53	06:41	20:15 (4)	07:31		08:21	08:15	08:48
	17:16	18:13	19:01 6	18:36 (2)	20:54 20	20:26 (4)	21:41	22:05	21:45	20:49 6	20:21 (4)	19:39		18:33	16:43	16:36
25	08:33	07:39	06:36	18:28 (2)	06:28	20:06 (4)	05:38	05:26	05:54	06:43	20:19 (4)	07:32		07:23	08:17	08:48
	17:18	18:14	19:03 10	18:38 (2)	20:55 20	20:26 (4)	21:42	22:05	21:44	20:47 1	20:20 (4)	19:37		17:31	16:42	16:37
26	08:32	07:37	06:34	18:27 (2)	06:26	20:06 (4)	05:37	05:26	05:56	06:44		07:34		07:25	08:18	08:49
	17:20	18:16	19:05 13	18:40 (2)	20:57 22	20:28 (3)	21:43	22:05	21:42	20:45		19:34		17:29	16:41	16:38
27	08:30	07:35	06:32	18:25 (2)	06:24	20:06 (4)	05:36	05:26	05:57 20:27 (3)	06:46		07:36		07:26	08:20	08:49
	17:22	18:18	19:07 16	18:41 (2)	20:59 24	20:30 (3)	21:45	22:05	21:41 7 20:34 (3)	20:43		19:32		17:27	16:41	16:38
28	08:29	07:33	06:30	18:24 (2)	06:22	20:06 (4)	05:35	05:27	05:59 20:25 (3)	06:47		07:37		07:28	08:21	08:49
	17:23	18:20	19:08 19	18:43 (2)	21:00 25	20:31 (3)	21:46	22:05	21:39 12 20:37 (3)	20:40		19:30		17:25	16:40	16:39
29	08:28		07:27	19:24 (2)	06:20	20:06 (4)	05:34	05:27	06:00 20:23 (3)	06:49		07:39		07:30	08:23	08:49
	17:25		20:10 20	19:44 (2)	21:02 26	20:32 (3)	21:47	22:05	21:38 15 20:38 (3)	20:38		19:27		17:23	16:39	16:40
30	08:26		07:25	19:23 (2)	06:18	20:07 (4)	05:33	05:28	06:02 20:22 (3)	06:51		07:41		07:32	08:24	08:49
	17:27		20:12 20	19:43 (2)	21:04 25	20:32 (3)	21:48	22:05	21:36 17 20:39 (3)	20:36		19:25		17:21	16:38	16:41
31	08:25		07:23	19:23 (2)			05:32		06:03 20:21 (3)	06:52				07:34		08:50
	17:29		20:13 19	19:42 (2)			21:49		21:35 20 20:41 (3)	20:34				17:19		16:42
Potential sun hours	260	278	367	415	484	497	501	453	381	332	267	245
Total, worst case			123	290	364		71	528	188			
Sun reduction			0,37	0,45	0,45		0,45	0,45	0,39			
Oper. time red.			0,99	0,99	0,99		0,99	0,99	0,99			
Wind dir. red.			0,61	0,56	0,55		0,55	0,55	0,61			
Total reduction			0,22	0,25	0,25		0,24	0,25	0,24			
Total, real			28	73	90		17	130	45			

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

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

Licensed user:
LBP SIGHT
Kelvinbaan 40, PO box 1475
NL-3430BL Nieuwegein
+31 3023 11377
David Vrolijk / dv@lbpsight.nl
Calculated:
3-2-2020 14:38/3.1.633

SHADOW - Calendar

Calculation: V136@147mShadow receptor: 4671RN3 - Sasdijk 3

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2,20	3,20	4,40	6,30	7,10	7,20	7,20	6,60	5,00	3,90	2,30	1,70

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
563	673	737	507	350	394	853	1.312	1.152	974	554	619	8.688

Idle start wind speed: Cut in wind speed from power curve

	January		February		March		April	May	June	July	August	September		October		November		December
1	08:50		08:23		16:40 (2)		07:30	16:45 (3)	07:20	06:16	05:31	05:29	06:05	06:54		07:42		17:25 (3)	07:35	16:07 (2)	08:26
	16:43		17:31	19	16:59 (2)		18:22	53 17:38 (1)	20:15	21:05	21:51	22:04	21:33	20:32		19:23	68	18:41 (4)	17:17	26 16:33 (2)	16:37
2	08:50		08:22		16:40 (2)		07:28	16:43 (3)	07:18	06:14	05:31	05:29	06:06	06:55		07:44		17:24 (3)	07:37	16:07 (2)	08:27
	16:44		17:32	21	17:01 (2)		18:23	52 17:35 (1)	20:17	21:07	21:52	22:04	21:31	20:29		19:20	70	18:41 (4)	17:15	26 16:33 (2)	16:37
3	08:49		08:20		16:39 (2)		07:26	16:43 (3)	07:16	06:12	05:30	05:30	06:08	06:57		07:46		17:22 (3)	07:39	16:07 (2)	08:29
	16:45		17:34	22	17:01 (2)		18:25	52 17:51 (4)	20:18	21:09	21:53	22:04	21:30	20:27		19:18	71	18:39 (4)	17:14	26 16:33 (2)	16:36
4	08:49		08:19		16:38 (2)		07:24	16:43 (3)	07:14	06:11	05:29	05:31	06:09	06:59		07:47		17:21 (3)	07:41	16:07 (2)	08:30
	16:47		17:36	24	17:02 (2)		18:27	60 17:55 (4)	20:20	21:10	21:54	22:03	21:28	20:25		19:16	71	18:39 (4)	17:12	26 16:33 (2)	16:36
5	08:49		08:17		16:37 (2)		07:22	16:43 (3)	07:11	06:09	05:28	05:32	06:11	07:00		07:49		17:21 (3)	07:42	16:08 (2)	08:31
	16:48		17:38	25	17:02 (2)		18:29	65 17:57 (4)	20:22	21:12	21:55	22:03	21:26	20:23		19:14	71	18:38 (4)	17:10	25 16:33 (2)	16:35
6	08:49		08:15		16:38 (2)		07:19	16:43 (3)	07:09	06:07	05:28	05:32	06:12	07:02		07:50		17:20 (3)	07:44	16:08 (2)	08:33
	16:49		17:40	25	17:03 (2)		18:31	67 17:59 (4)	20:23	21:14	21:56	22:02	21:25	20:20		19:11	70	18:37 (4)	17:08	25 16:33 (2)	16:35
7	08:48		08:14		16:38 (2)		07:17	16:43 (3)	07:07	06:05	05:27	05:33	06:14	07:03		07:52		17:19 (3)	07:46	16:09 (2)	08:34
	16:50		17:42	26	17:04 (2)		18:32	69 18:00 (4)	20:25	21:15	21:57	22:02	21:23	20:18		19:09	68	18:35 (4)	17:07	24 16:33 (2)	16:34
8	08:48		08:12		16:37 (2)		07:15	16:43 (3)	07:05	06:03	05:27	05:34	06:15	07:05		07:54		17:18 (3)	07:48	16:09 (2)	08:35
	16:51		17:43	27	17:04 (2)		18:34	71 18:01 (4)	20:27	21:17	21:58	22:01	21:21	20:16		19:07	67	18:33 (4)	17:05	22 16:31 (2)	16:34
9	08:47		08:10		16:37 (2)		07:13	16:44 (3)	07:02	06:02	05:26	05:35	06:17	07:07		07:55		17:18 (3)	07:50	16:09 (2)	08:36
	16:53		17:45	27	17:04 (2)		18:36	72 18:02 (4)	20:29	21:18	21:58	22:01	21:19	20:14		19:05	63	18:31 (4)	17:03	21 16:30 (2)	16:34
10	08:47		08:08		16:38 (2)		07:11	16:44 (3)	07:00	06:00	05:26	05:36	06:19	07:08		07:57		17:17 (3)	07:51	16:11 (2)	08:37
	16:54		17:47	25	17:03 (2)		18:38	70 18:01 (4)	20:30	21:20	21:59	22:00	21:17	20:11		19:02	57	18:28 (4)	17:02	18 16:29 (2)	16:33
11	08:46		08:06		16:38 (2)		07:08	16:45 (3)	06:58	05:58	05:25	05:37	06:20	07:10		07:59		17:17 (3)	07:53	16:12 (2)	08:38
	16:56		17:49	25	17:03 (2)		18:39	70 18:02 (4)	20:32	21:22	22:00	21:59	21:15	20:09		19:00	48	18:06 (1)	17:00	16 16:28 (2)	16:33
12	08:46		08:05		16:39 (2)		07:06	16:46 (3)	06:56	05:57	05:25	05:38	06:22	07:11		08:01		17:18 (3)	07:55	16:14 (2)	08:39
	16:57		17:51	23	17:02 (2)		18:41	68 18:02 (4)	20:34	21:23	22:01	21:58	21:14	20:07		18:58	52	18:10 (1)	16:59	12 16:26 (2)	16:33
13	08:45		08:03		16:39 (2)		07:04	16:47 (3)	06:53	05:55	05:25	05:39	06:23	07:13		08:02		17:18 (3)	07:57	16:17 (2)	08:40
	16:59		17:53	23	17:02 (2)		18:43	66 18:02 (4)	20:35	21:25	22:01	21:57	21:12	20:04		18:56	54	18:12 (1)	16:57	7 16:24 (2)	16:33
14	08:44		08:01		16:40 (2)		07:02	16:48 (3)	06:51	05:54	05:25	05:40	06:25	07:15		08:04		17:18 (3)	07:58		08:41
	17:00		17:54	21	17:01 (2)		18:44	63 18:01 (4)	20:37	21:26	22:02	21:56	21:10	20:02		18:54	55	18:13 (1)	16:56		16:33
15	08:43		07:59		16:42 (2)		06:59	16:50 (3)	06:49	05:52	05:24	05:42	06:27	07:16		08:06		17:18 (3)	08:00		08:42
	17:02		17:56	17	16:59 (2)		18:46	58 18:00 (4)	20:39	21:28	22:02	21:56	21:08	20:00		18:51	55	18:13 (1)	16:54		16:33
16	08:43		07:57		16:44 (2)		06:57	16:52 (3)	06:47	05:50	05:24	05:43	06:28	07:18		08:07		17:19 (3)	08:02		08:43
	17:03		17:58	14	16:58 (2)		18:48	53 18:00 (4)	20:40	21:29	22:03	21:55	21:06	19:57		18:49	54	18:13 (1)	16:53		16:33
17	08:42		07:55		16:47 (2)		06:55	16:54 (3)	06:45	05:49	05:24	05:44	06:30	07:19		08:09		17:20 (3)	08:04		08:44
	17:05		18:00	11	17:32 (1)		18:50	47 17:58 (4)	20:42	21:31	22:03	21:53	21:04	19:55		18:47	54	18:14 (1)	16:52		16:34
18	08:41		07:53		17:01 (3)		06:52	16:58 (3)	06:43	05:48	05:24	05:45	06:31	07:21		08:11		17:20 (3)	08:05		08:45
	17:06		18:02	19	17:34 (1)		18:51	36 17:57 (4)	20:44	21:32	22:04	21:52	21:02	19:53		18:45	54	18:14 (1)	16:50		16:34
19	08:40		07:51		16:57 (3)		06:50	17:34 (4)	06:40	05:46	05:24	05:46	06:33	07:23		08:13		17:22 (3)	08:07		08:45
	17:08		18:04	31	17:36 (1)		18:53	22 17:56 (4)	20:45	21:34	22:04	21:51	21:00	19:50		18:43	52	18:14 (1)	16:49		16:34
20	08:39		07:49		16:55 (3)		06:48	17:35 (4)	06:38	05:45	05:24	05:48	06:35	07:24		08:14		17:22 (3)	08:09		08:46
	17:10		18:05	39	17:38 (1)		18:55	18 17:53 (4)	20:47	21:35	22:04	21:50	20:58	19:48		18:41	50	18:12 (1)	16:48		16:34
21	08:38		07:47		16:53 (3)		06:46	17:38 (4)	06:36	05:43	05:25	05:49	06:36	07:26		08:16		17:24 (3)	08:10		08:47
	17:11		18:07	46	17:40 (1)		18:56	13 17:51 (4)	20:49	21:37	22:05	21:49	20:55	19:46		18:39	43	18:10 (1)	16:47		16:35
22	08:37		07:45		16:51 (3)		06:43	17:43 (4)	06:34	05:42	05:25	05:50	06:38	07:28	18:23 (4)	08:18		17:26 (3)	08:12		08:47
	17:13		18:09	51	17:42 (1)		18:58	3 17:46 (4)	20:50	21:38	22:05	21:48	20:53	19:44	12 18:35 (4)	18:37	36	18:08 (1)	16:46		16:35
23	08:35		07:43		16:50 (3)		06:41		06:32	05:41	05:25	05:52	06:39	07:29	18:20 (4)	08:19		17:28 (3)	08:14		08:48
	17:15		18:11	52	17:42 (1)		19:00		20:52	21:39	22:05	21:46	20:51	19:41	17 18:37 (4)	18:35	29	18:06 (1)	16:44		16:36
24	08:34		07:41		16:49 (3)		06:39		06:30	05:40	05:25	05:53	06:41	07:31	18:18 (4)	08:21		17:33 (3)	08:15		08:48
	17:16		18:13	54	17:43 (1)		19:02		20:54	21:41	22:05	21:45	20:49	19:39	21 18:39 (4)	18:33	15	18:04 (1)	16:43		16:36
25	08:33		07:39		16:47 (3)		06:36		06:28	05:39	05:26	05:54	06:43	07:32	17:42 (3)	07:23		16:16 (2)	08:17		08:48
	17:18		18:14	54	17:41 (1)		19:03		20:55	21:42	22:05	21:44	20:47	19:37	31 18:39 (4)	17:31	10	16:26 (2)	16:42		16:37
26	08:32		07:37		16:46 (3)		06:34		06:26	05:37	05:26	05:56	06:44	07:34	17:38 (3)	07:25		16:14 (2)	08:18		08:49
	17:20		18:16	55	17:41 (1)		19:05		20:57	21:43	22:05	21:42	20:45	19:34	44 18:41 (4)	17:29	15	16:29 (2)	16:41		16:38
27	08:30		07:35		16:45 (3)		06:32		06:24	05:36	05:26	05:57	06:46	07:36	17:35 (3)	07:27		16:11 (2)	08:20		08:49
	17:22		18:18	55	17:40 (1)		19:07		20:59	21:45	22:05	21:41	20:43	19:32	50 18:41 (4)	17:27	18	16:29 (2)	16:41		16:38
28	08:29		07:33		16:45 (3)		06:30		06:22	05:35	05:27	05:59	06:47	07:37	17:31 (3)	07:28		16:10 (2)	08:21		08:49
	17:23		18:20	54	17:39 (1)		19:08		21:00	21:46	22:05	21:39	20:40	19:30	57 18:41 (4)	17:25	20	16:30 (2)	16:40		16:39
29	08:28	16:45 (2)					07:27		06:20	05:34	05:27	06:00	06:49	07:39	17:29 (3)	07:30		16:09 (2)	08:23		08:49
	17:25	8 16:53 (2)					20:10		21:02	21:47	22:05	21:38	20:38	19:27	61 18:41 (4)	17:23	22	16:31 (2)	16:39		16:40
30	08:26	16:42 (2)					07:25		06:18	05:33	05:28	06:02	06:51	07:41	17:27 (3)	07:32		16:08 (2)	08:24		08:50
	17:27	13 16:55 (2)					20:12		21:04	21:48	22:05	21:36	20:36	19:25	65 18:41 (4)	17:21	24	16:32 (2)	16:38		16:41
31	08:25	16:41 (2)					07:23			05:32		06:03	06:52			07:34		16:08 (2)			08:50
	17:29	16 16:57 (2)					20:13			21:49		21:35	20:34			17:19	25	16:33 (2)			16:42
Potential sun hours	260		278				367		415	484	497	501	453	381		332			267		245
Total, worst case		37		885		1148									358		1461		274		
Sun reduction		0,26		0,32		0,37									0,39		0,36		0,26		
Oper. time red.		0,99		0,99		0,99									0,99		0,99		0,99		
Wind dir. red.		0,69		0,68		0,65									0,65		0,67		0,69		
Total reduction		0,18		0,22		0,24									0,25		0,24		0,18		
Total, real		7		192		277									90		352		49		

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

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

Licensed user:
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Kelvinbaan 40, PO box 1475
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+31 3023 11377
David Vrolijk / dv@lbpsight.nl
Calculated:
3-2-2020 14:38/3.1.633

SHADOW - Calendar

Calculation: V136@147mShadow receptor: 4671RN4 - Sasdijk 4

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2,20	3,20	4,40	6,30	7,10	7,20	7,20	6,60	5,00	3,90	2,30	1,70

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
563	673	737	507	350	394	853	1.312	1.152	974	554	619	8.688

Idle start wind speed: Cut in wind speed from power curve

	January	February		March		April		May	June	July	August		September		October		November	December
1	08:50	08:23		07:30		17:26 (2)		07:20		18:54 (3)	06:16	05:31	05:29	06:05		06:54		18:56 (3)	07:42		18:34 (1)	07:35	08:26
	16:43	17:31		18:22	24	17:50 (2)	47	20:15		19:41 (4)	21:05	21:51	22:04	21:33		20:32	27	19:23 (3)	19:23	19	18:53 (1)	17:17	16:37
2	08:50	08:22		07:28		17:25 (2)		07:18		18:54 (3)	06:14	05:31	05:29	06:06		06:55		18:54 (3)	07:44		18:34 (1)	07:37	08:27
	16:44	17:32		18:23	24	17:49 (2)	47	20:17		19:41 (4)	21:07	21:52	22:04	21:31		20:29	29	19:23 (3)	19:20	19	18:53 (1)	17:15	16:37
3	08:49	08:20		07:26		17:26 (2)		07:16		18:53 (3)	06:12	05:30	05:30	06:08		06:57		18:53 (3)	07:45		18:33 (1)	07:39	08:29
	16:45	17:34		18:25	23	17:49 (2)	46	20:18		19:39 (4)	21:09	21:53	22:04	21:30		20:27	35	19:28 (4)	19:18	17	18:50 (1)	17:14	16:36
4	08:49	08:19		07:24		17:26 (2)		07:14		18:53 (3)	06:11	05:29	05:31	06:09		06:59		18:51 (3)	07:47		18:33 (1)	07:41	08:30
	16:47	17:36		18:27	23	17:49 (2)	46	20:20		19:39 (4)	21:10	21:54	22:03	21:28		20:25	39	19:30 (4)	19:16	15	18:48 (1)	17:12	16:36
5	08:49	08:17		07:22		17:27 (2)		07:11		18:54 (3)	06:09	05:28	05:32	06:11		07:00		18:51 (3)	07:49		18:09 (2)	07:42	08:31
	16:48	17:38		18:29	21	17:48 (2)	44	20:22		19:38 (4)	21:12	21:55	22:03	21:26		20:23	41	19:32 (4)	19:14	22	18:46 (1)	17:10	16:35
6	08:49	08:15		07:19		17:28 (2)		07:09		18:54 (3)	06:07	05:28	05:32	06:12		07:02		18:49 (3)	07:50		18:06 (2)	07:44	08:33
	16:49	17:40		18:30	21	18:05 (1)	43	20:23		19:37 (4)	21:14	21:56	22:02	21:25		20:20	43	19:32 (4)	19:11	24	18:44 (1)	17:08	16:35
7	08:48	08:14		07:17		17:28 (2)		07:07		18:53 (3)	06:05	05:27	05:33	06:14		07:03		18:49 (3)	07:52		18:04 (2)	07:46	08:34
	16:50	17:42		18:32	24	18:06 (1)	42	20:25		19:35 (4)	21:15	21:57	22:02	21:23		20:18	44	19:33 (4)	19:09	23	18:41 (1)	17:07	16:34
8	08:48	08:12		07:15		17:30 (2)		07:05		18:54 (3)	06:03	05:27	05:34	06:15		07:05		18:47 (3)	07:54		18:02 (2)	07:48	08:35
	16:51	17:43		18:34	24	18:08 (1)	39	20:27		19:33 (4)	21:17	21:57	22:01	21:21		20:16	46	19:33 (4)	19:07	21	18:23 (2)	17:05	16:34
9	08:47	08:10		07:13		17:34 (2)		07:02		18:55 (3)	06:02	05:26	05:35	06:17		07:07		18:47 (3)	07:55		18:01 (2)	07:50	08:36
	16:53	17:45		18:36	20	18:11 (1)	35	20:28		19:30 (4)	21:18	21:58	22:01	21:19		20:14	47	19:34 (4)	19:05	23	18:24 (2)	17:03	16:34
10	08:47	08:08		07:11		17:55 (1)		07:00		18:56 (3)	06:00	05:26	05:36	06:19		07:08		18:47 (3)	07:57		18:00 (2)	07:51	08:37
	16:54	17:47		18:37	17	18:12 (1)	30	20:30	29	19:25 (3)	21:20	21:59	22:00	21:17		20:11	47	19:34 (4)	19:02	23	18:23 (2)	17:02	16:33
11	08:46	08:06		07:08		17:55 (1)		06:58		18:58 (3)	05:58	05:25	05:37	06:20		07:10		18:47 (3)	07:59		18:00 (2)	07:53	08:38
	16:56	17:49		18:39	19	18:14 (1)	26	20:32		19:24 (3)	21:22	22:00	21:59	21:15		20:09	46	19:33 (4)	19:00	23	18:23 (2)	17:00	16:33
12	08:46	08:05		07:06		17:55 (1)		06:56		18:58 (3)	05:57	05:25	05:38	06:22		07:11		18:47 (3)	08:01		17:59 (2)	07:55	08:39
	16:57	17:51		18:41	19	18:14 (1)	23	20:34		19:21 (3)	21:23	22:01	21:58	21:13		20:07	46	19:33 (4)	18:58	24	18:23 (2)	16:59	16:33
13	08:45	08:03		07:04		17:55 (1)		06:53		19:00 (3)	05:55	05:25	05:39	06:23		07:13		18:46 (3)	08:02		18:00 (2)	07:57	08:40
	16:59	17:53		18:43	19	18:14 (1)	19	20:35		19:19 (3)	21:25	22:01	21:57	21:12		20:04	46	19:32 (4)	18:56	23	18:23 (2)	16:57	16:33
14	08:44	08:01		07:02		17:55 (1)		06:51		19:03 (3)	05:54	05:25	05:40	06:25		07:15		18:47 (3)	08:04		17:59 (2)	07:58	08:41
	17:00	17:54		18:44	17	18:12 (1)	14	20:37		19:17 (3)	21:26	22:02	21:56	21:10		20:02	44	19:31 (4)	18:54	23	18:22 (2)	16:56	16:33
15	08:43	07:59		06:59		17:56 (1)		06:49		19:08 (3)	05:52	05:24	05:42	06:27		07:16		18:47 (3)	08:06		17:59 (2)	08:00	08:42
	17:02	17:56		18:46	15	18:11 (1)	3	20:39		19:11 (3)	21:28	22:02	21:55	21:08		20:00	43	19:30 (4)	18:51	22	18:21 (2)	16:54	16:33
16	08:43	07:57		06:57		17:57 (1)		06:47			05:50	05:24	05:43	06:28		07:18		18:48 (3)	08:07		18:00 (2)	08:02	08:43
	17:03	17:58		18:48	13	18:10 (1)		20:40			21:29	22:03	21:54	21:06		19:57	40	19:28 (4)	18:49	20	18:20 (2)	16:53	16:33
17	08:42	07:55		06:55		17:59 (1)		06:45			05:49	05:24	05:44	06:30		07:19		18:49 (3)	08:09		18:01 (2)	08:04	08:44
	17:05	18:00		18:50	8	18:07 (1)		20:42			21:31	22:03	21:53	21:04		19:55	38	19:27 (4)	18:47	18	18:19 (2)	16:52	16:34
18	08:41	07:53		06:52				06:43			05:48	05:24	05:45	06:31		07:21		18:49 (3)	08:11		18:03 (2)	08:05	08:45
	17:06	18:02		18:51				20:44			21:32	22:04	21:52	21:02		19:53	35	19:24 (4)	18:45	14	18:17 (2)	16:50	16:34
19	08:40	07:51		06:50				06:40			05:46	05:24	05:46	06:33		07:23		18:51 (3)	08:13		18:05 (2)	08:07	08:45
	17:08	18:04		18:53				20:45			21:34	22:04	21:51	21:00		19:50	30	19:21 (4)	18:43	10	18:15 (2)	16:49	16:34
20	08:39	07:49		06:48				06:38			05:45	05:24	05:48	06:35		07:24		18:53 (3)	08:14			08:09	08:46
	17:10	18:05		18:55				20:47			21:35	22:04	21:50	20:58		19:48	16	19:09 (3)	18:41			16:48	16:34
21	08:38	07:47		06:46				06:36			05:43	05:25	05:49	06:36		07:26		18:57 (3)	08:16			08:10	08:47
	17:11	18:07		18:56				20:49			21:37	22:05	21:49	20:55		19:46	9	19:06 (3)	18:39			16:47	16:35
22	08:37	07:45		06:43		18:13 (3)		06:34			05:42	05:25	05:50	06:38		07:28			08:18			08:12	08:47
	17:13	18:09	4	18:58	5	18:18 (3)		20:50			21:38	22:05	21:48	20:53		19:43			18:37			16:46	16:35
23	08:35	07:43		06:41		18:07 (3)		06:32			05:41	05:25	05:52	06:39		07:29			08:19			08:14	08:48
	17:15	18:11	12	19:00	15	18:22 (3)		20:52			21:39	22:05	21:46	20:51		19:41			18:35			16:44	16:36
24	08:34	07:41		06:39		18:04 (3)		06:30			05:40	05:25	05:53	06:41		07:31			08:21			08:15	08:48
	17:16	18:13	16	19:01	26	18:32 (4)		20:54			21:41	22:05	21:45	20:49		19:39			18:33			16:43	16:36
25	08:33	07:39		06:36		18:02 (3)		06:28			05:39	05:26	05:54	06:43		07:32			07:23			08:17	08:48
	17:18	18:14	18	19:03	34	18:36 (4)		20:55			21:42	22:05	21:44	20:47		19:37			17:31			16:42	16:37
26	08:32	07:37		06:34		18:01 (3)		06:26			05:37	05:26	05:56	06:44		07:34		18:43 (1)	07:25			08:18	08:49
	17:20	18:16	20	19:05	37	18:38 (4)		20:57			21:43	22:05	21:42	20:45		19:34	5	18:48 (1)	17:29			16:41	16:38
27	08:30	07:35		06:32		17:59 (3)		06:24			05:36	05:26	05:57	06:46		07:36		18:40 (1)	07:26			08:20	08:49
	17:22	18:18	22	19:07	40	18:39 (4)		20:59			21:45	22:05	21:41	20:43		19:32	11	18:51 (1)	17:27			16:41	16:38
28	08:29	07:33		06:30		17:58 (3)		06:22			05:35	05:27	05:59	06:47	19:09 (3)	07:37		18:37 (1)	07:28			08:21	08:49
	17:23	18:20	23	19:08	42	18:40 (4)		21:00			21:46	22:05	21:39	20:40	5	19:14 (3)	19:30	14	18:51 (1)	17:25			16:40	16:39
29	08:28			07:27		18:57 (3)		06:20			05:34	05:27	06:00	06:49		19:03 (3)	07:39		18:36 (1)	07:30			08:23	08:49
	17:25			20:10	44	19:41 (4)		21:02			21:47	22:05	21:38	20:38	15	19:18 (3)	19:27	17	18:53 (1)	17:23			16:39	16:40
30	08:26			07:25		18:55 (3)		06:18			05:33	05:28	06:02	06:51		19:01 (3)	07:41		18:34 (1)	07:32			08:24	08:50
	17:27			20:12	45	19:40 (4)		21:04			21:48	22:05	21:36	20:36	19	19:20 (3)	19:25	18	18:52 (1)	17:21			16:38	16:41
31	08:25			07:23		18:55 (3)					05:32		06:03	06:52		18:58 (3)				07:34				08:50
	17:29			20:13	46	19:41 (4)					21:49		21:35	20:34	23	19:21 (3)				17:19				16:42
Potential sun hours	260	278		367			415		484	497	501	453		381			332				267	245	
Total, worst case			115		665		503						62		856			383					
Sun reduction			0,32		0,37		0,45						0,45		0,39			0,36					
Oper. time red.			0,99		0,99		0,99						0,99		0,99			0,99					
Wind dir. red.			0,65		0,62		0,61						0,61		0,61			0,64					
Total reduction			0,21		0,23		0,28						0,27		0,24			0,23					
Total, real			24		153		139						17		205			89					

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)

Licensed user:
LBP SIGHT
Kelvinbaan 40, PO box 1475
NL-3430BL Nieuwegein
+31 3023 11377
David Vrolijk / dv@lbpsight.nl
Calculated:
3-2-2020 14:38/3.1.633

SHADOW - Calendar

Calculation: V136@147mShadow receptor: 4671RN6 - Sasdijk 6

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2,20	3,20	4,40	6,30	7,10	7,20	7,20	6,60	5,00	3,90	2,30	1,70

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
563	673	737	507	350	394	853	1.312	1.152	974	554	619	8.688

Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:50	08:23	07:30	17:24 (2) 07:20	18:50 (3) 06:16	05:31	05:29	06:05	06:54	18:55 (3) 07:42	18:32 (1) 07:35	08:26
	16:43	17:31	18:22 24	17:48 (2) 20:15 48	19:38 (4) 21:05	21:51	22:04	21:33	20:32 22	19:17 (3) 19:23 18	18:50 (1) 17:17	16:37
2	08:50	08:22	07:28	17:23 (2) 07:18	18:50 (3) 06:14	05:31	05:29	06:06	06:55	18:52 (3) 07:44	18:32 (1) 07:37	08:27
	16:44	17:32	18:23 23	17:46 (2) 20:17 48	19:38 (4) 21:07	21:52	22:04	21:31	20:29 26	19:18 (3) 19:20 19	18:51 (1) 17:15	16:37
3	08:49	08:20	07:26	17:23 (2) 07:16	18:49 (3) 06:12	05:30	05:30	06:08	06:57	18:51 (3) 07:45	18:31 (1) 07:39	08:29
	16:45	17:34	18:25 23	17:46 (2) 20:18 47	19:36 (4) 21:09	21:53	22:04	21:30	20:27 28	19:19 (3) 19:18 19	18:50 (1) 17:14	16:36
4	08:49	08:19	07:24	17:24 (2) 07:14	18:50 (3) 06:11	05:29	05:31	06:09	06:59	18:49 (3) 07:47	18:31 (1) 07:41	08:30
	16:47	17:36	18:27 21	17:45 (2) 20:20 46	19:36 (4) 21:10	21:54	22:03	21:28	20:25 36	19:25 (4) 19:16 17	18:48 (1) 17:12	16:36
5	08:49	08:17	07:22	17:25 (2) 07:11	18:50 (3) 06:09	05:28	05:32	06:11	07:00	18:48 (3) 07:49	18:31 (1) 07:42	08:31
	16:48	17:38	18:29 21	18:03 (1) 20:22 45	19:35 (4) 21:12	21:55	22:03	21:26	20:23 39	19:27 (4) 19:14 15	18:46 (1) 17:10	16:35
6	08:49	08:15	07:19	17:27 (2) 07:09	18:51 (3) 06:07	05:28	05:32	06:12	07:02	18:46 (3) 07:50	18:06 (2) 07:44	08:33
	16:49	17:40	18:30 23	18:05 (1) 20:23 42	19:33 (4) 21:14	21:56	22:02	21:25	20:20 42	19:28 (4) 19:11 22	18:44 (1) 17:08	16:35
7	08:48	08:14	07:17	17:28 (2) 07:07	18:51 (3) 06:05	05:27	05:33	06:14	07:03	18:45 (3) 07:52	18:03 (2) 07:46	08:34
	16:50	17:42	18:32 22	18:06 (1) 20:25 40	19:31 (4) 21:15	21:57	22:02	21:23	20:18 45	19:30 (4) 19:09 23	18:41 (1) 17:07	16:34
8	08:48	08:12	07:15	17:32 (2) 07:05	18:52 (3) 06:03	05:27	05:34	06:15	07:05	18:44 (3) 07:54	18:01 (2) 07:48	08:35
	16:51	17:43	18:34 18	18:08 (1) 20:27 36	19:28 (4) 21:17	21:57	22:01	21:21	20:16 46	19:30 (4) 19:07 23	18:39 (1) 17:05	16:34
9	08:47	08:10	07:13	17:54 (1) 07:02	18:53 (3) 06:02	05:26	05:35	06:17	07:07	18:44 (3) 07:55	18:00 (2) 07:50	08:36
	16:53	17:45	18:36 17	18:11 (1) 20:28 28	19:21 (3) 21:18	21:58	22:01	21:19	20:14 47	19:31 (4) 19:05 20	18:20 (2) 17:03	16:34
10	08:47	08:08	07:11	17:53 (1) 07:00	18:55 (3) 06:00	05:26	05:36	06:19	07:08	18:43 (3) 07:57	17:58 (2) 07:51	08:37
	16:54	17:47	18:37 19	18:12 (1) 20:30 25	19:20 (3) 21:20	21:59	22:00	21:17	20:11 48	19:31 (4) 19:02 22	18:20 (2) 17:02	16:33
11	08:46	08:06	07:08	17:53 (1) 06:58	18:56 (3) 05:58	05:25	05:37	06:20	07:10	18:42 (3) 07:59	17:57 (2) 07:53	08:38
	16:56	17:49	18:39 19	18:12 (1) 20:32 22	19:18 (3) 21:22	22:00	21:59	21:15	20:09 48	19:30 (4) 19:00 23	18:20 (2) 17:00	16:33
12	08:46	08:05	07:06	17:53 (1) 06:56	18:57 (3) 05:57	05:25	05:38	06:22	07:11	18:43 (3) 08:01	17:57 (2) 07:55	08:39
	16:57	17:51	18:41 19	18:12 (1) 20:34 18	19:15 (3) 21:23	22:01	21:58	21:13	20:07 48	19:31 (4) 18:58 24	18:21 (2) 16:59	16:33
13	08:45	08:03	07:04	17:54 (1) 06:53	19:01 (3) 05:55	05:25	05:39	06:23	07:13	18:42 (3) 08:02	17:57 (2) 07:57	08:40
	16:59	17:53	18:43 17	18:11 (1) 20:35 10	19:11 (3) 21:25	22:01	21:57	21:12	20:04 48	19:30 (4) 18:56 24	18:21 (2) 16:57	16:33
14	08:44	08:01	07:02	17:54 (1) 06:51	05:54	05:25	05:40	06:25	07:15	18:42 (3) 08:04	17:56 (2) 07:58	08:41
	17:00	17:54	18:44 15	18:09 (1) 20:37	21:26	22:02	21:56	21:10	20:02 47	19:29 (4) 18:54 24	18:20 (2) 16:56	16:33
15	08:43	07:59	06:59	17:55 (1) 06:49	05:52	05:24	05:42	06:27	07:16	18:42 (3) 08:06	17:56 (2) 08:00	08:42
	17:02	17:56	18:46 13	18:08 (1) 20:39	21:28	22:02	21:55	21:08	20:00 46	19:28 (4) 18:51 23	18:19 (2) 16:54	16:33
16	08:43	07:57	06:57	17:57 (1) 06:47	05:50	05:24	05:43	06:28	07:18	18:42 (3) 08:07	17:56 (2) 08:02	08:43
	17:03	17:58	18:48 9	18:06 (1) 20:40	21:29	22:03	21:54	21:06	19:57 45	19:27 (4) 18:49 23	18:19 (2) 16:53	16:33
17	08:42	07:55	06:55	06:45	05:49	05:24	05:44	06:30	07:19	18:43 (3) 08:09	17:57 (2) 08:04	08:44
	17:05	18:00	18:50	20:42	21:31	22:03	21:53	21:04	19:55 43	19:26 (4) 18:47 21	18:18 (2) 16:52	16:34
18	08:41	07:53	06:52	06:43	05:48	05:24	05:45	06:31	07:21	18:43 (3) 08:11	17:58 (2) 08:05	08:45
	17:06	18:02	18:51	20:44	21:32	22:04	21:52	21:02	19:53 41	19:24 (4) 18:45 19	18:17 (2) 16:50	16:34
19	08:40	07:51	06:50	06:40	05:46	05:24	05:46	06:33	07:23	18:44 (3) 08:13	17:59 (2) 08:07	08:45
	17:08	18:04	18:53	20:45	21:34	22:04	21:51	21:00	19:50 38	19:22 (4) 18:43 16	18:15 (2) 16:49	16:34
20	08:39	07:49	06:48	06:38	05:45	05:24	05:48	06:35	07:24	18:45 (3) 08:14	18:00 (2) 08:09	08:46
	17:10	18:05	18:55	20:47	21:35	22:04	21:50	20:58	19:48 33	19:18 (4) 18:41 12	18:12 (2) 16:48	16:34
21	08:38	07:47 17:32 (2)	06:46 18:05 (3)	06:36	05:43	05:25	05:49	06:36	07:26	18:47 (3) 08:16	18:04 (2) 08:10	08:47
	17:11	18:07 8 17:40 (2)	18:56 13 18:18 (3)	20:49	21:37	22:05	21:49	20:55	19:46 20	19:07 (3) 18:39 4	18:08 (2) 16:47	16:35
22	08:37	07:45 17:29 (2)	06:43 18:02 (3)	06:34	05:42	05:25	05:50	06:38	07:28	18:49 (3) 08:18	08:12	08:47
	17:13	18:09 13 17:42 (2)	18:58 19 18:21 (3)	20:50	21:38	22:05	21:48	20:53	19:43 15	19:04 (3) 18:37	16:46	16:35
23	08:35	07:43 17:28 (2)	06:41 17:59 (3)	06:32	05:41	05:25	05:52	06:39	07:29	18:54 (3) 08:19	08:14	08:48
	17:15	18:11 17 17:45 (2)	19:00 31 18:31 (4)	20:52	21:39	22:05	21:46	20:51	19:41 4	18:58 (3) 18:35	16:44	16:36
24	08:34	07:41 17:26 (2)	06:39 17:57 (3)	06:30	05:40	05:25	05:53	06:41	07:31	08:21	08:15	08:48
	17:16	18:13 20 17:46 (2)	19:01 37 18:34 (4)	20:54	21:41	22:05	21:45	20:49	19:39	18:33	16:43	16:36
25	08:33	07:39 17:25 (2)	06:36 17:56 (3)	06:28	05:39	05:26	05:54	06:43	07:32	07:23	08:17	08:48
	17:18	18:14 21 17:46 (2)	19:03 40 18:36 (4)	20:55	21:42	22:05	21:44	20:47	19:37	17:31	16:42	16:37
26	08:32	07:37 17:24 (2)	06:34 17:55 (3)	06:26	05:37	05:26	05:56	06:44	07:34	07:25	08:18	08:49
	17:20	18:16 23 17:47 (2)	19:05 43 18:38 (4)	20:57	21:43	22:05	21:42	20:45	19:34	17:29	16:41	16:38
27	08:30	07:35 17:24 (2)	06:32 17:53 (3)	06:24	05:36	05:26	05:57	06:46	07:36 18:40 (1)	07:26	08:20	08:49
	17:22	18:18 23 17:47 (2)	19:07 45 18:38 (4)	20:59	21:45	22:05	21:41	20:43	19:32 6	18:46 (1) 17:27	16:41	16:38
28	08:29	07:33 17:23 (2)	06:30 17:52 (3)	06:22	05:35	05:27	05:59	06:47	07:37	18:37 (1) 07:28	08:21	08:49
	17:23	18:20 24 17:47 (2)	19:08 46 18:38 (4)	21:00	21:46	22:05	21:39	20:40	19:30 11	18:48 (1) 17:25	16:40	16:39
29	08:28		07:27 18:52 (3)	06:20	05:34	05:27	06:00	06:49	07:39	18:35 (1) 07:30	08:23	08:49
	17:25		20:10 47 19:39 (4)	21:02	21:47	22:05	21:38	20:38	19:27 15	18:50 (1) 17:23	16:39	16:40
30	08:26		07:25 18:50 (3)	06:18	05:33	05:28	06:02	06:51 19:02 (3)	07:41	18:33 (1) 07:32	08:24	08:50
	17:27		20:12 48 19:38 (4)	21:04	21:48	22:05	21:36	20:36 10 19:12 (3)	19:25 17	18:50 (1) 17:21	16:38	16:41
31	08:25		07:23 18:50 (3)		05:32		06:03	06:52 18:57 (3)		07:34		08:50
	17:29		20:13 48 19:38 (4)		21:49		21:35	20:34 18 19:15 (3)		17:19		16:42
Potential sun hours	260	278	367	415	484	497	501	453	381	332	267	245
Total, worst case		149	720	455				28	904	411		
Sun reduction		0,32	0,37	0,45				0,45	0,39	0,36		
Oper. time red.		0,99	0,99	0,99				0,99	0,99	0,99		
Wind dir. red.		0,65	0,62	0,61				0,61	0,61	0,64		
Total reduction		0,21	0,23	0,28				0,28	0,24	0,23		
Total, real		31	165	126				8	217	96		

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

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

Project:
Windpro 068475aa v3.1

Licensed user:
LBP SIGHT
Kelvinbaan 40, PO box 1475
NL-3430BL Nieuwegein
+31 3023 11377
David Vrolijk / dv@lbpsight.nl
Calculated:
3-2-2020 14:38/3.1.633

SHADOW - Calendar

Calculation: V136@147mShadow receptor: 4671RN8 - Sasdijk 8

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2,20	3,20	4,40	6,30	7,10	7,20	7,20	6,60	5,00	3,90	2,30	1,70

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
563	673	737	507	350	394	853	1.312	1.152	974	554	619	8.688

Idle start wind speed: Cut in wind speed from power curve

	January	February			March			April			May	June	July	August	September			October			November	December
1	08:50	08:23			07:30		17:21 (2)	07:20		18:46 (3)	06:16	05:31	05:29	06:05	06:54		18:55 (3)	07:42		18:30 (1)	07:35	08:26
	16:43	17:31			18:22	23	17:44 (2)	20:15	49	19:35 (4)	21:05	21:51	22:04	21:33	20:32	14	19:09 (3)	19:23	17	18:47 (1)	17:17	16:37
2	08:50	08:22			07:28		17:20 (2)	07:18		18:46 (3)	06:14	05:31	05:29	06:06	06:55		18:51 (3)	07:44		18:30 (1)	07:37	08:27
	16:44	17:32			18:23	23	17:43 (2)	20:17	49	19:35 (4)	21:07	21:52	22:04	21:31	20:29	20	19:11 (3)	19:20	18	18:48 (1)	17:15	16:37
3	08:49	08:20			07:26		17:21 (2)	07:16		18:46 (3)	06:12	05:30	05:30	06:08	06:57		18:49 (3)	07:45		18:28 (1)	07:39	08:29
	16:45	17:34			18:25	21	17:42 (2)	20:18	47	19:33 (4)	21:09	21:53	22:04	21:30	20:27	24	19:13 (3)	19:18	19	18:47 (1)	17:14	16:36
4	08:49	08:19			07:24		17:22 (2)	07:14		18:46 (3)	06:11	05:29	05:31	06:09	06:59		18:47 (3)	07:47		18:28 (1)	07:41	08:30
	16:47	17:36			18:27	22	18:01 (1)	20:20	46	19:32 (4)	21:10	21:54	22:03	21:28	20:25	26	19:13 (3)	19:16	19	18:47 (1)	17:12	16:36
5	08:49	08:17			07:22		17:24 (2)	07:11		18:47 (3)	06:09	05:28	05:32	06:11	07:00		18:45 (3)	07:49		18:28 (1)	07:42	08:31
	16:48	17:38			18:29	23	18:03 (1)	20:22	43	19:30 (4)	21:12	21:55	22:03	21:26	20:23	36	19:21 (4)	19:14	18	18:46 (1)	17:10	16:35
6	08:49	08:15			07:19		17:27 (2)	07:09		18:48 (3)	06:07	05:28	05:32	06:12	07:02		18:43 (3)	07:50		18:29 (1)	07:44	08:33
	16:49	17:40			18:30	22	18:05 (1)	20:23	41	19:29 (4)	21:14	21:56	22:02	21:25	20:20	41	19:24 (4)	19:11	15	18:44 (1)	17:08	16:35
7	08:48	08:14			07:17		17:52 (1)	07:07		18:48 (3)	06:05	05:27	05:33	06:14	07:03		18:42 (3)	07:52		18:03 (2)	07:46	08:34
	16:50	17:42			18:32	14	18:06 (1)	20:25	36	19:24 (4)	21:15	21:57	22:02	21:23	20:18	43	19:25 (4)	19:09	20	18:41 (1)	17:07	16:34
8	08:48	08:12			07:15		17:52 (1)	07:05		18:50 (3)	06:03	05:27	05:34	06:15	07:05		18:40 (3)	07:54		18:00 (2)	07:48	08:35
	16:51	17:43			18:34	16	18:08 (1)	20:27	26	19:16 (3)	21:17	21:57	22:01	21:21	20:16	46	19:26 (4)	19:07	23	18:39 (1)	17:05	16:34
9	08:47	08:10			07:13		17:51 (1)	07:02		18:51 (3)	06:02	05:26	05:35	06:17	07:07		18:40 (3)	07:55		17:58 (2)	07:50	08:36
	16:53	17:45			18:36	19	18:10 (1)	20:28	24	19:15 (3)	21:18	21:58	22:01	21:19	20:14	47	19:27 (4)	19:05	22	18:37 (1)	17:03	16:34
10	08:47	08:08			07:11		17:50 (1)	07:00		18:53 (3)	06:00	05:26	05:36	06:19	07:08		18:39 (3)	07:57		17:56 (2)	07:51	08:37
	16:54	17:47			18:37	20	18:10 (1)	20:30	20	19:13 (3)	21:20	21:59	22:00	21:17	20:11	49	19:28 (4)	19:02	20	18:16 (2)	17:02	16:33
11	08:46	08:06			07:08		17:51 (1)	06:58		18:56 (3)	05:58	05:25	05:37	06:20	07:10		18:38 (3)	07:59		17:55 (2)	07:53	08:38
	16:56	17:49			18:39	18	18:09 (1)	20:32	14	19:10 (3)	21:22	22:00	21:59	21:15	20:09	49	19:27 (4)	19:00	22	18:17 (2)	17:00	16:33
12	08:46	08:05			07:06		17:51 (1)	06:56			05:57	05:25	05:38	06:22	07:11		18:38 (3)	08:01		17:54 (2)	07:55	08:39
	16:57	17:51			18:41	18	18:09 (1)	20:34			21:23	22:01	21:58	21:13	20:07	50	19:28 (4)	18:58	23	18:17 (2)	16:59	16:33
13	08:45	08:03			07:04		17:52 (1)	06:53			05:55	05:25	05:39	06:23	07:13		18:37 (3)	08:02		17:54 (2)	07:57	08:40
	16:59	17:53			18:43	16	18:08 (1)	20:35			21:25	22:01	21:57	21:12	20:04	50	19:27 (4)	18:56	24	18:18 (2)	16:57	16:33
14	08:44	08:01			07:02		17:53 (1)	06:51			05:54	05:25	05:40	06:25	07:15		18:37 (3)	08:04		17:53 (2)	07:58	08:41
	17:00	17:54			18:44	13	18:06 (1)	20:37			21:26	22:02	21:56	21:10	20:02	50	19:27 (4)	18:54	24	18:17 (2)	16:56	16:33
15	08:43	07:59			06:59		17:55 (1)	06:49			05:52	05:24	05:42	06:27	07:16		18:36 (3)	08:06		17:52 (2)	08:00	08:42
	17:02	17:56			18:46	9	18:04 (1)	20:39			21:28	22:02	21:55	21:08	20:00	50	19:26 (4)	18:51	25	18:17 (2)	16:54	16:33
16	08:43	07:57			06:57			06:47			05:50	05:24	05:43	06:28	07:18		18:37 (3)	08:07		17:53 (2)	08:02	08:43
	17:03	17:58			18:48			20:40			21:29	22:03	21:54	21:06	19:57	48	19:25 (4)	18:49	23	18:16 (2)	16:53	16:33
17	08:42	07:55			06:55			06:45			05:49	05:24	05:44	06:30	07:19		18:37 (3)	08:09		17:53 (2)	08:04	08:44
	17:05	18:00			18:50			20:42			21:31	22:03	21:53	21:04	19:55	48	19:25 (4)	18:47	23	18:16 (2)	16:52	16:34
18	08:41	07:53			06:52			06:43			05:48	05:24	05:45	06:31	07:21		18:37 (3)	08:11		17:54 (2)	08:05	08:45
	17:06	18:02			18:51			20:44			21:32	22:04	21:52	21:02	19:53	46	19:23 (4)	18:45	21	18:15 (2)	16:50	16:34
19	08:40	07:51			06:50		18:02 (3)	06:40			05:46	05:24	05:46	06:33	07:23		18:38 (3)	08:13		17:55 (2)	08:07	08:45
	17:08	18:04			18:53	12	18:14 (3)	20:45			21:34	22:04	21:51	21:00	19:50	44	19:22 (4)	18:43	19	18:14 (2)	16:49	16:34
20	08:39	07:49		17:27 (2)	06:48		17:58 (3)	06:38			05:45	05:24	05:48	06:35	07:24		18:38 (3)	08:14		17:55 (2)	08:09	08:46
	17:10	18:05	11	17:38 (2)	18:55	19	18:17 (3)	20:47			21:35	22:04	21:50	20:58	19:48	41	19:19 (4)	18:41	17	18:12 (2)	16:48	16:34
21	08:38	07:47		17:25 (2)	06:46		17:56 (3)	06:36			05:43	05:25	05:49	06:36	07:26		18:39 (3)	08:16		17:56 (2)	08:10	08:47
	17:11	18:07	15	17:40 (2)	18:56	23	18:19 (3)	20:49			21:37	22:05	21:49	20:55	19:46	37	19:16 (4)	18:39	14	18:10 (2)	16:47	16:35
22	08:37	07:45		17:24 (2)	06:43		17:54 (3)	06:34			05:42	05:25	05:50	06:38	07:28		18:40 (3)	08:18		17:59 (2)	08:12	08:47
	17:13	18:09	18	17:42 (2)	18:58	36	18:30 (4)	20:50			21:38	22:05	21:48	20:53	19:43	24	19:04 (3)	18:37	9	18:08 (2)	16:46	16:35
23	08:35	07:43		17:23 (2)	06:41		17:52 (3)	06:32			05:41	05:25	05:52	06:39	07:29		18:42 (3)	08:19			08:14	08:48
	17:15	18:11	20	17:43 (2)	19:00	40	18:32 (4)	20:52			21:39	22:05	21:46	20:51	19:41	20	19:02 (3)	18:35			16:44	16:36
24	08:34	07:41		17:22 (2)	06:39		17:51 (3)	06:30			05:40	05:25	05:53	06:41	07:31		18:45 (3)	08:21			08:15	08:48
	17:16	18:13	22	17:44 (2)	19:01	43	18:34 (4)	20:54			21:41	22:05	21:45	20:49	19:39	14	18:59 (3)	18:33			16:43	16:36
25	08:33	07:39		17:21 (2)	06:36		17:50 (3)	06:28			05:39	05:26	05:54	06:43	07:32			07:23			08:17	08:48
	17:18	18:14	23	17:44 (2)	19:03	45	18:35 (4)	20:55			21:42	22:05	21:44	20:47	19:37			17:31			16:42	16:37
26	08:32	07:37		17:20 (2)	06:34		17:49 (3)	06:26			05:37	05:26	05:56	06:44	07:34			07:25			08:18	08:49
	17:20	18:16	24	17:44 (2)	19:05	47	18:36 (4)	20:57			21:43	22:05	21:42	20:45	19:34			17:29			16:41	16:38
27	08:30	07:35		17:20 (2)	06:32		17:47 (3)	06:24			05:36	05:26	05:57	06:46	07:36			07:26			08:20	08:49
	17:22	18:18	24	17:44 (2)	19:07	49	18:36 (4)	20:59			21:45	22:05	21:41	20:43	19:32			17:27			16:41	16:38
28	08:29	07:33		17:20 (2)	06:30		17:47 (3)	06:22			05:35	05:27	05:59	06:47	07:37		18:37 (1)	07:28			08:21	08:49
	17:23	18:20	24	17:44 (2)	19:08	49	18:36 (4)	21:00			21:46	22:05	21:39	20:40	19:30	6	18:43 (1)	17:25			16:40	16:39
29	08:28				07:27		18:47 (3)	06:20			05:34	05:27	06:00	06:49	07:39		18:34 (1)	07:30			08:23	08:49
	17:25				20:10	50	19:37 (4)	21:02			21:47	22:05	21:38	20:38	19:27	12	18:46 (1)	17:23			16:39	16:40
30	08:26				07:25		18:46 (3)	06:18			05:33	05:28	06:02	06:51	07:41		18:32 (1)	07:32			08:24	08:50
	17:27				20:12	50	19:36 (4)	21:04			21:48	22:05	21:36	20:36	19:25	14	18:46 (1)	17:21			16:38	16:41
31	08:25				07:23		18:46 (3)				05:32		06:03	06:52				07:34				08:50
	17:29				20:13	50	19:36 (4)				21:49		21:35	20:34				17:19				16:42
Potential sun hours	260	278			367			415			484	497	501	453	381			332			267	245
Total, worst case			181			790			395							949			435			
Sun reduction			0,32			0,37			0,45							0,39			0,36			
Oper. time red.			0,99			0,99			0,99							0,99			0,99			
Wind dir. red.			0,66			0,62			0,61							0,61			0,65			
Total reduction			0,21			0,23			0,28							0,24			0,23			
Total, real			38			181			110							228			102			

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

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

Licensed user:
LBP SIGHT
Kelvinbaan 40, PO box 1475
NL-3430BL Nieuwegein
+31 3023 11377
David Vrolijk / dv@lbpsight.nl
Calculated:
3-2-2020 14:38/3.1.633

SHADOW - Calendar

Calculation: V136@147mShadow receptor: 4671TH7 - Schenkeldijk 7

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2,20	3,20	4,40	6,30	7,10	7,20	7,20	6,60	5,00	3,90	2,30	1,70

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
563	673	737	507	350	394	853	1.312	1.152	974	554	619	8.688

Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April		May		June		July		August		September		October	November	December
1	08:50	08:23	07:30	07:21		06:16		06:42 (3)	05:32	06:11 (4)	05:29	06:14 (4)	06:05	06:47 (3)	06:54	07:40 (2)	07:42	07:35	08:26
	16:43	17:31	18:22	20:15		21:05	19	07:01 (3)	21:51 94	07:56 (1)	22:05 105	08:04 (1)	21:33 46	07:43 (1)	20:32 38	08:18 (2)	19:23	17:17	16:38
2	08:50	08:22	07:28	07:18		06:14		06:41 (3)	05:31	06:10 (4)	05:29	06:14 (4)	06:06	06:48 (3)	06:56	07:39 (2)	07:44	07:37	08:27
	16:44	17:33	18:24	20:17	14	07:56 (2)		07:01 (3)	21:52 97	07:56 (1)	22:04 105	08:04 (1)	21:32 36	07:38 (1)	20:30 38	08:17 (2)	19:21	17:16	16:37
3	08:49	08:20	07:26	07:16		07:52 (2)	06:13	06:39 (3)	05:30	06:10 (4)	05:30	06:15 (4)	06:08	06:47 (3)	06:57	07:40 (2)	07:46	07:39	08:29
	16:46	17:34	18:25	20:19	20	08:10 (2)		07:02 (3)	21:53 99	07:56 (1)	22:04 105	08:04 (1)	21:30 36	07:38 (1)	20:30 38	08:17 (2)	19:18	17:14	16:37
4	08:49	08:19	07:24	07:14		07:50 (2)	06:11	06:38 (3)	05:29	06:10 (4)	05:31	06:15 (4)	06:09	06:48 (3)	06:59	07:40 (2)	07:47	07:41	08:30
	16:47	17:36	18:27	20:20	24	08:12 (2)		07:02 (3)	21:54 99	07:57 (1)	22:03 103	08:04 (1)	21:28 25	07:13 (3)	20:25 35	08:15 (2)	19:16	17:12	16:36
5	08:49	08:17	07:22	07:11		07:48 (2)	06:09	06:39 (3)	05:29	06:09 (4)	05:32	06:15 (4)	06:11	06:47 (3)	07:00	07:41 (2)	07:49	07:43	08:31
	16:48	17:38	18:29	20:22	28	08:14 (2)		07:03 (3)	21:55 101	07:57 (1)	22:03 103	08:04 (1)	21:26 26	07:13 (3)	20:23 33	08:14 (2)	19:14	17:10	16:35
6	08:49	08:15	07:20	07:09		07:46 (2)	06:07	06:38 (3)	05:28	06:10 (4)	05:33	06:16 (4)	06:12	06:48 (3)	07:02	07:42 (2)	07:51	07:44	08:33
	16:49	17:40	18:31	20:24	31	08:16 (2)		07:03 (3)	21:56 101	07:58 (1)	22:02 101	08:04 (1)	21:25 25	07:13 (3)	20:20 31	08:13 (2)	19:12	17:09	16:35
7	08:48	08:14	07:17	07:07		07:44 (2)	06:05	06:37 (3)	05:27	06:09 (4)	05:33	06:16 (4)	06:14	06:47 (3)	07:04	07:43 (2)	07:52	07:46	08:34
	16:50	17:42	18:32	20:25	33	08:17 (2)		07:03 (3)	21:57 103	07:58 (1)	22:02 101	08:05 (1)	21:23 25	07:12 (3)	20:18 28	08:11 (2)	19:09	17:07	16:34
8	08:48	08:12	07:15	07:05		07:43 (2)	06:04	06:38 (3)	05:27	06:09 (4)	05:34	06:17 (4)	06:16	06:47 (3)	07:05	07:45 (2)	07:54	07:48	08:35
	16:52	17:44	18:34	20:27	35	08:18 (2)		07:03 (3)	21:58 104	07:59 (1)	22:01 100	08:05 (1)	21:21 24	07:11 (3)	20:16 25	08:10 (2)	19:07	17:05	16:34
9	08:47	08:10	07:13	07:02		07:42 (2)	06:02	06:37 (3)	05:26	06:10 (4)	05:35	06:17 (4)	06:17	06:48 (3)	07:07	07:46 (2)	07:56	07:50	08:36
	16:53	17:45	18:36	20:29	37	08:19 (2)		07:03 (3)	21:58 103	07:59 (1)	22:01 98	08:04 (1)	21:19 23	07:11 (3)	20:14 21	08:07 (2)	19:05	17:04	16:34
10	08:47	08:08	07:11	07:00		07:41 (2)	06:00	06:37 (3)	05:26	06:09 (4)	05:36	06:17 (4)	06:19	06:48 (3)	07:08	07:49 (2)	07:57	07:51	08:37
	16:54	17:47	18:38	20:30	38	08:19 (2)		07:02 (3)	21:59 105	07:59 (1)	22:00 98	08:04 (1)	21:17 22	07:10 (3)	20:11 15	08:04 (2)	19:03	17:02	16:34
11	08:46	08:07	07:08	06:58		07:41 (2)	05:58	06:37 (3)	05:26	06:10 (4)	05:37	06:18 (4)	06:20	06:50 (3)	07:10	07:53 (2)	07:59	07:53	08:38
	16:56	17:49	18:39	20:32	38	08:19 (2)		07:30 (1)	22:00 104	08:00 (1)	21:59 95	08:03 (1)	21:16 20	07:10 (3)	20:09 4	07:57 (2)	19:00	17:00	16:33
12	08:46	08:05	07:06	06:56		07:40 (2)	05:57	06:37 (3)	05:25	06:10 (4)	05:38	06:18 (4)	06:22	06:50 (3)	07:12		08:01	07:55	08:40
	16:57	17:51	18:41	20:34	39	08:19 (2)		07:34 (1)	22:01 105	08:00 (1)	21:58 95	08:03 (1)	21:14 18	07:08 (3)	20:07		18:58	16:59	16:33
13	08:45	08:03	07:04	06:54		07:39 (2)	05:55	06:38 (3)	05:25	06:10 (4)	05:39	06:19 (4)	06:23	06:52 (3)	07:13		08:02	07:57	08:40
	16:59	17:53	18:43	20:35	39	08:18 (2)		07:37 (1)	22:01 106	08:01 (1)	21:57 92	08:03 (1)	21:12 15	07:07 (3)	20:04		18:56	16:57	16:33
14	08:44	08:01	07:02	06:51		07:38 (2)	05:54	06:38 (3)	05:25	06:10 (4)	05:41	06:20 (4)	06:25	06:54 (3)	07:15		08:04	07:58	08:41
	17:00	17:55	18:45	20:37	40	08:18 (2)		07:38 (1)	22:02 107	08:01 (1)	21:57 91	08:03 (1)	21:10 10	07:04 (3)	20:02		18:54	16:56	16:33
15	08:44	07:59	06:59	06:49		07:38 (2)	05:52	06:39 (3)	05:25	06:10 (4)	05:42	06:21 (4)	06:27	07:56 (2)	07:16		08:06	08:00	08:42
	17:02	17:56	18:46	20:39	40	08:18 (2)		07:41 (1)	22:02 106	08:01 (1)	21:56 88	08:03 (1)	21:08 12	08:08 (2)	20:00		18:52	16:54	16:33
16	08:43	07:57	06:57	06:47		07:38 (2)	05:51	06:40 (3)	05:25	06:10 (4)	05:43	06:22 (4)	06:28	07:52 (2)	07:18		08:07	08:02	08:43
	17:03	17:58	18:48	20:40	40	08:18 (2)		07:43 (1)	22:03 107	08:01 (1)	21:55 86	08:03 (1)	21:06 18	08:10 (2)	19:58		18:49	16:53	16:33
17	08:42	07:55	06:55	06:45		07:38 (2)	05:49	06:40 (3)	05:24	06:10 (4)	05:44	06:23 (4)	06:30	07:51 (2)	07:20		08:09	08:04	08:44
	17:05	18:00	18:50	20:42	39	08:17 (2)		07:43 (1)	22:03 107	08:01 (1)	21:54 83	08:02 (1)	21:04 22	08:13 (2)	19:55		18:47	16:52	16:34
18	08:41	07:53	06:53	06:43		07:39 (2)	05:48	06:42 (3)	05:24	06:10 (4)	05:45	06:24 (4)	06:31	07:48 (2)	07:21		08:11	08:05	08:45
	17:06	18:02	18:51	20:44	38	08:17 (2)		07:45 (1)	22:04 107	08:01 (1)	21:52 79	08:01 (1)	21:02 26	08:14 (2)	19:53		18:45	16:50	16:34
19	08:40	07:51	06:50	06:41		07:39 (2)	05:46	06:43 (3)	05:24	06:11 (4)	05:47	06:25 (4)	06:33	07:47 (2)	07:23		08:13	08:07	08:45
	17:08	18:04	18:53	20:45	37	08:16 (2)		07:46 (1)	22:04 107	08:02 (1)	21:51 77	08:01 (1)	21:00 29	08:16 (2)	19:51		18:43	16:49	16:34
20	08:39	07:49	06:48	06:39		07:39 (2)	05:45	06:45 (3)	05:25	06:11 (4)	05:48	06:27 (4)	06:35	07:46 (2)	07:24		08:14	08:09	08:46
	17:10	18:06	18:55	20:47	36	08:15 (2)		07:48 (1)	22:05 108	08:03 (1)	21:50 71	08:00 (1)	20:58 30	08:16 (2)	19:48		18:41	16:48	16:35
21	08:38	07:47	06:46	06:36		07:40 (2)	05:44	06:47 (3)	05:25	06:11 (4)	05:49	06:30 (4)	06:36	07:45 (2)	07:26		08:16	08:10	08:47
	17:11	18:07	18:57	20:49	34	08:14 (2)		07:48 (1)	22:05 108	08:03 (1)	21:49 65	08:00 (1)	20:56 33	08:18 (2)	19:46		18:39	16:47	16:35
22	08:37	07:45	06:43	06:34		07:40 (2)	05:42	06:21 (4)	05:25	06:11 (4)	05:51	07:06 (1)	06:38	07:44 (2)	07:28		08:18	08:12	08:47
	17:13	18:09	18:58	20:50	33	08:13 (2)		07:49 (1)	22:05 108	08:03 (1)	21:48 53	07:59 (1)	20:53 35	08:19 (2)	19:44		18:37	16:46	16:35
23	08:36	07:43	06:41	06:32		07:41 (2)	05:41	06:18 (4)	05:25	06:11 (4)	05:52	06:56 (3)	06:39	07:43 (2)	07:29		08:20	08:14	08:48
	17:15	18:11	19:00	20:52	30	08:11 (2)		07:50 (1)	22:05 108	08:03 (1)	21:46 58	07:58 (1)	20:51 36	08:19 (2)	19:41		18:35	16:45	16:36
24	08:34	07:41	06:39	06:30		07:42 (2)	05:40	06:16 (4)	05:25	06:12 (4)	05:53	06:54 (3)	06:41	07:42 (2)	07:31		08:21	08:15	08:48
	17:16	18:13	19:02	20:54	28	08:10 (2)		07:51 (1)	22:05 107	08:03 (1)	21:45 61	07:57 (1)	20:49 38	08:20 (2)	19:39		18:33	16:44	16:37
25	08:33	07:39	06:37	06:28		07:43 (2)	05:39	06:15 (4)	05:26	06:12 (4)	05:55	06:53 (3)	06:43	07:41 (2)	07:33		07:23	08:17	08:49
	17:18	18:15	19:03	20:55	25	08:08 (2)		07:51 (1)	22:05 107	08:03 (1)	21:44 61	07:56 (1)	20:47 39	08:20 (2)	19:37		17:31	16:43	16:37
26	08:32	07:37	06:34	06:26		07:44 (2)	05:38	06:14 (4)	05:26	06:12 (4)	05:56	06:52 (3)	06:44	07:41 (2)	07:34		07:25	08:18	08:49
	17:20	18:16	19:05	20:57	22	08:06 (2)		07:52 (1)	22:05 107	08:03 (1)	21:42 61	07:55 (1)	20:45 39	08:20 (2)	19:34		17:29	16:42	16:38
27	08:30	07:35	06:32	06:24		07:46 (2)	05:36	06:13 (4)	05:27	06:13 (4)	05:57	06:50 (3)	06:46	07:40 (2)	07:36		07:27	08:20	08:49
	17:22	18:18	19:07	20:59	17	08:03 (2)		07:53 (1)	22:05 106	08:04 (1)	21:41 61	07:53 (1)	20:43 40	08:20 (2)	19:32		17:27	16:41	16:39
28	08:29	07:33	06:30	06:22		06:49 (3)	05:35	06:12 (4)	05:27	06:13 (4)	05:59	06:50 (3)	06:47	07:40 (2)	07:37		07:28	08:21	08:49
	17:24	18:20	19:08	21:00	16	08:00 (2)		07:53 (1)	22:05 106	08:03 (1)	21:39 59	07:52 (1)	20:41 40	08:20 (2)	19:30		17:25	16:40	16:39
29	08:28		07:27	06:20		06:45 (3)	05:34	06:12 (4)	05:28	06:13 (4)	06:00	06:49 (3)	06:49	07:39 (2)	07:39		07:30	08:23	08:50
	17:25		20:10	21:02	12	06:57 (3)		07:54 (1)	22:05 107	08:04 (1)	21:38 57	07:50 (1)	20:38 40	08:19 (2)	19:27		17:23	16:39	16:40
30	08:26		07:25	06:18		06:43 (3)	05:33	06:11 (4)	05:28	06:14 (4)	06:02	06:49 (3)	06:51	07:40 (2)	07:41		07:32	08:24	08:50
	17:27		20:12	21:04	16	06:59 (3)		07:54 (1)	22:05 105	08:04 (1)	21:36 55	07:49 (1)	20:36 39	08:19 (2)	19:25		17:21	16:38	16:41
31	08:25		07:23				05:33	06:11 (4)			06:03	06:48 (3)	06:52	07:39 (2)			07:34		08:50
	17:29		20:13				21:50 94	07:56 (1)			21:35 51	07:46 (1)	20:34 39	08:18 (2)			17:19		16:42
Potential sun hours	260	278	367	415		484		497		501		453		381		332	267	245	
Total, worst case					879		1661		3139		2518		896		305				
Sun reduction					0,45		0,45		0,43		0,45		0,45		0,39				
Oper. time red.					0,99		0,99		0,99		0,99		0,99		0,99				
Wind dir. red.					0,61		0,66		0,66		0,66		0,63		0,61				
Total reduction					0,28		0,30		0,29		0,29		0,28		0,24				
Total, real					243		491		896		734		252		73				

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)

Licensed user:
LBP SIGHT
Kelvinbaan 40, PO box 1475
NL-3430BL Nieuwegein
+31 3023 11377
David Vrolijk / dv@lbpsight.nl
Calculated:
3-2-2020 14:38/3.1.633

SHADOW - Calendar

Calculation: V136@147mShadow receptor: 4671TH9 - Schenkeldijk 9

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2,20	3,20	4,40	6,30	7,10	7,20	7,20	6,60	5,00	3,90	2,30	1,70

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
563	673	737	507	350	394	853	1.312	1.152	974	554	619	8.688

Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April		May		June		July		August		September		October	November	December
1	08:50	08:23	07:30	07:21		08:00 (2)	06:16	06:43 (3)	05:32	06:11 (4)	05:29	06:13 (4)	06:05	06:47 (3)	06:54	07:41 (2)	07:42	07:35	08:26
	16:43	17:31	18:22	20:15	11	08:11 (2)	21:05 17	07:00 (3)	21:51 92	07:58 (1)	22:05 106	08:07 (1)	21:33 26	07:13 (3)	20:32 41	08:22 (2)	19:23	17:17	16:38
2	08:50	08:22	07:28	07:18		07:56 (2)	06:14	06:41 (3)	05:31	06:10 (4)	05:29	06:14 (4)	06:06	06:47 (3)	06:56	07:41 (2)	07:44	07:37	08:27
	16:44	17:33	18:24	20:17	19	08:15 (2)	21:07 20	07:01 (3)	21:52 95	07:59 (1)	22:04 105	08:08 (1)	21:32 27	07:14 (3)	20:30 39	08:20 (2)	19:21	17:16	16:37
3	08:49	08:20	07:26	07:16		07:53 (2)	06:13	06:40 (3)	05:30	06:10 (4)	05:30	06:14 (4)	06:08	06:47 (3)	06:57	07:42 (2)	07:46	07:39	08:29
	16:46	17:34	18:25	20:19	23	08:16 (2)	21:09 22	07:02 (3)	21:53 97	08:00 (1)	22:04 105	08:08 (1)	21:30 26	07:13 (3)	20:27 38	08:20 (2)	19:18	17:14	16:36
4	08:49	08:19	07:24	07:14		07:51 (2)	06:11	06:39 (3)	05:29	06:10 (4)	05:31	06:14 (4)	06:09	06:47 (3)	06:59	07:41 (2)	07:47	07:41	08:30
	16:47	17:36	18:27	20:20	27	08:18 (2)	21:10 23	07:02 (3)	21:54 97	08:00 (1)	22:03 104	08:07 (1)	21:28 27	07:14 (3)	20:25 37	08:18 (2)	19:16	17:12	16:36
5	08:49	08:17	07:22	07:11		07:49 (2)	06:09	06:39 (3)	05:29	06:09 (4)	05:32	06:15 (4)	06:11	06:47 (3)	07:00	07:42 (2)	07:49	07:43	08:31
	16:48	17:38	18:29	20:22	30	08:19 (2)	21:12 24	07:03 (3)	21:55 100	08:00 (1)	22:03 102	08:07 (1)	21:26 26	07:13 (3)	20:23 36	08:18 (2)	19:14	17:10	16:35
6	08:49	08:15	07:20	07:09		07:48 (2)	06:07	06:38 (3)	05:28	06:09 (4)	05:33	06:15 (4)	06:12	06:48 (3)	07:02	07:44 (2)	07:51	07:44	08:33
	16:49	17:40	18:31	20:24	33	08:21 (2)	21:14 25	07:03 (3)	21:56 102	08:01 (1)	22:02 101	08:07 (1)	21:25 25	07:13 (3)	20:20 33	08:17 (2)	19:12	17:09	16:35
7	08:48	08:14	07:17	07:07		07:45 (2)	06:05	06:37 (3)	05:27	06:09 (4)	05:33	06:16 (4)	06:14	06:47 (3)	07:04	07:44 (2)	07:52	07:46	08:34
	16:50	17:42	18:32	20:25	36	08:21 (2)	21:15 26	07:03 (3)	21:57 101	08:01 (1)	22:02 100	08:07 (1)	21:23 26	07:13 (3)	20:18 31	08:15 (2)	19:09	17:07	16:34
8	08:48	08:12	07:15	07:05		07:44 (2)	06:04	06:37 (3)	05:27	06:09 (4)	05:34	06:17 (4)	06:16	06:47 (3)	07:05	07:46 (2)	07:54	07:48	08:35
	16:52	17:44	18:34	20:27	37	08:21 (2)	21:17 27	07:04 (3)	21:58 103	08:02 (1)	22:01 98	08:07 (1)	21:21 25	07:12 (3)	20:16 27	08:13 (2)	19:07	17:05	16:34
9	08:47	08:10	07:13	07:02		07:44 (2)	06:02	06:37 (3)	05:26	06:09 (4)	05:35	06:16 (4)	06:17	06:48 (3)	07:07	07:47 (2)	07:56	07:50	08:36
	16:53	17:45	18:36	20:29	38	08:22 (2)	21:18 26	07:03 (3)	21:58 105	08:03 (1)	22:01 97	08:06 (1)	21:19 23	07:11 (3)	20:14 24	08:11 (2)	19:05	17:04	16:34
10	08:47	08:08	07:11	07:00		07:43 (2)	06:00	06:36 (3)	05:26	06:09 (4)	05:36	06:17 (4)	06:19	06:48 (3)	07:08	07:49 (2)	07:57	07:51	08:37
	16:54	17:47	18:38	20:30	39	08:22 (2)	21:20 27	07:03 (3)	21:59 104	08:02 (1)	22:00 96	08:06 (1)	21:17 22	07:10 (3)	20:11 19	08:08 (2)	19:03	17:02	16:34
11	08:46	08:07	07:08	06:58		07:42 (2)	05:58	06:37 (3)	05:26	06:09 (4)	05:37	06:18 (4)	06:20	06:50 (3)	07:10	07:52 (2)	07:59	07:53	08:38
	16:56	17:49	18:39	20:32	41	08:23 (2)	21:22 26	07:03 (3)	22:00 105	08:03 (1)	21:59 93	08:06 (1)	21:16 19	07:09 (3)	20:09 12	08:04 (2)	19:00	17:00	16:33
12	08:46	08:05	07:06	06:56		07:42 (2)	05:57	06:37 (3)	05:25	06:09 (4)	05:38	06:19 (4)	06:22	06:51 (3)	07:12		08:01	07:55	08:40
	16:57	17:51	18:41	20:34	41	08:23 (2)	21:23 25	07:02 (3)	22:01 107	08:04 (1)	21:58 91	08:06 (1)	21:14 17	07:08 (3)	20:07		18:58	16:59	16:33
13	08:45	08:03	07:04	06:54		07:40 (2)	05:55	06:37 (3)	05:25	06:09 (4)	05:39	06:19 (4)	06:23	06:53 (3)	07:13		08:02	07:57	08:40
	16:59	17:53	18:43	20:35	42	08:22 (2)	21:25 38	07:31 (1)	22:01 107	08:04 (1)	21:57 90	08:05 (1)	21:12 13	07:06 (3)	20:04		18:56	16:57	16:33
14	08:44	08:01	07:02	06:51		07:40 (2)	05:54	06:37 (3)	05:25	06:10 (4)	05:41	06:20 (4)	06:25	06:55 (3)	07:15		08:04	07:58	08:41
	17:00	17:55	18:45	20:37	42	08:22 (2)	21:26 46	07:35 (1)	22:02 108	08:05 (1)	21:57 87	08:05 (1)	21:10 16	08:08 (2)	20:02		18:54	16:56	16:33
15	08:44	07:59	06:59	06:49		07:40 (2)	05:52	06:38 (3)	05:25	06:09 (4)	05:42	06:22 (4)	06:27	07:57 (2)	07:16		08:06	08:00	08:42
	17:02	17:56	18:46	20:39	41	08:21 (2)	21:28 51	07:39 (1)	22:02 107	08:04 (1)	21:56 83	08:05 (1)	21:08 15	08:12 (2)	20:00		18:52	16:54	16:33
16	08:43	07:57	06:57	06:47		07:40 (2)	05:51	06:39 (3)	05:25	06:09 (4)	05:43	06:23 (4)	06:28	07:54 (2)	07:18		08:07	08:02	08:43
	17:03	17:58	18:48	20:40	41	08:21 (2)	21:29 55	07:42 (1)	22:03 108	08:04 (1)	21:55 81	08:05 (1)	21:06 20	08:14 (2)	19:58		18:49	16:53	16:33
17	08:42	07:55	06:55	06:45		07:40 (2)	05:49	06:39 (3)	05:24	06:09 (4)	05:44	06:24 (4)	06:30	07:52 (2)	07:20		08:09	08:04	08:44
	17:05	18:00	18:50	20:42	40	08:20 (2)	21:31 57	07:43 (1)	22:03 109	08:05 (1)	21:54 77	08:04 (1)	21:04 24	08:16 (2)	19:55		18:47	16:52	16:34
18	08:41	07:53	06:53	06:43		07:40 (2)	05:48	06:40 (3)	05:24	06:09 (4)	05:45	06:26 (4)	06:31	07:50 (2)	07:21		08:11	08:05	08:45
	17:06	18:02	18:51	20:44	40	08:20 (2)	21:32 59	07:45 (1)	22:04 109	08:05 (1)	21:52 72	08:03 (1)	21:02 27	08:17 (2)	19:53		18:45	16:50	16:34
19	08:40	07:51	06:50	06:41		07:41 (2)	05:46	06:42 (3)	05:24	06:10 (4)	05:47	06:27 (4)	06:33	07:49 (2)	07:23		08:13	08:07	08:45
	17:08	18:04	18:53	20:45	38	08:19 (2)	21:34 60	07:47 (1)	22:04 109	08:06 (1)	21:51 67	08:02 (1)	21:00 30	08:19 (2)	19:51		18:43	16:49	16:34
20	08:39	07:49	06:48	06:39		07:41 (2)	05:45	06:43 (3)	05:25	06:11 (4)	05:48	06:31 (4)	06:35	07:47 (2)	07:24		08:14	08:09	08:46
	17:10	18:06	18:55	20:47	37	08:18 (2)	21:35 60	07:48 (1)	22:05 108	08:06 (1)	21:50 57	08:01 (1)	20:58 33	08:20 (2)	19:48		18:41	16:48	16:35
21	08:38	07:47	06:46	06:36		07:41 (2)	05:44	06:44 (3)	05:25	06:11 (4)	05:49	07:10 (1)	06:36	07:47 (2)	07:26		08:16	08:10	08:47
	17:11	18:07	18:57	20:49	36	08:17 (2)	21:37 59	07:49 (1)	22:05 108	08:06 (1)	21:49 51	08:01 (1)	20:56 34	08:21 (2)	19:46		18:39	16:47	16:35
22	08:37	07:45	06:43	06:34		07:42 (2)	05:42	06:46 (3)	05:25	06:11 (4)	05:50	06:56 (3)	06:38	07:46 (2)	07:28		08:18	08:12	08:47
	17:13	18:09	18:58	20:50	34	08:16 (2)	21:38 57	07:50 (1)	22:05 108	08:06 (1)	21:48 58	08:00 (1)	20:53 36	08:22 (2)	19:44		18:37	16:46	16:35
23	08:36	07:43	06:41	06:32		07:43 (2)	05:41	06:59 (1)	05:25	06:11 (4)	05:52	06:54 (3)	06:39	07:45 (2)	07:29		08:20	08:14	08:48
	17:15	18:11	19:00	20:52	32	08:15 (2)	21:39 52	07:51 (1)	22:05 108	08:06 (1)	21:46 60	07:59 (1)	20:51 37	08:22 (2)	19:41		18:35	16:45	16:36
24	08:34	07:41	06:39	06:30		07:44 (2)	05:40	06:19 (4)	05:25	06:11 (4)	05:53	06:52 (3)	06:41	07:44 (2)	07:31		08:21	08:15	08:48
	17:16	18:13	19:02	20:54	29	08:13 (2)	21:41 63	07:52 (1)	22:05 109	08:07 (1)	21:45 60	07:57 (1)	20:49 39	08:23 (2)	19:39		18:33	16:44	16:37
25	08:33	07:39	06:37	06:28		07:45 (2)	05:39	06:17 (4)	05:26	06:11 (4)	05:55	06:52 (3)	06:43	07:43 (2)	07:32		07:23	08:17	08:49
	17:18	18:15	19:03	20:55	26	08:11 (2)	21:42 69	07:53 (1)	22:05 109	08:07 (1)	21:44 60	07:57 (1)	20:47 40	08:23 (2)	19:37		17:31	16:43	16:37
26	08:32	07:37	06:34	06:26		07:46 (2)	05:38	06:15 (4)	05:26	06:11 (4)	05:56	06:50 (3)	06:44	07:43 (2)	07:34		07:25	08:18	08:49
	17:20	18:16	19:05	20:57	23	08:09 (2)	21:43 75	07:54 (1)	22:05 108	08:06 (1)	21:42 58	07:55 (1)	20:45 40	08:23 (2)	19:34		17:29	16:42	16:38
27	08:30	07:35	06:32	06:24		07:47 (2)	05:36	06:14 (4)	05:27	06:12 (4)	05:57	06:49 (3)	06:46	07:42 (2)	07:36		07:27	08:20	08:49
	17:22	18:18	19:07	20:59	20	08:07 (2)	21:45 79	07:55 (1)	22:05 107	08:07 (1)	21:41 57	07:53 (1)	20:43 41	08:23 (2)	19:32		17:27	16:41	16:39
28	08:29	07:33	06:30	06:22		07:50 (2)	05:35	06:13 (4)	05:27	06:12 (4)	05:59	06:49 (3)	06:47	07:42 (2)	07:37		07:28	08:21	08:49
	17:24	18:20	19:08	21:00	14	08:04 (2)	21:46 82	07:55 (1)	22:05 107	08:07 (1)	21:39 53	07:51 (1)	20:41 41	08:23 (2)	19:30		17:25	16:40	16:39
29	08:28		07:27	06:20		06:46 (3)	05:34	06:12 (4)	05:28	06:13 (4)	06:00	06:48 (3)	06:49	07:41 (2)	07:39		07:30	08:23	08:50
	17:25		20:10	21:02	13	07:58 (2)	21:47 85	07:56 (1)	22:05 107	08:07 (1)	21:38 50	07:48 (1)	20:38 41	08:22 (2)	19:27		17:23	16:39	16:40
30	08:26		07:25	06:18		06:44 (3)	05:33	06:11 (4)	05:28	06:13 (4)	06:02	06:49 (3)	06:51	07:41 (2)	07:41		07:32	08:24	08:50
	17:27		20:12	21:04	14	06:58 (3)	21:48 89	07:57 (1)	22:05 107	08:08 (1)	21:36 43	07:45 (1)	20:36 42	08:23 (2)	19:25		17:21	16:38	16:41
31	08:25		07:23				05:33	06:11 (4)			06:03	06:48 (3)	06:52	07:41 (2)			07:34		08:50
	17:29		20:13				21:50 91	07:58 (1)			21:35 30	07:38 (1)	20:34 41	08:22 (2)			17:19		16:42
Potential sun hours	260	278	367	415		484		497		501		453		381		332	267	245	
Total, worst case					937		1515		3151		2392		899		337				
Sun reduction					0,45		0,45		0,43		0,45		0,45		0,39				
Oper. time red.					0,99		0,99		0,99		0,99		0,99		0,99				
Wind dir. red.					0,61		0,66		0,66		0,66		0,62		0,61				
Total reduction					0,28		0,30		0,29		0,29		0,28		0,24				
Total, real					259		448		901		698		252		80				

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

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

Licensed user:
LBP SIGHT
Kelvinbaan 40, PO box 1475
NL-3430BL Nieuwegein
+31 3023 11377
David Vrolijk / dv@lbpsight.nl
Calculated:
3-2-2020 14:38/3.1.633

SHADOW - Calendar

Calculation: V136@147mShadow receptor: 4794SM15 - 1-Februariweg 15

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2,20	3,20	4,40	6,30	7,10	7,20	7,20	6,60	5,00	3,90	2,30	1,70

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
563	673	737	507	350	394	853	1.312	1.152	974	554	619	8.688

Idle start wind speed: Cut in wind speed from power curve

	January		February		March	April	May	June	July	August	September	October	November		December	
1	08:50	15:41 (3)	08:23	16:34 (4)	07:30	07:20	06:16	05:31	05:29	06:05	06:54	07:42	07:35		08:26	15:26 (3)
	16:43 23	16:04 (3)	17:31 21	16:55 (4)	18:22	20:15	21:05	21:51	22:04	21:33	20:32	19:23	17:17		16:37 26	15:52 (3)
2	08:50	15:41 (3)	08:22	16:35 (4)	07:28	07:18	06:14	05:31	05:29	06:06	06:55	07:44	07:37	16:12 (4)	08:27	15:26 (3)
	16:44 23	16:04 (3)	17:32 21	16:56 (4)	18:23	20:17	21:07	21:52	22:04	21:31	20:29	19:20	17:15 8	16:20 (4)	16:37 26	15:52 (3)
3	08:49	15:41 (3)	08:20	16:35 (4)	07:26	07:16	06:12	05:30	05:30	06:08	06:57	07:45	07:39	16:09 (4)	08:29	15:27 (3)
	16:45 24	16:05 (3)	17:34 21	16:56 (4)	18:25	20:18	21:09	21:53	22:04	21:30	20:27	19:18	17:14 13	16:22 (4)	16:36 26	15:53 (3)
4	08:49	15:42 (3)	08:19	16:35 (4)	07:24	07:14	06:11	05:29	05:31	06:09	06:59	07:47	07:41	16:08 (4)	08:30	15:27 (3)
	16:46 24	16:06 (3)	17:36 20	16:55 (4)	18:27	20:20	21:10	21:54	22:03	21:28	20:25	19:16	17:12 15	16:23 (4)	16:36 26	15:53 (3)
5	08:49	15:41 (3)	08:17	16:35 (4)	07:22	07:11	06:09	05:28	05:32	06:11	07:00	07:49	07:42	16:07 (4)	08:31	15:27 (3)
	16:48 25	16:06 (3)	17:38 19	16:54 (4)	18:29	20:22	21:12	21:55	22:03	21:26	20:23	19:14	17:10 17	16:24 (4)	16:35 25	15:52 (3)
6	08:49	15:42 (3)	08:15	16:37 (4)	07:19	07:09	06:07	05:28	05:32	06:12	07:02	07:50	07:44	16:06 (4)	08:33	15:28 (3)
	16:49 25	16:07 (3)	17:40 18	16:55 (4)	18:30	20:23	21:14	21:56	22:02	21:25	20:20	19:11	17:08 19	16:25 (4)	16:35 25	15:53 (3)
7	08:48	15:42 (3)	08:14	16:38 (4)	07:17	07:07	06:05	05:27	05:33	06:14	07:03	07:52	07:46	16:06 (4)	08:34	15:28 (3)
	16:50 25	16:07 (3)	17:42 16	16:54 (4)	18:32	20:25	21:15	21:57	22:02	21:23	20:18	19:09	17:07 20	16:26 (4)	16:34 25	15:53 (3)
8	08:48	15:43 (3)	08:12	16:40 (4)	07:15	07:05	06:03	05:27	05:34	06:15	07:05	07:54	07:48	16:05 (4)	08:35	15:29 (3)
	16:51 25	16:08 (3)	17:43 12	16:52 (4)	18:34	20:27	21:17	21:58	22:01	21:21	20:16	19:07	17:05 21	16:26 (4)	16:34 24	15:53 (3)
9	08:47	15:43 (3)	08:10	16:43 (4)	07:13	07:02	06:02	05:26	05:35	06:17	07:07	07:55	07:50	16:04 (4)	08:36	15:30 (3)
	16:53 26	16:09 (3)	17:45 6	16:49 (4)	18:36	20:29	21:18	21:58	22:01	21:19	20:14	19:05	17:03 22	16:26 (4)	16:34 24	15:54 (3)
10	08:47	15:43 (3)	08:08		07:11	07:00	06:00	05:26	05:36	06:19	07:08	07:57	07:51	16:05 (4)	08:37	15:31 (3)
	16:54 26	16:09 (3)	17:47		18:37	20:30	21:20	21:59	22:00	21:17	20:11	19:02	17:02 21	16:26 (4)	16:33 23	15:54 (3)
11	08:46	15:44 (3)	08:06		07:08	06:58	05:58	05:25	05:37	06:20	07:10	07:59	07:53	16:05 (4)	08:38	15:31 (3)
	16:56 26	16:10 (3)	17:49		18:39	20:32	21:22	22:00	21:59	21:15	20:09	19:00	17:00 21	16:26 (4)	16:33 23	15:54 (3)
12	08:46	15:44 (3)	08:05		07:06	06:56	05:57	05:25	05:38	06:22	07:11	08:01	07:55	16:05 (4)	08:39	15:32 (3)
	16:57 26	16:10 (3)	17:51		18:41	20:34	21:23	22:01	21:58	21:14	20:07	18:58	16:59 21	16:26 (4)	16:33 22	15:54 (3)
13	08:45	15:44 (3)	08:03		07:04	06:53	05:55	05:25	05:39	06:23	07:13	08:02	07:57	16:06 (4)	08:40	15:32 (3)
	16:58 27	16:11 (3)	17:53		18:43	20:35	21:25	22:01	21:57	21:12	20:04	18:56	16:57 20	16:26 (4)	16:33 23	15:55 (3)
14	08:44	15:44 (3)	08:01		07:02	06:51	05:53	05:25	05:40	06:25	07:15	08:04	07:58	16:07 (4)	08:41	15:33 (3)
	17:00 27	16:11 (3)	17:54		18:44	20:37	21:26	22:02	21:56	21:10	20:02	18:54	16:56 18	16:25 (4)	16:33 22	15:55 (3)
15	08:43	15:45 (3)	07:59		06:59	06:49	05:52	05:24	05:42	06:26	07:16	08:06	08:00	16:08 (4)	08:42	15:34 (3)
	17:01 26	16:11 (3)	17:56		18:46	20:39	21:28	22:02	21:56	21:08	20:00	18:51	16:54 15	16:23 (4)	16:33 21	15:55 (3)
16	08:43	15:45 (3)	07:57		06:57	06:47	05:50	05:24	05:43	06:28	07:18	08:07	08:02	15:31 (3)	08:43	15:34 (3)
	17:03 26	16:11 (3)	17:58		18:48	20:40	21:29	22:03	21:55	21:06	19:57	18:49	16:53 22	16:22 (4)	16:33 22	15:56 (3)
17	08:42	15:46 (3)	07:55		06:55	06:45	05:49	05:24	05:44	06:30	07:19	08:09	08:04	15:29 (3)	08:44	15:34 (3)
	17:05 25	16:11 (3)	18:00		18:50	20:42	21:31	22:03	21:53	21:04	19:55	18:47	16:52 24	16:21 (4)	16:33 21	15:55 (3)
18	08:41	15:47 (3)	07:53		06:52	06:43	05:48	05:24	05:45	06:31	07:21	08:11	08:05	15:26 (3)	08:45	15:35 (3)
	17:06 25	16:12 (3)	18:02		18:51	20:44	21:32	22:04	21:52	21:02	19:53	18:45	16:50 25	16:18 (4)	16:34 21	15:56 (3)
19	08:40	15:48 (3)	07:51		06:50	06:40	05:46	05:24	05:46	06:33	07:23	08:13	08:07	15:26 (3)	08:45	15:36 (3)
	17:08 24	16:12 (3)	18:04		18:53	20:45	21:34	22:04	21:51	21:00	19:50	18:43	16:49 23	16:17 (4)	16:34 21	15:57 (3)
20	08:39	15:49 (3)	07:49		06:48	06:38	05:45	05:24	05:48	06:34	07:24	08:14	08:09	15:25 (3)	08:46	15:36 (3)
	17:10 23	16:12 (3)	18:05		18:55	20:47	21:35	22:04	21:50	20:58	19:48	18:41	16:48 21	15:46 (3)	16:34 21	15:57 (3)
21	08:38	15:49 (3)	07:47		06:46	06:36	05:43	05:24	05:49	06:36	07:26	08:16	08:10	15:25 (3)	08:47	15:37 (3)
	17:11 22	16:11 (3)	18:07		18:56	20:49	21:37	22:05	21:49	20:55	19:46	18:39	16:47 22	15:47 (3)	16:35 20	15:57 (3)
22	08:37	15:50 (3)	07:45		06:43	06:34	05:42	05:25	05:50	06:38	07:28	08:18	08:12	15:25 (3)	08:47	15:37 (3)
	17:13 21	16:11 (3)	18:09		18:58	20:50	21:38	22:05	21:48	20:53	19:43	18:37	16:45 23	15:48 (3)	16:35 20	15:57 (3)
23	08:35	15:52 (3)	07:43		06:41	06:32	05:41	05:25	05:52	06:39	07:29	08:19	08:14	15:24 (3)	08:48	15:38 (3)
	17:15 23	16:43 (4)	18:11		19:00	20:52	21:39	22:05	21:46	20:51	19:41	18:35	16:44 24	15:48 (3)	16:36 20	15:58 (3)
24	08:34	15:52 (3)	07:41		06:39	06:30	05:40	05:25	05:53	06:41	07:31	08:21	08:15	15:24 (3)	08:48	15:38 (3)
	17:16 25	16:44 (4)	18:13		19:01	20:54	21:41	22:05	21:45	20:49	19:39	18:33	16:43 25	15:49 (3)	16:36 21	15:59 (3)
25	08:33	15:55 (3)	07:39		06:36	06:28	05:38	05:26	05:54	06:43	07:32	07:23	08:17	15:24 (3)	08:48	15:38 (3)
	17:18 24	16:47 (4)	18:14		19:03	20:55	21:42	22:05	21:44	20:47	19:37	17:31	16:42 26	15:50 (3)	16:37 21	15:59 (3)
26	08:32	15:58 (3)	07:37		06:34	06:26	05:37	05:26	05:56	06:44	07:34	07:25	08:18	15:24 (3)	08:49	15:39 (3)
	17:20 22	16:49 (4)	18:16		19:05	20:57	21:43	22:05	21:42	20:45	19:34	17:29	16:41 26	15:50 (3)	16:38 21	16:00 (3)
27	08:30	16:35 (4)	07:35		06:32	06:24	05:36	05:26	05:57	06:46	07:36	07:27	08:20	15:24 (3)	08:49	15:39 (3)
	17:22 16	16:51 (4)	18:18		19:07	20:59	21:45	22:05	21:41	20:43	19:32	17:27	16:40 26	15:50 (3)	16:38 22	16:01 (3)
28	08:29	16:35 (4)	07:33		06:30	06:22	05:35	05:27	05:59	06:47	07:37	07:28	08:21	15:24 (3)	08:49	15:40 (3)
	17:23 18	16:53 (4)	18:20		19:08	21:00	21:46	22:05	21:39	20:40	19:30	17:25	16:40 27	15:51 (3)	16:39 21	16:01 (3)
29	08:28	16:34 (4)			07:27	06:20	05:34	05:27	06:00	06:49	07:39	07:30	08:23	15:25 (3)	08:49	15:40 (3)
	17:25 20	16:54 (4)			20:10	21:02	21:47	22:05	21:38	20:38	19:27	17:23	16:39 27	15:52 (3)	16:40 22	16:02 (3)
30	08:26	16:33 (4)			07:25	06:18	05:33	05:28	06:02	06:51	07:41	07:32	08:24	15:25 (3)	08:50	15:40 (3)
	17:27 21	16:54 (4)			20:12	21:04	21:48	22:05	21:36	20:36	19:25	17:21	16:38 26	15:51 (3)	16:41 22	16:02 (3)
31	08:25	16:34 (4)			07:23		05:32		06:03	06:52		07:34			08:50	15:41 (3)
	17:29 21	16:55 (4)			20:13		21:49		21:35	20:34		17:19			16:42 22	16:03 (3)
Potential sun hours	260		278		367	415	484	497	501	453	381	332	267		245	
Total, worst case	734		154										618		699	
Sun reduction	0,26		0,32										0,26		0,22	
Oper. time red.	0,99		0,99										0,99		0,99	
Wind dir. red.	0,70		0,69										0,70		0,71	
Total reduction	0,18		0,22										0,18		0,15	
Total, real	134		34										111		105	

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)

Licensed user:
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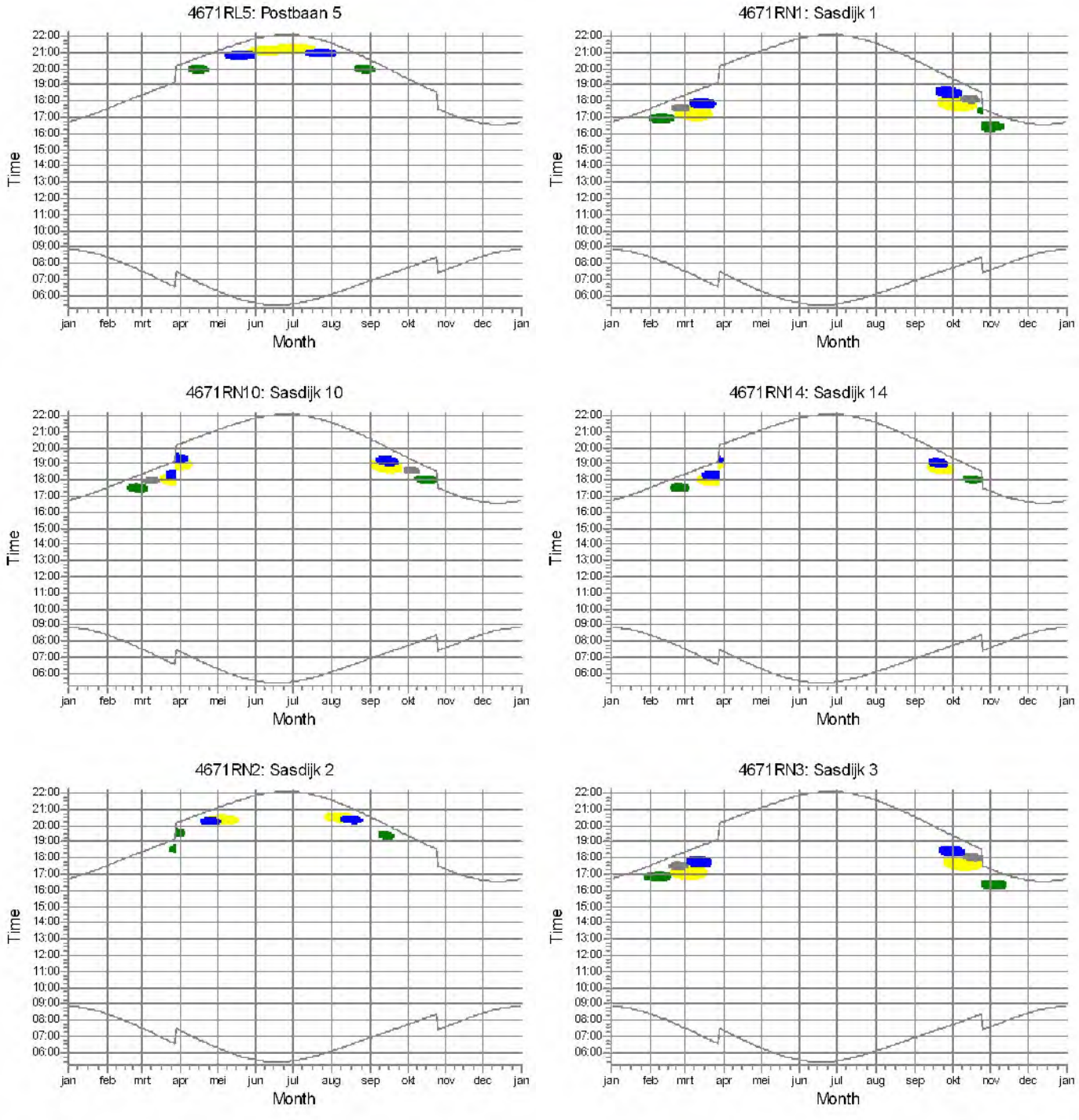
David Vrolijk / dv@lbpsight.nl
Calculated:
3-2-2020 14:38/3.1.633

SHADOW - Calendar, graphical

Calculation: V136@147m



WTGs

2: VESTAS V136-4.2 4200 136.0 !O! hub: 147,0 m (TOT: 215,0 m) (27)
3: VESTAS V136-4.2 4200 136.0 !O! hub: 147,0 m (TOT: 215,0 m) (28)
4: VESTAS V136-4.2 4200 136.0 !O! hub: 147,0 m (TOT: 215,0 m) (29)
1: VESTAS V136-4.2 4200 136.0 !O! hub: 147,0 m (TOT: 215,0 m) (26)

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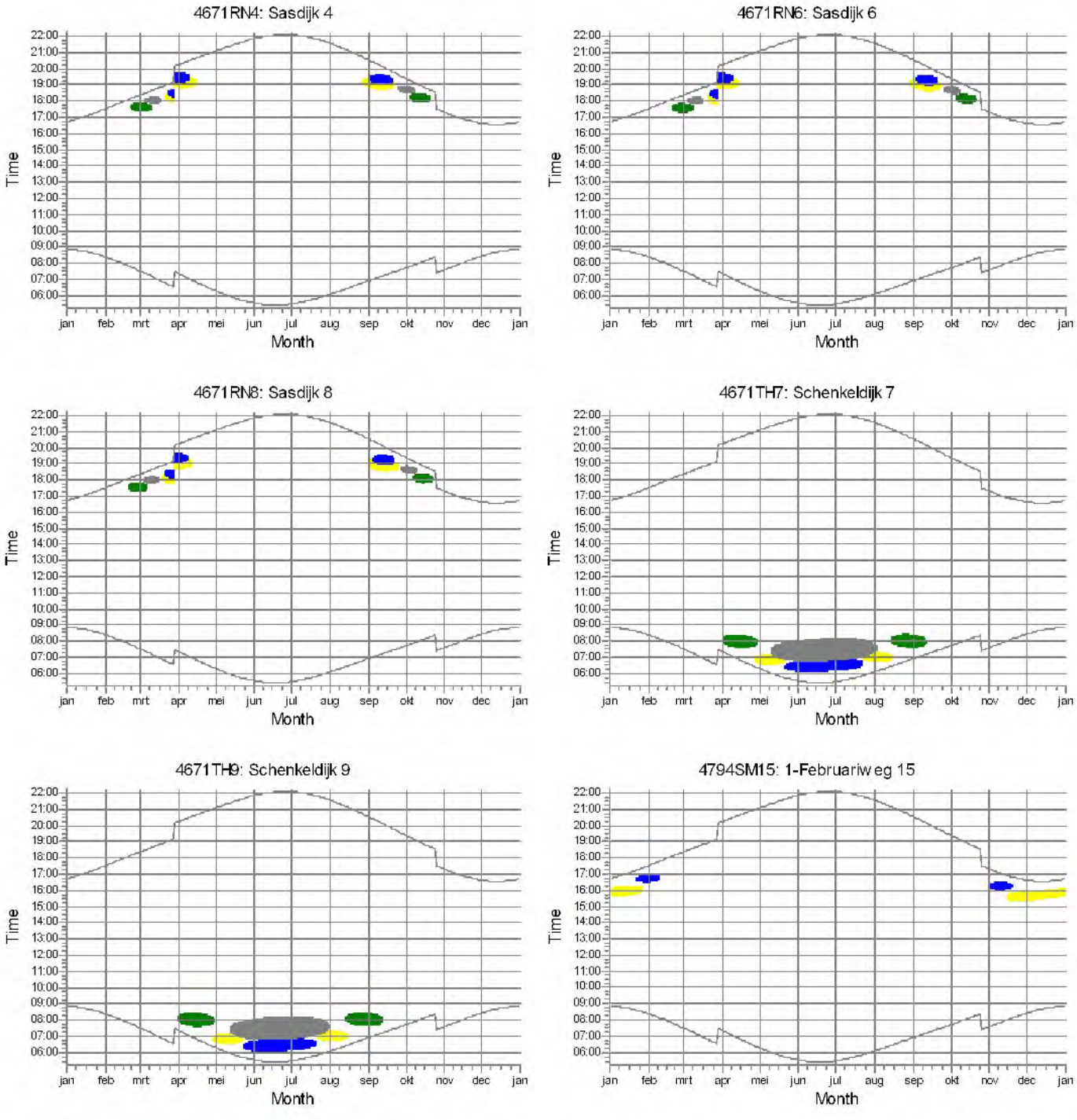
3-2-2020 14:38/3.1.633

SHADOW - Calendar, graphical

Calculation: V136@147m



WTGs

- 2: VESTAS V136-4.2 4200 136.0 !O! hub: 147,0 m (TOT: 215,0 m) (27)
- 3: VESTAS V136-4.2 4200 136.0 !O! hub: 147,0 m (TOT: 215,0 m) (28)
- 4: VESTAS V136-4.2 4200 136.0 !O! hub: 147,0 m (TOT: 215,0 m) (29)
- 1: VESTAS V136-4.2 4200 136.0 !O! hub: 147,0 m (TOT: 215,0 m) (26)

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Calculated:
3-2-2020 14:39/3.1.633

SHADOW - Main Result

Calculation: L136@147m

Assumptions for shadow calculations

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

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

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2,20	3,20	4,40	6,30	7,10	7,20	7,20	6,60	5,00	3,90	2,30	1,70

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
563	673	737	507	350	394	853	1.312	1.152	974	554	619	8.688

Idle start wind speed: Cut in wind speed from power curve

A ZVI (Zones of Visual Influence) calculation is performed before flicker calculation so non visible WTG do not contribute to calculated flicker values. A WTG will be visible if it is visible from any part of the receiver window. The ZVI calculation is based on the following assumptions:
Height contours used: Height Contours: CONTOURLINE_ONLINEDATA_0.wpo
Obstacles used in calculation
Eye height: 1,5 m
Grid resolution: 10,0 m

All coordinates are in
Dutch Stereo-RD/NAP 2008

Scale 1:40.000
New WTG Shadow receptor

WTGs

	X (east)	Y (north)	Z	Row data/Description	WTG type Valid	Manufact.	Type-generator	Power, rated	Rotor diameter	Hub height	Shadow data Calculation distance	RPM
			[m]					[kW]	[m]	[m]	[m]	[RPM]
1	83.370	407.032	0,0	LAGERWEY L136-4.5MW 4500 136.0 !...	No	LAGERWEY	L136-4.5MW-4.500	4.500	136,0	147,0	1.697	11,1
2	83.773	406.912	0,0	LAGERWEY L136-4.5MW 4500 136.0 !...	No	LAGERWEY	L136-4.5MW-4.500	4.500	136,0	147,0	1.697	11,1
3	84.210	407.322	0,0	LAGERWEY L136-4.5MW 4500 136.0 !...	No	LAGERWEY	L136-4.5MW-4.500	4.500	136,0	147,0	1.697	11,1
4	83.827	407.361	0,0	LAGERWEY L136-4.5MW 4500 136.0 !...	No	LAGERWEY	L136-4.5MW-4.500	4.500	136,0	147,0	1.697	11,1

Shadow receptor-Input

No.	Name	X (east)	Y (north)	Z	Width	Height	Height a.g.l.	Degrees from south cw	Slope of window	Direction mode
				[m]	[m]	[m]	[m]	[°]	[°]	
4671RL5	Postbaan 5	85.262	406.654	0,0	8,0	4,0	1,0	0,0	90,0	"Green house mode"
4671RN1	Sasdijk 1	84.868	407.588	0,0	8,0	4,0	1,0	0,0	90,0	"Green house mode"
4671RN10	Sasdijk 10	85.046	407.415	0,0	8,0	4,0	1,0	0,0	90,0	"Green house mode"
4671RN14	Sasdijk 14	85.201	407.476	0,0	8,0	4,0	1,0	0,0	90,0	"Green house mode"
4671RN2	Sasdijk 2	85.431	406.903	0,0	8,0	4,0	1,0	0,0	90,0	"Green house mode"
4671RN3	Sasdijk 3	84.864	407.624	0,0	8,0	4,0	1,0	0,0	90,0	"Green house mode"
4671RN4	Sasdijk 4	85.089	407.362	0,0	8,0	4,0	1,0	0,0	90,0	"Green house mode"
4671RN6	Sasdijk 6	85.076	407.379	0,0	8,0	4,0	1,0	0,0	90,0	"Green house mode"
4671RN8	Sasdijk 8	85.061	407.397	0,0	8,0	4,0	1,0	0,0	90,0	"Green house mode"
4671TH7	Schenkeldijk 7	82.948	406.883	0,0	8,0	4,0	1,0	0,0	90,0	"Green house mode"
4671TH9	Schenkeldijk 9	82.978	406.891	0,0	8,0	4,0	1,0	0,0	90,0	"Green house mode"
4794SM15	1-Februariweg 15	85.139	408.288	0,0	8,0	4,0	1,0	0,0	90,0	"Green house mode"

Calculation Results

Shadow receptor

		Shadow, worst case			Shadow, expected values
No.	Name	Shadow hours per year [h/year]	Shadow days per year [days/year]	Max shadow hours per day [h/day]	Shadow hours per year [h/year]
4671RL5	Postbaan 5	41:51	121	0:28	10:26
4671RN1	Sasdijk 1	68:47	106	1:13	16:06

To be continued on next page...

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Calculated:
3-2-2020 14:39/3.1.633

SHADOW - Main Result

Calculation: L136@147m

...continued from previous page

No.	Name	Shadow, worst case Shadow hours per year [h/year]	Shadow days per year [days/year]	Max shadow hours per day [h/day]	Shadow, expected values Shadow hours per year [h/year]
4671RN10	Sasdijk 10	42:13	83	0:52	10:08
4671RN14	Sasdijk 14	31:41	70	0:46	7:23
4671RN2	Sasdijk 2	26:04	85	0:27	6:23
4671RN3	Sasdijk 3	69:23	106	1:12	16:06
4671RN4	Sasdijk 4	37:43	81	0:47	9:12
4671RN6	Sasdijk 6	39:04	81	0:48	9:28
4671RN8	Sasdijk 8	40:22	79	0:50	9:44
4671TH7	Schenkeldijk 7	156:38	163	1:48	44:48
4671TH9	Schenkeldijk 9	153:51	164	1:49	43:58
4794SM15	1-Februariweg 15	36:45	100	0:27	6:24

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

No.	Name	Worst case [h/year]	Expected [h/year]
1	LAGERWEY L136-4.5MW 4500 136.0 !O! hub: 147,0 m (TOT: 215,0 m) (35)	95:08	26:44
2	LAGERWEY L136-4.5MW 4500 136.0 !O! hub: 147,0 m (TOT: 215,0 m) (36)	79:32	19:30
3	LAGERWEY L136-4.5MW 4500 136.0 !O! hub: 147,0 m (TOT: 215,0 m) (37)	165:18	39:07
4	LAGERWEY L136-4.5MW 4500 136.0 !O! hub: 147,0 m (TOT: 215,0 m) (38)	101:51	25:47

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

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David Vrolijk / dv@lbpsight.nl
Calculated:
3-2-2020 14:39/3.1.633

SHADOW - Calendar

Calculation: L136@147mShadow receptor: 4671RL5 - Postbaan 5

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2,20	3,20	4,40	6,30	7,10	7,20	7,20	6,60	5,00	3,90	2,30	1,70

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
563	673	737	507	350	394	853	1.312	1.152	974	554	619	8.688

Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April		May		June		
1	08:50	08:23	07:30	07:20		06:16		05:32		20:46 (4)
	16:43	17:31	18:22	20:15		21:05		21:51	25	21:16 (3)
2	08:49	08:22	07:28	07:18		06:14		05:31		20:56 (3)
	16:44	17:32	18:23	20:17		21:07		21:52	21	21:17 (3)
3	08:49	08:20	07:26	07:16		06:12		05:30		20:55 (3)
	16:45	17:34	18:25	20:18		21:09		21:53	22	21:17 (3)
4	08:49	08:18	07:24	07:14		06:11		05:29		20:56 (3)
	16:47	17:36	18:27	20:20		21:10		21:54	22	21:18 (3)
5	08:49	08:17	07:22	07:11		06:09		05:29		20:55 (3)
	16:48	17:38	18:29	20:22		21:12		21:55	23	21:18 (3)
6	08:49	08:15	07:19	07:09		06:07		05:28		20:55 (3)
	16:49	17:40	18:30	20:23		21:13		21:56	24	21:19 (3)
7	08:48	08:13	07:17	07:07		06:05		05:27		20:55 (3)
	16:50	17:42	18:32	20:25		21:15		21:57	24	21:19 (3)
8	08:48	08:12	07:15	07:05	19:57 (2)	06:03	20:45 (4)	05:27		20:55 (3)
	16:51	17:43	18:34	20:27	3 20:00 (2)	21:17	2 20:47 (4)	21:57	25	21:20 (3)
9	08:47	08:10	07:13	07:02	19:53 (2)	06:02	20:42 (4)	05:26		20:55 (3)
	16:53	17:45	18:36	20:28	9 20:02 (2)	21:18	7 20:49 (4)	21:58	26	21:21 (3)
10	08:47	08:08	07:11	07:00	19:51 (2)	06:00	20:40 (4)	05:26		20:55 (3)
	16:54	17:47	18:37	20:30	13 20:04 (2)	21:20	10 20:50 (4)	21:59	26	21:21 (3)
11	08:46	08:06	07:08	06:58	19:50 (2)	05:58	20:39 (4)	05:26		20:55 (3)
	16:56	17:49	18:39	20:32	16 20:06 (2)	21:21	13 20:52 (4)	22:00	26	21:21 (3)
12	08:46	08:05	07:06	06:56	19:48 (2)	05:57	20:38 (4)	05:25		20:55 (3)
	16:57	17:51	18:41	20:34	19 20:07 (2)	21:23	15 20:53 (4)	22:00	27	21:22 (3)
13	08:45	08:03	07:04	06:53	19:47 (2)	05:55	20:38 (4)	05:25		20:56 (3)
	16:59	17:53	18:43	20:35	21 20:08 (2)	21:25	17 20:55 (4)	22:01	26	21:22 (3)
14	08:44	08:01	07:02	06:51	19:46 (2)	05:54	20:37 (4)	05:25		20:55 (3)
	17:00	17:54	18:44	20:37	22 20:08 (2)	21:26	19 20:56 (4)	22:02	27	21:22 (3)
15	08:43	07:59	06:59	06:49	19:46 (2)	05:52	20:37 (4)	05:25		20:55 (3)
	17:02	17:56	18:46	20:39	22 20:08 (2)	21:28	21 20:58 (4)	22:02	27	21:22 (3)
16	08:43	07:57	06:57	06:47	19:46 (2)	05:50	20:37 (4)	05:24		20:55 (3)
	17:03	17:58	18:48	20:40	22 20:08 (2)	21:29	21 20:58 (4)	22:03	28	21:23 (3)
17	08:42	07:55	06:55	06:45	19:46 (2)	05:49	20:36 (4)	05:24		20:55 (3)
	17:05	18:00	18:50	20:42	22 20:08 (2)	21:31	22 20:58 (4)	22:03	28	21:23 (3)
18	08:41	07:53	06:52	06:43	19:46 (2)	05:48	20:36 (4)	05:24		20:56 (3)
	17:06	18:02	18:51	20:44	21 20:07 (2)	21:32	22 20:58 (4)	22:04	27	21:23 (3)
19	08:40	07:51	06:50	06:40	19:47 (2)	05:46	20:37 (4)	05:24		20:56 (3)
	17:08	18:04	18:53	20:45	19 20:06 (2)	21:34	22 20:59 (4)	22:04	27	21:23 (3)
20	08:39	07:49	06:48	06:38	19:48 (2)	05:45	20:36 (4)	05:24		20:57 (3)
	17:10	18:05	18:55	20:47	17 20:05 (2)	21:35	22 20:58 (4)	22:04	27	21:24 (3)
21	08:38	07:47	06:46	06:36	19:49 (2)	05:43	20:36 (4)	05:25		20:57 (3)
	17:11	18:07	18:56	20:49	15 20:04 (2)	21:37	22 20:58 (4)	22:05	27	21:24 (3)
22	08:37	07:45	06:43	06:34	19:51 (2)	05:42	20:37 (4)	05:25		20:57 (3)
	17:13	18:09	18:58	20:50	11 20:02 (2)	21:38	21 20:58 (4)	22:05	27	21:24 (3)
23	08:35	07:43	06:41	06:32	19:54 (2)	05:41	20:37 (4)	05:25		20:57 (3)
	17:15	18:11	19:00	20:52	4 19:58 (2)	21:39	21 20:58 (4)	22:05	27	21:24 (3)
24	08:34	07:41	06:39	06:30		05:40	20:38 (4)	05:25		20:58 (3)
	17:16	18:13	19:01	20:54		21:41	19 20:57 (4)	22:05	27	21:25 (3)
25	08:33	07:39	06:36	06:28		05:39	20:39 (4)	05:26		20:58 (3)
	17:18	18:14	19:03	20:55		21:42	18 20:57 (4)	22:05	27	21:25 (3)
26	08:32	07:37	06:34	06:26		05:37	20:39 (4)	05:26		20:57 (3)
	17:20	18:16	19:05	20:57		21:43	18 20:57 (4)	22:05	28	21:25 (3)
27	08:30	07:35	06:32	06:24		05:36	20:40 (4)	05:26		20:58 (3)
	17:22	18:18	19:07	20:59		21:45	25 21:10 (3)	22:05	27	21:25 (3)
28	08:29	07:33	06:30	06:22		05:35	20:41 (4)	05:27		20:58 (3)
	17:23	18:20	19:08	21:00		21:46	26 21:11 (3)	22:05	27	21:25 (3)
29	08:28		07:27	06:20		05:34	20:42 (4)	05:27		20:59 (3)
	17:25		20:10	21:02		21:47	28 21:13 (3)	22:05	27	21:26 (3)
30	08:26		07:25	06:18		05:33	20:43 (4)	05:28		20:58 (3)
	17:27		20:12	21:04		21:48	27 21:13 (3)	22:05	27	21:25 (3)
31	08:25		07:23			05:32	20:45 (4)			
	17:29		20:13			21:49	27 21:15 (3)			
Potential sun hours	260	278	367	415		484		497		
Total, worst case					256		465		779	
Sun reduction					0,45		0,45		0,43	
Oper. time red.					0,99		0,99		0,99	
Wind dir. red.					0,58		0,56		0,56	
Total reduction					0,26		0,25		0,24	
Total, real					67		118		189	

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

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

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Calculated:
3-2-2020 14:39/3.1.633

SHADOW - Calendar

Calculation: L136@147mShadow receptor: 4671RL5 - Postbaan 5

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2,20	3,20	4,40	6,30	7,10	7,20	7,20	6,60	5,00	3,90	2,30	1,70

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
563	673	737	507	350	394	853	1.312	1.152	974	554	619	8.688

Idle start wind speed: Cut in wind speed from power curve

	July		August		September		October	November	December
1	05:29		20:59 (3)	06:05		20:49 (4)	06:54		19:49 (2)	07:42	07:35	08:26
	22:04	27	21:26 (3)	21:33	14	21:03 (4)	20:32	16	20:05 (2)	19:23	17:17	16:37
2	05:29		21:00 (3)	06:06		20:50 (4)	06:55		19:49 (2)	07:44	07:37	08:27
	22:04	26	21:26 (3)	21:31	12	21:02 (4)	20:29	13	20:02 (2)	19:20	17:15	16:37
3	05:30		21:00 (3)	06:08		20:51 (4)	06:57		19:51 (2)	07:45	07:39	08:29
	22:04	25	21:25 (3)	21:30	9	21:00 (4)	20:27	9	20:00 (2)	19:18	17:14	16:36
4	05:31		21:00 (3)	06:09		20:53 (4)	06:59		19:54 (2)	07:47	07:41	08:30
	22:03	25	21:25 (3)	21:28	6	20:59 (4)	20:25	4	19:58 (2)	19:16	17:12	16:36
5	05:32		21:01 (3)	06:11			07:00			07:49	07:42	08:31
	22:03	25	21:26 (3)	21:26			20:23			19:14	17:10	16:35
6	05:32		21:01 (3)	06:12			07:02			07:50	07:44	08:33
	22:02	25	21:26 (3)	21:25			20:20			19:11	17:08	16:35
7	05:33		21:02 (3)	06:14			07:03			07:52	07:46	08:34
	22:02	24	21:26 (3)	21:23			20:18			19:09	17:07	16:34
8	05:34		21:02 (3)	06:15			07:05			07:54	07:48	08:35
	22:01	23	21:25 (3)	21:21			20:16			19:07	17:05	16:34
9	05:35		21:02 (3)	06:17			07:07			07:55	07:50	08:36
	22:00	22	21:24 (3)	21:19			20:14			19:05	17:03	16:34
10	05:36		21:03 (3)	06:19			07:08			07:57	07:51	08:37
	22:00	21	21:24 (3)	21:17			20:11			19:02	17:02	16:33
11	05:37		20:54 (4)	06:20			07:10			07:59	07:53	08:38
	21:59	25	21:24 (3)	21:15			20:09			19:00	17:00	16:33
12	05:38		20:53 (4)	06:22			07:11			08:01	07:55	08:39
	21:58	27	21:23 (3)	21:13			20:07			18:58	16:59	16:33
13	05:39		20:51 (4)	06:23			07:13			08:02	07:57	08:40
	21:57	28	21:22 (3)	21:12			20:04			18:56	16:57	16:33
14	05:40		20:51 (4)	06:25			07:15			08:04	07:58	08:41
	21:56	28	21:22 (3)	21:10			20:02			18:54	16:56	16:33
15	05:42		20:50 (4)	06:27			07:16			08:06	08:00	08:42
	21:55	27	21:20 (3)	21:08			20:00			18:51	16:54	16:33
16	05:43		20:50 (4)	06:28			07:18			08:07	08:02	08:43
	21:54	25	21:20 (3)	21:06			19:57			18:49	16:53	16:33
17	05:44		20:49 (4)	06:30			07:19			08:09	08:03	08:44
	21:53	23	21:18 (3)	21:04			19:55			18:47	16:52	16:34
18	05:45		20:48 (4)	06:31			07:21			08:11	08:05	08:45
	21:52	18	21:06 (4)	21:02			19:53			18:45	16:50	16:34
19	05:46		20:48 (4)	06:33			07:23			08:12	08:07	08:45
	21:51	19	21:07 (4)	21:00			19:50			18:43	16:49	16:34
20	05:48		20:47 (4)	06:35		19:58 (2)	07:24			08:14	08:09	08:46
	21:50	20	21:07 (4)	20:57	6	20:04 (2)	19:48			18:41	16:48	16:34
21	05:49		20:48 (4)	06:36		19:55 (2)	07:26			08:16	08:10	08:47
	21:49	20	21:08 (4)	20:55	12	20:07 (2)	19:46			18:39	16:47	16:35
22	05:50		20:47 (4)	06:38		19:53 (2)	07:28			08:18	08:12	08:47
	21:48	21	21:08 (4)	20:53	15	20:08 (2)	19:43			18:37	16:46	16:35
23	05:52		20:47 (4)	06:39		19:51 (2)	07:29			08:19	08:13	08:48
	21:46	21	21:08 (4)	20:51	18	20:09 (2)	19:41			18:35	16:44	16:36
24	05:53		20:46 (4)	06:41		19:50 (2)	07:31			08:21	08:15	08:48
	21:45	22	21:08 (4)	20:49	19	20:09 (2)	19:39			18:33	16:43	16:36
25	05:54		20:47 (4)	06:43		19:49 (2)	07:32			07:23	08:17	08:48
	21:44	22	21:09 (4)	20:47	21	20:10 (2)	19:37			17:31	16:42	16:37
26	05:56		20:47 (4)	06:44		19:48 (2)	07:34			07:25	08:18	08:49
	21:42	22	21:09 (4)	20:45	21	20:09 (2)	19:34			17:29	16:41	16:38
27	05:57		20:47 (4)	06:46		19:48 (2)	07:36			07:26	08:20	08:49
	21:41	21	21:08 (4)	20:43	22	20:10 (2)	19:32			17:27	16:41	16:38
28	05:59		20:47 (4)	06:47		19:48 (2)	07:37			07:28	08:21	08:49
	21:39	22	21:09 (4)	20:40	22	20:10 (2)	19:30			17:25	16:40	16:39
29	06:00		20:47 (4)	06:49		19:47 (2)	07:39			07:30	08:23	08:49
	21:38	21	21:08 (4)	20:38	22	20:09 (2)	19:27			17:23	16:39	16:40
30	06:02		20:47 (4)	06:51		19:48 (2)	07:41			07:32	08:24	08:49
	21:36	19	21:06 (4)	20:36	21	20:09 (2)	19:25			17:21	16:38	16:41
31	06:03		20:49 (4)	06:52		19:48 (2)				07:34		08:50
	21:35	16	21:05 (4)	20:34	19	20:07 (2)				17:19		16:42
Potential sun hours	501			453			381			332	267	245
Total, worst case		710			259			42				
Sun reduction		0,45			0,45			0,39				
Oper. time red.		0,99			0,99			0,99				
Wind dir. red.		0,56			0,57			0,58				
Total reduction		0,25			0,26			0,23				
Total, real		177			67			9				

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)

Licensed user:
LBP SIGHT
Kelvinbaan 40, PO box 1475
NL-3430BL Nieuwegein
+31 3023 11377
David Vrolijk / dv@lbpsight.nl
Calculated:
3-2-2020 14:39/3.1.633

SHADOW - Calendar

Calculation: L136@147mShadow receptor: 4671RN1 - Sasdijk 1

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2,20	3,20	4,40	6,30	7,10	7,20	7,20	6,60	5,00	3,90	2,30	1,70

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
563	673	737	507	350	394	853	1.312	1.152	974	554	619	8.688

Idle start wind speed: Cut in wind speed from power curve

	January	February		March		April	May	June	July	August	September		October		November		December
1	08:50	08:23		16:49 (2)	07:30	16:56 (3)	07:20	06:16	05:31	05:29	06:05	06:54		07:42		17:30 (3)	07:35	16:12 (2)	08:26
	16:43	17:31	9	16:58 (2)	18:22	49	17:45 (1)	20:15	21:05	21:51	22:04	21:33	20:32		19:23	73	18:46 (4)	17:17	26	16:38 (2)	16:37
2	08:50	08:22		16:48 (2)	07:28	16:54 (3)	07:18	06:14	05:31	05:29	06:06	06:55		07:44		17:29 (3)	07:37	16:12 (2)	08:27
	16:44	17:32	13	17:01 (2)	18:23	49	17:43 (1)	20:17	21:07	21:52	22:04	21:31	20:29		19:20	73	18:45 (4)	17:15	26	16:38 (2)	16:37
3	08:49	08:20		16:46 (2)	07:26	16:53 (3)	07:16	06:12	05:30	05:30	06:08	06:57		07:46		17:28 (3)	07:39	16:12 (2)	08:29
	16:45	17:34	17	17:03 (2)	18:25	48	17:41 (1)	20:18	21:09	21:53	22:04	21:30	20:27		19:18	71	18:43 (4)	17:14	26	16:38 (2)	16:36
4	08:49	08:19		16:45 (2)	07:24	16:53 (3)	07:14	06:11	05:29	05:31	06:09	06:59		07:47		17:28 (3)	07:41	16:13 (2)	08:30
	16:47	17:36	19	17:04 (2)	18:27	46	17:39 (1)	20:20	21:10	21:54	22:03	21:28	20:25		19:16	69	18:42 (4)	17:12	24	16:37 (2)	16:36
5	08:49	08:17		16:44 (2)	07:22	16:52 (3)	07:11	06:09	05:29	05:32	06:11	07:00		07:49		17:28 (3)	07:42	16:14 (2)	08:31
	16:48	17:38	21	17:05 (2)	18:29	44	17:36 (3)	20:22	21:12	21:55	22:03	21:26	20:23		19:14	66	18:40 (4)	17:10	23	16:37 (2)	16:35
6	08:49	08:15		16:44 (2)	07:19	16:52 (3)	07:09	06:07	05:28	05:32	06:12	07:02		07:50		17:28 (3)	07:44	16:15 (2)	08:33
	16:49	17:40	23	17:07 (2)	18:31	53	17:58 (4)	20:23	21:14	21:56	22:02	21:25	20:20		19:11	62	18:38 (4)	17:08	21	16:36 (2)	16:35
7	08:48	08:14		16:43 (2)	07:17	16:51 (3)	07:07	06:05	05:27	05:33	06:14	07:03		07:52		17:27 (3)	07:46	16:16 (2)	08:34
	16:50	17:42	25	17:08 (2)	18:32	60	18:00 (4)	20:25	21:15	21:57	22:02	21:23	20:18		19:09	57	18:35 (4)	17:07	19	16:35 (2)	16:34
8	08:48	08:12		16:43 (2)	07:15	16:51 (3)	07:05	06:03	05:27	05:34	06:15	07:05		07:54		17:27 (3)	07:48	16:16 (2)	08:35
	16:51	17:43	25	17:08 (2)	18:34	65	18:03 (4)	20:27	21:17	21:58	22:01	21:21	20:16		19:07	45	18:12 (3)	17:05	17	16:33 (2)	16:34
9	08:47	08:10		16:42 (2)	07:13	16:51 (3)	07:02	06:02	05:26	05:35	06:17	07:07		07:55		17:27 (3)	07:50	16:18 (2)	08:36
	16:53	17:45	26	17:08 (2)	18:36	68	18:04 (4)	20:29	21:18	21:58	22:01	21:19	20:14		19:05	44	18:11 (1)	17:03	13	16:31 (2)	16:34
10	08:47	08:08		16:42 (2)	07:11	16:50 (3)	07:00	06:00	05:26	05:36	06:19	07:08		07:57		17:27 (3)	07:51	16:20 (2)	08:37
	16:54	17:47	26	17:08 (2)	18:38	70	18:05 (4)	20:30	21:20	21:59	22:00	21:17	20:11		19:02	47	18:14 (1)	17:02	9	16:29 (2)	16:33
11	08:46	08:06		16:42 (2)	07:08	16:50 (3)	06:58	05:58	05:25	05:37	06:20	07:10		07:59		17:28 (3)	07:53			08:38
	16:56	17:49	26	17:08 (2)	18:39	72	18:06 (4)	20:32	21:22	22:00	21:59	21:15	20:09		19:00	48	18:16 (1)	17:00			16:33
12	08:46	08:05		16:42 (2)	07:06	16:51 (3)	06:56	05:57	05:25	05:38	06:22	07:11		08:01		17:28 (3)	07:55			08:39
	16:57	17:51	26	17:08 (2)	18:41	73	18:07 (4)	20:34	21:23	22:01	21:58	21:14	20:07		18:58	49	18:17 (1)	16:59			16:33
13	08:45	08:03		16:42 (2)	07:04	16:51 (3)	06:53	05:55	05:25	05:39	06:23	07:13		08:02		17:29 (3)	07:57			08:40
	16:59	17:53	26	17:08 (2)	18:43	73	18:07 (4)	20:35	21:25	22:01	21:57	21:12	20:04		18:56	49	18:18 (1)	16:57			16:33
14	08:44	08:01		16:43 (2)	07:02	16:51 (3)	06:51	05:54	05:25	05:40	06:25	07:15		08:04		17:30 (3)	07:58			08:41
	17:00	17:54	24	17:07 (2)	18:44	73	18:07 (4)	20:37	21:26	22:02	21:56	21:10	20:02		18:54	49	18:19 (1)	16:56			16:33
15	08:43	07:59		16:44 (2)	06:59	16:52 (3)	06:49	05:52	05:24	05:42	06:27	07:16		08:06		17:31 (3)	08:00			08:42
	17:02	17:56	23	17:07 (2)	18:46	72	18:07 (4)	20:39	21:28	22:02	21:56	21:08	20:00		18:51	47	18:18 (1)	16:54			16:33
16	08:43	07:57		16:45 (2)	06:57	16:53 (3)	06:47	05:50	05:24	05:43	06:28	07:18		08:07		17:32 (3)	08:02			08:43
	17:03	17:58	21	17:06 (2)	18:48	70	18:07 (4)	20:40	21:29	22:03	21:55	21:06	19:57		18:49	46	18:18 (1)	16:53			16:33
17	08:42	07:55		16:46 (2)	06:55	16:53 (3)	06:45	05:49	05:24	05:44	06:30	07:19		08:09		17:34 (3)	08:04			08:44
	17:05	18:00	19	17:05 (2)	18:50	67	18:06 (4)	20:42	21:31	22:03	21:53	21:04	19:55		18:47	44	18:18 (1)	16:52			16:34
18	08:41	07:53		16:48 (2)	06:52	16:55 (3)	06:43	05:48	05:24	05:45	06:31	07:21		08:11		17:36 (3)	08:05			08:45
	17:06	18:02	15	17:03 (2)	18:51	64	18:06 (4)	20:44	21:32	22:04	21:52	21:02	19:53		18:45	41	18:17 (1)	16:50			16:34
19	08:40	07:51		16:50 (2)	06:50	16:57 (3)	06:40	05:46	05:24	05:46	06:33	07:23		18:31 (4)	08:13		17:40 (3)	08:07			08:45
	17:08	18:04	13	17:36 (1)	18:53	58	18:05 (4)	20:45	21:34	22:04	21:51	21:00	19:50	12	18:43 (4)	30	18:43	18:15 (1)		16:49	16:34
20	08:39	07:49		17:30 (1)	06:48	16:58 (3)	06:38	05:45	05:24	05:48	06:35	07:24		18:27 (4)	08:14		17:58 (1)	08:09			08:46
	17:10	18:05	8	17:38 (1)	18:55	54	18:03 (4)	20:47	21:35	22:04	21:50	20:58	19:48	17	18:44 (4)	14	18:41	18:12 (1)		16:48	16:34
21	08:38	07:47		17:29 (1)	06:46	17:00 (3)	06:36	05:43	05:25	05:49	06:36	07:26		17:50 (3)	08:16		17:59 (1)	08:10			08:47
	17:11	18:07	11	17:40 (1)	18:56	46	18:02 (4)	20:49	21:37	22:05	21:49	20:55	19:46	35	18:46 (4)	18:39	11	18:10 (1)		16:47	16:35
22	08:37	07:45		17:13 (3)	06:43	17:03 (3)	06:34	05:42	05:25	05:50	06:38	07:28		17:45 (3)	08:18		17:24 (2)	08:12			08:47
	17:13	18:09	19	17:42 (1)	18:58	38	18:01 (4)	20:50	21:38	22:05	21:48	20:53	19:44	44	18:46 (4)	18:37	12	18:08 (1)		16:46	16:35
23	08:35	07:43		17:07 (3)	06:41	17:10 (3)	06:32	05:41	05:25	05:52	06:39	07:29		17:43 (3)	08:19		17:20 (2)	08:14			08:48
	17:15	18:11	34	17:45 (1)	19:00	19	17:58 (4)	20:52	21:39	22:05	21:46	20:51	19:41	53	18:48 (4)	18:35	12	17:32 (2)		16:44	16:36
24	08:34	07:41		17:04 (3)	06:39	17:43 (4)	06:30	05:40	05:25	05:53	06:41	07:31		17:41 (3)	08:21		17:18 (2)	08:15			08:48
	17:16	18:13	42	17:46 (1)	19:02	13	17:56 (4)	20:54	21:41	22:05	21:45	20:49	19:39	57	18:48 (4)	18:33	16	17:34 (2)		16:43	16:36
25	08:33	07:39		17:01 (3)	06:36	17:47 (4)	06:28	05:39	05:26	05:54	06:43	07:32		17:38 (3)	07:23		16:16 (2)	08:17			08:48
	17:18	18:14	45	17:46 (1)	19:03	4	17:51 (4)	20:55	21:42	22:05	21:44	20:47	19:37	62	18:48 (4)	17:31	20	16:36 (2)		16:42	16:37
26	08:32	07:37		16:59 (3)	06:34		06:26	05:37	05:26	05:56	06:44	07:34		17:36 (3)	07:25		16:15 (2)	08:18			08:49
	17:20	18:16	47	17:46 (1)	19:05		20:57	21:43	22:05	21:42	20:45	19:34	66	18:48 (4)	17:29	22	16:37 (2)	16:41			16:38
27	08:30	07:35		16:58 (3)	06:32		06:24	05:36	05:26	05:57	06:46	07:36		17:35 (3)	07:27		16:13 (2)	08:20			08:49
	17:22	18:18	48	17:46 (1)	19:07		20:59	21:45	22:05	21:41	20:43	19:32	69	18:49 (4)	17:27	24	16:37 (2)	16:41			16:38
28	08:29	07:33		16:57 (3)	06:30		06:22	05:35	05:27	05:59	06:47	07:37		17:33 (3)	07:28		16:12 (2)	08:21			08:49
	17:23	18:20	48	17:45 (1)	19:08		21:00	21:46	22:05	21:39	20:40	19:30	71	18:48 (4)	17:25	25	16:37 (2)	16:40			16:39
29	08:28				07:27		06:20	05:34	05:27	06:00	06:49	07:39		17:32 (3)	07:30		16:12 (2)	08:23			08:49
	17:25				20:10		21:02	21:47	22:05	21:38	20:38	19:27	73	18:48 (4)	17:23	26	16:38 (2)	16:39			16:40
30	08:26				07:25		06:18	05:33	05:28	06:02	06:51	07:41		17:30 (3)	07:32		16:12 (2)	08:24			08:50
	17:27				20:12		21:04	21:48	22:05	21:36	20:36	19:25	73	18:46 (4)	17:21	26	16:38 (2)	16:38			16:41
31	08:25				07:23			05:32		06:03	06:52				07:34		16:12 (2)				08:50
	17:29				20:13			21:49		21:35	20:34				17:19	26	16:38 (2)				16:42
Potential sun hours	260	278		367		415	484	497	501	453	381		332		267			245	
Total, worst case			699		1348							632		1244		204			
Sun reduction			0,32		0,37							0,39		0,36		0,26			
Oper. time red.			0,99		0,99							0,99		0,99		0,99			
Wind dir. red.			0,68		0,65							0,64		0,66		0,69			
Total reduction			0,22		0,24							0,25		0,24		0,18			
Total, real			151		322							159		298		36			

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

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

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David Vrolijk / dv@lbpsight.nl
Calculated:
3-2-2020 14:39/3.1.633

SHADOW - Calendar

Calculation: L136@147mShadow receptor: 4671RN10 - Sasdijk 10

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2,20	3,20	4,40	6,30	7,10	7,20	7,20	6,60	5,00	3,90	2,30	1,70

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
563	673	737	507	350	394	853	1.312	1.152	974	554	619	8.688

Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:50	08:23	07:30	17:18 (2)	07:20	18:42 (3)	06:16	05:31	05:29	06:05	06:54	07:42	07:35	08:26
	16:43	17:31	18:22	23 17:41 (2)	20:15	50 19:32 (4)	21:05	21:51	22:04	21:33	20:32	19:23	17:17	16:37
2	08:50	08:22	07:28	17:18 (2)	07:18	18:42 (3)	06:14	05:31	05:29	06:06	06:55	18:53 (3)	07:44	07:37	08:27
	16:44	17:32	18:23	21 17:39 (2)	20:17	49 19:31 (4)	21:07	21:52	22:04	21:31	20:29	7 19:00 (3)	19:20	17:15	16:37
3	08:49	08:20	07:26	17:20 (2)	07:16	18:42 (3)	06:12	05:30	05:30	06:08	06:57	18:49 (3)	07:45	07:39	08:29
	16:45	17:34	18:25	18 17:38 (2)	20:18	47 19:29 (4)	21:09	21:53	22:04	21:30	20:27	16 19:05 (3)	19:18	17:14	16:36
4	08:49	08:19	07:24	17:22 (2)	07:14	18:43 (3)	06:11	05:29	05:31	06:09	06:59	18:45 (3)	07:47	07:41	08:30
	16:47	17:36	18:27	14 17:36 (2)	20:20	44 19:27 (4)	21:10	21:54	22:03	21:28	20:25	21 19:06 (3)	19:16	17:12	16:36
5	08:49	08:17	07:22	17:24 (2)	07:11	18:44 (3)	06:09	05:28	05:32	06:11	07:00	18:44 (3)	07:49	07:42	08:31
	16:48	17:38	18:29	10 17:34 (2)	20:22	41 19:25 (4)	21:12	21:55	22:03	21:26	20:23	24 19:08 (3)	19:14	17:10	16:35
6	08:49	08:15	07:19		07:09	18:46 (3)	06:07	05:28	05:32	06:12	07:02	18:41 (3)	07:50	07:44	08:33
	16:49	17:40	18:30		20:23	35 19:22 (4)	21:14	21:56	22:02	21:25	20:20	34 19:17 (4)	19:11	17:08	16:35
7	08:48	08:14	07:17		07:07	18:46 (3)	06:05	05:27	05:33	06:14	07:03	18:39 (3)	07:52	07:46	08:34
	16:50	17:42	18:32		20:25	25 19:11 (3)	21:15	21:57	22:02	21:23	20:18	41 19:20 (4)	19:09	17:07	16:34
8	08:48	08:12	07:15		07:05	18:48 (3)	06:03	05:27	05:34	06:15	07:05	18:37 (3)	07:54	18:02 (2)	07:48	08:35
	16:51	17:43	18:34		20:27	21 19:09 (3)	21:17	21:57	22:01	21:21	20:16	44 19:21 (4)	19:07	4 18:06 (2)	17:05	16:34
9	08:47	08:10	07:13		07:02	18:51 (3)	06:02	05:26	05:35	06:17	07:07	18:36 (3)	07:55	17:58 (2)	07:50	08:36
	16:53	17:45	18:36		20:28	16 19:07 (3)	21:18	21:58	22:01	21:19	20:14	47 19:23 (4)	19:05	12 18:10 (2)	17:03	16:34
10	08:47	08:08	07:11		07:00	18:55 (3)	06:00	05:26	05:36	06:19	07:08	18:36 (3)	07:57	17:55 (2)	07:51	08:37
	16:54	17:47	18:38		20:30	7 19:02 (3)	21:20	21:59	22:00	21:17	20:11	48 19:24 (4)	19:02	16 18:11 (2)	17:02	16:33
11	08:46	08:06	07:08		06:58		05:58	05:25	05:37	06:20	07:10	18:34 (3)	07:59	17:53 (2)	07:53	08:38
	16:56	17:49	18:39		20:32		21:22	22:00	21:59	21:15	20:09	50 19:24 (4)	19:00	19 18:12 (2)	17:00	16:33
12	08:46	08:05	07:06		06:56		05:57	05:25	05:38	06:22	07:11	18:34 (3)	08:01	17:52 (2)	07:55	08:39
	16:57	17:51	18:41		20:34		21:23	22:01	21:58	21:13	20:07	51 19:25 (4)	18:58	21 18:13 (2)	16:59	16:33
13	08:45	08:03	07:04		06:53		05:55	05:25	05:39	06:23	07:13	18:33 (3)	08:02	17:51 (2)	07:57	08:40
	16:59	17:53	18:43		20:35		21:25	22:01	21:57	21:12	20:04	51 19:24 (4)	18:56	23 18:14 (2)	16:57	16:33
14	08:44	08:01	07:02		06:51		05:54	05:25	05:40	06:25	07:15	18:32 (3)	08:04	17:50 (2)	07:58	08:41
	17:00	17:54	18:44		20:37		21:26	22:02	21:56	21:10	20:02	52 19:24 (4)	18:54	23 18:13 (2)	16:56	16:33
15	08:43	07:59	06:59		06:49		05:52	05:24	05:42	06:27	07:16	18:31 (3)	08:06	17:49 (2)	08:00	08:42
	17:02	17:56	18:46		20:39		21:28	22:02	21:55	21:08	20:00	52 19:23 (4)	18:51	25 18:14 (2)	16:54	16:33
16	08:43	07:57	06:57		06:47		05:50	05:24	05:43	06:28	07:18	18:32 (3)	08:07	17:49 (2)	08:02	08:43
	17:03	17:58	18:48		20:40		21:29	22:03	21:54	21:06	19:57	51 19:23 (4)	18:49	25 18:14 (2)	16:53	16:33
17	08:42	07:55	06:55	17:58 (3)	06:45		05:49	05:24	05:44	06:30	07:19	18:32 (3)	08:09	17:49 (2)	08:04	08:44
	17:05	18:00	18:50	11 18:09 (3)	20:42		21:31	22:03	21:53	21:04	19:55	51 19:23 (4)	18:47	24 18:13 (2)	16:52	16:34
18	08:41	07:53	06:52	17:55 (3)	06:43		05:48	05:24	05:45	06:31	07:21	18:31 (3)	08:11	17:50 (2)	08:05	08:45
	17:06	18:02 7	17:33 (2)	18:51 18	18:13 (3)	20:44		21:32	22:04	21:52	21:02	19:53	50 19:21 (4)	18:45	23 18:13 (2)	16:50	16:34
19	08:40	07:51	17:23 (2)	06:50	17:52 (3)	06:40		05:46	05:24	05:46	06:33	07:23	18:32 (3)	08:13	17:50 (2)	08:07	08:45
	17:08	18:04 13	17:36 (2)	18:53 23	18:15 (3)	20:45		21:34	22:04	21:51	21:00	19:50	48 19:20 (4)	18:43	23 18:13 (2)	16:49	16:34
20	08:39	07:49	17:21 (2)	06:48	17:50 (3)	06:38		05:45	05:24	05:48	06:35	07:24	18:31 (3)	08:14	17:50 (2)	08:09	08:46
	17:10	18:05 17	17:38 (2)	18:55 26	18:16 (3)	20:47		21:35	22:04	21:50	20:58	19:48	47 19:18 (4)	18:41	21 18:11 (2)	16:48	16:34
21	08:38	07:47	17:20 (2)	06:46	17:48 (3)	06:36		05:43	05:25	05:49	06:36	07:26	18:32 (3)	08:16	17:51 (2)	08:10	08:47
	17:11	18:07 20	17:40 (2)	18:56 40	18:28 (4)	20:49		21:37	22:05	21:49	20:55	19:46	45 19:17 (4)	18:39	19 18:10 (2)	16:47	16:35
22	08:37	07:45	17:19 (2)	06:43	17:47 (3)	06:34		05:42	05:25	05:50	06:38	07:28	18:33 (3)	08:18	17:52 (2)	08:12	08:47
	17:13	18:09 22	17:41 (2)	18:58 44	18:31 (4)	20:50		21:38	22:05	21:48	20:53	19:43	41 19:14 (4)	18:37	16 18:08 (2)	16:46	16:35
23	08:35	07:43	17:19 (2)	06:41	17:45 (3)	06:32		05:41	05:25	05:52	06:39	07:29	18:34 (3)	08:19	17:54 (2)	08:14	08:48
	17:15	18:11 22	17:41 (2)	19:00 46	18:31 (4)	20:52		21:39	22:05	21:46	20:51	19:41	33 19:10 (4)	18:35	12 18:06 (2)	16:44	16:36
24	08:34	07:41	17:18 (2)	06:39	17:44 (3)	06:30		05:40	05:25	05:53	06:41	07:31	18:35 (3)	08:21	17:58 (2)	08:15	08:48
	17:16	18:13 24	17:42 (2)	19:01 49	18:33 (4)	20:54		21:41	22:05	21:45	20:49	19:39	25 19:00 (3)	18:33	4 18:02 (2)	16:43	16:36
25	08:33	07:39	17:17 (2)	06:36	17:44 (3)	06:28		05:39	05:26	05:54	06:43	07:32	18:36 (3)	07:23		08:17	08:48
	17:18	18:14 24	17:41 (2)	19:03 50	18:34 (4)	20:55		21:42	22:05	21:44	20:47	19:37	21 18:57 (3)	17:31		16:42	16:37
26	08:32	07:37	17:17 (2)	06:34	17:43 (3)	06:26		05:37	05:26	05:56	06:44	07:34	18:39 (3)	07:25		08:18	08:49
	17:20	18:16 24	17:41 (2)	19:05 51	18:34 (4)	20:57		21:43	22:05	21:42	20:45	19:34	15 18:54 (3)	17:29		16:41	16:38
27	08:30	07:35	17:17 (2)	06:32	17:42 (3)	06:24		05:36	05:26	05:57	06:46	07:36		07:26		08:20	08:49
	17:22	18:18 24	17:41 (2)	19:07 52	18:34 (4)	20:59		21:45	22:05	21:41	20:43	19:32		17:27		16:41	16:38
28	08:29	07:33	17:18 (2)	06:30	17:42 (3)	06:22		05:35	05:27	05:59	06:47	07:37		07:28		08:21	08:49
	17:23	18:20 23	17:41 (2)	19:08 52	18:34 (4)	21:00		21:46	22:05	21:39	20:40	19:30		17:25		16:40	16:39
29	08:28		07:27	18:42 (3)	06:20		05:34	05:27	06:00	06:49	07:39		07:30		08:23	08:49
	17:25		20:10	52 19:34 (4)	21:02		21:47	22:05	21:38	20:38	19:27		17:23		16:39	16:40
30	08:26		07:25	18:41 (3)	06:18		05:33	05:28	06:02	06:51	07:41		07:32		08:24	08:50
	17:27		20:12	52 19:33 (4)	21:04		21:48	22:05	21:36	20:36	19:25		17:21		16:38	16:41
31	08:25		07:23	18:41 (3)			05:32		06:03	06:52			07:34			08:50
	17:29		20:13	51 19:32 (4)			21:49		21:35	20:34			17:19			16:42
Potential sun hours	260	278	367		415		484	497	501	453	381		332		267	245
Total, worst case		220		703		335						965		310		
Sun reduction		0,32		0,37		0,45						0,39		0,36		
Oper. time red.		0,99		0,99		0,99						0,99		0,99		
Wind dir. red.		0,66		0,62		0,62						0,62		0,66		
Total reduction		0,21		0,23		0,28						0,24		0,24		
Total, real		47		161		93						233		74		

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)

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David Vrolijk / dv@lbpsight.nl
Calculated:
3-2-2020 14:39/3.1.633

SHADOW - Calendar

Calculation: L136@147mShadow receptor: 4671RN14 - Sasdijk 14

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2,20	3,20	4,40	6,30	7,10	7,20	7,20	6,60	5,00	3,90	2,30	1,70

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
563	673	737	507	350	394	853	1.312	1.152	974	554	619	8.688

Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:50	08:23	07:30	17:23 (2)	07:20	18:56 (3)	06:16	05:31	05:29	06:05	06:54	07:42	18:34 (3)	07:35	08:26
	16:43	17:31	18:22	16 17:39 (2)	20:15	2 18:58 (3)	21:05	21:51	22:04	21:33	20:32	19:23	13 18:47 (3)	17:17	16:37
2	08:50	08:22	07:28	17:24 (2)	07:18		06:14	05:31	05:29	06:06	06:55	07:44	18:40 (3)	07:37	08:27
	16:44	17:32	18:23	13 17:37 (2)	20:17		21:07	21:52	22:04	21:31	20:29	19:20	2 18:42 (3)	17:15	16:37
3	08:49	08:20	07:26	17:27 (2)	07:16		06:12	05:30	05:30	06:08	06:57	07:45		07:39	08:29
	16:45	17:34	18:25	7 17:34 (2)	20:18		21:09	21:53	22:04	21:30	20:27	19:18		17:14	16:36
4	08:49	08:19	07:24		07:14		06:11	05:29	05:31	06:09	06:59	07:47		07:41	08:30
	16:47	17:36	18:27		20:20		21:10	21:54	22:03	21:28	20:25	19:16		17:12	16:36
5	08:49	08:17	07:22		07:11		06:09	05:28	05:32	06:11	07:00	07:49		07:42	08:31
	16:48	17:38	18:29		20:22		21:12	21:55	22:03	21:26	20:23	19:14		17:10	16:35
6	08:49	08:15	07:19		07:09		06:07	05:28	05:32	06:12	07:02	07:50		07:44	08:33
	16:49	17:40	18:30		20:23		21:14	21:56	22:02	21:25	20:20	19:11		17:08	16:35
7	08:48	08:14	07:17		07:07		06:05	05:27	05:33	06:14	07:03	07:52		07:46	08:34
	16:50	17:42	18:32		20:25		21:15	21:57	22:02	21:23	20:18	19:09		17:07	16:34
8	08:48	08:12	07:15		07:05		06:03	05:27	05:34	06:15	07:05	07:54		07:48	08:35
	16:51	17:43	18:34		20:27		21:17	21:57	22:01	21:21	20:16	19:07		17:05	16:34
9	08:47	08:10	07:13		07:02		06:02	05:26	05:35	06:17	07:07	07:55		07:50	08:36
	16:53	17:45	18:36		20:28		21:18	21:58	22:01	21:19	20:14	19:05		17:03	16:34
10	08:47	08:08	07:11		07:00		06:00	05:26	05:36	06:19	07:08	07:57		07:51	08:37
	16:54	17:47	18:37		20:30		21:20	21:59	22:00	21:17	20:11	19:02		17:02	16:33
11	08:46	08:06	07:08		06:58		05:58	05:25	05:37	06:20	07:10	07:59	17:59 (2)	07:53	08:38
	16:56	17:49	18:39		20:32		21:22	22:00	21:59	21:15	20:09	19:00	11 18:10 (2)	17:00	16:33
12	08:46	08:05	07:06	17:56 (3)	06:56		05:57	05:25	05:38	06:22	07:11	18:43 (3)	08:01	17:57 (2)	07:55	08:39
	16:57	17:51	18:41	11 18:07 (3)	20:34		21:23	22:01	21:58	21:13	20:07	13 18:56 (3)	18:58	15 18:12 (2)	16:59	16:33
13	08:45	08:03	07:04	17:53 (3)	06:53		05:55	05:25	05:39	06:23	07:13	18:39 (3)	08:02	17:55 (2)	07:57	08:40
	16:58	17:53	18:43	17 18:10 (3)	20:35		21:25	22:01	21:57	21:12	20:04	29 19:12 (4)	18:56	18 18:13 (2)	16:57	16:33
14	08:44	08:01	07:02	17:50 (3)	06:51		05:54	05:25	05:40	06:25	07:15	18:37 (3)	08:04	17:53 (2)	07:58	08:41
	17:00	17:54	18:44	21 18:11 (3)	20:37		21:26	22:02	21:56	21:10	20:02	37 19:14 (4)	18:54	20 18:13 (2)	16:56	16:33
15	08:43	07:59	06:59	17:49 (3)	06:49		05:52	05:24	05:42	06:27	07:16	18:35 (3)	08:06	17:53 (2)	08:00	08:42
	17:02	17:56	18:46	24 18:13 (3)	20:39		21:28	22:02	21:55	21:08	20:00	39 19:14 (4)	18:51	20 18:13 (2)	16:54	16:33
16	08:43	07:57	06:57	17:48 (3)	06:47		05:50	05:24	05:43	06:28	07:18	18:33 (3)	08:07	17:52 (2)	08:02	08:43
	17:03	17:58	18:48	29 18:20 (4)	20:40		21:29	22:03	21:54	21:06	19:57	42 19:15 (4)	18:49	22 18:14 (2)	16:53	16:33
17	08:42	07:55	06:55	17:46 (3)	06:45		05:49	05:24	05:44	06:30	07:19	18:32 (3)	08:09	17:52 (2)	08:04	08:44
	17:05	18:00	18:50	38 18:24 (4)	20:42		21:31	22:03	21:53	21:04	19:55	44 19:16 (4)	18:47	22 18:14 (2)	16:52	16:34
18	08:41	07:53	17:26 (2) 06:52	17:45 (3)	06:43		05:48	05:24	05:45	06:31	07:21	18:31 (3)	08:11	17:52 (2)	08:05	08:45
	17:06	18:02	8 17:34 (2) 18:51	41 18:26 (4)	20:44		21:32	22:04	21:52	21:02	19:53	45 19:16 (4)	18:45	22 18:14 (2)	16:50	16:34
19	08:40	07:51	17:24 (2) 06:50	17:45 (3)	06:40		05:46	05:24	05:46	06:33	07:23	18:30 (3)	08:12	17:52 (2)	08:07	08:45
	17:08	18:04	12 17:36 (2) 18:53	43 18:28 (4)	20:45		21:34	22:04	21:51	21:00	19:50	46 19:16 (4)	18:43	21 18:13 (2)	16:49	16:34
20	08:39	07:49	17:23 (2) 06:48	17:43 (3)	06:38		05:45	05:24	05:48	06:35	07:24	18:29 (3)	08:14	17:52 (2)	08:09	08:46
	17:10	18:05	15 17:38 (2) 18:55	45 18:28 (4)	20:47		21:35	22:04	21:50	20:58	19:48	46 19:15 (4)	18:41	20 18:12 (2)	16:48	16:34
21	08:38	07:47	17:22 (2) 06:46	17:43 (3)	06:36		05:43	05:25	05:49	06:36	07:26	18:29 (3)	08:16	17:53 (2)	08:10	08:47
	17:11	18:07	18 17:40 (2) 18:56	46 18:29 (4)	20:49		21:37	22:05	21:49	20:55	19:46	46 19:15 (4)	18:39	17 18:10 (2)	16:47	16:35
22	08:37	07:45	17:21 (2) 06:43	17:43 (3)	06:34		05:42	05:25	05:50	06:38	07:28	18:28 (3)	08:18	17:54 (2)	08:12	08:47
	17:13	18:09	21 17:42 (2) 18:58	46 18:29 (4)	20:50		21:38	22:05	21:48	20:53	19:43	45 19:13 (4)	18:37	14 18:08 (2)	16:46	16:35
23	08:35	07:43	17:21 (2) 06:41	17:42 (3)	06:32		05:41	05:25	05:52	06:39	07:29	18:28 (3)	08:19	17:55 (2)	08:14	08:48
	17:15	18:11	21 17:42 (2) 19:00	46 18:28 (4)	20:52		21:39	22:05	21:46	20:51	19:41	45 19:13 (4)	18:35	11 18:06 (2)	16:44	16:36
24	08:34	07:41	17:21 (2) 06:39	17:43 (3)	06:30		05:40	05:25	05:53	06:41	07:31	18:28 (3)	08:21	17:57 (2)	08:15	08:48
	17:16	18:13	22 17:43 (2) 19:01	45 18:28 (4)	20:54		21:41	22:05	21:45	20:49	19:39	44 19:12 (4)	18:33	7 18:04 (2)	16:43	16:36
25	08:33	07:39	17:20 (2) 06:36	17:43 (3)	06:28		05:38	05:26	05:54	06:43	07:32	18:28 (3)	07:23		08:17	08:48
	17:18	18:14	22 17:42 (2) 19:03	45 18:28 (4)	20:55		21:42	22:05	21:44	20:47	19:37	41 19:09 (4)	17:31		16:42	16:37
26	08:32	07:37	17:20 (2) 06:34	17:44 (3)	06:26		05:37	05:26	05:56	06:44	07:34	18:28 (3)	07:25		08:18	08:49
	17:20	18:16	21 17:41 (2) 19:05	44 18:28 (4)	20:57		21:43	22:05	21:42	20:45	19:34	39 19:07 (4)	17:29		16:41	16:38
27	08:30	07:35	17:21 (2) 06:32	17:44 (3)	06:24		05:36	05:26	05:57	06:46	07:36	18:29 (3)	07:26		08:20	08:49
	17:22	18:18	20 17:41 (2) 19:07	42 18:26 (4)	20:59		21:45	22:05	21:41	20:43	19:32	35 19:04 (4)	17:27		16:41	16:38
28	08:29	07:33	17:22 (2) 06:30	17:45 (3)	06:22		05:35	05:27	05:59	06:47	07:37	18:29 (3)	07:28		08:21	08:49
	17:23	18:20	18 17:40 (2) 19:08	40 18:25 (4)	21:00		21:46	22:05	21:39	20:40	19:30	25 18:54 (3)	17:25		16:40	16:39
29	08:28		07:27	18:47 (3)	06:20		05:34	05:27	06:00	06:49	07:39	18:30 (3)	07:30		08:23	08:49
	17:25		20:10	37 19:24 (4)	21:02		21:47	22:05	21:38	20:38	19:27	23 18:53 (3)	17:23		16:39	16:40
30	08:26		07:25	18:48 (3)	06:18		05:33	05:28	06:02	06:51	07:41	18:31 (3)	07:32		08:24	08:50
	17:27		20:12	30 19:21 (4)	21:04		21:48	22:05	21:36	20:36	19:25	19 18:50 (3)	17:21		16:38	16:41
31	08:25		07:23	18:50 (3)			05:32		06:03	06:52			07:34			08:50
	17:29		20:13	17 19:16 (4)			21:49		21:35	20:34			17:19			16:42
Potential sun hours	260	278	367		415		484	497	501	453	381		332		267	245
Total, worst case		198	743		2						703		255			
Sun reduction		0,32	0,37		0,45						0,39		0,36			
Oper. time red.		0,99	0,99		0,99						0,99		0,99			
Wind dir. red.		0,66	0,62		0,62						0,62		0,66			
Total reduction		0,21	0,23		0,28						0,24		0,24			
Total, real		42	170		1						170		61			

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

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

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David Vrolijk / dv@lbpsight.nl
Calculated:
3-2-2020 14:39/3.1.633

SHADOW - Calendar

Calculation: L136@147mShadow receptor: 4671RN2 - Sasdijk 2

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2,20	3,20	4,40	6,30	7,10	7,20	7,20	6,60	5,00	3,90	2,30	1,70

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
563	673	737	507	350	394	853	1.312	1.152	974	554	619	8.688

Idle start wind speed: Cut in wind speed from power curve

	January	February	March		April		May		June
1	08:50	08:23	07:30		07:20		19:24 (2)	06:16	20:08 (4)	05:31
	16:43	17:31	18:22		20:15	18	19:42 (2)	21:05	25	20:33 (3)	21:51
2	08:49	08:22	07:28		07:18		19:24 (2)	06:14		20:08 (3)	05:31
	16:44	17:32	18:23		20:17	17	19:41 (2)	21:07	26	20:34 (3)	21:52
3	08:49	08:20	07:26		07:16		19:25 (2)	06:12		20:08 (3)	05:30
	16:45	17:34	18:25		20:18	14	19:39 (2)	21:09	26	20:34 (3)	21:53
4	08:49	08:18	07:24		07:14		19:27 (2)	06:11		20:07 (3)	05:29
	16:47	17:36	18:27		20:20	10	19:37 (2)	21:10	27	20:34 (3)	21:54
5	08:49	08:17	07:22		07:11			06:09		20:07 (3)	05:28
	16:48	17:38	18:29		20:22			21:12	26	20:33 (3)	21:55
6	08:49	08:15	07:19		07:09			06:07		20:07 (3)	05:28
	16:49	17:40	18:30		20:23			21:13	27	20:34 (3)	21:56
7	08:48	08:13	07:17		07:07			06:05		20:07 (3)	05:27
	16:50	17:42	18:32		20:25			21:15	26	20:33 (3)	21:57
8	08:48	08:12	07:15		07:05			06:03		20:07 (3)	05:27
	16:51	17:43	18:34		20:27			21:17	25	20:32 (3)	21:57
9	08:47	08:10	07:13		07:02			06:02		20:08 (3)	05:26
	16:53	17:45	18:36		20:28			21:18	25	20:33 (3)	21:58
10	08:47	08:08	07:11		07:00			06:00		20:08 (3)	05:26
	16:54	17:47	18:37		20:30			21:20	24	20:32 (3)	21:59
11	08:46	08:06	07:08		06:58			05:58		20:09 (3)	05:25
	16:56	17:49	18:39		20:32			21:21	23	20:32 (3)	22:00
12	08:46	08:05	07:06		06:56			05:57		20:09 (3)	05:25
	16:57	17:51	18:41		20:34			21:23	21	20:30 (3)	22:01
13	08:45	08:03	07:04		06:53			05:55		20:11 (3)	05:25
	16:59	17:53	18:43		20:35			21:25	19	20:30 (3)	22:01
14	08:44	08:01	07:02		06:51			05:54		20:12 (3)	05:25
	17:00	17:54	18:44		20:37			21:26	16	20:28 (3)	22:02
15	08:43	07:59	06:59		06:49			05:52		20:13 (3)	05:24
	17:02	17:56	18:46		20:39			21:28	14	20:27 (3)	22:02
16	08:43	07:57	06:57		06:47			05:50		20:16 (3)	05:24
	17:03	17:58	18:48		20:40			21:29	10	20:26 (3)	22:03
17	08:42	07:55	06:55		06:45			05:49		20:18 (3)	05:24
	17:05	18:00	18:50		20:42			21:31	4	20:22 (3)	22:03
18	08:41	07:53	06:52		06:43		20:15 (4)	05:48			05:24
	17:06	18:02	18:51		20:44	2	20:17 (4)	21:32			22:04
19	08:40	07:51	06:50		06:40		20:11 (4)	05:46			05:24
	17:08	18:04	18:53		20:45	8	20:19 (4)	21:34			22:04
20	08:39	07:49	06:48		06:38		20:10 (4)	05:45			05:24
	17:10	18:05	18:55		20:47	10	20:20 (4)	21:35			22:04
21	08:38	07:47	06:46		06:36		20:08 (4)	05:43			05:25
	17:11	18:07	18:56		20:49	14	20:22 (4)	21:37			22:05
22	08:37	07:45	06:43		06:34		20:07 (4)	05:42			05:25
	17:13	18:09	18:58		20:50	17	20:24 (4)	21:38			22:05
23	08:35	07:43	06:41		06:32		20:07 (4)	05:41			05:25
	17:15	18:11	19:00		20:52	18	20:25 (4)	21:39			22:05
24	08:34	07:41	06:39	18:30 (2)	06:30		20:06 (4)	05:40			05:25
	17:16	18:13	19:01	6	18:36 (2)	20:54	20	20:26 (4)	21:41			22:05
25	08:33	07:39	06:36		18:28 (2)	06:28		20:06 (4)	05:38			05:26
	17:18	18:14	19:03	10	18:38 (2)	20:55	20	20:26 (4)	21:42			22:05
26	08:32	07:37	06:34		18:27 (2)	06:26		20:06 (4)	05:37			05:26
	17:20	18:16	19:05	13	18:40 (2)	20:57	22	20:28 (3)	21:43			22:05
27	08:30	07:35	06:32		18:25 (2)	06:24		20:06 (4)	05:36			05:26
	17:22	18:18	19:07	16	18:41 (2)	20:59	24	20:30 (3)	21:45			22:05
28	08:29	07:33	06:30		18:24 (2)	06:22		20:06 (4)	05:35			05:27
	17:23	18:20	19:08	19	18:43 (2)	21:00	25	20:31 (3)	21:46			22:05
29	08:28		07:27		19:24 (2)	06:20		20:06 (4)	05:34			05:27
	17:25		20:10	20	19:44 (2)	21:02	26	20:32 (3)	21:47			22:05
30	08:26		07:25		19:23 (2)	06:18		20:07 (4)	05:33			05:28
	17:27		20:12	20	19:43 (2)	21:04	25	20:32 (3)	21:48			22:05
31	08:25		07:23		19:23 (2)				05:32			
	17:29		20:13	19	19:42 (2)				21:49			
Potential sun hours	260	278	367			415			484			497
Total, worst case				123			290			364		
Sun reduction				0,37			0,45			0,45		
Oper. time red.				0,99			0,99			0,99		
Wind dir. red.				0,61			0,56			0,55		
Total reduction				0,22			0,25			0,25		
Total, real				28			73			90		

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

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

Licensed user:
LBP SIGHT
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David Vrolijk / dv@lbpsight.nl
Calculated:
3-2-2020 14:39/3.1.633

SHADOW - Calendar

Calculation: L136@147mShadow receptor: 4671RN2 - Sasdijk 2

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2,20	3,20	4,40	6,30	7,10	7,20	7,20	6,60	5,00	3,90	2,30	1,70

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
563	673	737	507	350	394	853	1.312	1.152	974	554	619	8.688

Idle start wind speed: Cut in wind speed from power curve

	July		August		September		October	November	December
1	05:29		06:05		20:20 (3)	06:54		07:42	07:35	08:26
	22:04		21:33	21	20:41 (3)	20:32		19:23	17:17	16:37
2	05:29		06:06		20:19 (3)	06:55		07:44	07:37	08:27
	22:04		21:31	23	20:42 (3)	20:29		19:20	17:15	16:37
3	05:30		06:08		20:18 (3)	06:57		07:45	07:39	08:29
	22:04		21:30	24	20:42 (3)	20:27		19:18	17:14	16:36
4	05:31		06:09		20:17 (3)	06:59		07:47	07:41	08:30
	22:03		21:28	25	20:42 (3)	20:25		19:16	17:12	16:36
5	05:32		06:11		20:17 (3)	07:00		07:49	07:42	08:31
	22:03		21:26	26	20:43 (3)	20:23		19:14	17:10	16:35
6	05:32		06:12		20:16 (3)	07:02		07:50	07:44	08:33
	22:02		21:25	27	20:43 (3)	20:20		19:11	17:08	16:35
7	05:33		06:14		20:17 (3)	07:03		07:52	07:46	08:34
	22:02		21:23	26	20:43 (3)	20:18		19:09	17:07	16:34
8	05:34		06:15		20:16 (3)	07:05	19:21 (2)	07:54	07:48	08:35
	22:01		21:21	27	20:43 (3)	20:16	10	19:31 (2)	19:07	17:05	16:34
9	05:35		06:17		20:17 (3)	07:07	19:19 (2)	07:55	07:50	08:36
	22:00		21:19	26	20:43 (3)	20:14	14	19:33 (2)	19:05	17:03	16:34
10	05:36		06:19		20:16 (3)	07:08	19:18 (2)	07:57	07:51	08:37
	22:00		21:17	26	20:42 (3)	20:11	16	19:34 (2)	19:02	17:02	16:33
11	05:37		06:20		20:17 (3)	07:10	19:16 (2)	07:59	07:53	08:38
	21:59		21:15	25	20:42 (3)	20:09	18	19:34 (2)	19:00	17:00	16:33
12	05:38		06:22		20:16 (4)	07:11	19:15 (2)	08:01	07:55	08:39
	21:58		21:13	25	20:41 (3)	20:07	20	19:35 (2)	18:58	16:59	16:33
13	05:39		06:23		20:15 (4)	07:13	19:14 (2)	08:02	07:57	08:40
	21:57		21:12	26	20:41 (3)	20:04	20	19:34 (2)	18:56	16:57	16:33
14	05:40		06:25		20:14 (4)	07:15	19:14 (2)	08:04	07:58	08:41
	21:56		21:10	25	20:39 (3)	20:02	20	19:34 (2)	18:54	16:56	16:33
15	05:42		06:27		20:13 (4)	07:16	19:13 (2)	08:06	08:00	08:42
	21:55		21:08	25	20:38 (3)	20:00	20	19:33 (2)	18:51	16:54	16:33
16	05:43		06:28		20:12 (4)	07:18	19:14 (2)	08:07	08:02	08:43
	21:54		21:06	24	20:36 (3)	19:57	17	19:31 (2)	18:49	16:53	16:33
17	05:44		06:30		20:12 (4)	07:19	19:14 (2)	08:09	08:03	08:44
	21:53		21:04	22	20:34 (3)	19:55	14	19:28 (2)	18:47	16:52	16:34
18	05:45		06:31		20:11 (4)	07:21	19:15 (2)	08:11	08:05	08:45
	21:52		21:02	21	20:32 (4)	19:53	11	19:26 (2)	18:45	16:50	16:34
19	05:46		06:33		20:12 (4)	07:23	19:17 (2)	08:12	08:07	08:45
	21:51		21:00	20	20:32 (4)	19:50	7	19:24 (2)	18:43	16:49	16:34
20	05:48		06:35		20:11 (4)	07:24	19:20 (2)	08:14	08:09	08:46
	21:50		20:57	18	20:29 (4)	19:48	1	19:21 (2)	18:41	16:48	16:34
21	05:49		06:36		20:12 (4)	07:26		08:16	08:10	08:47
	21:49		20:55	16	20:28 (4)	19:46		18:39	16:47	16:35
22	05:50		06:38		20:12 (4)	07:27		08:18	08:12	08:47
	21:48		20:53	13	20:25 (4)	19:43		18:37	16:46	16:35
23	05:52		06:39		20:14 (4)	07:29		08:19	08:13	08:48
	21:46		20:51	10	20:24 (4)	19:41		18:35	16:44	16:36
24	05:53		06:41		20:15 (4)	07:31		08:21	08:15	08:48
	21:45		20:49	6	20:21 (4)	19:39		18:33	16:43	16:36
25	05:54		06:43		20:19 (4)	07:32		07:23	08:17	08:48
	21:44		20:47	1	20:20 (4)	19:37		17:31	16:42	16:37
26	05:56		06:44			07:34		07:25	08:18	08:49
	21:42		20:45			19:34		17:29	16:41	16:38
27	05:57	20:27 (3)	06:46			07:36		07:26	08:20	08:49
	21:41	7 20:34 (3)	20:43			19:32		17:27	16:41	16:38
28	05:59	20:25 (3)	06:47			07:37		07:28	08:21	08:49
	21:39	12 20:37 (3)	20:40			19:30		17:25	16:40	16:39
29	06:00	20:23 (3)	06:49			07:39		07:30	08:23	08:49
	21:38	15 20:38 (3)	20:38			19:27		17:23	16:39	16:40
30	06:02	20:22 (3)	06:51			07:41		07:32	08:24	08:49
	21:36	17 20:39 (3)	20:36			19:25		17:21	16:38	16:41
31	06:03	20:21 (3)	06:52					07:34		08:50
	21:35	20 20:41 (3)	20:34					17:19		16:42
Potential sun hours	501		453			381		332	267	245
Total, worst case		71		528		188				
Sun reduction		0,45		0,45		0,39				
Oper. time red.		0,99		0,99		0,99				
Wind dir. red.		0,55		0,55		0,61				
Total reduction		0,24		0,25		0,24				
Total, real		17		130		45				

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

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

Licensed user:
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Calculated:
3-2-2020 14:39/3.1.633

SHADOW - Calendar

Calculation: L136@147mShadow receptor: 4671RN3 - Sasdijk 3

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2,20	3,20	4,40	6,30	7,10	7,20	7,20	6,60	5,00	3,90	2,30	1,70

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
563	673	737	507	350	394	853	1.312	1.152	974	554	619	8.688

Idle start wind speed: Cut in wind speed from power curve

	January		February		March		April	May	June
1	08:50		08:23		16:40 (2)		07:30	16:45 (3)	07:20	06:16	05:31
	16:43		17:31	19	16:59 (2)		18:22	53	17:38 (1)	20:15	21:05	21:51
2	08:50		08:22		16:40 (2)		07:28	16:43 (3)	07:18	06:14	05:31
	16:44		17:32	21	17:01 (2)		18:23	52	17:35 (1)	20:17	21:07	21:52
3	08:49		08:20		16:39 (2)		07:26	16:43 (3)	07:16	06:12	05:30
	16:45		17:34	22	17:01 (2)		18:25	52	17:51 (4)	20:18	21:09	21:53
4	08:49		08:19		16:38 (2)		07:24	16:43 (3)	07:14	06:11	05:29
	16:47		17:36	24	17:02 (2)		18:27	60	17:55 (4)	20:20	21:10	21:54
5	08:49		08:17		16:37 (2)		07:22	16:43 (3)	07:11	06:09	05:28
	16:48		17:38	25	17:02 (2)		18:29	65	17:57 (4)	20:22	21:12	21:55
6	08:49		08:15		16:38 (2)		07:19	16:43 (3)	07:09	06:07	05:28
	16:49		17:40	25	17:03 (2)		18:31	67	17:59 (4)	20:23	21:14	21:56
7	08:48		08:14		16:38 (2)		07:17	16:43 (3)	07:07	06:05	05:27
	16:50		17:42	26	17:04 (2)		18:32	69	18:00 (4)	20:25	21:15	21:57
8	08:48		08:12		16:37 (2)		07:15	16:43 (3)	07:05	06:03	05:27
	16:51		17:43	27	17:04 (2)		18:34	71	18:01 (4)	20:27	21:17	21:58
9	08:47		08:10		16:37 (2)		07:13	16:44 (3)	07:02	06:02	05:26
	16:53		17:45	27	17:04 (2)		18:36	72	18:02 (4)	20:29	21:18	21:58
10	08:47		08:08		16:38 (2)		07:11	16:44 (3)	07:00	06:00	05:26
	16:54		17:47	25	17:03 (2)		18:38	70	18:01 (4)	20:30	21:20	21:59
11	08:46		08:06		16:38 (2)		07:08	16:45 (3)	06:58	05:58	05:25
	16:56		17:49	25	17:03 (2)		18:39	70	18:02 (4)	20:32	21:22	22:00
12	08:46		08:05		16:39 (2)		07:06	16:46 (3)	06:56	05:57	05:25
	16:57		17:51	23	17:02 (2)		18:41	68	18:02 (4)	20:34	21:23	22:01
13	08:45		08:03		16:39 (2)		07:04	16:47 (3)	06:53	05:55	05:25
	16:59		17:53	23	17:02 (2)		18:43	66	18:02 (4)	20:35	21:25	22:01
14	08:44		08:01		16:40 (2)		07:02	16:48 (3)	06:51	05:54	05:25
	17:00		17:54	21	17:01 (2)		18:44	63	18:01 (4)	20:37	21:26	22:02
15	08:43		07:59		16:42 (2)		06:59	16:50 (3)	06:49	05:52	05:24
	17:02		17:56	17	16:59 (2)		18:46	58	18:00 (4)	20:39	21:28	22:02
16	08:43		07:57		16:44 (2)		06:57	16:52 (3)	06:47	05:50	05:24
	17:03		17:58	14	16:58 (2)		18:48	53	18:00 (4)	20:40	21:29	22:03
17	08:42		07:55		16:47 (2)		06:55	16:54 (3)	06:45	05:49	05:24
	17:05		18:00	11	17:32 (1)		18:50	47	17:58 (4)	20:42	21:31	22:03
18	08:41		07:53		17:01 (3)		06:52	16:58 (3)	06:43	05:48	05:24
	17:06		18:02	19	17:34 (1)		18:51	36	17:57 (4)	20:44	21:32	22:04
19	08:40		07:51		16:57 (3)		06:50	17:34 (4)	06:40	05:46	05:24
	17:08		18:04	31	17:36 (1)		18:53	22	17:56 (4)	20:45	21:34	22:04
20	08:39		07:49		16:55 (3)		06:48	17:35 (4)	06:38	05:45	05:24
	17:10		18:05	39	17:38 (1)		18:55	18	17:53 (4)	20:47	21:35	22:04
21	08:38		07:47		16:53 (3)		06:46	17:38 (4)	06:36	05:43	05:25
	17:11		18:07	46	17:40 (1)		18:56	13	17:51 (4)	20:49	21:37	22:05
22	08:37		07:45		16:51 (3)		06:43	17:43 (4)	06:34	05:42	05:25
	17:13		18:09	51	17:42 (1)		18:58	3	17:46 (4)	20:50	21:38	22:05
23	08:35		07:43		16:50 (3)		06:41		06:32	05:41	05:25
	17:15		18:11	52	17:42 (1)		19:00		20:52	21:39	22:05
24	08:34		07:41		16:49 (3)		06:39		06:30	05:40	05:25
	17:16		18:13	54	17:43 (1)		19:02		20:54	21:41	22:05
25	08:33		07:39		16:47 (3)		06:36		06:28	05:39	05:26
	17:18		18:14	54	17:41 (1)		19:03		20:55	21:42	22:05
26	08:32		07:37		16:46 (3)		06:34		06:26	05:37	05:26
	17:20		18:16	55	17:41 (1)		19:05		20:57	21:43	22:05
27	08:30		07:35		16:45 (3)		06:32		06:24	05:36	05:26
	17:22		18:18	55	17:40 (1)		19:07		20:59	21:45	22:05
28	08:29		07:33		16:45 (3)		06:30		06:22	05:35	05:27
	17:23		18:20	54	17:39 (1)		19:08		21:00	21:46	22:05
29	08:28	16:45 (2)					07:27		06:20	05:34	05:27
	17:25	8 16:53 (2)					20:10		21:02	21:47	22:05
30	08:26	16:42 (2)					07:25		06:18	05:33	05:28
	17:27	13 16:55 (2)					20:12		21:04	21:48	22:05
31	08:25	16:41 (2)					07:23			05:32	
	17:29	16 16:57 (2)					20:13			21:49	
Potential sun hours	260		278		367		415	484	497
Total, worst case	37		885		1148				
Sun reduction	0,26		0,32		0,37				
Oper. time red.	0,99		0,99		0,99				
Wind dir. red.	0,69		0,68		0,65				
Total reduction	0,18		0,22		0,24				
Total, real	7		192		277				

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)

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David Vrolijk / dv@lbpsight.nl
Calculated:
3-2-2020 14:39/3.1.633

SHADOW - Calendar

Calculation: L136@147mShadow receptor: 4671RN3 - Sasdijk 3

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2,20	3,20	4,40	6,30	7,10	7,20	7,20	6,60	5,00	3,90	2,30	1,70

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
563	673	737	507	350	394	853	1.312	1.152	974	554	619	8.688

Idle start wind speed: Cut in wind speed from power curve

	July	August	September			October			November			December
1	05:29	06:05	06:54			07:42		17:25 (3)	07:35		16:07 (2)	08:26
	22:04	21:33	20:32			19:23	68	18:41 (4)	17:17	26	16:33 (2)	16:37
2	05:29	06:06	06:55			07:44		17:24 (3)	07:37		16:07 (2)	08:27
	22:04	21:31	20:29			19:20	70	18:41 (4)	17:15	26	16:33 (2)	16:37
3	05:30	06:08	06:57			07:46		17:22 (3)	07:39		16:07 (2)	08:29
	22:04	21:30	20:27			19:18	71	18:39 (4)	17:14	26	16:33 (2)	16:36
4	05:31	06:09	06:59			07:47		17:21 (3)	07:41		16:07 (2)	08:30
	22:03	21:28	20:25			19:16	71	18:39 (4)	17:12	26	16:33 (2)	16:36
5	05:32	06:11	07:00			07:49		17:21 (3)	07:42		16:08 (2)	08:31
	22:03	21:26	20:23			19:14	71	18:38 (4)	17:10	25	16:33 (2)	16:35
6	05:32	06:12	07:02			07:50		17:20 (3)	07:44		16:08 (2)	08:33
	22:02	21:25	20:20			19:11	70	18:37 (4)	17:08	25	16:33 (2)	16:35
7	05:33	06:14	07:03			07:52		17:19 (3)	07:46		16:09 (2)	08:34
	22:02	21:23	20:18			19:09	68	18:35 (4)	17:07	24	16:33 (2)	16:34
8	05:34	06:15	07:05			07:54		17:18 (3)	07:48		16:09 (2)	08:35
	22:01	21:21	20:16			19:07	67	18:33 (4)	17:05	22	16:31 (2)	16:34
9	05:35	06:17	07:07			07:55		17:18 (3)	07:50		16:09 (2)	08:36
	22:01	21:19	20:14			19:05	63	18:31 (4)	17:03	21	16:30 (2)	16:34
10	05:36	06:19	07:08			07:57		17:17 (3)	07:51		16:11 (2)	08:37
	22:00	21:17	20:11			19:02	57	18:28 (4)	17:02	18	16:29 (2)	16:33
11	05:37	06:20	07:10			07:59		17:17 (3)	07:53		16:12 (2)	08:38
	21:59	21:15	20:09			19:00	48	18:06 (1)	17:00	16	16:28 (2)	16:33
12	05:38	06:22	07:11			08:01		17:18 (3)	07:55		16:14 (2)	08:39
	21:58	21:14	20:07			18:58	52	18:10 (1)	16:59	12	16:26 (2)	16:33
13	05:39	06:23	07:13			08:02		17:18 (3)	07:57		16:17 (2)	08:40
	21:57	21:12	20:04			18:56	54	18:12 (1)	16:57	7	16:24 (2)	16:33
14	05:40	06:25	07:15			08:04		17:18 (3)	07:58			08:41
	21:56	21:10	20:02			18:54	55	18:13 (1)	16:56			16:33
15	05:42	06:27	07:16			08:06		17:18 (3)	08:00			08:42
	21:56	21:08	20:00			18:51	55	18:13 (1)	16:54			16:33
16	05:43	06:28	07:18			08:07		17:19 (3)	08:02			08:43
	21:55	21:06	19:57			18:49	54	18:13 (1)	16:53			16:33
17	05:44	06:30	07:19			08:09		17:20 (3)	08:04			08:44
	21:53	21:04	19:55			18:47	54	18:14 (1)	16:52			16:34
18	05:45	06:31	07:21			08:11		17:20 (3)	08:05			08:45
	21:52	21:02	19:53			18:45	54	18:14 (1)	16:50			16:34
19	05:46	06:33	07:23			08:13		17:22 (3)	08:07			08:45
	21:51	21:00	19:50			18:43	52	18:14 (1)	16:49			16:34
20	05:48	06:35	07:24			08:14		17:22 (3)	08:09			08:46
	21:50	20:58	19:48			18:41	50	18:12 (1)	16:48			16:34
21	05:49	06:36	07:26			08:16		17:24 (3)	08:10			08:47
	21:49	20:55	19:46			18:39	43	18:10 (1)	16:47			16:35
22	05:50	06:38	07:28		18:23 (4)	08:18		17:26 (3)	08:12			08:47
	21:48	20:53	19:44	12	18:35 (4)	18:37	36	18:08 (1)	16:46			16:35
23	05:52	06:39	07:29		18:20 (4)	08:19		17:28 (3)	08:14			08:48
	21:46	20:51	19:41	17	18:37 (4)	18:35	29	18:06 (1)	16:44			16:36
24	05:53	06:41	07:31		18:18 (4)	08:21		17:33 (3)	08:15			08:48
	21:45	20:49	19:39	21	18:39 (4)	18:33	15	18:04 (1)	16:43			16:36
25	05:54	06:43	07:32		17:42 (3)	07:23		16:16 (2)	08:17			08:48
	21:44	20:47	19:37	31	18:39 (4)	17:31	10	16:26 (2)	16:42			16:37
26	05:56	06:44	07:34		17:38 (3)	07:25		16:14 (2)	08:18			08:49
	21:42	20:45	19:34	44	18:41 (4)	17:29	15	16:29 (2)	16:41			16:38
27	05:57	06:46	07:36		17:35 (3)	07:27		16:11 (2)	08:20			08:49
	21:41	20:43	19:32	50	18:41 (4)	17:27	18	16:29 (2)	16:41			16:38
28	05:59	06:47	07:37		17:31 (3)	07:28		16:10 (2)	08:21			08:49
	21:39	20:40	19:30	57	18:41 (4)	17:25	20	16:30 (2)	16:40			16:39
29	06:00	06:49	07:39		17:29 (3)	07:30		16:09 (2)	08:23			08:49
	21:38	20:38	19:27	61	18:41 (4)	17:23	22	16:31 (2)	16:39			16:40
30	06:02	06:51	07:41		17:27 (3)	07:32		16:08 (2)	08:24			08:50
	21:36	20:36	19:25	65	18:41 (4)	17:21	24	16:32 (2)	16:38			16:41
31	06:03	06:52				07:34		16:08 (2)				08:50
	21:35	20:34				17:19	25	16:33 (2)				16:42
Potential sun hours	501	453	381			332			267			245
Total, worst case				358			1461			274		
Sun reduction				0,39			0,36			0,26		
Oper. time red.				0,99			0,99			0,99		
Wind dir. red.				0,65			0,67			0,69		
Total reduction				0,25			0,24			0,18		
Total, real				90			352			49		

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

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

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Calculated:
3-2-2020 14:39/3.1.633

SHADOW - Calendar

Calculation: L136@147mShadow receptor: 4671RN4 - Sasdijk 4

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2,20	3,20	4,40	6,30	7,10	7,20	7,20	6,60	5,00	3,90	2,30	1,70

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
563	673	737	507	350	394	853	1.312	1.152	974	554	619	8.688

Idle start wind speed: Cut in wind speed from power curve

	January	February		March		April		May	June
1	08:50	08:23		07:30		17:26 (2)	07:20	18:54 (3)	06:16	05:31
	16:43	17:31		18:22	24	17:50 (2)	20:15	47	19:41 (4)	21:05	21:51
2	08:50	08:22		07:28		17:25 (2)	07:18	18:54 (3)	06:14	05:31
	16:44	17:32		18:23	24	17:49 (2)	20:17	47	19:41 (4)	21:07	21:52
3	08:49	08:20		07:26		17:26 (2)	07:16	18:53 (3)	06:12	05:30
	16:45	17:34		18:25	23	17:49 (2)	20:18	46	19:39 (4)	21:09	21:53
4	08:49	08:19		07:24		17:26 (2)	07:14	18:53 (3)	06:11	05:29
	16:47	17:36		18:27	23	17:49 (2)	20:20	46	19:39 (4)	21:10	21:54
5	08:49	08:17		07:22		17:27 (2)	07:11	18:54 (3)	06:09	05:28
	16:48	17:38		18:29	21	17:48 (2)	20:22	44	19:38 (4)	21:12	21:55
6	08:49	08:15		07:19		17:28 (2)	07:09	18:54 (3)	06:07	05:28
	16:49	17:40		18:30	19	17:47 (2)	20:23	43	19:37 (4)	21:14	21:56
7	08:48	08:14		07:17		17:28 (2)	07:07	18:53 (3)	06:05	05:27
	16:50	17:42		18:32	17	17:45 (2)	20:25	42	19:35 (4)	21:15	21:57
8	08:48	08:12		07:15		17:30 (2)	07:05	18:54 (3)	06:03	05:27
	16:51	17:43		18:34	14	17:44 (2)	20:27	39	19:33 (4)	21:17	21:57
9	08:47	08:10		07:13		17:34 (2)	07:02	18:55 (3)	06:02	05:26
	16:53	17:45		18:36	6	17:40 (2)	20:28	35	19:30 (4)	21:18	21:58
10	08:47	08:08		07:11			07:00	18:56 (3)	06:00	05:26
	16:54	17:47		18:37			20:30	29	19:25 (3)	21:20	21:59
11	08:46	08:06		07:08			06:58	18:58 (3)	05:58	05:25
	16:56	17:49		18:39			20:32	26	19:24 (3)	21:22	22:00
12	08:46	08:05		07:06			06:56	18:58 (3)	05:57	05:25
	16:57	17:51		18:41			20:34	23	19:21 (3)	21:23	22:01
13	08:45	08:03		07:04			06:53	19:00 (3)	05:55	05:25
	16:59	17:53		18:43			20:35	19	19:19 (3)	21:25	22:01
14	08:44	08:01		07:02			06:51	19:03 (3)	05:54	05:25
	17:00	17:54		18:44			20:37	14	19:17 (3)	21:26	22:02
15	08:43	07:59		06:59			06:49	19:08 (3)	05:52	05:24
	17:02	17:56		18:46			20:39	3	19:11 (3)	21:28	22:02
16	08:43	07:57		06:57			06:47		05:50	05:24
	17:03	17:58		18:48			20:40		21:29	22:03
17	08:42	07:55		06:55			06:45		05:49	05:24
	17:05	18:00		18:50			20:42		21:31	22:03
18	08:41	07:53		06:52			06:43		05:48	05:24
	17:06	18:02		18:51			20:44		21:32	22:04
19	08:40	07:51		06:50			06:40		05:46	05:24
	17:08	18:04		18:53			20:45		21:34	22:04
20	08:39	07:49		06:48			06:38		05:45	05:24
	17:10	18:05		18:55			20:47		21:35	22:04
21	08:38	07:47		06:46			06:36		05:43	05:25
	17:11	18:07		18:56			20:49		21:37	22:05
22	08:37	07:45	17:37 (2)	06:43		18:13 (3)	06:34		05:42	05:25
	17:13	18:09	4 17:41 (2)	18:58	5	18:18 (3)	20:50		21:38	22:05
23	08:35	07:43	17:33 (2)	06:41		18:07 (3)	06:32		05:41	05:25
	17:15	18:11	12 17:45 (2)	19:00	15	18:22 (3)	20:52		21:39	22:05
24	08:34	07:41	17:31 (2)	06:39		18:04 (3)	06:30		05:40	05:25
	17:16	18:13	16 17:47 (2)	19:01	26	18:32 (4)	20:54		21:41	22:05
25	08:33	07:39	17:29 (2)	06:36		18:02 (3)	06:28		05:39	05:26
	17:18	18:14	18 17:47 (2)	19:03	34	18:36 (4)	20:55		21:42	22:05
26	08:32	07:37	17:28 (2)	06:34		18:01 (3)	06:26		05:37	05:26
	17:20	18:16	20 17:48 (2)	19:05	37	18:38 (4)	20:57		21:43	22:05
27	08:30	07:35	17:27 (2)	06:32		17:59 (3)	06:24		05:36	05:26
	17:22	18:18	22 17:49 (2)	19:07	40	18:39 (4)	20:59		21:45	22:05
28	08:29	07:33	17:27 (2)	06:30		17:58 (3)	06:22		05:35	05:27
	17:23	18:20	23 17:50 (2)	19:08	42	18:40 (4)	21:00		21:46	22:05
29	08:28			07:27		18:57 (3)	06:20		05:34	05:27
	17:25			20:10	44	19:41 (4)	21:02		21:47	22:05
30	08:26			07:25		18:55 (3)	06:18		05:33	05:28
	17:27			20:12	45	19:40 (4)	21:04		21:48	22:05
31	08:25			07:23		18:55 (3)			05:32	
	17:29			20:13	46	19:41 (4)			21:49	
Potential sun hours	260	278		367			415		484	497
Total, worst case			115		505			503		
Sun reduction			0,32		0,37			0,45		
Oper. time red.			0,99		0,99			0,99		
Wind dir. red.			0,65		0,62			0,61		
Total reduction			0,21		0,23			0,28		
Total, real			24		116			139		

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

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

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+31 3023 11377
David Vrolijk / dv@lbpsight.nl
Calculated:
3-2-2020 14:39/3.1.633

SHADOW - Calendar

Calculation: L136@147mShadow receptor: 4671RN4 - Sasdijk 4

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2,20	3,20	4,40	6,30	7,10	7,20	7,20	6,60	5,00	3,90	2,30	1,70

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
563	673	737	507	350	394	853	1.312	1.152	974	554	619	8.688

Idle start wind speed: Cut in wind speed from power curve

	July	August		September		October			November	December
1	05:29	06:05		06:54		18:56 (3)	07:42		07:35	08:26
	22:04	21:33		20:32	27	19:23 (3)	19:23		17:17	16:37
2	05:29	06:06		06:55		18:54 (3)	07:44		07:37	08:27
	22:04	21:31		20:29	29	19:23 (3)	19:20		17:15	16:37
3	05:30	06:08		06:57		18:53 (3)	07:45		07:39	08:29
	22:04	21:30		20:27	35	19:28 (4)	19:18		17:14	16:36
4	05:31	06:09		06:59		18:51 (3)	07:47		07:41	08:30
	22:03	21:28		20:25	39	19:30 (4)	19:16		17:12	16:36
5	05:32	06:11		07:00		18:51 (3)	07:49	18:09 (2)	07:42	08:31
	22:03	21:26		20:23	41	19:32 (4)	19:14	10 18:19 (2)	17:10	16:35
6	05:32	06:12		07:02		18:49 (3)	07:50	18:06 (2)	07:44	08:33
	22:02	21:25		20:20	43	19:32 (4)	19:11	15 18:21 (2)	17:08	16:35
7	05:33	06:14		07:03		18:49 (3)	07:52	18:04 (2)	07:46	08:34
	22:02	21:23		20:18	44	19:33 (4)	19:09	18 18:22 (2)	17:07	16:34
8	05:34	06:15		07:05		18:47 (3)	07:54	18:02 (2)	07:48	08:35
	22:01	21:21		20:16	46	19:33 (4)	19:07	21 18:23 (2)	17:05	16:34
9	05:35	06:17		07:07		18:47 (3)	07:55	18:01 (2)	07:50	08:36
	22:01	21:19		20:14	47	19:34 (4)	19:05	23 18:24 (2)	17:03	16:34
10	05:36	06:19		07:08		18:47 (3)	07:57	18:00 (2)	07:51	08:37
	22:00	21:17		20:11	47	19:34 (4)	19:02	23 18:23 (2)	17:02	16:33
11	05:37	06:20		07:10		18:47 (3)	07:59	18:00 (2)	07:53	08:38
	21:59	21:15		20:09	46	19:33 (4)	19:00	23 18:23 (2)	17:00	16:33
12	05:38	06:22		07:11		18:47 (3)	08:01	17:59 (2)	07:55	08:39
	21:58	21:13		20:07	46	19:33 (4)	18:58	24 18:23 (2)	16:59	16:33
13	05:39	06:23		07:13		18:46 (3)	08:02	18:00 (2)	07:57	08:40
	21:57	21:12		20:04	46	19:32 (4)	18:56	23 18:23 (2)	16:57	16:33
14	05:40	06:25		07:15		18:47 (3)	08:04	17:59 (2)	07:58	08:41
	21:56	21:10		20:02	44	19:31 (4)	18:54	23 18:22 (2)	16:56	16:33
15	05:42	06:27		07:16		18:47 (3)	08:06	17:59 (2)	08:00	08:42
	21:55	21:08		20:00	43	19:30 (4)	18:51	22 18:21 (2)	16:54	16:33
16	05:43	06:28		07:18		18:48 (3)	08:07	18:00 (2)	08:02	08:43
	21:54	21:06		19:57	40	19:28 (4)	18:49	20 18:20 (2)	16:53	16:33
17	05:44	06:30		07:19		18:49 (3)	08:09	18:01 (2)	08:04	08:44
	21:53	21:04		19:55	38	19:27 (4)	18:47	18 18:19 (2)	16:52	16:34
18	05:45	06:31		07:21		18:49 (3)	08:11	18:03 (2)	08:05	08:45
	21:52	21:02		19:53	35	19:24 (4)	18:45	14 18:17 (2)	16:50	16:34
19	05:46	06:33		07:23		18:51 (3)	08:13	18:05 (2)	08:07	08:45
	21:51	21:00		19:50	30	19:21 (4)	18:43	10 18:15 (2)	16:49	16:34
20	05:48	06:35		07:24		18:53 (3)	08:14		08:09	08:46
	21:50	20:58		19:48	16	19:09 (3)	18:41		16:48	16:34
21	05:49	06:36		07:26		18:57 (3)	08:16		08:10	08:47
	21:49	20:55		19:46	9	19:06 (3)	18:39		16:47	16:35
22	05:50	06:38		07:28			08:18		08:12	08:47
	21:48	20:53		19:43			18:37		16:46	16:35
23	05:52	06:39		07:29			08:19		08:14	08:48
	21:46	20:51		19:41			18:35		16:44	16:36
24	05:53	06:41		07:31			08:21		08:15	08:48
	21:45	20:49		19:39			18:33		16:43	16:36
25	05:54	06:43		07:32			07:23		08:17	08:48
	21:44	20:47		19:37			17:31		16:42	16:37
26	05:56	06:44		07:34			07:25		08:18	08:49
	21:42	20:45		19:34			17:29		16:41	16:38
27	05:57	06:46		07:36			07:26		08:20	08:49
	21:41	20:43		19:32			17:27		16:41	16:38
28	05:59	06:47	19:09 (3)	07:37			07:28		08:21	08:49
	21:39	20:40	5 19:14 (3)	19:30			17:25		16:40	16:39
29	06:00	06:49	19:03 (3)	07:39			07:30		08:23	08:49
	21:38	20:38	15 19:18 (3)	19:27			17:23		16:39	16:40
30	06:02	06:51	19:01 (3)	07:41			07:32		08:24	08:50
	21:36	20:36	19 19:20 (3)	19:25			17:21		16:38	16:41
31	06:03	06:52	18:58 (3)				07:34			08:50
	21:35	20:34	23 19:21 (3)				17:19			16:42
Potential sun hours	501	453		381			332		267	245
Total, worst case			62		791			287		
Sun reduction			0,45		0,39			0,36		
Oper. time red.			0,99		0,99			0,99		
Wind dir. red.			0,61		0,61			0,65		
Total reduction			0,27		0,24			0,24		
Total, real			17		189			68		

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

Day in month	Sun rise (hh:mm) Sun set (hh:mm)	Minutes 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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David Vrolijk / dv@lbpsight.nl
Calculated:
3-2-2020 14:39/3.1.633

SHADOW - Calendar

Calculation: L136@147mShadow receptor: 4671RN6 - Sasdijk 6

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2,20	3,20	4,40	6,30	7,10	7,20	7,20	6,60	5,00	3,90	2,30	1,70

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
563	673	737	507	350	394	853	1.312	1.152	974	554	619	8.688

Idle start wind speed: Cut in wind speed from power curve

	January	February		March		April		May	June
1	08:50	08:23		07:30		17:24 (2)	07:20	18:50 (3)	06:16	05:31
	16:43	17:31		18:22	24	17:48 (2)	20:15	48	19:38 (4)	21:05	21:51
2	08:50	08:22		07:28		17:23 (2)	07:18	18:50 (3)	06:14	05:31
	16:44	17:32		18:23	23	17:46 (2)	20:17	48	19:38 (4)	21:07	21:52
3	08:49	08:20		07:26		17:23 (2)	07:16	18:49 (3)	06:12	05:30
	16:45	17:34		18:25	23	17:46 (2)	20:18	47	19:36 (4)	21:09	21:53
4	08:49	08:19		07:24		17:24 (2)	07:14	18:50 (3)	06:11	05:29
	16:47	17:36		18:27	21	17:45 (2)	20:20	46	19:36 (4)	21:10	21:54
5	08:49	08:17		07:22		17:25 (2)	07:11	18:50 (3)	06:09	05:28
	16:48	17:38		18:29	19	17:44 (2)	20:22	45	19:35 (4)	21:12	21:55
6	08:49	08:15		07:19		17:27 (2)	07:09	18:51 (3)	06:07	05:28
	16:49	17:40		18:30	16	17:43 (2)	20:23	42	19:33 (4)	21:14	21:56
7	08:48	08:14		07:17		17:28 (2)	07:07	18:51 (3)	06:05	05:27
	16:50	17:42		18:32	12	17:40 (2)	20:25	40	19:31 (4)	21:15	21:57
8	08:48	08:12		07:15		17:32 (2)	07:05	18:52 (3)	06:03	05:27
	16:51	17:43		18:34	5	17:37 (2)	20:27	36	19:28 (4)	21:17	21:57
9	08:47	08:10		07:13			07:02	18:53 (3)	06:02	05:26
	16:53	17:45		18:36			20:28	28	19:21 (3)	21:18	21:58
10	08:47	08:08		07:11			07:00	18:55 (3)	06:00	05:26
	16:54	17:47		18:37			20:30	25	19:20 (3)	21:20	21:59
11	08:46	08:06		07:08			06:58	18:56 (3)	05:58	05:25
	16:56	17:49		18:39			20:32	22	19:18 (3)	21:22	22:00
12	08:46	08:05		07:06			06:56	18:57 (3)	05:57	05:25
	16:57	17:51		18:41			20:34	18	19:15 (3)	21:23	22:01
13	08:45	08:03		07:04			06:53	19:01 (3)	05:55	05:25
	16:59	17:53		18:43			20:35	10	19:11 (3)	21:25	22:01
14	08:44	08:01		07:02			06:51		05:54	05:25
	17:00	17:54		18:44			20:37		21:26	22:02
15	08:43	07:59		06:59			06:49		05:52	05:24
	17:02	17:56		18:46			20:39		21:28	22:02
16	08:43	07:57		06:57			06:47		05:50	05:24
	17:03	17:58		18:48			20:40		21:29	22:03
17	08:42	07:55		06:55			06:45		05:49	05:24
	17:05	18:00		18:50			20:42		21:31	22:03
18	08:41	07:53		06:52			06:43		05:48	05:24
	17:06	18:02		18:51			20:44		21:32	22:04
19	08:40	07:51		06:50			06:40		05:46	05:24
	17:08	18:04		18:53			20:45		21:34	22:04
20	08:39	07:49		06:48			06:38		05:45	05:24
	17:10	18:05		18:55			20:47		21:35	22:04
21	08:38	07:47	17:32 (2)	06:46		18:05 (3)	06:36		05:43	05:25
	17:11	18:07	8	17:40 (2)	18:56	13	18:18 (3)	20:49		21:37	22:05
22	08:37	07:45	17:29 (2)	06:43		18:02 (3)	06:34		05:42	05:25
	17:13	18:09	13	17:42 (2)	18:58	19	18:21 (3)	20:50		21:38	22:05
23	08:35	07:43	17:28 (2)	06:41		17:59 (3)	06:32		05:41	05:25
	17:15	18:11	17	17:45 (2)	19:00	31	18:31 (4)	20:52		21:39	22:05
24	08:34	07:41	17:26 (2)	06:39		17:57 (3)	06:30		05:40	05:25
	17:16	18:13	20	17:46 (2)	19:01	37	18:34 (4)	20:54		21:41	22:05
25	08:33	07:39	17:25 (2)	06:36		17:56 (3)	06:28		05:39	05:26
	17:18	18:14	21	17:46 (2)	19:03	40	18:36 (4)	20:55		21:42	22:05
26	08:32	07:37	17:24 (2)	06:34		17:55 (3)	06:26		05:37	05:26
	17:20	18:16	23	17:47 (2)	19:05	43	18:38 (4)	20:57		21:43	22:05
27	08:30	07:35	17:24 (2)	06:32		17:53 (3)	06:24		05:36	05:26
	17:22	18:18	23	17:47 (2)	19:07	45	18:38 (4)	20:59		21:45	22:05
28	08:29	07:33	17:23 (2)	06:30		17:52 (3)	06:22		05:35	05:27
	17:23	18:20	24	17:47 (2)	19:08	46	18:38 (4)	21:00		21:46	22:05
29	08:28				07:27		18:52 (3)	06:20		05:34	05:27
	17:25				20:10	47	19:39 (4)	21:02		21:47	22:05
30	08:26				07:25		18:50 (3)	06:18		05:33	05:28
	17:27				20:12	48	19:38 (4)	21:04		21:48	22:05
31	08:25				07:23		18:50 (3)			05:32	
	17:29				20:13	48	19:38 (4)			21:49	
Potential sun hours	260	278		367			415		484	497
Total, worst case			149		560			455			
Sun reduction			0,32		0,37			0,45			
Oper. time red.			0,99		0,99			0,99			
Wind dir. red.			0,65		0,62			0,61			
Total reduction			0,21		0,23			0,28			
Total, real			31		129			126			

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

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

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Calculated:
3-2-2020 14:39/3.1.633

SHADOW - Calendar

Calculation: L136@147mShadow receptor: 4671RN6 - Sasdijk 6

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2,20	3,20	4,40	6,30	7,10	7,20	7,20	6,60	5,00	3,90	2,30	1,70

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
563	673	737	507	350	394	853	1.312	1.152	974	554	619	8.688

Idle start wind speed: Cut in wind speed from power curve

	July	August		September		October		November	December
1	05:29	06:05		06:54		18:55 (3)	07:42	07:35	08:26
	22:04	21:33		20:32	22	19:17 (3)	19:23	17:17	16:37
2	05:29	06:06		06:55		18:52 (3)	07:44	07:37	08:27
	22:04	21:31		20:29	26	19:18 (3)	19:20	17:15	16:37
3	05:30	06:08		06:57		18:51 (3)	07:45	07:39	08:29
	22:04	21:30		20:27	28	19:19 (3)	19:18	17:14	16:36
4	05:31	06:09		06:59		18:49 (3)	07:47	07:41	08:30
	22:03	21:28		20:25	36	19:25 (4)	19:16	17:12	16:36
5	05:32	06:11		07:00		18:48 (3)	07:49	07:42	08:31
	22:03	21:26		20:23	39	19:27 (4)	19:14	17:10	16:35
6	05:32	06:12		07:02		18:46 (3)	07:50	18:06 (2) 07:44	08:33
	22:02	21:25		20:20	42	19:28 (4)	19:11	10 18:16 (2) 17:08	16:35
7	05:33	06:14		07:03		18:45 (3)	07:52	18:03 (2) 07:46	08:34
	22:02	21:23		20:18	45	19:30 (4)	19:09	14 18:17 (2) 17:07	16:34
8	05:34	06:15		07:05		18:44 (3)	07:54	18:01 (2) 07:48	08:35
	22:01	21:21		20:16	46	19:30 (4)	19:07	18 18:19 (2) 17:05	16:34
9	05:35	06:17		07:07		18:44 (3)	07:55	18:00 (2) 07:50	08:36
	22:01	21:19		20:14	47	19:31 (4)	19:05	20 18:20 (2) 17:03	16:34
10	05:36	06:19		07:08		18:43 (3)	07:57	17:58 (2) 07:51	08:37
	22:00	21:17		20:11	48	19:31 (4)	19:02	22 18:20 (2) 17:02	16:33
11	05:37	06:20		07:10		18:42 (3)	07:59	17:57 (2) 07:53	08:38
	21:59	21:15		20:09	48	19:30 (4)	19:00	23 18:20 (2) 17:00	16:33
12	05:38	06:22		07:11		18:43 (3)	08:01	17:57 (2) 07:55	08:39
	21:58	21:13		20:07	48	19:31 (4)	18:58	24 18:21 (2) 16:59	16:33
13	05:39	06:23		07:13		18:42 (3)	08:02	17:57 (2) 07:57	08:40
	21:57	21:12		20:04	48	19:30 (4)	18:56	24 18:21 (2) 16:57	16:33
14	05:40	06:25		07:15		18:42 (3)	08:04	17:56 (2) 07:58	08:41
	21:56	21:10		20:02	47	19:29 (4)	18:54	24 18:20 (2) 16:56	16:33
15	05:42	06:27		07:16		18:42 (3)	08:06	17:56 (2) 08:00	08:42
	21:55	21:08		20:00	46	19:28 (4)	18:51	23 18:19 (2) 16:54	16:33
16	05:43	06:28		07:18		18:42 (3)	08:07	17:56 (2) 08:02	08:43
	21:54	21:06		19:57	45	19:27 (4)	18:49	23 18:19 (2) 16:53	16:33
17	05:44	06:30		07:19		18:43 (3)	08:09	17:57 (2) 08:04	08:44
	21:53	21:04		19:55	43	19:26 (4)	18:47	21 18:18 (2) 16:52	16:34
18	05:45	06:31		07:21		18:43 (3)	08:11	17:58 (2) 08:05	08:45
	21:52	21:02		19:53	41	19:24 (4)	18:45	19 18:17 (2) 16:50	16:34
19	05:46	06:33		07:23		18:44 (3)	08:13	17:59 (2) 08:07	08:45
	21:51	21:00		19:50	38	19:22 (4)	18:43	16 18:15 (2) 16:49	16:34
20	05:48	06:35		07:24		18:45 (3)	08:14	18:00 (2) 08:09	08:46
	21:50	20:58		19:48	33	19:18 (4)	18:41	12 18:12 (2) 16:48	16:34
21	05:49	06:36		07:26		18:47 (3)	08:16	18:04 (2) 08:10	08:47
	21:49	20:55		19:46	20	19:07 (3)	18:39	4 18:08 (2) 16:47	16:35
22	05:50	06:38		07:28		18:49 (3)	08:18	08:12	08:47
	21:48	20:53		19:43	15	19:04 (3)	18:37	16:46	16:35
23	05:52	06:39		07:29		18:54 (3)	08:19	08:14	08:48
	21:46	20:51		19:41	4	18:58 (3)	18:35	16:44	16:36
24	05:53	06:41		07:31			08:21	08:15	08:48
	21:45	20:49		19:39			18:33	16:43	16:36
25	05:54	06:43		07:32			07:23	08:17	08:48
	21:44	20:47		19:37			17:31	16:42	16:37
26	05:56	06:44		07:34			07:25	08:18	08:49
	21:42	20:45		19:34			17:29	16:41	16:38
27	05:57	06:46		07:36			07:26	08:20	08:49
	21:41	20:43		19:32			17:27	16:41	16:38
28	05:59	06:47		07:37			07:28	08:21	08:49
	21:39	20:40		19:30			17:25	16:40	16:39
29	06:00	06:49		07:39			07:30	08:23	08:49
	21:38	20:38		19:27			17:23	16:39	16:40
30	06:02	06:51	19:02 (3)	07:41			07:32	08:24	08:50
	21:36	20:36	10 19:12 (3)	19:25			17:21	16:38	16:41
31	06:03	06:52	18:57 (3)				07:34		08:50
	21:35	20:34	18 19:15 (3)				17:19		16:42
Potential sun hours	501	453		381			332	267	245
Total, worst case			28		855		297		
Sun reduction			0,45		0,39		0,36		
Oper. time red.			0,99		0,99		0,99		
Wind dir. red.			0,61		0,61		0,65		
Total reduction			0,28		0,24		0,24		
Total, real			8		205		70		

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

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

Licensed user:
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David Vrolijk / dv@lbpsight.nl
Calculated:
3-2-2020 14:39/3.1.633

SHADOW - Calendar

Calculation: L136@147mShadow receptor: 4671RN8 - Sasdijk 8

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2,20	3,20	4,40	6,30	7,10	7,20	7,20	6,60	5,00	3,90	2,30	1,70

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
563	673	737	507	350	394	853	1.312	1.152	974	554	619	8.688

Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:50	08:23	07:30	17:21 (2)	07:20	18:46 (3)	06:16	05:31	05:29	06:05	06:54	18:55 (3)	07:42		07:35	08:26
	16:43	17:31	18:22	23 17:44 (2)	20:15	49 19:35 (4)	21:05	21:51	22:04	21:33	20:32	14 19:09 (3)	19:23		17:17	16:37
2	08:50	08:22	07:28	17:20 (2)	07:18	18:46 (3)	06:14	05:31	05:29	06:06	06:55	18:51 (3)	07:44		07:37	08:27
	16:44	17:32	18:23	23 17:43 (2)	20:17	49 19:35 (4)	21:07	21:52	22:04	21:31	20:29	20 19:11 (3)	19:20		17:15	16:37
3	08:49	08:20	07:26	17:21 (2)	07:16	18:46 (3)	06:12	05:30	05:30	06:08	06:57	18:49 (3)	07:45		07:39	08:29
	16:45	17:34	18:25	21 17:42 (2)	20:18	47 19:33 (4)	21:09	21:53	22:04	21:30	20:27	24 19:13 (3)	19:18		17:14	16:36
4	08:49	08:19	07:24	17:22 (2)	07:14	18:46 (3)	06:11	05:29	05:31	06:09	06:59	18:47 (3)	07:47		07:41	08:30
	16:47	17:36	18:27	19 17:41 (2)	20:20	46 19:32 (4)	21:10	21:54	22:03	21:28	20:25	26 19:13 (3)	19:16		17:12	16:36
5	08:49	08:17	07:22	17:24 (2)	07:11	18:47 (3)	06:09	05:28	05:32	06:11	07:00	18:45 (3)	07:49		07:42	08:31
	16:48	17:38	18:29	16 17:40 (2)	20:22	43 19:30 (4)	21:12	21:55	22:03	21:26	20:23	36 19:21 (4)	19:14		17:10	16:35
6	08:49	08:15	07:19	17:27 (2)	07:09	18:48 (3)	06:07	05:28	05:32	06:12	07:02	18:43 (3)	07:50		07:44	08:33
	16:49	17:40	18:30	11 17:38 (2)	20:23	41 19:29 (4)	21:14	21:56	22:02	21:25	20:20	41 19:24 (4)	19:11		17:08	16:35
7	08:48	08:14	07:17		07:07	18:48 (3)	06:05	05:27	05:33	06:14	07:03	18:42 (3)	07:52	18:03 (2)	07:46	08:34
	16:50	17:42	18:32		20:25	36 19:24 (4)	21:15	21:57	22:02	21:23	20:18	43 19:25 (4)	19:09	8 18:11 (2)	17:07	16:34
8	08:48	08:12	07:15		07:05	18:50 (3)	06:03	05:27	05:34	06:15	07:05	18:40 (3)	07:54	18:00 (2)	07:48	08:35
	16:51	17:43	18:34		20:27	26 19:16 (3)	21:17	21:57	22:01	21:21	20:16	46 19:26 (4)	19:07	14 18:14 (2)	17:05	16:34
9	08:47	08:10	07:13		07:02	18:51 (3)	06:02	05:26	05:35	06:17	07:07	18:40 (3)	07:55	17:58 (2)	07:50	08:36
	16:53	17:45	18:36		20:28	24 19:15 (3)	21:18	21:58	22:01	21:19	20:14	47 19:27 (4)	19:05	17 18:15 (2)	17:03	16:34
10	08:47	08:08	07:11		07:00	18:53 (3)	06:00	05:26	05:36	06:19	07:08	18:39 (3)	07:57	17:56 (2)	07:51	08:37
	16:54	17:47	18:37		20:30	20 19:13 (3)	21:20	21:59	22:00	21:17	20:11	49 19:28 (4)	19:02	20 18:16 (2)	17:02	16:33
11	08:46	08:06	07:08		06:58	18:56 (3)	05:58	05:25	05:37	06:20	07:10	18:38 (3)	07:59	17:55 (2)	07:53	08:38
	16:56	17:49	18:39		20:32	14 19:10 (3)	21:22	22:00	21:59	21:15	20:09	49 19:27 (4)	19:00	22 18:17 (2)	17:00	16:33
12	08:46	08:05	07:06		06:56		05:57	05:25	05:38	06:22	07:11	18:38 (3)	08:01	17:54 (2)	07:55	08:39
	16:57	17:51	18:41		20:34		21:23	22:01	21:58	21:13	20:07	50 19:28 (4)	18:58	23 18:17 (2)	16:59	16:33
13	08:45	08:03	07:04		06:53		05:55	05:25	05:39	06:23	07:13	18:37 (3)	08:02	17:54 (2)	07:57	08:40
	16:59	17:53	18:43		20:35		21:25	22:01	21:57	21:12	20:04	50 19:27 (4)	18:56	24 18:18 (2)	16:57	16:33
14	08:44	08:01	07:02		06:51		05:54	05:25	05:40	06:25	07:15	18:37 (3)	08:04	17:53 (2)	07:58	08:41
	17:00	17:54	18:44		20:37		21:26	22:02	21:56	21:10	20:02	50 19:27 (4)	18:54	24 18:17 (2)	16:56	16:33
15	08:43	07:59	06:59		06:49		05:52	05:24	05:42	06:27	07:16	18:36 (3)	08:06	17:52 (2)	08:00	08:42
	17:02	17:56	18:46		20:39		21:28	22:02	21:55	21:08	20:00	50 19:26 (4)	18:51	25 18:17 (2)	16:54	16:33
16	08:43	07:57	06:57		06:47		05:50	05:24	05:43	06:28	07:18	18:37 (3)	08:07	17:53 (2)	08:02	08:43
	17:03	17:58	18:48		20:40		21:29	22:03	21:54	21:06	19:57	48 19:25 (4)	18:49	23 18:16 (2)	16:53	16:33
17	08:42	07:55	06:55		06:45		05:49	05:24	05:44	06:30	07:19	18:37 (3)	08:09	17:53 (2)	08:04	08:44
	17:05	18:00	18:50		20:42		21:31	22:03	21:53	21:04	19:55	48 19:25 (4)	18:47	23 18:16 (2)	16:52	16:34
18	08:41	07:53	06:52		06:43		05:48	05:24	05:45	06:31	07:21	18:37 (3)	08:11	17:54 (2)	08:05	08:45
	17:06	18:02	18:51		20:44		21:32	22:04	21:52	21:02	19:53	46 19:23 (4)	18:45	21 18:15 (2)	16:50	16:34
19	08:40	07:51	06:50	18:02 (3)	06:40		05:46	05:24	05:46	06:33	07:23	18:38 (3)	08:13	17:55 (2)	08:07	08:45
	17:08	18:04	18:53	12 18:14 (3)	20:45		21:34	22:04	21:51	21:00	19:50	44 19:22 (4)	18:43	19 18:14 (2)	16:49	16:34
20	08:39	07:49	17:27 (2)	06:48	17:58 (3)	06:38		05:45	05:24	05:48	06:35	07:24	18:38 (3)	08:14	17:55 (2)	08:09	08:46
	17:10	18:05	11 17:38 (2)	18:55	19 18:17 (3)	20:47		21:35	22:04	21:50	20:58	19:48	41 19:19 (4)	18:41	17 18:12 (2)	16:48	16:34
21	08:38	07:47	17:25 (2)	06:46	17:56 (3)	06:36		05:43	05:25	05:49	06:36	07:26	18:39 (3)	08:16	17:56 (2)	08:10	08:47
	17:11	18:07	15 17:40 (2)	18:56	23 18:19 (3)	20:49		21:37	22:05	21:49	20:55	19:46	37 19:16 (4)	18:39	14 18:10 (2)	16:47	16:35
22	08:37	07:45	17:24 (2)	06:43	17:54 (3)	06:34		05:42	05:25	05:50	06:38	07:28	18:40 (3)	08:18	17:59 (2)	08:12	08:47
	17:13	18:09	18 17:42 (2)	18:58	36 18:30 (4)	20:50		21:38	22:05	21:48	20:53	19:43	24 19:04 (3)	18:37	9 18:08 (2)	16:46	16:35
23	08:35	07:43	17:23 (2)	06:41	17:52 (3)	06:32		05:41	05:25	05:52	06:39	07:29	18:42 (3)	08:19		08:14	08:48
	17:15	18:11	20 17:43 (2)	19:00	40 18:32 (4)	20:52		21:39	22:05	21:46	20:51	19:41	20 19:02 (3)	18:35		16:44	16:36
24	08:34	07:41	17:22 (2)	06:39	17:51 (3)	06:30		05:40	05:25	05:53	06:41	07:31	18:45 (3)	08:21		08:15	08:48
	17:16	18:13	22 17:44 (2)	19:01	43 18:34 (4)	20:54		21:41	22:05	21:45	20:49	19:39	14 18:59 (3)	18:33		16:43	16:36
25	08:33	07:39	17:21 (2)	06:36	17:50 (3)	06:28		05:39	05:26	05:54	06:43	07:32		07:23		08:17	08:48
	17:18	18:14	23 17:44 (2)	19:03	45 18:35 (4)	20:55		21:42	22:05	21:44	20:47	19:37		17:31		16:42	16:37
26	08:32	07:37	17:20 (2)	06:34	17:49 (3)	06:26		05:37	05:26	05:56	06:44	07:34		07:25		08:18	08:49
	17:20	18:16	24 17:44 (2)	19:05	47 18:36 (4)	20:57		21:43	22:05	21:42	20:45	19:34		17:29		16:41	16:38
27	08:30	07:35	17:20 (2)	06:32	17:47 (3)	06:24		05:36	05:26	05:57	06:46	07:36		07:26		08:20	08:49
	17:22	18:18	24 17:44 (2)	19:07	49 18:36 (4)	20:59		21:45	22:05	21:41	20:43	19:32		17:27		16:41	16:38
28	08:29	07:33	17:20 (2)	06:30	17:47 (3)	06:22		05:35	05:27	05:59	06:47	07:37		07:28		08:21	08:49
	17:23	18:20	24 17:44 (2)	19:08	49 18:36 (4)	21:00		21:46	22:05	21:39	20:40	19:30		17:25		16:40	16:39
29	08:28			07:27	18:47 (3)	06:20		05:34	05:27	06:00	06:49	07:39		07:30		08:23	08:49
	17:25			20:10	50 19:37 (4)	21:02		21:47	22:05	21:38	20:38	19:27		17:23		16:39	16:40
30	08:26			07:25	18:46 (3)	06:18		05:33	05:28	06:02	06:51	07:41		07:32		08:24	08:50
	17:27			20:12	50 19:36 (4)	21:04		21:48	22:05	21:36	20:36	19:25		17:21		16:38	16:41
31	08:25			07:23	18:46 (3)			05:32		06:03	06:52			07:34			08:50
	17:29			20:13	50 19:36 (4)			21:49		21:35	20:34			17:19			16:42
Potential sun hours	260	278	367		415		484	497	501	453	381		332		267	245
Total, worst case		181		626	395							917		303		
Sun reduction		0,32		0,37	0,45							0,39		0,36		
Oper. time red.		0,99		0,99	0,99							0,99		0,99		
Wind dir. red.		0,66		0,62	0,61							0,61		0,66		
Total reduction		0,21		0,23	0,28							0,24		0,24		
Total, real		38		144	110							221		72		

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

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

Licensed user:
LBP SIGHT
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+31 3023 11377
David Vrolijk / dv@lbpsight.nl
Calculated:
3-2-2020 14:39/3.1.633

SHADOW - Calendar

Calculation: L136@147mShadow receptor: 4671TH7 - Schenkeldijk 7

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2,20	3,20	4,40	6,30	7,10	7,20	7,20	6,60	5,00	3,90	2,30	1,70

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
563	673	737	507	350	394	853	1.312	1.152	974	554	619	8.688

Idle start wind speed: Cut in wind speed from power curve

	January		February		March		April		May		June	
1	08:50		08:23		07:30		07:21		06:16		06:42 (3)	05:32		06:11 (4)
	16:43		17:31		18:22		20:15		21:05	19	07:01 (3)	21:51	94	07:56 (1)
2	08:50		08:22		07:28		07:18		07:56 (2)		06:14	06:41 (3)	05:31	06:10 (4)
	16:44		17:33		18:24		20:17	14	08:10 (2)		21:07	20	07:01 (3)	21:52	97	07:56 (1)
3	08:49		08:20		07:26		07:16		07:52 (2)		06:13	06:39 (3)	05:30	06:10 (4)
	16:46		17:34		18:25		20:19	20	08:12 (2)		21:09	23	07:02 (3)	21:53	99	07:57 (1)
4	08:49		08:19		07:24		07:14		07:50 (2)		06:11	06:38 (3)	05:29	06:10 (4)
	16:47		17:36		18:27		20:20	24	08:14 (2)		21:10	24	07:02 (3)	21:54	99	07:57 (1)
5	08:49		08:17		07:22		07:11		07:48 (2)		06:09	06:39 (3)	05:29	06:09 (4)
	16:48		17:38		18:29		20:22	28	08:16 (2)		21:12	24	07:03 (3)	21:55	101	07:57 (1)
6	08:49		08:15		07:20		07:09		07:46 (2)		06:07	06:38 (3)	05:28	06:10 (4)
	16:49		17:40		18:31		20:24	31	08:17 (2)		21:14	25	07:03 (3)	21:56	101	07:58 (1)
7	08:48		08:14		07:17		07:07		07:44 (2)		06:05	06:37 (3)	05:27	06:09 (4)
	16:50		17:42		18:32		20:25	33	08:17 (2)		21:15	26	07:03 (3)	21:57	103	07:58 (1)
8	08:48		08:12		07:15		07:05		07:43 (2)		06:04	06:38 (3)	05:27	06:09 (4)
	16:52		17:44		18:34		20:27	35	08:18 (2)		21:17	25	07:03 (3)	21:58	104	07:59 (1)
9	08:47		08:10		07:13		07:02		07:42 (2)		06:02	06:37 (3)	05:26	06:10 (4)
	16:53		17:45		18:36		20:29	37	08:19 (2)		21:18	26	07:03 (3)	21:58	103	07:59 (1)
10	08:47		08:08		07:11		07:00		07:41 (2)		06:00	06:37 (3)	05:26	06:09 (4)
	16:54		17:47		18:38		20:30	38	08:19 (2)		21:20	25	07:02 (3)	21:59	105	07:59 (1)
11	08:46		08:07		07:08		06:58		07:41 (2)		05:58	06:37 (3)	05:26	06:10 (4)
	16:56		17:49		18:39		20:32	38	08:19 (2)		21:22	41	07:30 (1)	22:00	104	08:00 (1)
12	08:46		08:05		07:06		06:56		07:40 (2)		05:57	06:37 (3)	05:25	06:10 (4)
	16:57		17:51		18:41		20:34	39	08:19 (2)		21:23	49	07:34 (1)	22:01	105	08:00 (1)
13	08:45		08:03		07:04		06:54		07:39 (2)		05:55	06:38 (3)	05:25	06:10 (4)
	16:59		17:53		18:43		20:35	39	08:18 (2)		21:25	53	07:37 (1)	22:01	106	08:01 (1)
14	08:44		08:01		07:02		06:51		07:38 (2)		05:54	06:38 (3)	05:25	06:10 (4)
	17:00		17:55		18:45		20:37	40	08:18 (2)		21:26	55	07:38 (1)	22:02	107	08:01 (1)
15	08:44		07:59		06:59		06:49		07:38 (2)		05:52	06:39 (3)	05:25	06:10 (4)
	17:02		17:56		18:46		20:39	40	08:18 (2)		21:28	59	07:41 (1)	22:02	106	08:01 (1)
16	08:43		07:57		06:57		06:47		07:38 (2)		05:51	06:40 (3)	05:25	06:10 (4)
	17:03		17:58		18:48		20:40	40	08:18 (2)		21:29	61	07:43 (1)	22:03	107	08:01 (1)
17	08:42		07:55		06:55		06:45		07:38 (2)		05:49	06:40 (3)	05:24	06:10 (4)
	17:05		18:00		18:50		20:42	39	08:17 (2)		21:31	61	07:43 (1)	22:03	107	08:01 (1)
18	08:41		07:53		06:53		06:43		07:39 (2)		05:48	06:42 (3)	05:24	06:10 (4)
	17:06		18:02		18:51		20:44	38	08:17 (2)		21:32	61	07:45 (1)	22:04	107	08:01 (1)
19	08:40		07:51		06:50		06:41		07:39 (2)		05:46	06:43 (3)	05:24	06:11 (4)
	17:08		18:04		18:53		20:45	37	08:16 (2)		21:34	61	07:46 (1)	22:04	107	08:02 (1)
20	08:39		07:49		06:48		06:39		07:39 (2)		05:45	06:45 (3)	05:25	06:11 (4)
	17:10		18:06		18:55		20:47	36	08:15 (2)		21:35	61	07:48 (1)	22:05	108	08:03 (1)
21	08:38		07:47		06:46		06:36		07:40 (2)		05:44	06:47 (3)	05:25	06:11 (4)
	17:11		18:07		18:57		20:49	34	08:14 (2)		21:37	56	07:48 (1)	22:05	108	08:03 (1)
22	08:37		07:45		06:43		06:34		07:40 (2)		05:42	06:21 (4)	05:25	06:11 (4)
	17:13		18:09		18:58		20:50	33	08:13 (2)		21:38	60	07:49 (1)	22:05	108	08:03 (1)
23	08:36		07:43		06:41		06:32		07:41 (2)		05:41	06:18 (4)	05:25	06:11 (4)
	17:15		18:11		19:00		20:52	30	08:11 (2)		21:39	68	07:50 (1)	22:05	108	08:03 (1)
24	08:34		07:41		06:39		06:30		07:42 (2)		05:40	06:16 (4)	05:25	06:12 (4)
	17:16		18:13		19:02		20:54	28	08:10 (2)		21:41	74	07:51 (1)	22:05	107	08:03 (1)
25	08:33		07:39		06:37		06:28		07:43 (2)		05:39	06:15 (4)	05:26	06:12 (4)
	17:18		18:15		19:03		20:55	25	08:08 (2)		21:42	77	07:51 (1)	22:05	107	08:03 (1)
26	08:32		07:37		06:34		06:26		07:44 (2)		05:38	06:14 (4)	05:26	06:12 (4)
	17:20		18:16		19:05		20:57	22	08:06 (2)		21:43	81	07:52 (1)	22:05	107	08:03 (1)
27	08:30		07:35		06:32		06:24		07:46 (2)		05:36	06:13 (4)	05:27	06:13 (4)
	17:22		18:18		19:07		20:59	17	08:03 (2)		21:45	85	07:53 (1)	22:05	106	08:04 (1)
28	08:29		07:33		06:30		06:22		06:49 (3)		05:35	06:12 (4)	05:27	06:13 (4)
	17:24		18:20		19:08		21:00	16	08:00 (2)		21:46	87	07:53 (1)	22:05	106	08:03 (1)
29	08:28				07:27		06:20		06:45 (3)		05:34	06:12 (4)	05:28	06:13 (4)
	17:25				20:10		21:02	12	06:57 (3)		21:47	89	07:54 (1)	22:05	107	08:04 (1)
30	08:26				07:25		06:18		06:43 (3)		05:33	06:11 (4)	05:28	06:14 (4)
	17:27				20:12		21:04	16	06:59 (3)		21:48	91	07:54 (1)	22:05	105	08:04 (1)
31	08:25				07:23						05:33	06:11 (4)		
	17:29				20:13						21:50	94	07:56 (1)			
Potential sun hours	260		278		367		415				484			497		
Total, worst case								879				1661			3139	
Sun reduction								0,45				0,45			0,43	
Oper. time red.								0,99				0,99			0,99	
Wind dir. red.								0,61				0,66			0,66	
Total reduction								0,28				0,30			0,29	
Total, real								243				491			896	

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

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

Licensed user:
LBP SIGHT
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+31 3023 11377
David Vrolijk / dv@lbpsight.nl
Calculated:
3-2-2020 14:39/3.1.633

SHADOW - Calendar

Calculation: L136@147mShadow receptor: 4671TH7 - Schenkeldijk 7

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2,20	3,20	4,40	6,30	7,10	7,20	7,20	6,60	5,00	3,90	2,30	1,70

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
563	673	737	507	350	394	853	1.312	1.152	974	554	619	8.688

Idle start wind speed: Cut in wind speed from power curve

	July		August		September		October	November	December
1	05:29		06:14 (4)	06:05		06:47 (3)	06:54	07:40 (2)	07:42	07:35	08:26
	22:05	105	08:04 (1)	21:33	46	07:43 (1)	20:32	38	08:18 (2)	19:23	17:17	16:38
2	05:29		06:14 (4)	06:06		06:48 (3)	06:56	07:39 (2)	07:44	07:37	08:27
	22:04	105	08:04 (1)	21:32	36	07:38 (1)	20:30	38	08:17 (2)	19:21	17:16	16:37
3	05:30		06:15 (4)	06:08		06:47 (3)	06:57	07:40 (2)	07:46	07:39	08:29
	22:04	105	08:05 (1)	21:30	26	07:13 (3)	20:27	37	08:17 (2)	19:18	17:14	16:36
4	05:31		06:15 (4)	06:09		06:48 (3)	06:59	07:40 (2)	07:47	07:41	08:30
	22:03	103	08:04 (1)	21:28	25	07:13 (3)	20:25	35	08:15 (2)	19:16	17:12	16:36
5	05:32		06:15 (4)	06:11		06:47 (3)	07:00	07:41 (2)	07:49	07:43	08:31
	22:03	103	08:04 (1)	21:26	26	07:13 (3)	20:23	33	08:14 (2)	19:14	17:10	16:35
6	05:33		06:16 (4)	06:12		06:48 (3)	07:02	07:42 (2)	07:51	07:44	08:33
	22:02	101	08:04 (1)	21:25	25	07:13 (3)	20:20	31	08:13 (2)	19:12	17:09	16:35
7	05:33		06:16 (4)	06:14		06:47 (3)	07:04	07:43 (2)	07:52	07:46	08:34
	22:02	101	08:05 (1)	21:23	25	07:12 (3)	20:18	28	08:11 (2)	19:09	17:07	16:34
8	05:34		06:17 (4)	06:16		06:47 (3)	07:05	07:45 (2)	07:54	07:48	08:35
	22:01	100	08:05 (1)	21:21	24	07:11 (3)	20:16	25	08:10 (2)	19:07	17:05	16:34
9	05:35		06:17 (4)	06:17		06:48 (3)	07:07	07:46 (2)	07:56	07:50	08:36
	22:01	98	08:04 (1)	21:19	23	07:11 (3)	20:14	21	08:07 (2)	19:05	17:04	16:34
10	05:36		06:17 (4)	06:19		06:48 (3)	07:08	07:49 (2)	07:57	07:51	08:37
	22:00	98	08:04 (1)	21:17	22	07:10 (3)	20:11	15	08:04 (2)	19:03	17:02	16:34
11	05:37		06:18 (4)	06:20		06:50 (3)	07:10	07:53 (2)	07:59	07:53	08:38
	21:59	95	08:03 (1)	21:16	20	07:10 (3)	20:09	4	07:57 (2)	19:00	17:00	16:33
12	05:38		06:18 (4)	06:22		06:50 (3)	07:12		08:01	07:55	08:40
	21:58	95	08:03 (1)	21:14	18	07:08 (3)	20:07		18:58	16:59	16:33
13	05:39		06:19 (4)	06:23		06:52 (3)	07:13		08:02	07:57	08:40
	21:57	92	08:03 (1)	21:12	15	07:07 (3)	20:04		18:56	16:57	16:33
14	05:41		06:20 (4)	06:25		06:54 (3)	07:15		08:04	07:58	08:41
	21:57	91	08:03 (1)	21:10	10	07:04 (3)	20:02		18:54	16:56	16:33
15	05:42		06:21 (4)	06:27		07:56 (2)	07:16		08:06	08:00	08:42
	21:56	88	08:03 (1)	21:08	12	08:08 (2)	20:00		18:52	16:54	16:33
16	05:43		06:22 (4)	06:28		07:52 (2)	07:18		08:07	08:02	08:43
	21:55	86	08:03 (1)	21:06	18	08:10 (2)	19:58		18:49	16:53	16:33
17	05:44		06:23 (4)	06:30		07:51 (2)	07:20		08:09	08:04	08:44
	21:54	83	08:02 (1)	21:04	22	08:13 (2)	19:55		18:47	16:52	16:34
18	05:45		06:24 (4)	06:31		07:48 (2)	07:21		08:11	08:05	08:45
	21:52	79	08:01 (1)	21:02	26	08:14 (2)	19:53		18:45	16:50	16:34
19	05:47		06:25 (4)	06:33		07:47 (2)	07:23		08:13	08:07	08:45
	21:51	77	08:01 (1)	21:00	29	08:16 (2)	19:51		18:43	16:49	16:34
20	05:48		06:27 (4)	06:35		07:46 (2)	07:24		08:14	08:09	08:46
	21:50	71	08:00 (1)	20:58	30	08:16 (2)	19:48		18:41	16:48	16:35
21	05:49		06:30 (4)	06:36		07:45 (2)	07:26		08:16	08:10	08:47
	21:49	65	08:00 (1)	20:56	33	08:18 (2)	19:46		18:39	16:47	16:35
22	05:51		07:06 (1)	06:38		07:44 (2)	07:28		08:18	08:12	08:47
	21:48	53	07:59 (1)	20:53	35	08:19 (2)	19:44		18:37	16:46	16:35
23	05:52		06:56 (3)	06:39		07:43 (2)	07:29		08:20	08:14	08:48
	21:46	58	07:58 (1)	20:51	36	08:19 (2)	19:41		18:35	16:45	16:36
24	05:53		06:54 (3)	06:41		07:42 (2)	07:31		08:21	08:15	08:48
	21:45	61	07:57 (1)	20:49	38	08:20 (2)	19:39		18:33	16:44	16:37
25	05:55		06:53 (3)	06:43		07:41 (2)	07:33		07:23	08:17	08:49
	21:44	61	07:56 (1)	20:47	39	08:20 (2)	19:37		17:31	16:43	16:37
26	05:56		06:52 (3)	06:44		07:41 (2)	07:34		07:25	08:18	08:49
	21:42	61	07:55 (1)	20:45	39	08:20 (2)	19:34		17:29	16:42	16:38
27	05:57		06:50 (3)	06:46		07:40 (2)	07:36		07:27	08:20	08:49
	21:41	61	07:53 (1)	20:43	40	08:20 (2)	19:32		17:27	16:41	16:39
28	05:59		06:50 (3)	06:47		07:40 (2)	07:37		07:28	08:21	08:49
	21:39	59	07:52 (1)	20:41	40	08:20 (2)	19:30		17:25	16:40	16:39
29	06:00		06:49 (3)	06:49		07:39 (2)	07:39		07:30	08:23	08:50
	21:38	57	07:50 (1)	20:38	40	08:19 (2)	19:27		17:23	16:39	16:40
30	06:02		06:49 (3)	06:51		07:40 (2)	07:41		07:32	08:24	08:50
	21:36	55	07:49 (1)	20:36	39	08:19 (2)	19:25		17:21	16:38	16:41
31	06:03		06:48 (3)	06:52		07:39 (2)			07:34		08:50
	21:35	51	07:46 (1)	20:34	39	08:18 (2)			17:19		16:42
Potential sun hours	501			453			381		332	267	245
Total, worst case		2518			896			305			
Sun reduction		0,45			0,45			0,39			
Oper. time red.		0,99			0,99			0,99			
Wind dir. red.		0,66			0,63			0,61			
Total reduction		0,29			0,28			0,24			
Total, real		734			252			73			

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)

Licensed user:
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David Vrolijk / dv@lbpsight.nl
Calculated:
3-2-2020 14:39/3.1.633

SHADOW - Calendar

Calculation: L136@147mShadow receptor: 4671TH9 - Schenkeldijk 9

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2,20	3,20	4,40	6,30	7,10	7,20	7,20	6,60	5,00	3,90	2,30	1,70

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
563	673	737	507	350	394	853	1.312	1.152	974	554	619	8.688

Idle start wind speed: Cut in wind speed from power curve

	January		February		March		April		May		June	
1	08:50		08:23		07:30		07:21		08:00 (2)		06:16	
	16:43		17:31		18:22		20:15	11	08:11 (2)		21:05	17
2	08:50		08:22		07:28		07:18		07:56 (2)		06:14	
	16:44		17:33		18:24		20:17	19	08:15 (2)		21:07	20
3	08:49		08:20		07:26		07:16		07:53 (2)		06:13	
	16:46		17:34		18:25		20:19	23	08:16 (2)		21:09	22
4	08:49		08:19		07:24		07:14		07:51 (2)		06:11	
	16:47		17:36		18:27		20:20	27	08:18 (2)		21:10	23
5	08:49		08:17		07:22		07:11		07:49 (2)		06:09	
	16:48		17:38		18:29		20:22	30	08:19 (2)		21:12	24
6	08:49		08:15		07:20		07:09		07:48 (2)		06:07	
	16:49		17:40		18:31		20:24	33	08:21 (2)		21:14	25
7	08:48		08:14		07:17		07:07		07:45 (2)		06:05	
	16:50		17:42		18:32		20:25	36	08:21 (2)		21:15	26
8	08:48		08:12		07:15		07:05		07:44 (2)		06:04	
	16:52		17:44		18:34		20:27	37	08:21 (2)		21:17	27
9	08:47		08:10		07:13		07:02		07:44 (2)		06:02	
	16:53		17:45		18:36		20:29	38	08:22 (2)		21:18	26
10	08:47		08:08		07:11		07:00		07:43 (2)		06:00	
	16:54		17:47		18:38		20:30	39	08:22 (2)		21:20	27
11	08:46		08:07		07:08		06:58		07:42 (2)		05:58	
	16:56		17:49		18:39		20:32	41	08:23 (2)		21:22	26
12	08:46		08:05		07:06		06:56		07:42 (2)		05:57	
	16:57		17:51		18:41		20:34	41	08:23 (2)		21:23	25
13	08:45		08:03		07:04		06:54		07:40 (2)		05:55	
	16:59		17:53		18:43		20:35	42	08:22 (2)		21:25	38
14	08:44		08:01		07:02		06:51		07:40 (2)		05:54	
	17:00		17:55		18:45		20:37	42	08:22 (2)		21:26	46
15	08:44		07:59		06:59		06:49		07:40 (2)		05:52	
	17:02		17:56		18:46		20:39	41	08:21 (2)		21:28	51
16	08:43		07:57		06:57		06:47		07:40 (2)		05:51	
	17:03		17:58		18:48		20:40	41	08:21 (2)		21:29	55
17	08:42		07:55		06:55		06:45		07:40 (2)		05:49	
	17:05		18:00		18:50		20:42	40	08:20 (2)		21:31	57
18	08:41		07:53		06:53		06:43		07:40 (2)		05:48	
	17:06		18:02		18:51		20:44	40	08:20 (2)		21:32	59
19	08:40		07:51		06:50		06:41		07:41 (2)		05:46	
	17:08		18:04		18:53		20:45	38	08:19 (2)		21:34	60
20	08:39		07:49		06:48		06:39		07:41 (2)		05:45	
	17:10		18:06		18:55		20:47	37	08:18 (2)		21:35	60
21	08:38		07:47		06:46		06:36		07:41 (2)		05:44	
	17:11		18:07		18:57		20:49	36	08:17 (2)		21:37	59
22	08:37		07:45		06:43		06:34		07:42 (2)		05:42	
	17:13		18:09		18:58		20:50	34	08:16 (2)		21:38	57
23	08:36		07:43		06:41		06:32		07:43 (2)		05:41	
	17:15		18:11		19:00		20:52	32	08:15 (2)		21:39	52
24	08:34		07:41		06:39		06:30		07:44 (2)		05:40	
	17:16		18:13		19:02		20:54	29	08:13 (2)		21:41	63
25	08:33		07:39		06:37		06:28		07:45 (2)		05:39	
	17:18		18:15		19:03		20:55	26	08:11 (2)		21:42	69
26	08:32		07:37		06:34		06:26		07:46 (2)		05:38	
	17:20		18:16		19:05		20:57	23	08:09 (2)		21:43	75
27	08:30		07:35		06:32		06:24		07:47 (2)		05:36	
	17:22		18:18		19:07		20:59	20	08:07 (2)		21:45	79
28	08:29		07:33		06:30		06:22		07:50 (2)		05:35	
	17:24		18:20		19:08		21:00	14	08:04 (2)		21:46	82
29	08:28				07:27		06:20		06:46 (3)		05:34	
	17:25				20:10		21:02	13	07:58 (2)		21:47	85
30	08:26				07:25		06:18		06:44 (3)		05:33	
	17:27				20:12		21:04	14	06:58 (3)		21:48	89
31	08:25				07:23						05:33	
	17:29				20:13						21:50	91
Potential sun hours	260		278		367		415				484	
Total, worst case								937				1515
Sun reduction								0,45				0,45
Oper. time red.								0,99				0,99
Wind dir. red.								0,61				0,66
Total reduction								0,28				0,30
Total, real								259				448

	June		
1	06:43 (3)	05:32	06:11 (4)
	07:00 (3)	21:51	07:58 (1)
2	06:41 (3)	05:31	06:10 (4)
	07:01 (3)	21:52	07:59 (1)
3	06:40 (3)	05:30	06:10 (4)
	07:02 (3)	21:53	08:00 (1)
4	06:39 (3)	05:29	06:10 (4)
	07:02 (3)	21:54	08:00 (1)
5	06:39 (3)	05:29	06:09 (4)
	07:03 (3)	21:55	08:00 (1)
6	06:38 (3)	05:28	06:09 (4)
	07:03 (3)	21:56	08:01 (1)
7	06:37 (3)	05:27	06:09 (4)
	07:03 (3)	21:57	08:01 (1)
8	06:37 (3)	05:27	06:09 (4)
	07:04 (3)	21:58	08:02 (1)
9	06:37 (3)	05:26	06:09 (4)
	07:03 (3)	21:58	08:03 (1)
10	06:36 (3)	05:26	06:09 (4)
	07:03 (3)	21:59	08:02 (1)
11	06:37 (3)	05:26	06:09 (4)
	07:03 (3)	22:00	08:03 (1)
12	06:37 (3)	05:25	06:09 (4)
	07:02 (3)	22:01	08:04 (1)
13	06:37 (3)	05:25	06:09 (4)
	07:31 (1)	22:01	08:04 (1)
14	06:37 (3)	05:25	06:10 (4)
	07:35 (1)	22:02	08:05 (1)
15	06:38 (3)	05:25	06:09 (4)
	07:39 (1)	22:02	08:04 (1)
16	06:39 (3)	05:25	06:09 (4)
	07:42 (1)	22:03	08:04 (1)
17	06:39 (3)	05:24	06:09 (4)
	07:43 (1)	22:03	08:05 (1)
18	06:40 (3)	05:24	06:09 (4)
	07:45 (1)	22:04	08:05 (1)
19	06:42 (3)	05:24	06:10 (4)
	07:47 (1)	22:04	08:06 (1)
20	06:43 (3)	05:25	06:11 (4)
	07:48 (1)	22:05	08:06 (1)
21	06:44 (3)	05:25	06:11 (4)
	07:49 (1)	22:05	08:06 (1)
22	06:46 (3)	05:25	06:11 (4)
	07:50 (1)	22:05	08:06 (1)
23	06:59 (1)	05:25	06:11 (4)
	07:51 (1)	22:05	08:06 (1)
24	06:19 (4)	05:25	06:11 (4)
	07:52 (1)	22:05	08:07 (1)
25	06:17 (4)	05:26	06:11 (4)
	07:53 (1)	22:05	08:07 (1)
26	06:15 (4)	05:26	06:11 (4)
	07:54 (1)	22:05	08:06 (1)
27	06:14 (4)	05:27	06:12 (4)
	07:55 (1)	22:05	08:07 (1)
28	06:13 (4)	05:27	06:12 (4)
	07:55 (1)	22:05	08:07 (1)
29	06:12 (4)	05:28	06:13 (4)
	07:56 (1)	22:05	08:07 (1)
30	06:11 (4)	05:28	06:13 (4)
	07:57 (1)	22:05	08:08 (1)
31	06:11 (4)		
	07:58 (1)		
Potential sun hours		497	
Total, worst case			3151
Sun reduction			0,43
Oper. time red.			0,99
Wind dir. red.			0,66
Total reduction			0,29
Total, real			901

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

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

Licensed user:
LBP SIGHT
Kelvinbaan 40, PO box 1475
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+31 3023 11377
David Vrolijk / dv@lbpsight.nl
Calculated:
3-2-2020 14:39/3.1.633

SHADOW - Calendar

Calculation: L136@147mShadow receptor: 4671TH9 - Schenkeldijk 9

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2,20	3,20	4,40	6,30	7,10	7,20	7,20	6,60	5,00	3,90	2,30	1,70

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
563	673	737	507	350	394	853	1.312	1.152	974	554	619	8.688

Idle start wind speed: Cut in wind speed from power curve

	July		August		September		October	November	December
1	05:29		06:13 (4)	06:05		06:47 (3)	06:54		07:41 (2)	07:42	07:35	08:26
	22:05	106	08:07 (1)	21:33	26	07:13 (3)	20:32	41	08:22 (2)	19:23	17:17	16:38
2	05:29		06:14 (4)	06:06		06:47 (3)	06:56		07:41 (2)	07:44	07:37	08:27
	22:04	105	08:08 (1)	21:32	27	07:14 (3)	20:30	39	08:20 (2)	19:21	17:16	16:37
3	05:30		06:14 (4)	06:08		06:47 (3)	06:57		07:42 (2)	07:46	07:39	08:29
	22:04	105	08:08 (1)	21:30	26	07:13 (3)	20:27	38	08:20 (2)	19:18	17:14	16:36
4	05:31		06:14 (4)	06:09		06:47 (3)	06:59		07:41 (2)	07:47	07:41	08:30
	22:03	104	08:07 (1)	21:28	27	07:14 (3)	20:25	37	08:18 (2)	19:16	17:12	16:36
5	05:32		06:15 (4)	06:11		06:47 (3)	07:00		07:42 (2)	07:49	07:43	08:31
	22:03	102	08:07 (1)	21:26	26	07:13 (3)	20:23	36	08:18 (2)	19:14	17:10	16:35
6	05:33		06:15 (4)	06:12		06:48 (3)	07:02		07:44 (2)	07:51	07:44	08:33
	22:02	101	08:07 (1)	21:25	25	07:13 (3)	20:20	33	08:17 (2)	19:12	17:09	16:35
7	05:33		06:16 (4)	06:14		06:47 (3)	07:04		07:44 (2)	07:52	07:46	08:34
	22:02	100	08:07 (1)	21:23	26	07:13 (3)	20:18	31	08:15 (2)	19:09	17:07	16:34
8	05:34		06:17 (4)	06:16		06:47 (3)	07:05		07:46 (2)	07:54	07:48	08:35
	22:01	98	08:07 (1)	21:21	25	07:12 (3)	20:16	27	08:13 (2)	19:07	17:05	16:34
9	05:35		06:16 (4)	06:17		06:48 (3)	07:07		07:47 (2)	07:56	07:50	08:36
	22:01	97	08:06 (1)	21:19	23	07:11 (3)	20:14	24	08:11 (2)	19:05	17:04	16:34
10	05:36		06:17 (4)	06:19		06:48 (3)	07:08		07:49 (2)	07:57	07:51	08:37
	22:00	96	08:06 (1)	21:17	22	07:10 (3)	20:11	19	08:08 (2)	19:03	17:02	16:34
11	05:37		06:18 (4)	06:20		06:50 (3)	07:10		07:52 (2)	07:59	07:53	08:38
	21:59	93	08:06 (1)	21:16	19	07:09 (3)	20:09	12	08:04 (2)	19:00	17:00	16:33
12	05:38		06:19 (4)	06:22		06:51 (3)	07:12			08:01	07:55	08:40
	21:58	91	08:06 (1)	21:14	17	07:08 (3)	20:07			18:58	16:59	16:33
13	05:39		06:19 (4)	06:23		06:53 (3)	07:13			08:02	07:57	08:40
	21:57	90	08:05 (1)	21:12	13	07:06 (3)	20:04			18:56	16:57	16:33
14	05:41		06:20 (4)	06:25		06:55 (3)	07:15			08:04	07:58	08:41
	21:57	87	08:05 (1)	21:10	16	08:08 (2)	20:02			18:54	16:56	16:33
15	05:42		06:22 (4)	06:27		07:57 (2)	07:16			08:06	08:00	08:42
	21:56	83	08:05 (1)	21:08	15	08:12 (2)	20:00			18:52	16:54	16:33
16	05:43		06:23 (4)	06:28		07:54 (2)	07:18			08:07	08:02	08:43
	21:55	81	08:05 (1)	21:06	20	08:14 (2)	19:58			18:49	16:53	16:33
17	05:44		06:24 (4)	06:30		07:52 (2)	07:20			08:09	08:04	08:44
	21:54	77	08:04 (1)	21:04	24	08:16 (2)	19:55			18:47	16:52	16:34
18	05:45		06:26 (4)	06:31		07:50 (2)	07:21			08:11	08:05	08:45
	21:52	72	08:03 (1)	21:02	27	08:17 (2)	19:53			18:45	16:50	16:34
19	05:47		06:27 (4)	06:33		07:49 (2)	07:23			08:13	08:07	08:45
	21:51	67	08:02 (1)	21:00	30	08:19 (2)	19:51			18:43	16:49	16:34
20	05:48		06:31 (4)	06:35		07:47 (2)	07:24			08:14	08:09	08:46
	21:50	57	08:01 (1)	20:58	33	08:20 (2)	19:48			18:41	16:48	16:35
21	05:49		07:10 (1)	06:36		07:47 (2)	07:26			08:16	08:10	08:47
	21:49	51	08:01 (1)	20:56	34	08:21 (2)	19:46			18:39	16:47	16:35
22	05:50		06:56 (3)	06:38		07:46 (2)	07:28			08:18	08:12	08:47
	21:48	58	08:00 (1)	20:53	36	08:22 (2)	19:44			18:37	16:46	16:35
23	05:52		06:54 (3)	06:39		07:45 (2)	07:29			08:20	08:14	08:48
	21:46	60	07:59 (1)	20:51	37	08:22 (2)	19:41			18:35	16:45	16:36
24	05:53		06:52 (3)	06:41		07:44 (2)	07:31			08:21	08:15	08:48
	21:45	60	07:57 (1)	20:49	39	08:23 (2)	19:39			18:33	16:44	16:37
25	05:55		06:52 (3)	06:43		07:43 (2)	07:32			07:23	08:17	08:49
	21:44	60	07:57 (1)	20:47	40	08:23 (2)	19:37			17:31	16:43	16:37
26	05:56		06:50 (3)	06:44		07:43 (2)	07:34			07:25	08:18	08:49
	21:42	58	07:55 (1)	20:45	40	08:23 (2)	19:34			17:29	16:42	16:38
27	05:57		06:49 (3)	06:46		07:42 (2)	07:36			07:27	08:20	08:49
	21:41	57	07:53 (1)	20:43	41	08:23 (2)	19:32			17:27	16:41	16:39
28	05:59		06:49 (3)	06:47		07:42 (2)	07:37			07:28	08:21	08:49
	21:39	53	07:51 (1)	20:41	41	08:23 (2)	19:30			17:25	16:40	16:39
29	06:00		06:48 (3)	06:49		07:41 (2)	07:39			07:30	08:23	08:50
	21:38	50	07:48 (1)	20:38	41	08:22 (2)	19:27			17:23	16:39	16:40
30	06:02		06:49 (3)	06:51		07:41 (2)	07:41			07:32	08:24	08:50
	21:36	43	07:45 (1)	20:36	42	08:23 (2)	19:25			17:21	16:38	16:41
31	06:03		06:48 (3)	06:52		07:41 (2)				07:34		08:50
	21:35	30	07:38 (1)	20:34	41	08:22 (2)				17:19		16:42
Potential sun hours	501			453			381			332	267	245
Total, worst case		2392			899			337				
Sun reduction		0,45			0,45			0,39				
Oper. time red.		0,99			0,99			0,99				
Wind dir. red.		0,66			0,62			0,61				
Total reduction		0,29			0,28			0,24				
Total, real		698			252			80				

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

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

Licensed user:
LBP SIGHT
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+31 3023 11377
David Vrolijk / dv@lbpsight.nl
Calculated:
3-2-2020 14:39/3.1.633

SHADOW - Calendar

Calculation: L136@147mShadow receptor: 4794SM15 - 1-Februariweg 15

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2,20	3,20	4,40	6,30	7,10	7,20	7,20	6,60	5,00	3,90	2,30	1,70

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
563	673	737	507	350	394	853	1.312	1.152	974	554	619	8.688

Idle start wind speed: Cut in wind speed from power curve

	January		February		March	April	May	June	July	August	September	October	November		December	
1	08:50	15:41 (3)	08:23	16:34 (4)	07:30	07:20	06:16	05:31	05:29	06:05	06:54	07:42	07:35		08:26	15:26 (3)
	16:43 23	16:04 (3)	17:31 21	16:55 (4)	18:22	20:15	21:05	21:51	22:04	21:33	20:32	19:23	17:17		16:37 26	15:52 (3)
2	08:50	15:41 (3)	08:22	16:35 (4)	07:28	07:18	06:14	05:31	05:29	06:06	06:55	07:44	07:37	16:12 (4)	08:27	15:26 (3)
	16:44 23	16:04 (3)	17:32 21	16:56 (4)	18:23	20:17	21:07	21:52	22:04	21:31	20:29	19:20	17:15 8	16:20 (4)	16:37 26	15:52 (3)
3	08:49	15:41 (3)	08:20	16:35 (4)	07:26	07:16	06:12	05:30	05:30	06:08	06:57	07:45	07:39	16:09 (4)	08:29	15:27 (3)
	16:45 24	16:05 (3)	17:34 21	16:56 (4)	18:25	20:18	21:09	21:53	22:04	21:30	20:27	19:18	17:14 13	16:22 (4)	16:36 26	15:53 (3)
4	08:49	15:42 (3)	08:19	16:35 (4)	07:24	07:14	06:11	05:29	05:31	06:09	06:59	07:47	07:41	16:08 (4)	08:30	15:27 (3)
	16:46 24	16:06 (3)	17:36 20	16:55 (4)	18:27	20:20	21:10	21:54	22:03	21:28	20:25	19:16	17:12 15	16:23 (4)	16:36 26	15:53 (3)
5	08:49	15:41 (3)	08:17	16:35 (4)	07:22	07:11	06:09	05:28	05:32	06:11	07:00	07:49	07:42	16:07 (4)	08:31	15:27 (3)
	16:48 25	16:06 (3)	17:38 19	16:54 (4)	18:29	20:22	21:12	21:55	22:03	21:26	20:23	19:14	17:10 17	16:24 (4)	16:35 25	15:52 (3)
6	08:49	15:42 (3)	08:15	16:37 (4)	07:19	07:09	06:07	05:28	05:32	06:12	07:02	07:50	07:44	16:06 (4)	08:33	15:28 (3)
	16:49 25	16:07 (3)	17:40 18	16:55 (4)	18:30	20:23	21:14	21:56	22:02	21:25	20:20	19:11	17:08 19	16:25 (4)	16:35 25	15:53 (3)
7	08:48	15:42 (3)	08:14	16:38 (4)	07:17	07:07	06:05	05:27	05:33	06:14	07:03	07:52	07:46	16:06 (4)	08:34	15:28 (3)
	16:50 25	16:07 (3)	17:42 16	16:54 (4)	18:32	20:25	21:15	21:57	22:02	21:23	20:18	19:09	17:07 20	16:26 (4)	16:34 25	15:53 (3)
8	08:48	15:43 (3)	08:12	16:40 (4)	07:15	07:05	06:03	05:27	05:34	06:15	07:05	07:54	07:48	16:05 (4)	08:35	15:29 (3)
	16:51 25	16:08 (3)	17:43 12	16:52 (4)	18:34	20:27	21:17	21:58	22:01	21:21	20:16	19:07	17:05 21	16:26 (4)	16:34 24	15:53 (3)
9	08:47	15:43 (3)	08:10	16:43 (4)	07:13	07:02	06:02	05:26	05:35	06:17	07:07	07:55	07:50	16:04 (4)	08:36	15:30 (3)
	16:53 26	16:09 (3)	17:45 6	16:49 (4)	18:36	20:29	21:18	21:58	22:01	21:19	20:14	19:05	17:03 22	16:26 (4)	16:34 24	15:54 (3)
10	08:47	15:43 (3)	08:08		07:11	07:00	06:00	05:26	05:36	06:19	07:08	07:57	07:51	16:05 (4)	08:37	15:31 (3)
	16:54 26	16:09 (3)	17:47		18:37	20:30	21:20	21:59	22:00	21:17	20:11	19:02	17:02 21	16:26 (4)	16:33 23	15:54 (3)
11	08:46	15:44 (3)	08:06		07:08	06:58	05:58	05:25	05:37	06:20	07:10	07:59	07:53	16:05 (4)	08:38	15:31 (3)
	16:56 26	16:10 (3)	17:49		18:39	20:32	21:22	22:00	21:59	21:15	20:09	19:00	17:00 21	16:26 (4)	16:33 23	15:54 (3)
12	08:46	15:44 (3)	08:05		07:06	06:56	05:57	05:25	05:38	06:22	07:11	08:01	07:55	16:05 (4)	08:39	15:32 (3)
	16:57 26	16:10 (3)	17:51		18:41	20:34	21:23	22:01	21:58	21:14	20:07	18:58	16:59 21	16:26 (4)	16:33 22	15:54 (3)
13	08:45	15:44 (3)	08:03		07:04	06:53	05:55	05:25	05:39	06:23	07:13	08:02	07:57	16:06 (4)	08:40	15:32 (3)
	16:58 27	16:11 (3)	17:53		18:43	20:35	21:25	22:01	21:57	21:12	20:04	18:56	16:57 20	16:26 (4)	16:33 23	15:55 (3)
14	08:44	15:44 (3)	08:01		07:02	06:51	05:53	05:25	05:40	06:25	07:15	08:04	07:58	16:07 (4)	08:41	15:33 (3)
	17:00 27	16:11 (3)	17:54		18:44	20:37	21:26	22:02	21:56	21:10	20:02	18:54	16:56 18	16:25 (4)	16:33 22	15:55 (3)
15	08:43	15:45 (3)	07:59		06:59	06:49	05:52	05:24	05:42	06:26	07:16	08:06	08:00	16:08 (4)	08:42	15:34 (3)
	17:01 26	16:11 (3)	17:56		18:46	20:39	21:28	22:02	21:56	21:08	20:00	18:51	16:54 15	16:23 (4)	16:33 21	15:55 (3)
16	08:43	15:45 (3)	07:57		06:57	06:47	05:50	05:24	05:43	06:28	07:18	08:07	08:02	15:31 (3)	08:43	15:34 (3)
	17:03 26	16:11 (3)	17:58		18:48	20:40	21:29	22:03	21:55	21:06	19:57	18:49	16:53 22	16:22 (4)	16:33 22	15:56 (3)
17	08:42	15:46 (3)	07:55		06:55	06:45	05:49	05:24	05:44	06:30	07:19	08:09	08:04	15:29 (3)	08:44	15:34 (3)
	17:05 25	16:11 (3)	18:00		18:50	20:42	21:31	22:03	21:53	21:04	19:55	18:47	16:52 24	16:21 (4)	16:33 21	15:55 (3)
18	08:41	15:47 (3)	07:53		06:52	06:43	05:48	05:24	05:45	06:31	07:21	08:11	08:05	15:26 (3)	08:45	15:35 (3)
	17:06 25	16:12 (3)	18:02		18:51	20:44	21:32	22:04	21:52	21:02	19:53	18:45	16:50 25	16:18 (4)	16:34 21	15:56 (3)
19	08:40	15:48 (3)	07:51		06:50	06:40	05:46	05:24	05:46	06:33	07:23	08:13	08:07	15:26 (3)	08:45	15:36 (3)
	17:08 24	16:12 (3)	18:04		18:53	20:45	21:34	22:04	21:51	21:00	19:50	18:43	16:49 23	16:17 (4)	16:34 21	15:57 (3)
20	08:39	15:49 (3)	07:49		06:48	06:38	05:45	05:24	05:48	06:34	07:24	08:14	08:09	15:25 (3)	08:46	15:36 (3)
	17:10 23	16:12 (3)	18:05		18:55	20:47	21:35	22:04	21:50	20:58	19:48	18:41	16:48 21	15:46 (3)	16:34 21	15:57 (3)
21	08:38	15:49 (3)	07:47		06:46	06:36	05:43	05:24	05:49	06:36	07:26	08:16	08:10	15:25 (3)	08:47	15:37 (3)
	17:11 22	16:11 (3)	18:07		18:56	20:49	21:37	22:05	21:49	20:55	19:46	18:39	16:47 22	15:47 (3)	16:35 20	15:57 (3)
22	08:37	15:50 (3)	07:45		06:43	06:34	05:42	05:25	05:50	06:38	07:28	08:18	08:12	15:25 (3)	08:47	15:37 (3)
	17:13 21	16:11 (3)	18:09		18:58	20:50	21:38	22:05	21:48	20:53	19:43	18:37	16:45 23	15:48 (3)	16:35 20	15:57 (3)
23	08:35	15:52 (3)	07:43		06:41	06:32	05:41	05:25	05:52	06:39	07:29	08:19	08:14	15:24 (3)	08:48	15:38 (3)
	17:15 23	16:43 (4)	18:11		19:00	20:52	21:39	22:05	21:46	20:51	19:41	18:35	16:44 24	15:48 (3)	16:36 20	15:58 (3)
24	08:34	15:52 (3)	07:41		06:39	06:30	05:40	05:25	05:53	06:41	07:31	08:21	08:15	15:24 (3)	08:48	15:38 (3)
	17:16 25	16:44 (4)	18:13		19:01	20:54	21:41	22:05	21:45	20:49	19:39	18:33	16:43 25	15:49 (3)	16:36 21	15:59 (3)
25	08:33	15:55 (3)	07:39		06:36	06:28	05:38	05:26	05:54	06:43	07:32	07:23	08:17	15:24 (3)	08:48	15:38 (3)
	17:18 24	16:47 (4)	18:14		19:03	20:55	21:42	22:05	21:44	20:47	19:37	17:31	16:42 26	15:50 (3)	16:37 21	15:59 (3)
26	08:32	15:58 (3)	07:37		06:34	06:26	05:37	05:26	05:56	06:44	07:34	07:25	08:18	15:24 (3)	08:49	15:39 (3)
	17:20 22	16:49 (4)	18:16		19:05	20:57	21:43	22:05	21:42	20:45	19:34	17:29	16:41 26	15:50 (3)	16:38 21	16:00 (3)
27	08:30	16:35 (4)	07:35		06:32	06:24	05:36	05:26	05:57	06:46	07:36	07:27	08:20	15:24 (3)	08:49	15:39 (3)
	17:22 16	16:51 (4)	18:18		19:07	20:59	21:45	22:05	21:41	20:43	19:32	17:27	16:40 26	15:50 (3)	16:38 22	16:01 (3)
28	08:29	16:35 (4)	07:33		06:30	06:22	05:35	05:27	05:59	06:47	07:37	07:28	08:21	15:24 (3)	08:49	15:40 (3)
	17:23 18	16:53 (4)	18:20		19:08	21:00	21:46	22:05	21:39	20:40	19:30	17:25	16:40 27	15:51 (3)	16:39 21	16:01 (3)
29	08:28	16:34 (4)			07:27	06:20	05:34	05:27	06:00	06:49	07:39	07:30	08:23	15:25 (3)	08:49	15:40 (3)
	17:25 20	16:54 (4)			20:10	21:02	21:47	22:05	21:38	20:38	19:27	17:23	16:39 27	15:52 (3)	16:40 22	16:02 (3)
30	08:26	16:33 (4)			07:25	06:18	05:33	05:28	06:02	06:51	07:41	07:32	08:24	15:25 (3)	08:50	15:40 (3)
	17:27 21	16:54 (4)			20:12	21:04	21:48	22:05	21:36	20:36	19:25	17:21	16:38 26	15:51 (3)	16:41 22	16:02 (3)
31	08:25	16:34 (4)			07:23		05:32		06:03	06:52		07:34			08:50	15:41 (3)
	17:29 21	16:55 (4)			20:13		21:49		21:35	20:34		17:19			16:42 22	16:03 (3)
Potential sun hours	260		278		367	415	484	497	501	453	381	332	267		245	
Total, worst case	734		154										618		699	
Sun reduction	0,26		0,32										0,26		0,22	
Oper. time red.	0,99		0,99										0,99		0,99	
Wind dir. red.	0,70		0,69										0,70		0,71	
Total reduction	0,18		0,22										0,18		0,15	
Total, real	134		34										111		105	

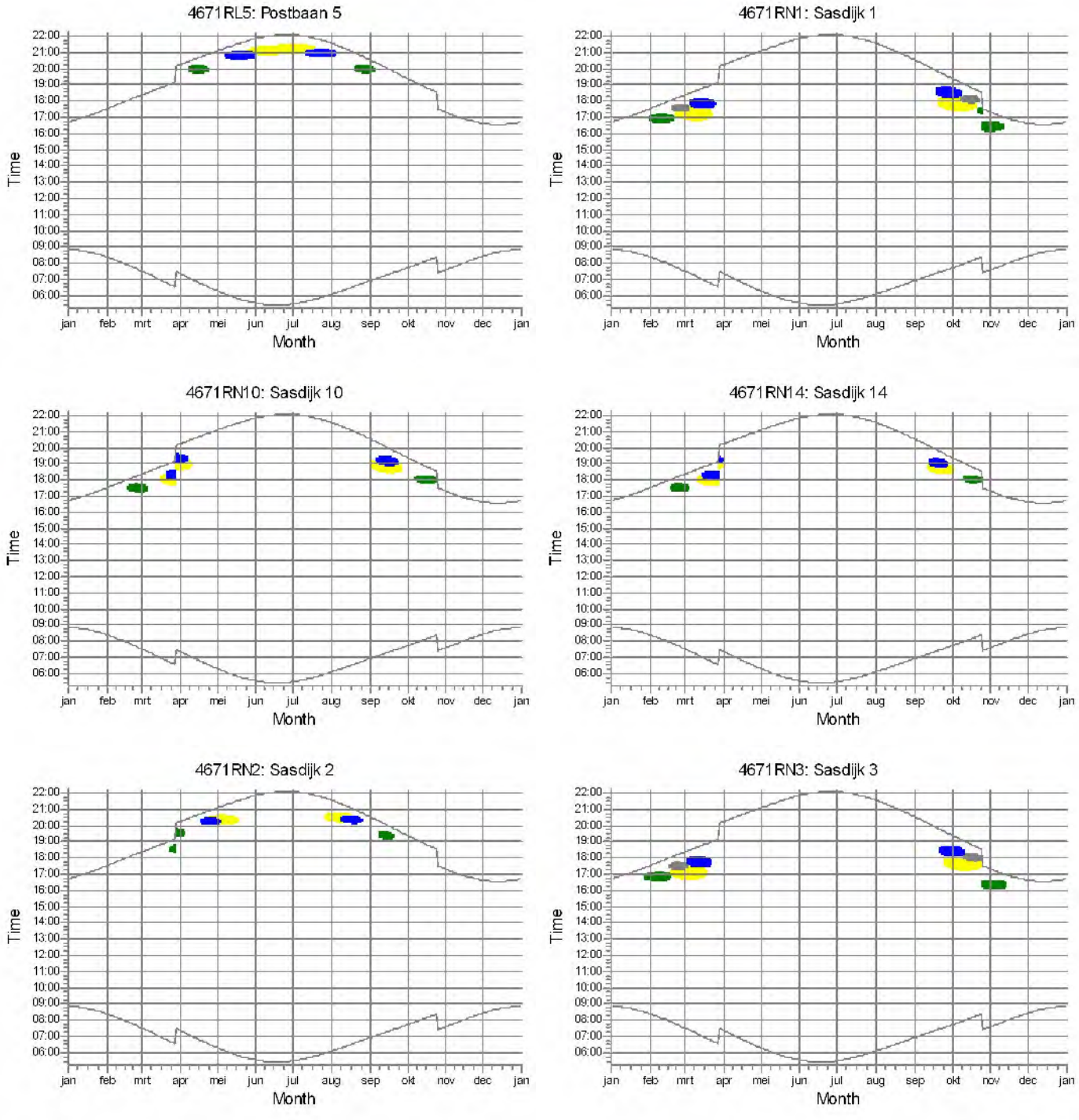
Table layout: For each day in each month the following matrix apply

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)

Licensed user:
LBP SIGHT
Kelvinbaan 40, PO box 1475
NL-3430BL Nieuwegein
+31 3023 11377
David Vrolijk / dv@lbpsight.nl
Calculated:
3-2-2020 14:39/3.1.633

SHADOW - Calendar, graphical

Calculation: L136@147m



WTGs

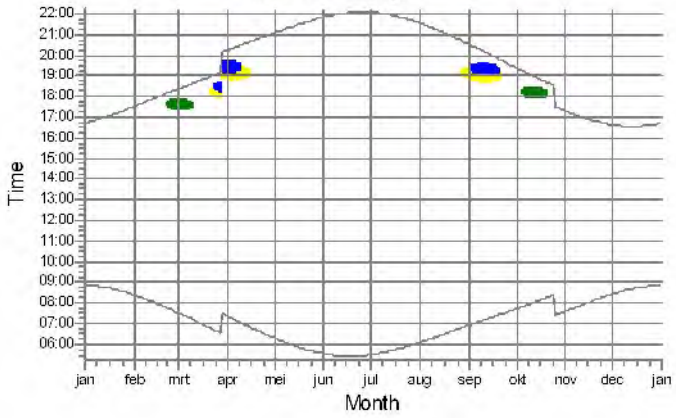
- 2: LAGERWEY L136-4.5MW 4500 136.0 !O! hub: 147,0 m (TOT: 215,0 m) (36)
- 3: LAGERWEY L136-4.5MW 4500 136.0 !O! hub: 147,0 m (TOT: 215,0 m) (37)
- 4: LAGERWEY L136-4.5MW 4500 136.0 !O! hub: 147,0 m (TOT: 215,0 m) (38)
- 1: LAGERWEY L136-4.5MW 4500 136.0 !O! hub: 147,0 m (TOT: 215,0 m) (35)

Licensed user:
LBP SIGHT
Kelvinbaan 40, PO box 1475
NL-3430BL Nieuwegein
+31 3023 11377
David Vrolijk / dv@lbpsight.nl
Calculated:
3-2-2020 14:39/3.1.633

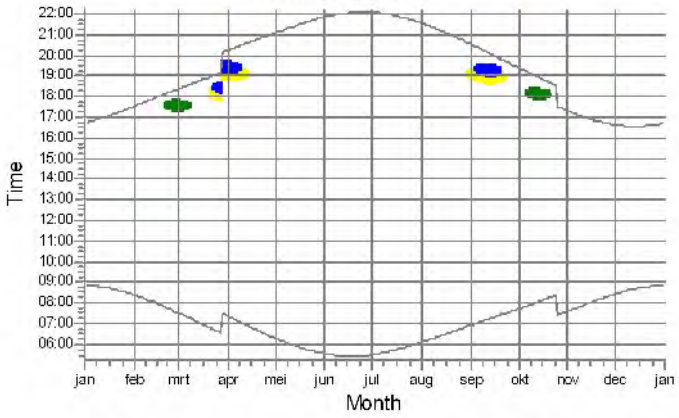
SHADOW - Calendar, graphical

Calculation: L136@147m

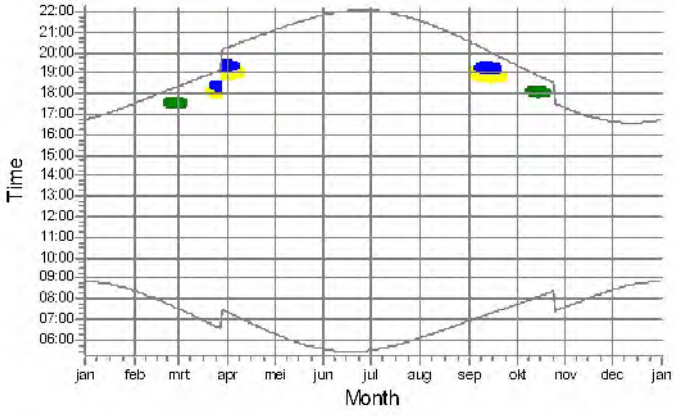
4671RN4: Sasdijk 4



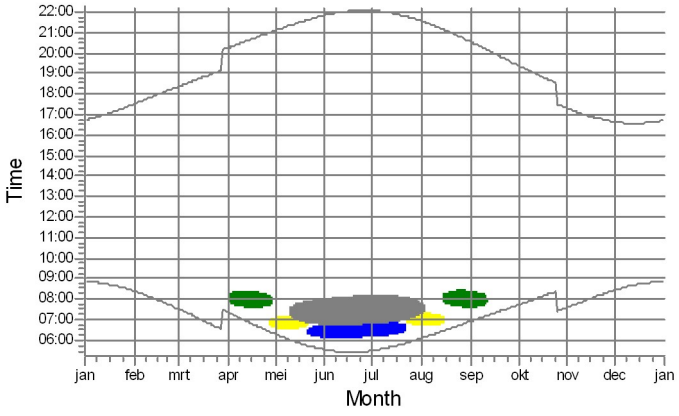
4671RN6: Sasdijk 6



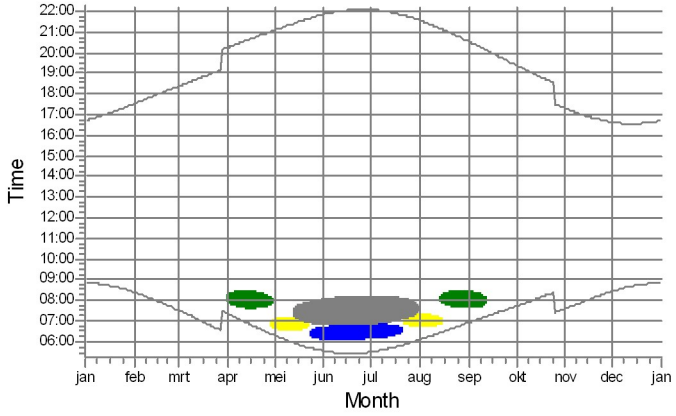
4671RN8: Sasdijk 8



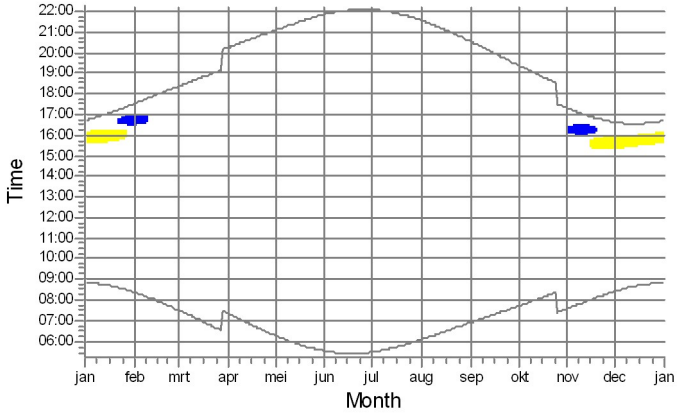
4671TH7: Schenkeldijk 7



4671TH9: Schenkeldijk 9



4794SM15: 1-Februariweg 15



WTGs

- 2: LAGERWEY L136-4.5MW 4500 136.0 !O! hub: 147,0 m (TOT: 215,0 m) (36)
- 3: LAGERWEY L136-4.5MW 4500 136.0 !O! hub: 147,0 m (TOT: 215,0 m) (37)
- 4: LAGERWEY L136-4.5MW 4500 136.0 !O! hub: 147,0 m (TOT: 215,0 m) (38)
- 1: LAGERWEY L136-4.5MW 4500 136.0 !O! hub: 147,0 m (TOT: 215,0 m) (35)

Bijlage II Aanvulling externe veiligheid tiphoogte 215 meter

Notitie

Datum:	17 februari 2020	Project:	Windpark Karolinapolder
Uw kenmerk:	-	Locatie:	Dinteloord gemeente Steenbergen
Ons kenmerk:	V068475aa.201S39V.jst	Betreft:	Aanvulling externe veiligheid tiphoogte
Versie:	02_002		215 meter

Inleiding

Door LBP|SIGHT is een kwalitatieve beoordeling gedaan naar het aspect externe veiligheid vanwege windpark Karolinapolder te Steenbergen. De beoordeling is opgenomen in de ruimtelijke onderbouwing welke is opgesteld in het kader van de aanvraag omgevingsvergunning[1]. Hierin is een worst-case turbine onderzocht met een tiphoogte van 234 m. In onderhavige notitie is een tweetal turbines onderzocht met een maximale tiphoogte van 215 m en zijn de relevante afstanden met betrekking tot veiligheid gegeven voor deze tiphoogte. Het betreft een aanvulling op de voornoemde beoordeling.

Onderzochte turbines

In tabel 1 zijn de twee onderzochte turbinetypes opgenomen. Het betreft potentiele turbines op deze locatie. Deze lijst is niet limitatief.

Tabel 1

Beschouwde turbines

Turbinetype	Vermogen [MW]	Rotordiameter [m]	Ashoogte [m]	Tiphoogte [m]	Nominaal toerental [RPM]
Vestas V136	4.2	136	147	215*	14[2]
Lagerwey L136	4.5	136	147	215*	12[3]

* maximale tiphoogte

Locatie turbines

Voor de locatie van de turbines is in beide situaties uitgegaan van de clusteropstelling B, zoals ook toegepast in de ruimtelijke onderbouwing. Voor de volledigheid zijn in onderstaande tabel de coördinaten opgenomen van de vier turbines[4].

1 LBP|SIGHTWindpark Karolinapolder nabij Dinteloord gemeente Steenbergen, Ruimtelijke onderbouwing van 10 april 2018 met kenmerk R068475aa.17I50W7.jwi.
2 Bron: Mailwisseling Thom de Rijk – Vestas P:\018\018300aa\294_windturbines\Windturbines - Fabrikant informatie\Vestas\Toerental vestas V105 - V136.png
3 Bron: general specifications L136-4.5 MW uit BP Synergie Nieuwleusen P:\068\068475aa\4. Werkmap LBPSIGHT\externe veiligheid\4.5.3 - Bestemmingsplan Windpark Synergie Nieuwleusen, Ontwerp omgevingsvergunning bijlagen.pdf
4 70233717_001A_situatie variant rood Karolinapolder met WT coördinaten 30-09-2019 (2).pdf

Kelvinbaan 40, 3439 MT Nieuwegein | Postbus 1475, 3430 BL Nieuwegein | T (030) 231 13 77 | F (030) 234 17 54
E info@lbpsight.nl | www.lbpsight.nl | IBAN: NL62 RABO 036 42 36 558 | KvK 30073990 | BTW NL007076083B01

Tabel 2

Coördinaten van de vier turbines

Variant	Clusteropstelling	Ø 140 m
WT1	X=83.369,806	Y=407.032,051
WT2	X=83.773,206	Y=406.911,647
WT3	X=84.210,430	Y=407.322,352
WT4	X=83.826,533	Y=407.360,725

Resultaten

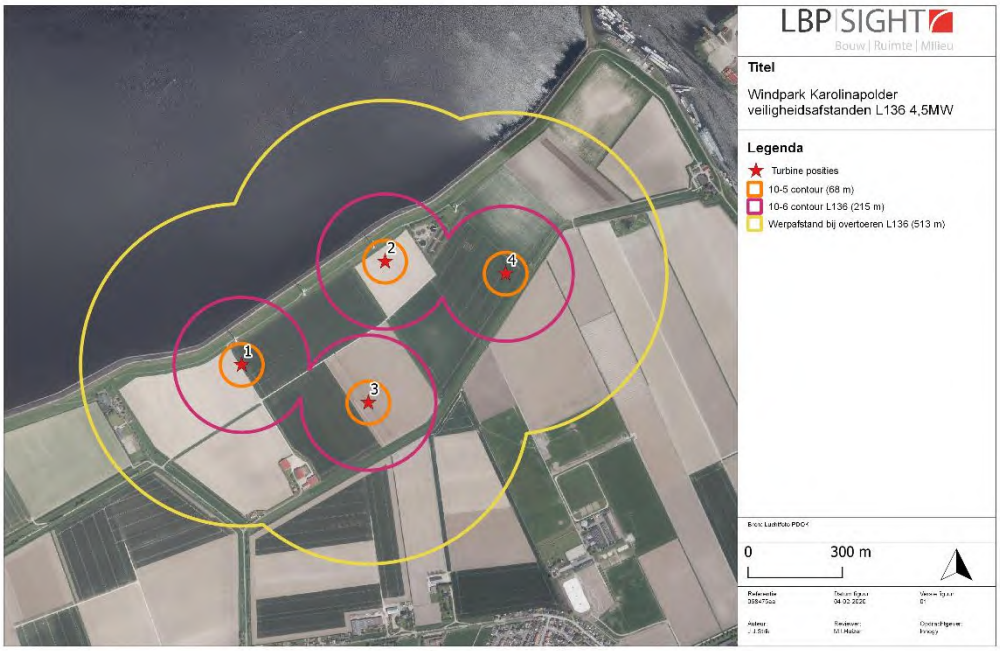
In Tabel 3 zijn de relevante afstanden met betrekking tot veiligheid voor de beschouwde windturbines gegeven.

De werpafstanden zijn berekend volgens de methode beschreven in het Handboek Risicozonering Windturbines (v.3.1, 2014; hierna het Handboek). De PR10-5-contour is gelijk aan een halve rotordiameter, volgens de vuistregels uit het Handboek. Deze contour komt overeen met het gebied waar de windturbinebladen kunnen draaien (overzwaai).
De PR10-6-contour is, volgens het Handboek, de grootste van: ofwel de nominale werpafstand, ofwel de tiphoogte.

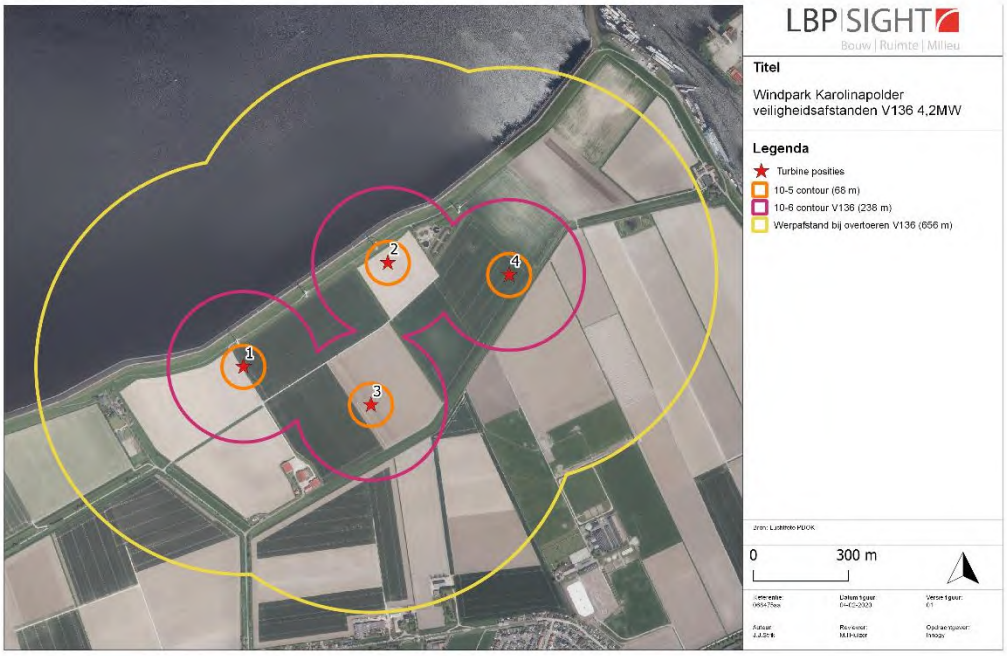
Tabel 3

Berekende veiligheidsafstanden van mogelijke windturbinetypes

Turbinetype	Vermogen [MW]	Nominale werpafstand [m]	Maximale werpafstand (bij overtoeren) [m]	$PR10^{-5}$-contour [m]	$PR10^{-6}$-contour [m]
Vestas V136	4.2	238	656	68	238
Lagerwey L136	4.5	196	513	68	215



Figuur 1
Veiligheidsafstanden van de L136 van 4,5 MW



Figuur 2
Veiligheidsafstanden van de V136 van 4.2 MW

Beoordeling

De volgende objecten liggen binnen het invloedsgebied van de mogelijke turbines en moeten beoordeeld worden volgens risicocriteria van het Handboek Risicozonering:

1. Bebouwing
2. Wegen
3. Vaarwegen
4. Dijklichamen en waterkeringen

Het invloedsgebied van de turbines wordt kleiner, maar de objecten die oorspronkelijk zijn meegenomen in de beoordeling in de ruimtelijke onderbouwing liggen nog in het invloedsgebied en moeten dus worden beschouwd.

Ad 1 Bebouwing

De $PR10^{-6}$-contour zijn beide kleiner dan voor de worst case turbine die in de ruimtelijke onderbouwing is beoordeeld. De PR 10^{-5}-contour is ongewijzigd en blijft 68 meter.
De conclusie wijzigt niet ten gevolge van de keuze voor kleinere turbines: binnen de $PR10^{-5}$-contour zijn er geen beperkt kwetsbare objecten gelegen, zoals kleine kantoorgebouwen, winkels of restaurants. Binnen de $PR10^{-6}$-contour zijn er bovendien geen kwetsbare objecten gelegen, zoals woningen scholen of ziekenhuis. Ter verduidelijking: de roze contour op figuur 1 en 2 geeft de $PR10^{-6}$-contour weer.

Ad 2 Wegen

De conclusie met betrekking tot wegen, personenvervoer en vervoer gevaarlijke stoffen, wijzigt niet. De beschouwde turbines hebben geen invloed op het individueel passanten risico (IPR) en maatschappelijk risico (MR). Met de beschouwde windturbines wordt - net als voor de worst-case turbine uit de ruimtelijke onderbouwing - ruimschoots voldaan aan de normen.

Ad 3 Vaarwegen

Door de plaatsing van de windturbines, zowel de eerder onderzochte als de beschouwde windturbines uit tabel 9.1, wordt er geen noemenswaardige toename van het risico verwacht. Er varen namelijk niet of nauwelijks schepen in het invloedsgebied van de turbines.

Ad 4 Dijklichamen en waterkeringen

Wat betreft het beoordelen van de risico's voor de waterkering verwijst het Handboek Risicozonering naar de "Beleidsregel voor het plaatsen van windturbines op, in of over rijkswaterstaatswerken".

Artikel 4 lid 1 en 2 van deze Beleidsregel luiden:

> *1. Langs kanalen, rivieren en havens wordt plaatsing van windturbines toegestaan bij een afstand van ten minste 50m uit de rand van de vaarweg.*
> *2. Binnen 50m uit de rand van de vaarweg wordt plaatsing slechts toegestaan indien uit aanvullend onderzoek blijkt dat er geen hinder voor wal- en scheepsradar optreedt. De minimale afstand tot de rand van de vaarweg is altijd ten minste de helft van de rotordiameter.*

Op basis van de meest actuele situatietekening (70233717_001A_situatie variant rood Karolinapolder met WT coördinaten 30-09-2019 (2).pdf), die onderdeel is van de verleende omgevingsvergunning, is de afstand tussen de rand van waterkant van de vaarweg en de

dichtstbijzijnde geprojecteerde windturbine zelfs 120 meter. Er wordt dus ruimschoots voldaan aan de eis van 50 meter.

In artikel 7 van deze Beleidsregel staat het volgende:
"*Plaatsing van windturbines in de kern- of beschermingszone van een waterkering in beheer van het Rijk, wordt slechts toegestaan indien door de initiatiefnemer voldoende kan worden aangetoond dat deze geen negatieve gevolgen heeft voor de waterkerende functie van de waterkering conform de veiligheidsnorm bij of krachtens de Waterwet*"

Oftewel voor waterkeringen geldt dat er geen windturbines in de kernzone en de beschermingszone van primaire waterkeringen mogen worden geplaatst. Primaire waterkeringen zijn dijken die beschermen tegen het buitenwater (zeeën en de grote rivieren). De dijk langs het Volkerak is een primaire waterkering volgens de legger van het waterschap Brabantse Delta. Plaatsing binnen de kern- en beschermingszone van de waterkering is alleen mogelijk als dit geen negatieve gevolgen heeft voor de waterkerende functie van de waterkering. Alle turbines bevinden zich buiten de kern- en beschermingszone van de waterkering. Zie onderstaand figuur 3.

Figuur 3
Turbine posities en overzwaai ten opzichte van de beschermingszone van de waterkering.

Zoals uit bovenstaand figuur 3 is op te maken is er sprake van overzwaai over het dijklichaam. Turbine 1 zwaait over de beschermingszone B en turbine 2 zwaait over de beschermingszone A en B.

Volgens de Keur van het waterschap Brabantse Delta is er in bepaalde situaties een watervergunning nodig indien er handelingen worden verricht in of boven de beschermingszones.

Vanwege de overzwaai van turbine 2 over de Beschermingszone A is een watervergunning noodzakelijk. De watervergunning wordt in een later stadium aangevraagd op het moment dat bekend is voor welke uitvoeringsaspecten een watervergunning noodzakelijk is. Nadere uitwerking en toetsing vindt plaats in het kader van de procedure waterwet op basis van de recent – september 2019 – door STOWA (Stichting toegepast onderzoek waterbeheer) uitgebrachte handreiking Windturbines en Waterkeringen- Techniek.

Conclusie

Het aspect externe veiligheid geeft geen belemmeringen bij plaatsing van de onderzochte windturbines uit tabel 1.

LBP|SIGHT BV

ir. J.J. (Judith) Strik

M.I. (Meriël) Huizer MSc