



Pentavia, Mill Hill

London NW7 2ET

Solar Glare

Date: 22/03/19

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APPENDIX A – SOLAR GLARE ANALYSIS DRAWINGS - 16336/GLR/309 - 312



1.0 INTRODUCTION

Delva Patman Redler LLP have been instructed by Meadow Residential to assess the impact of the proposed development on the site known as Pentavia Retail Park, Watford Way, for solar glare effects around the site at key neighbouring traffic routes and junctions.

This study has been carried out in accordance with the recommendations of the Building Research Establishment Report "Site Layout Planning for Daylight & Sunlight 2011" (BRE209).

The template drawings, which are attached, illustrate the results for the solar glare effects and identify the drawings used in these studies.

2.0 THE PROPOSAL

The proposed development consists of the redevelopment of site including the demolition of all existing buildings and construction of 844 new Build to Rent Class C3 residential units and 894sqm ancillary Class C3 Build to Rent facilities; 405sqm Class A1 Retail; 326sqm Class A3 and A4 food; and 297sqm Class D1 Community; new pedestrian access off Bunns Lane; open space, landscaping; car parking; and highway/pedestrian improvements.

The 844 dwellings are made up of 123 three bed dwellings, 436 two bed dwellings and 281 one bed and 4 studio dwellings.

3.0 POLICY / GUIDELINES

This study has been carried out in accordance with the recommendations of the Building Research Establishment report "Site Layout Planning for Daylight & Sunlight 2011" and by reference to the BRE Information Paper 'Solar dazzle reflected from sloping glazed facades'. These are the recognised guidelines against which solar glare assessments can be assessed.

The BRE guide is intended for building designers and their clients, consultants and planning officials. The advice given is not mandatory and the report should not be seen as a part of planning policy. Its aim is to help rather than constrain the designer. Although it gives numerical guidelines, these should be interpreted flexibly because natural lighting is only one of the many factors in site layout design. In certain circumstances, the developer or planning authority may wish to use alternative target values.

Whilst technical analysis can be carried out in accordance with numerical guidelines and reported factually by comparison with those guidelines, the final assessment as to whether affected dwellings are left with acceptable amounts of daylight and sunlight in an inner-city context where the findings are to be interpreted in a flexible manner is a matter of subjective opinion.

4.0 METHODOLOGY

Solar glare principally occurs when the sun is low in the sky and dazzles the eye either directly or indirectly via a reflected surface. Solar glare is a highly localised and Short term effect dependent on the direction of an individual's view, the position of the sun relative to the viewer and reflecting surface, together with localised weather conditions. Glare can affect all road users to include pedestrians and drivers. The effect of solar glare, the reflected image of the sun on the glass façade of the Development was analysed at specific locations chosen on the basis that they are most likely to be significantly affected by any Development generated glare. Key locations are generally considered to be relevant adjacent local traffic junctions and sections of road likely to be affected due to their orientation and direction of traffic flow in relation to the development site. These locations included in the solar glare assessments are as follows:



- Test Point 1: M1 heading North
- Test Point 2: Watford Way heading North
- Test Point 3: Watford Way heading South
- Test Point 4: M1 heading South

The BRE Information Paper 'Solar dazzle reflected from sloping glazed facades' presents a technique that can be used to predict solar reflection at the design stage. At the heart of the technique is the mathematical modelling of reflection from a sloping plane. For this assessment, the analysis was carried out using the 3D model of the Development and surrounding area and specialist lighting calculations to identify where, when and whether any glare would occur and whether the glare would be likely to create a safety issue to local pedestrian and vehicular daytime traffic.

It should be noted that this analysis is based on the potential for the building massing to generate solar glare regardless of building materials. It is noted however, that proposed façade materials include perforated polyester powder coated panels, anodised aluminium panels, glazed panels, honed limestone and glazed curtain walling.

Not all of these materials will create glare or could create possible glare but only of relatively low intensity. Therefore, the results reported within this report need be considered as worst case and the actual effects will be greatly reduced.

5.0 ASSUMPTIONS MADE

- This is an assessment of the potential for the building mass to create solar glare. Materials have not been specifically identified for their reflective or glare producing properties. These assessments can therefore be regarded as a worst case scenario.
- The assessment points considered were chosen by DPR in the absence of any other direction and were chosen for their location in relation to their site and the potential for glare to be generated at these points.
- Assessment points are set to 1.2m above the ground level indicated on the contextual ZMapping ground levels in accordance with BRE Guidance.

6.0 SOURCE DATA

The studies have been undertaken by calculating the daylight & sunlight based on the template drawings provided within the BRE Guide. The study was undertaken with plan drawings derived from:

- Existing and surrounding buildings:
Zmapping:
Dwg No's:
3D Zmapping context model
- Proposed Scheme:

Drawings Used:

Existing and surrounding buildings:

ZMapping:

Proposed Scheme:

Arney Fender Katsalidis:

Dwg No's: AFK_44032_MH_3D Mill Hill (3D Model received 13.02.2019)

GA_LEVEL 00_OVERALL PLAN - A10-00-01-P1

GA_LEVEL 01_OVERALL PLAN - A10-01-01-P1



7.0 SIGNIFICANCE CRITERIA

The guidance given by BRE has been used as a basis for the criteria to assess the Development's potential effects.

There are no numerical significance values available for solar glare effects affecting sensitive receptors. Instead, key locations are identified where glare may cause safety to be compromised for pedestrian and vehicular traffic. Views are analysed from these locations to ascertain whether there would be any glare. Professional judgement is applied to conclude significance. It is unreasonable to expect complete avoidance of solar glare; however, prolonged periods of glare may be regarded as a significant adverse effect.

8.0 BASELINE CONDITIONS

In its current condition the Site does not give rise for any significant solar glare. The buildings on site are limited in number and in height and are set back some distance from the rail lines.

The existing buildings are generally unobtrusive and largely unseen from the test points considered either because they are too far away, they are obstructed by other structures or by trees and vegetation that have been allowed to grow up along the boundary of the site.

In its current condition the Site does not give rise for any significant solar glare. The detailed results of the analysis and drawings are presented in Appendix A.

9.0 RESULTS – COMPLETED DEVELOPMENT

The glass façades of the Development would produce some solar glare as any building with glass or bright, shiny surface would at some point throughout the year. The Site is abutted by buildings along its northern, eastern, western and part of the southern boundaries, which will largely overshadow the lower floors of the new buildings; thereby preventing any significant solar glare affecting the adjacent train lines and the drivers from the trains.

The technical assessment drawings GLR/309 - 312 (contained in **Appendix A**) show the periods when glare would be created at the four assessment points chosen, as described above.

Test Point 1: M1 Heading north.



The tinted zones on the Sunlight Availability Indicator on Drawing No GLR/309 in **Appendix A** show the results of solar glare for Test Point 1.

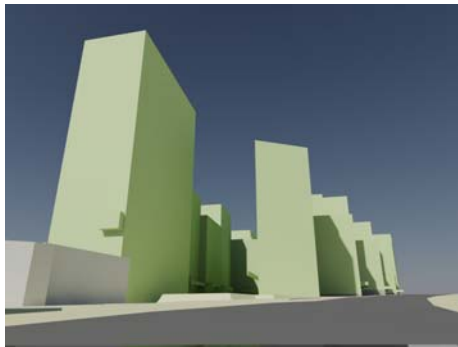
Inspection reveals that reflected solar glare could potentially occur for a series of periods across the day from very early in the morning in the summer months, to mid-morning in the winter months through to late in the evening in June totalling around 78 hours per year. The sunlight availability protractor (as set out in the BRE Information Paper 'Solar dazzle reflected from sloping glazed facades') indicates that during these periods sunlight is obtained for between 10% and 50%

of the time.

Therefore, solar dazzle could occur at Test Point 1 for around **23.5 hours per year**. This is considered to be a **minor adverse** highly **localised, Short term** (albeit it periodic) effect.



Test Point 2: Watford Way heading North



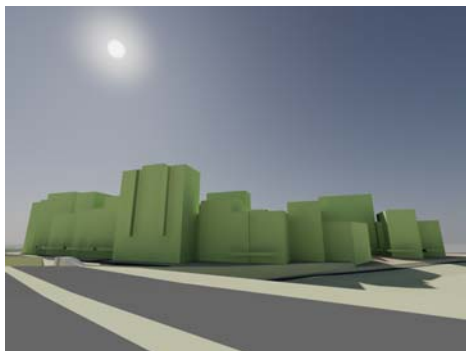
The tinted zones on the Sunlight Availability Indicator on Drawing No GLR/310 in **Appendix A** show the results of solar glare for Test Point 2.

Inspection reveals that reflected solar glare could potentially occur for brief intermittent periods early morning between March to September, mid-morning between September and March and then around midday throughout the year totalling around 410 hours per year. The sunlight availability protractor (as set out in the BRE Information Paper 'Solar dazzle reflected from sloping glazed facades') indicates that during these periods sunlight is obtained for between 10%

and 50% of the time.

Therefore, solar dazzle could occur at Test Point 2 for around **123 hours per year**. This is considered to be a **minor adverse** highly **localised**, **Short term** (albeit it periodic) effect.

Test point 3: Watford Way heading South.

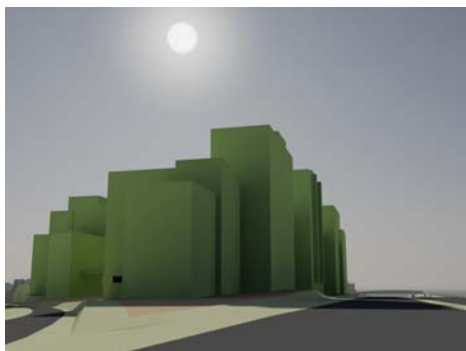


The tinted zones on the Sunlight Availability Indicator on Drawing No GLR/311 in **Appendix A** show the results of solar glare for Test Point 3.

Inspection reveals that reflected solar glare could potentially occur for brief intermittent periods throughout the year early morning and then again very limited periods late afternoon to early evening totalling around 1150 hours per year. The sunlight availability protractor (as set out in the BRE Information Paper 'Solar dazzle reflected from sloping glazed facades') indicates that during these periods sunlight is obtained for between 10% and 40% of the time.

Therefore, solar dazzle could occur at Test Point 3 for around **287.5 hours per year**. This is considered to be a **minor adverse** highly **localised**, **Short term** (albeit it periodic) effect.

Test point 4: M1 heading South.



The tinted zones on the Sunlight Availability Indicator on Drawing No GLR/312 in **Appendix A** show the results of solar glare for Test Point 4.

Inspection reveals that reflected solar glare could occur for very limited periods late morning from late September through to early March totalling around 140 hours per year. The sunlight availability protractor (as set out in the BRE Information Paper 'Solar dazzle reflected from sloping glazed facades') indicates that during these periods sunlight is obtained for between 20% and 50% of the time.

Therefore, solar dazzle could occur at Test Point 4 for around **50 hours per year**. This is considered to be a **minor adverse** highly **localised**, **Short term** (albeit it periodic) effect.



The technical analysis undertaken only considers main building façades to assess the worst-case scenario. The analysis does not take into account specific design features to mitigate the potential for solar glare, for example building materials that do not produce or limit the effect of glare. The true effect on solar glare would therefore be much lower than that actually assessed.

The technical analysis shows that for the majority of the year there would be a **negligible** solar glare effect. The nature of the proposed glazing and cladding does mean that reflected solar glare would be unavoidable at certain times of the day, assuming that there are actually clear skies at these times to allow the sun to reflect off the building façades. The analysis shows, however, that at worst this would be a highly **local, short term** potential effect of **minor adverse** significance, lasting only a few hours at any one time.

The analysis shows that there would be a potentially **negligible** or **local, short term minor adverse** effect from solar glare, but that this would not be detrimental to the safe movement of pedestrians and vehicular users on the pavements and roads surrounding the Development.

10.0 CONCLUSIONS

The site is in a suburban location in close proximity to the M1 motorway and Watford Way/Barnet By-Pass to the east and west of the site.

To assess the potential impact of the Development proposals on solar glare effects on train drivers a detailed 3D analysis has been undertaken in accordance with the BRE Information Paper 'Solar Dazzle Reflected from Sloping Facades' [1987].

Assessment point locations have been chosen by DPR in the absence of any detailed specific areas of concern provided.

As with any building with reflective façades, it is possible that glare from the Development would be experienced at different locations and distances than the key points chosen in this study. However, it is evident that at distances further from the Development the duration of glare would be both shorter and the effects more slight.

The technical analysis undertaken only considers all main building façades regardless of material to assess the worst-case scenario. The analysis does not take into account specific design features to mitigate the potential for solar glare, for example building materials that do not produce or limit the effect of glare.

Whilst material specification is not fully understood at this stage it is most likely that not all of the cladding materials will create glare, or some could create possible glare but only of relatively low intensity. Therefore, the results reported within this report need be considered as worst case and the true effect on solar glare would therefore be much lower than that actually assessed.

The technical analysis shows that for the majority of the year there would be a **negligible** solar glare effect. The nature of the proposed material cladding does mean that reflected solar glare may be unavoidable at certain times of the day, assuming that there are actually clear skies at these times to allow the sun to reflect off the building façades. The analysis shows, however, that at worst this would be a highly **local, short term** potential effect of **minor adverse** significance, lasting only seconds at any one time as a driver passes a certain point.

The analysis therefore shows that there would be a potentially **negligible** or **local, short term minor adverse** effect from solar glare, but that this should not be detrimental to the safe movement of traffic and road users adjacent to the Pentavia Retail Park development site.

Delva Patman Redler LLP



APPENDIX A

SOLAR GLARE ANALYSIS DRAWINGS

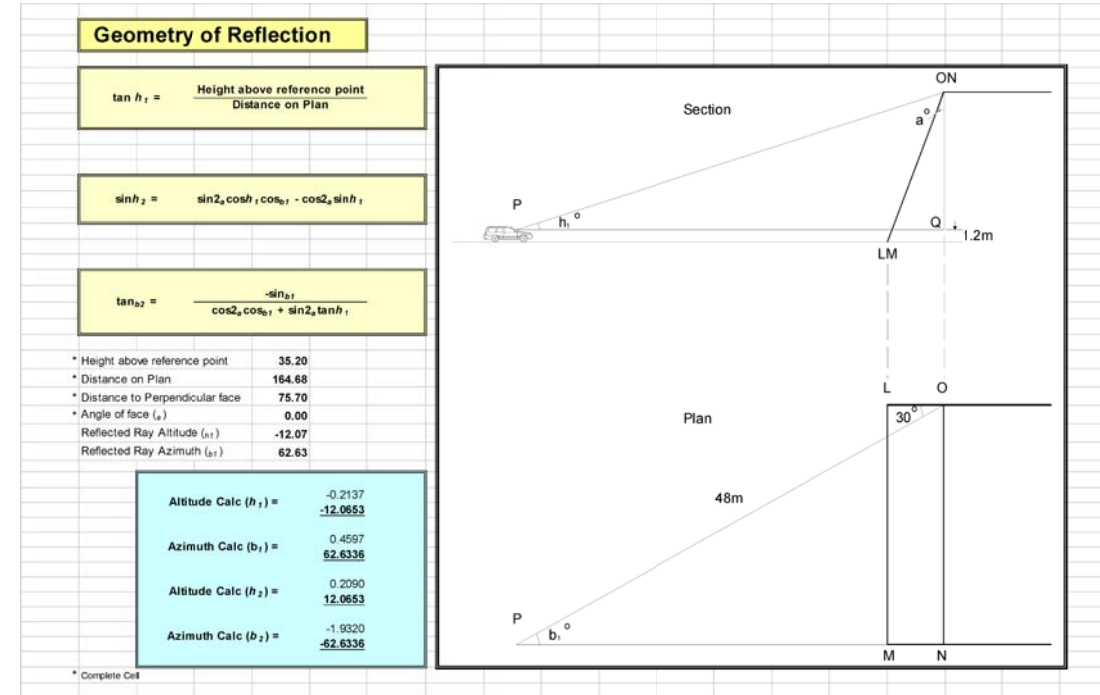
16336/GLR/309 - 312



Example Calculation



*Rendered image taken at 11:30am on 21 March



NO DIMENSIONS TO BE SCALED FROM THIS DRAWING:

Legend:

- Existing (Red)
- Proposed (Green)
- Surrounding (Grey)
- Possible Glare (Orange)

SOURCE DATA

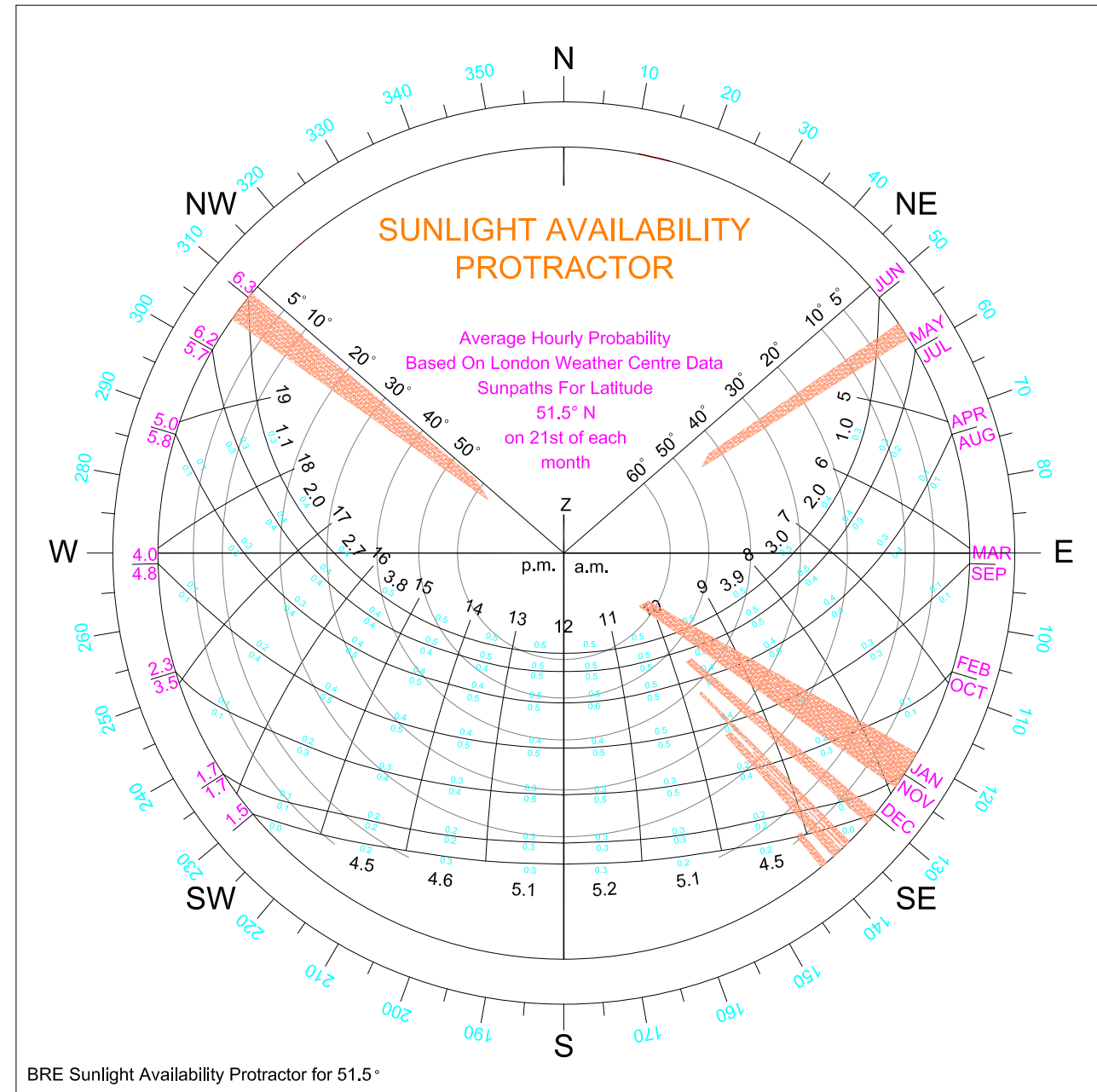
Drawings Used:
Existing and surrounding buildings:
ZMapping:

Proposed Scheme:
Arney Fender Katsalidis:
Dwg No's: AFK_44032_MH_3D Mill Hill (3D Model received 13.02.2019)
GA_LEVEL_00_OVERALL PLAN - A10-00-01-P1
GA_LEVEL_01_OVERALL PLAN - A10-01-01-P1

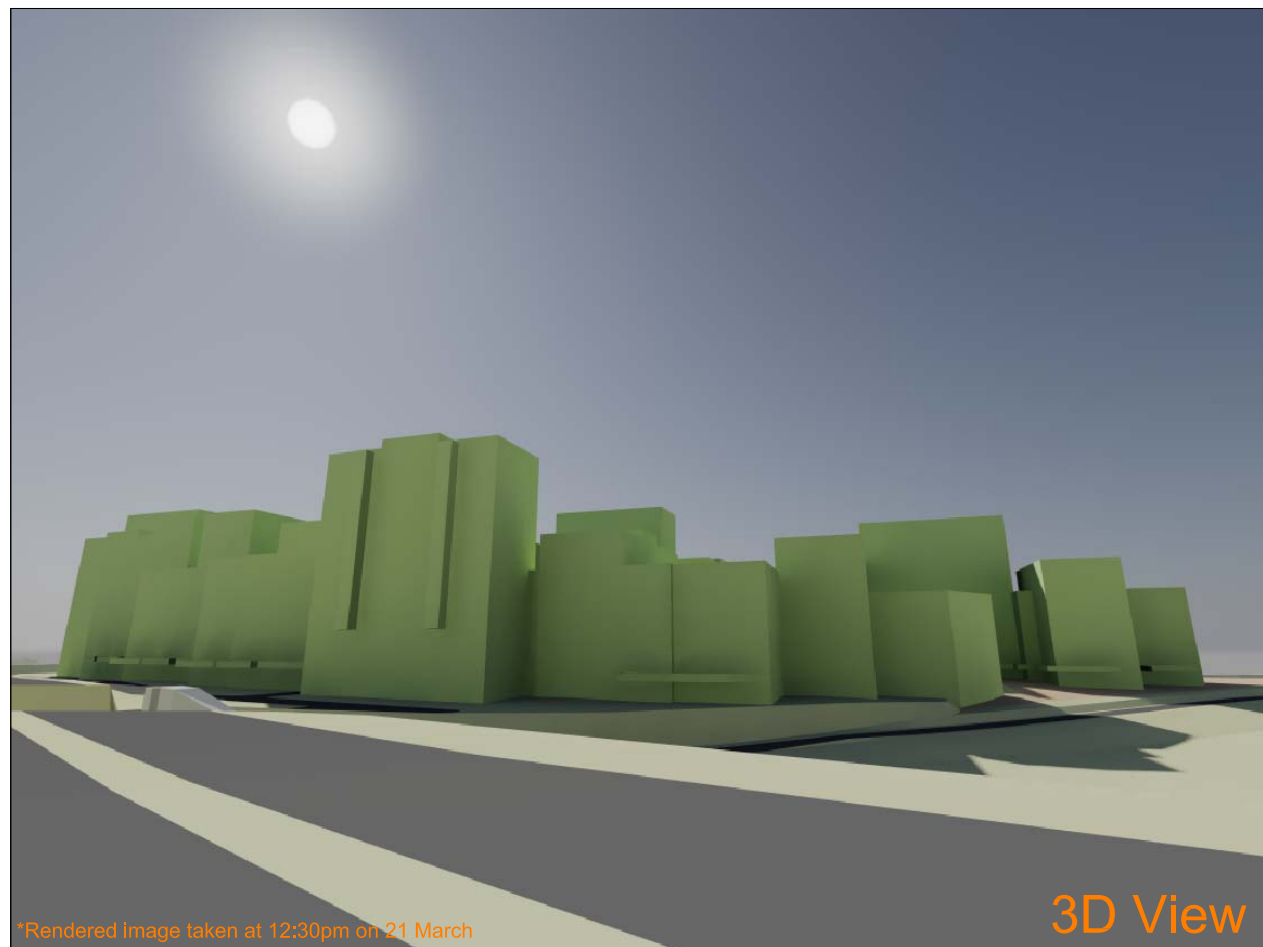
NOTES

Assessment taken at 1200mm above street level in accordance with BRE Guidance.

Site Plan



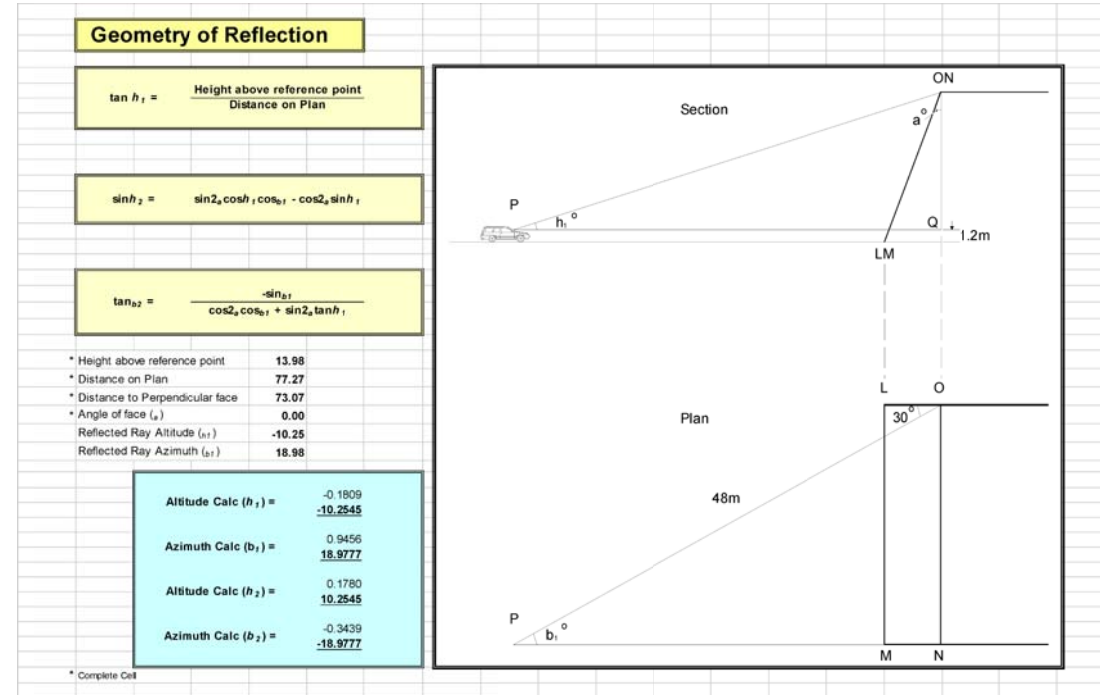
REV	Description	Drawn	Ch/ld	Date
<p>DELVA PATMAN REDLER Chartered Surveyors</p> <p>Thavies Inn House 020 7936 3668 3-4 Holborn Circus info@delvapatmanredler.co.uk London EC1N 2HA www.delvapatmanredler.co.uk</p>				
<p>TITLE: PENTAVIA RETAIL PARK WATFORD WAY LONDON NW7 - SOLAR GLARE ANALYSIS</p>				
<p>DRAWING: Pentavia Retail Park Solar Glare Analysis Proposed Scheme - M1 Heading North -</p>				
DRAWN: SG		JOB NO:		
SCALE: NTS		16336		
DATE: 14/03/2019				
DWG NO:		GLR/309		REV:
				-



*Rendered image taken at 12:30pm on 21 March

3D View

Example Calculation



NO DIMENSIONS TO BE SCALED FROM THIS DRAWING:

■ Existing	■ Possible Glare
■ Proposed	
■ Surrounding	

SOURCE DATA

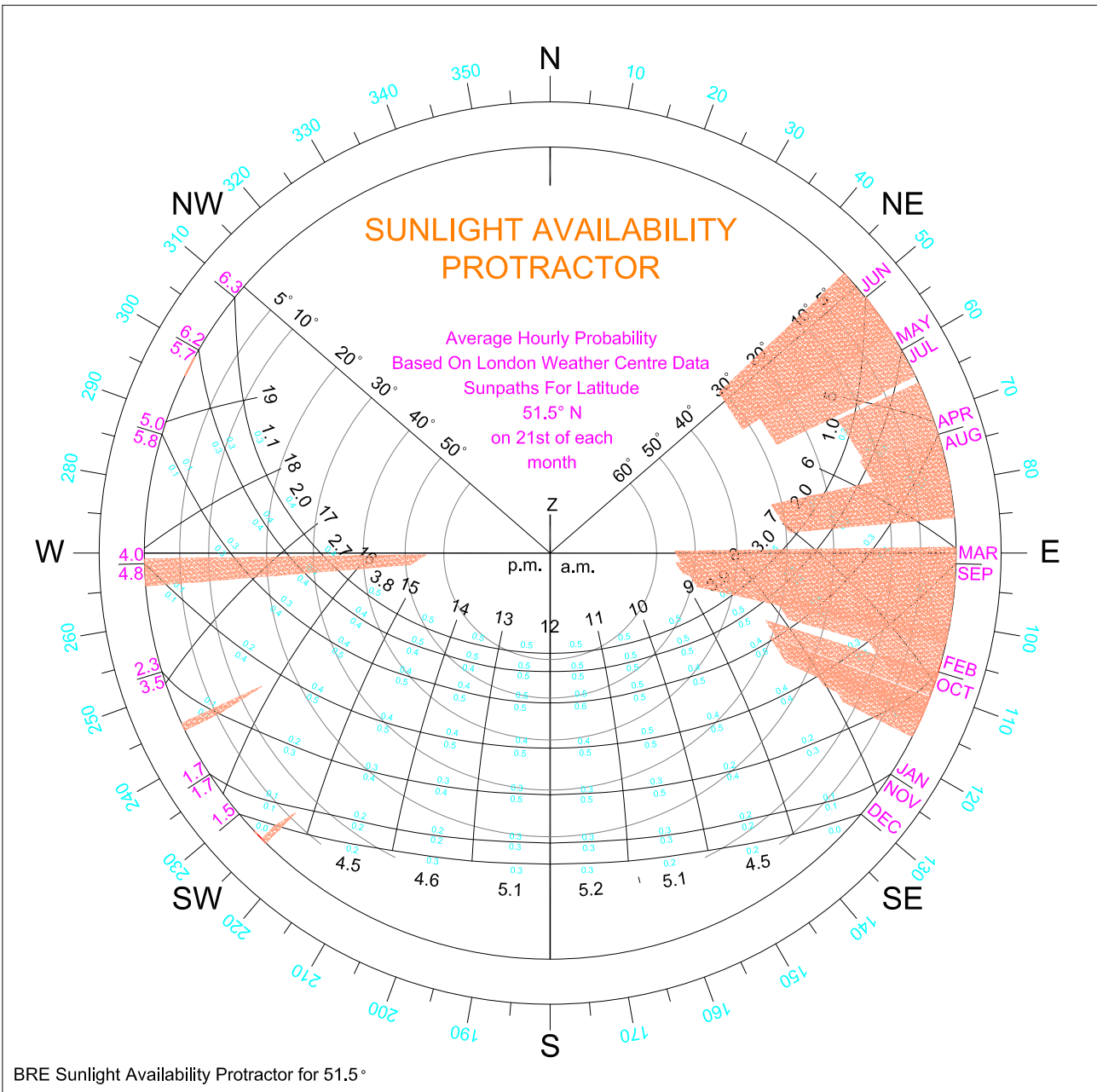
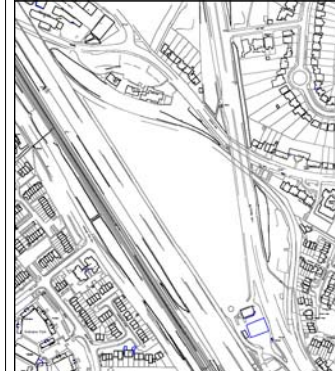
Drawings Used:
Existing and surrounding buildings:
ZMapping:

Proposed Scheme:
Arney Fender Katsalidis:
Dwg No's: AFK_44032_MH_3D Mill Hill (3D Model received 13.02.2019)
GA_LEVEL_00_OVERALL PLAN - A10-00-01-P1
GA_LEVEL_01_OVERALL PLAN - A10-01-01-P1

NOTES

Assessment taken at 1200mm above street level in accordance with BRE Guidance.

Site Plan



BRE Sunlight Availability Protractor for 51.5°

REV	Description	Drawn	Ch/ld	Date

DELVA PATMAN REDLER
Chartered Surveyors

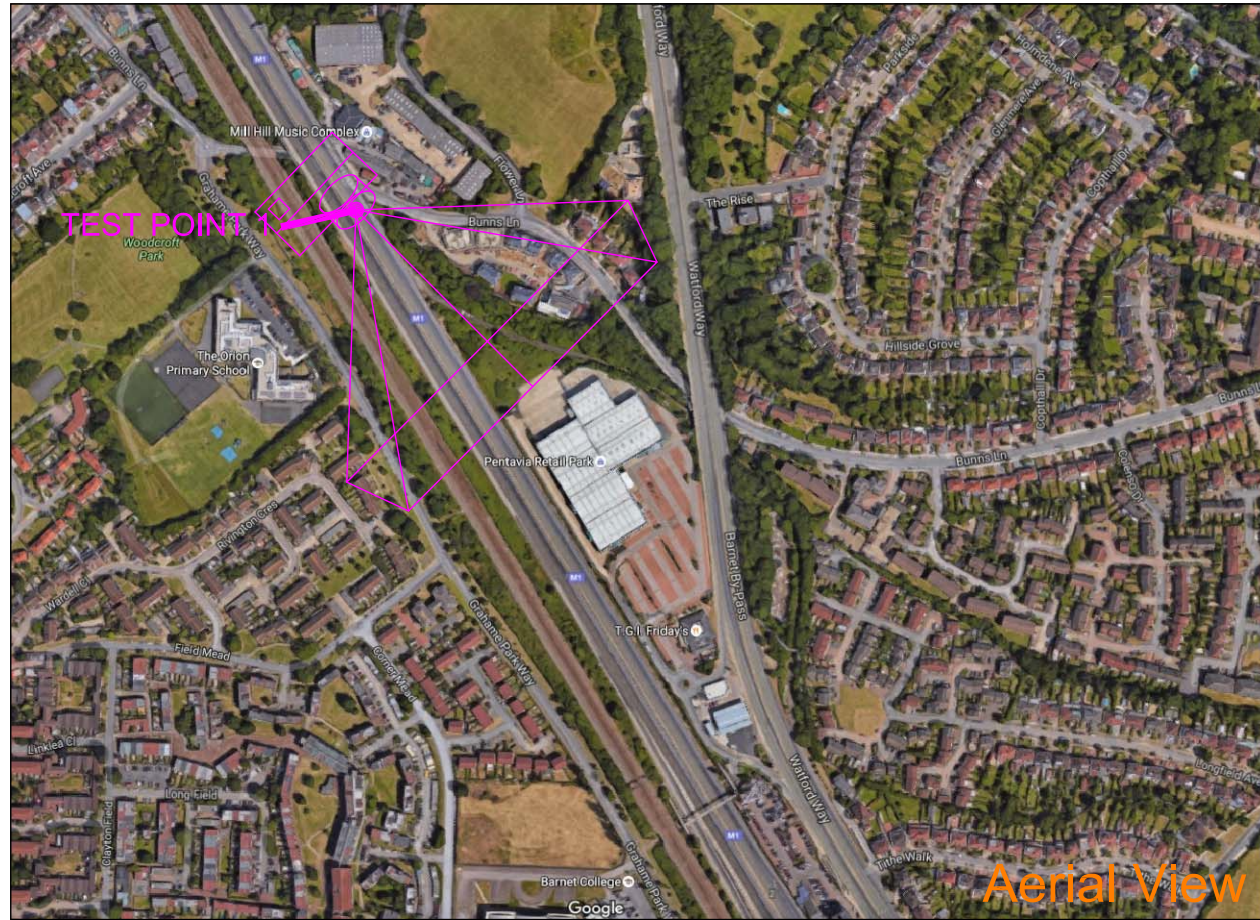
Thavies Inn House 020 7936 3668
3-4 Holborn Circus info@delvapatmanredler.co.uk
London EC1N 2HA www.delvapatmanredler.co.uk

TITLE: PENTAVIA RETAIL PARK
WATFORD WAY
LONDON NW7
-
SOLAR GLARE ANALYSIS

DRAWING:
Pentavia Retail Park
Solar Glare Analysis
Proposed Scheme
-
Watford Way Heading South
-
-

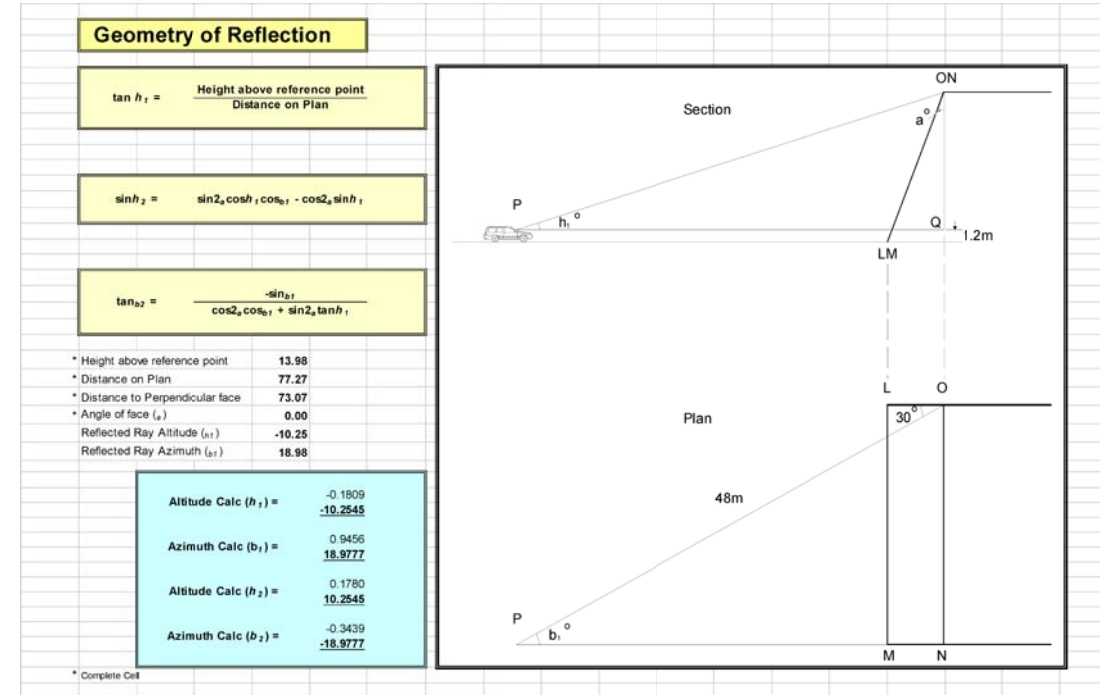
DRAWN: SG	JOB NO:
SCALE: NTS	16336
DATE: 14/03/2019	
DWG NO: GLR/311	REV: -

Example Calculation



*Rendered image taken at 9am on 21 March

3D View



NO DIMENSIONS TO BE SCALED FROM THIS DRAWING:

Existing Possible Glare
Proposed
Surrounding

SOURCE DATA

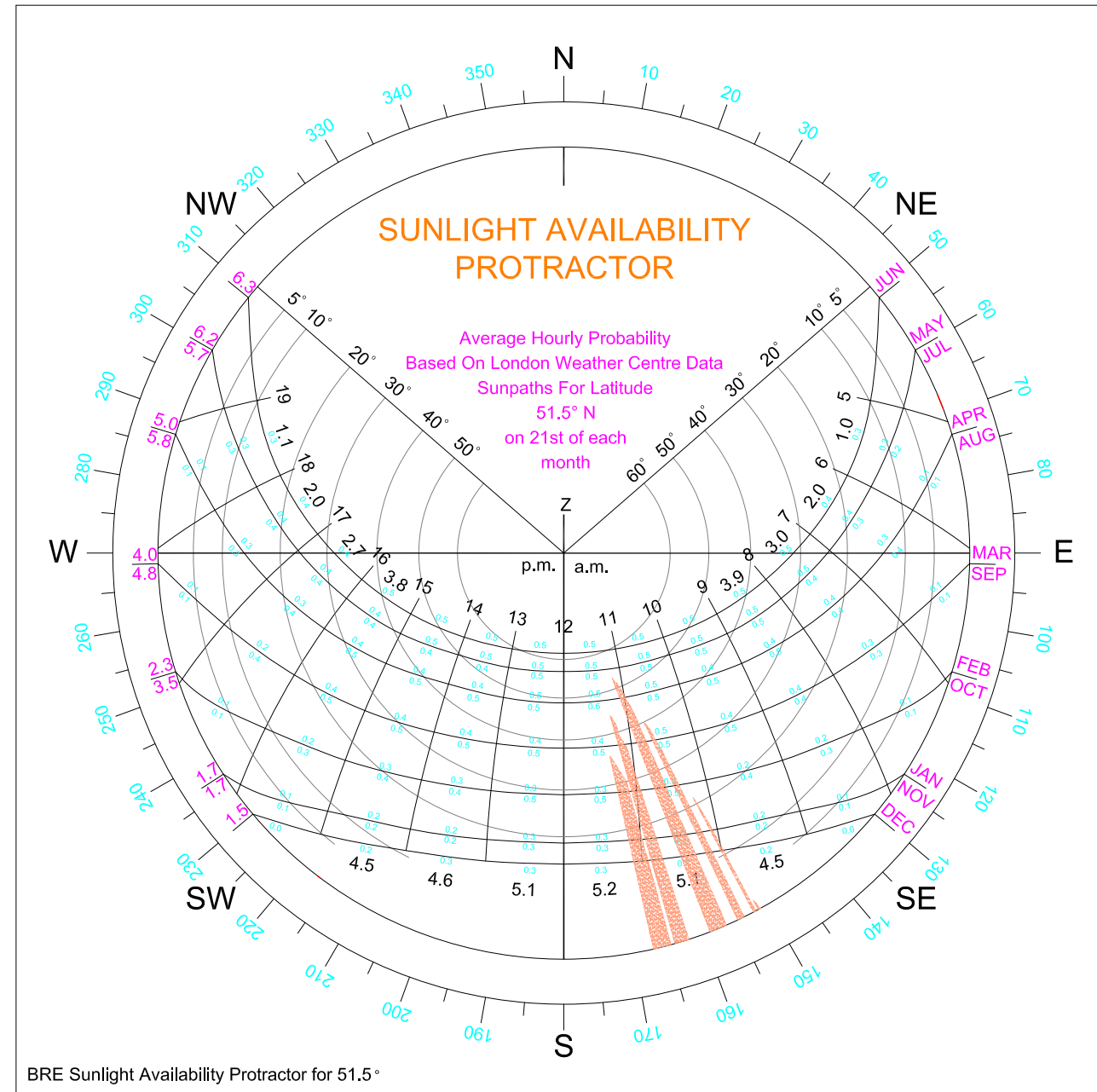
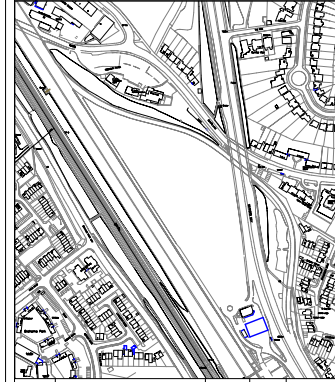
Drawings Used:
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GA_LEVEL_01_OVERALL PLAN - A10-01-01-P1

NOTES

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Site Plan



REV	Description	Drawn	Ch/Id	Date

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Chartered Surveyors

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SOLAR GLARE ANALYSIS

DRAWING:
Pentavia Retail Park
Solar Glare Analysis
Proposed Scheme
-
M1 Heading South
-
-

DRAWN: SG	JOB NO:
SCALE: NTS	16336
DATE: 14/03/2019	

DWG NO: **GLR/312** REV: -