



152 West End Lane – Lighting Study

Technical Report

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Lighting Study

Technical Report

Prepared for
CHP Management

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1. Executive Summary

Innovo have been instructed by CHP Management to complete a lighting study of the external lighting and surrounding area of their office at 152 West End Lane, Haskell House.

A study has been completed to help the client understand the impact on the buildings exposed to a specific set of 7no. external luminaires on one side of Haskell House. A lighting model and calculation has been completed for two scenarios: the impact on the residential house at Lymington Road, Canterbury Mansions, and the potential impact on the new development under construction opposite Haskell House.

The lux levels, Unified Glare Rating, UGR, and Glare Rating, GR, were calculated on the face of these buildings to understand the impact of the external luminaires.

At the existing angle of the luminaires, the UGR and GR was found to be unacceptably high for both the Canterbury Mansions and the new development. The findings are summarised in the table below.

However, further calculations were completed, and by adjusting the angle of the external luminaires, the UGR and GR of the new development could be brought to acceptable levels. This could be achieved without detriment to the lux levels of the pavement and car park of Haskell House.

It is noted that DialuxEvo, the lighting software used in this study, is not capable of calculating Upward Light Ratio, so that has not been included in this report.

	Existing Luminaire Angle		Proposed Luminaire Angle	
	Canterbury Mansions	New Development	Canterbury Mansions	New Development
UGR	>30	>30	n/a	>30
Glare Rating	78	75	n/a	26

2. Introduction

CHP Management have advised that there has been a complaint to the council from the residents of the Canterbury Mansions on Lymington Road regarding the brightness or glare at night-time from the external luminaires on Haskell House.

Photos were provided with the complaint that show the impact of the luminaires on the residents, as shown below.

The luminaires are situated at high level above the exit path and car park on the North side of Haskell House. There are 7no. luminaires, illuminating the car park which has an approximate depth from the luminaire wall of 11m.

The Canterbury Mansions are approximately 100m away from the luminaires, across a set of railway tracks and some development land. However, currently there is a new development under construction, in between the luminaires and the Canterbury Mansions which will block the glare from the luminaires for Canterbury Mansions. The layout of the relevant site geometry can be seen in picture 2.

Therefore, two scenarios have been calculated. One calculating the effect of the luminaires on the original Canterbury Mansions, and a second calculation for the potential impact on the new development.

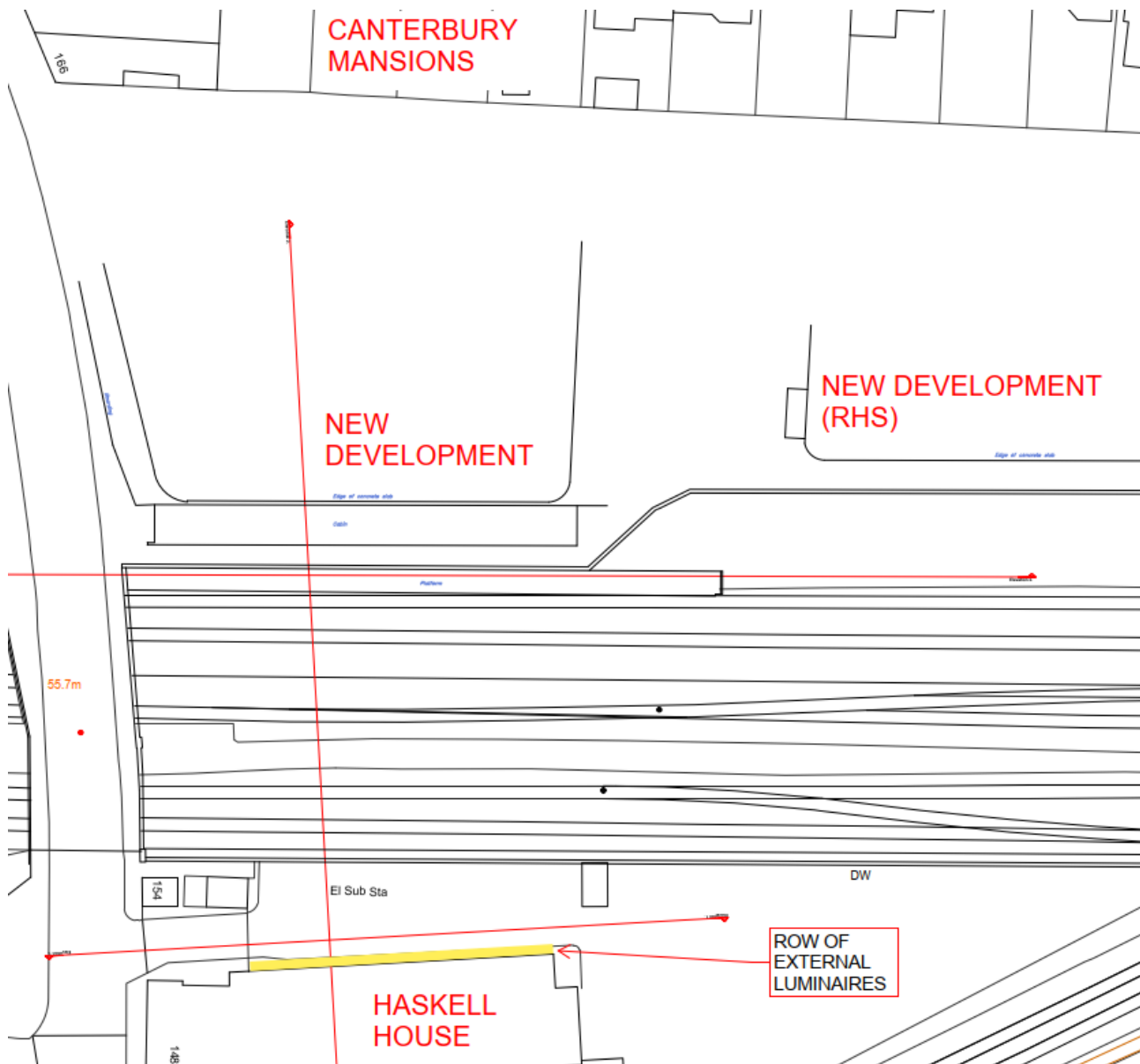
A site survey was undertaken for this light survey to allow for accurate calculations to be completed. This includes the location of the Haskell House, Canterbury Mansions, the new development and the land in between them all, as well as cross-sections of the relevant buildings to get accurate heights and angles.

The luminaires themselves were installed in 2021 and are V-TAC VT-54ST 50W Led Slim Streetlight Samsung Chip 4000K(120LM/W). These are high power luminaires and the choice and quantity exceeds the recommended illuminance levels for external spaces.

A calculation has also been completed for the lux levels of the car park, to understand the effect of any changes in luminaire angle.



Picture 1 - Glare from external Luminaires



Picture 2 - Site Survey Results

3. Camden Borough Planning Requirements and Lighting Design Standards

There are several key documents that pertain to the impact of external lighting in the borough of Camden, as well as British standards and codes. The documents “Camden Planning Authority – Amenity” January 2021 and “The reduction of obtrusive light” by the Institute of Lighting describe what are acceptable lighting levels in urban areas.

Chapter 4 of Camden Planning Authority, subsection 4.4 states “The Council will therefore expect that the design and layout of artificial light be considered at the design stage of a scheme to prevent potential harmful effects of the development on occupiers and neighbours in terms of visual privacy, outlook and disturbance. Artificial lighting should only illuminate the intended area and not affect or affect the amenity of neighbours.”

This shows that any external lighting should not affect the amenity of neighbours. It also states in 4.9 that “All light installations should be energy efficient and ‘Dark Sky’ compliant, not causing obtrusive light pollution, glare or spillage and preserving a sensitively lit night-time environment.”

This again states that the lighting installations should not cause glare. This can be interpreted to be within acceptable glare limits as most lighting at night will cause some glare.

Also the government guidance on light pollution, Paragraph: 005 Reference ID: 31-005-20191101, states “Glare needs to be avoided” and that lighting schemes should include some dimming.

There are two common methods for measuring glare: Glare Rating, GR, and Unified Glare Rating. UGR is values measure from 5 (very low glare) to 40 (extremely high glare), with <19 recommend for office lighting.

Glare Rating is another method which gives values between 10 (unnoticeable glare) and 90 (unbearable). A glare rating of 50 is the maximum acceptable value for this method.

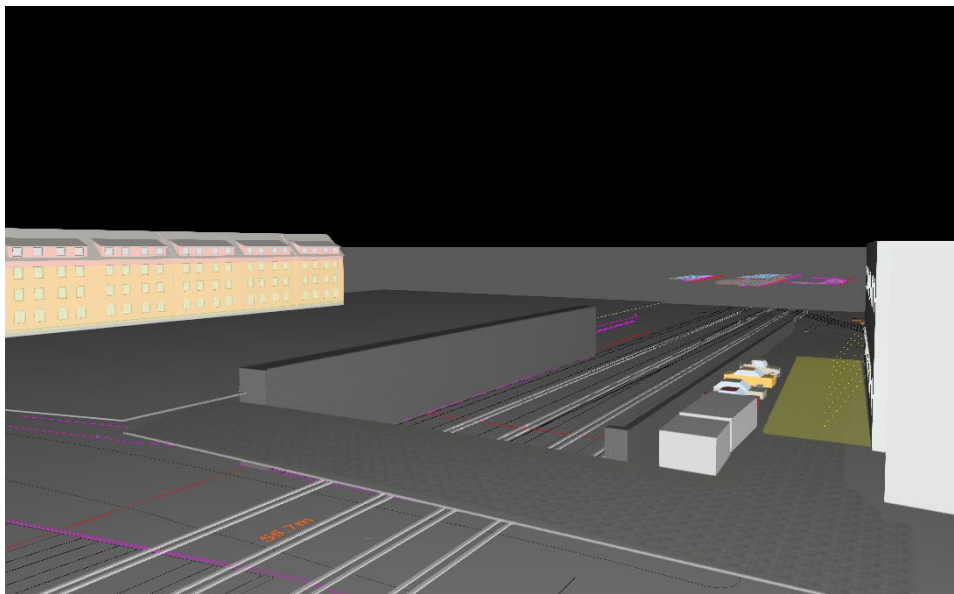
4. Existing Installation Scenario 1 – Lymington Road

The first scenario that was modelled and tested was the impact of the luminaries on the Canterbury Mansions, from where the complaint was originally made.

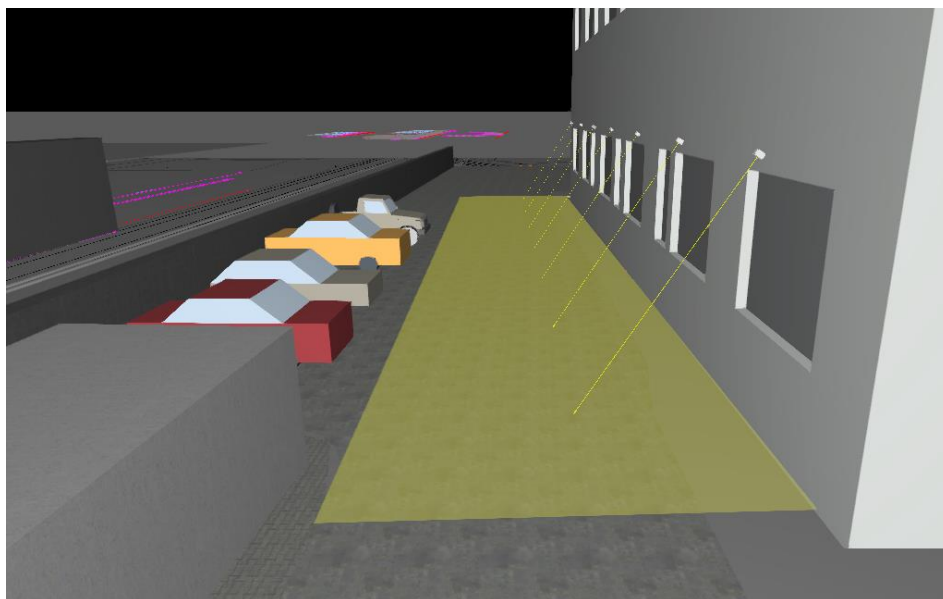
The survey results were modelled in Dialux, and the luminaire model placed at correct the height, location and angle. A calculation was then completed which measured lux, UGR and GR on a calculation plane both on the face of the Canterbury Mansions, and in the car park of Haskell House.

Only one calculation surface is required here, given the distance and angle from the luminaires. The calculations were completed at night for accuracy.

The model is shown below in picture 3.



Picture 3 - Canterbury Mansions Model



Picture 4 - Luminaires on Haskell House

When the calculation is ran, the Glare Rating for Canterbury Mansions is returned as 78, using the exact method of calculation according to CIE 112. This is graded between unbearable and disturbing according to the Glare Rating index, indicating that the luminaires would need to be adjusted to avoid causing a disturbance to the neighbouring properties.

The UGR is calculated to be greater than 30, which is above the maximum permissible glare of 30. These results are shown below.

Site 1 (Light scene 1) Calculation objects		Site 1 (Light scene 1) Calculation objects	
Canterbury Mansions (GR)		Canterbury Mansions (UGR)	
max	78	max	>30
Target	≤50	Target	-

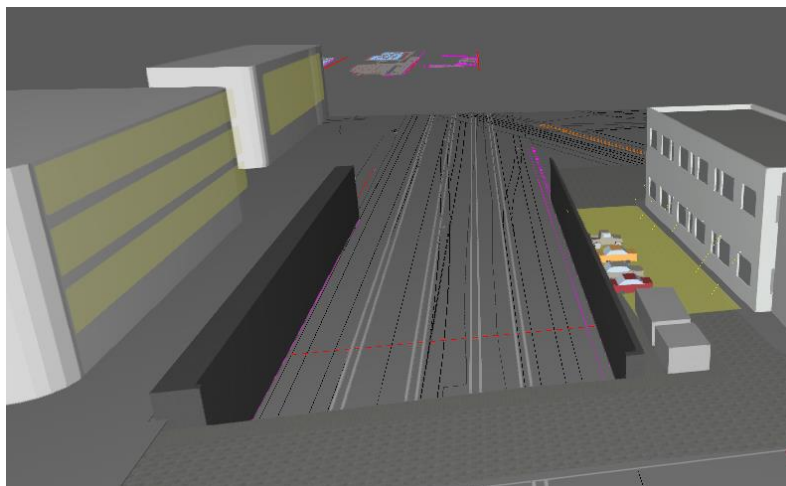
Picture 5 - Scenario 1 Results

5. Existing Installation Scenario 2 – New Development

Given that a new development is under construction in between the luminaires and the Canterbury Mansions, the potential impact on this building has also been calculated.

A new model was built, again using the site survey results and cross sections, to create an accurate virtual site. In this calculation, given the relative proximity of the new development to the luminaires and therefore a wider range of impact angle of the glare, the calculation surface was split in 3. This would simulate different floors of the new development.

There was also a calculation done for the second building of the new development. The model is shown below.



Picture 6 - New Development model

When the calculation was ran for this scenario, the Glare Rating came back between 43 and 75 depending on the height, and the UGR was 30 or >30. These results again indicate that the luminaires in their current arrangement are likely to cause a disturbance to neighbouring properties and would require adjustment fall within recommended levels. The full set of results are shown below.

Site 1 (Light scene 1)
Calculation objects

New Development Top (UGR)

max	30.0
Target	-

Site 1 (Light scene 1)
Calculation objects

New Development Top (GR)

max	43
Target	≤50

Picture 7 - Top level New Development Results

Site 1 (Light scene 1)
Calculation objects

New Development Middle (UGR)

max	>30
Target	-

Site 1 (Light scene 1)
Calculation objects

New Development Middle (GR)

max	59
Target	≤50

Picture 8 - Middle level New Development Results

Site 1 (Light scene 1)
Calculation objects

New Development Bottom (UGR)

max	>30
Target	-

Site 1 (Light scene 1)
Calculation objects

New Development Bottom (GR)

max	75
Target	≤50

Picture 9 - Bottom level New Development Results

Site 1 (Light scene 1)
Calculation objects

New Development RHS (UGR)

max	>30
Target	-

Site 1 (Light scene 1)
Calculation objects

New Development RHS (GR)

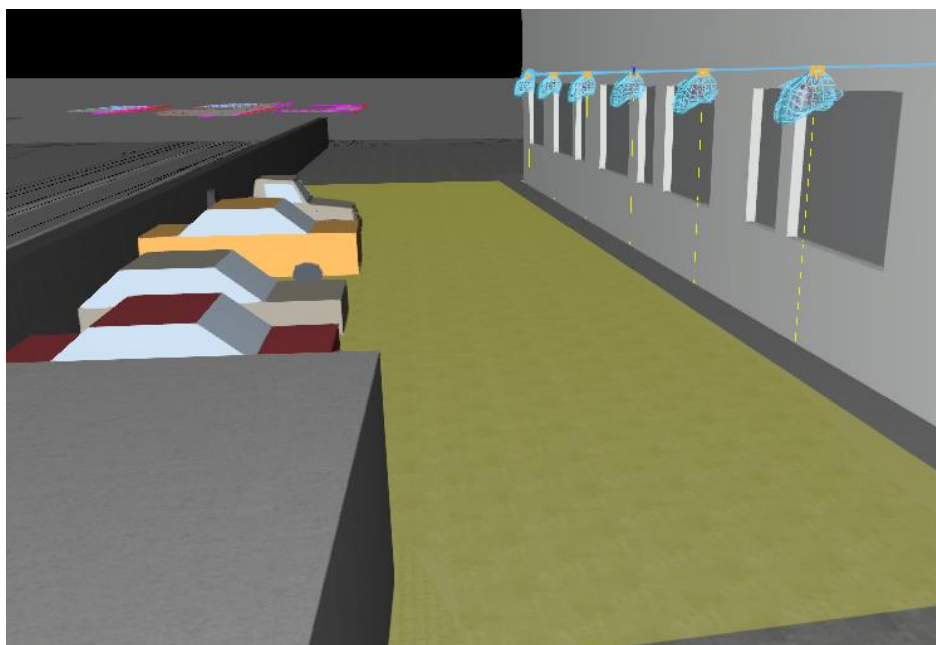
max	72
Target	≤50

Picture 10 - RHS New Development Results

6. Proposed Installation

The results of the calculations show that for both scenarios, Canterbury Mansions and the New Development, the current external luminaire situation results in levels of glare that are significantly higher than recommended levels and therefore likely to cause a disturbance to neighbouring properties.

However, additional calculations were completed, with the installation angle of the luminaires changed to 0°, such that the luminaires are parallel to the ground, or the beam angle is perpendicular. This is shown below.



Picture 11 - Proposed angle of installation

The results of this calculation show a reduced glare impact across all calculated surfaces. A comparison of the car park lux levels was also completed showing the proposed angle of installation still facilitates good lux levels for pedestrians in the car park.

The results of this calculation are shown below. The GR has been reduced in all cases to less than 10 or 26 for the RHS, and the UGR has been reduced to less than 10 as well. However, it is noted that the UGR is still greater than 30 for the bottom and RHS new development.

Site 1 (Light scene 1)
Calculation objects

New Development Top (UGR)

max	<10
Target	-

Site 1 (Light scene 1)
Calculation objects

New Development Top (GR)

max	<10
Target	≤50

Picture 12 – Top Level New Development Results (proposed)

Site 1 (Light scene 1)
Calculation objects

New Development Middle (UGR)

max	<10
Target	-

Site 1 (Light scene 1)
Calculation objects

New Development Middle (GR)

max	<10
Target	≤50

Picture 13 – Middle Level New Development Results (proposed)

Site 1 (Light scene 1)
Calculation objects

New Development Bottom (UGR)

max	>30
Target	-

Site 1 (Light scene 1)
Calculation objects

New Development Bottom (GR)

max	24
Target	≤50

Picture 14 – Bottom Level New Development Results (proposed)

Site 1 (Light scene 1)
Calculation objects

New Development RHS (UGR)

max	>30
Target	-

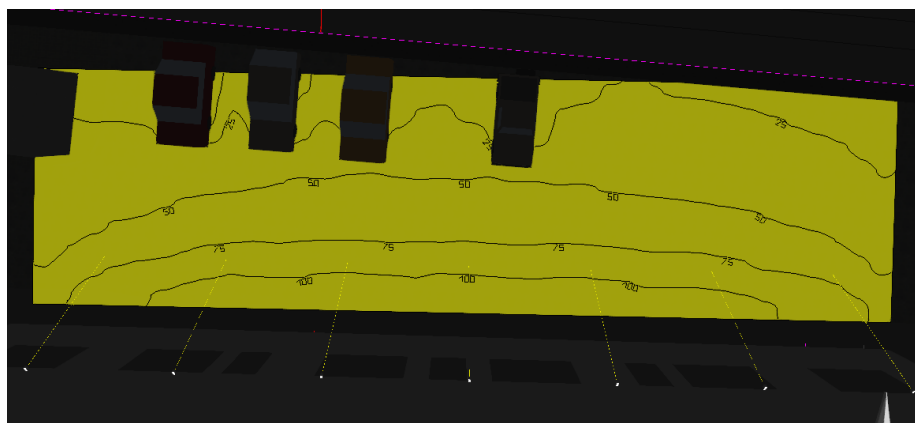
Site 1 (Light scene 1)
Calculation objects

New Development RHS (GR)

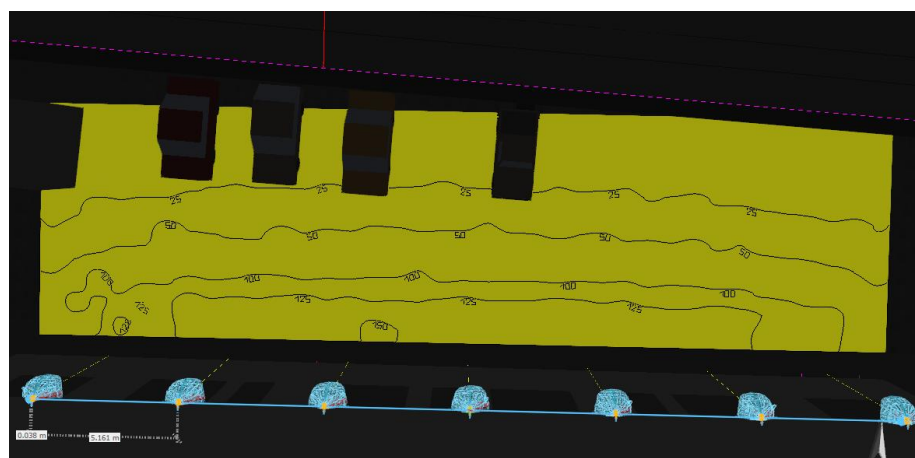
max	26
Target	≤50

Picture 15 - RHS New Development Results (proposed)

For this change in angle there has been minimal change to the lux levels of the car park. The path remains well lit at around 100-150 lux, and the edge of the car parking bays is still around 25 lux. This comparison is shown below.



Picture 16 - Existing Angle Lux Levels



Picture 17 - Proposed Angle Lux Levels

7. Conclusion

It is clear from the calculations that the existing external luminaire installation will have a significant impact, in terms of glare and disturbance, on the Canterbury Mansions. They have also shown that there will be significant glare impact on the new development currently under construction.

The calculated glare levels for both of these scenarios is significantly above recommended levels, rated between “unbearable” and “disturbing” on the Glare Rating index, and “extremely high” in UGR.

However, a possible resolution has been identified, by adjusting the installation angle of the luminaires. The calculations were ran again based on the revised angle, and they now show that for the Glare Rating, on all calculated surfaces of the new development, they are acceptable.

However, for the lower levels of one building and the more distant building of the new development, the UGR is still greater than 30. Therefore there is still some risk of visual impact from the glare of these luminaires.

Therefore the luminaries, in addition to having the angle adjusted, should be on a timer to within reasonable hours, to reduce the risk of impacting any other local residents. The use of PIR or sensors, would also reduce the time the luminaires are on, only switching on when required.

VTAC, the luminaire manufacturer, offer a 62mm “Adaptor Holder For Street Light” with adjustable angle bracket, which will be used to adjust the angle to zero degrees.