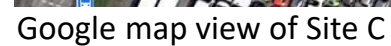


The background of the entire page is an abstract, low-angle photograph of a ceiling or floor composed of large, rectangular panels. The panels are arranged in a grid-like pattern, but the lighting creates a strong sense of depth and perspective. Bright, rectangular patches of light illuminate some of the panels, while others are in deep shadow, creating a high-contrast, geometric pattern that recedes into the distance.

QODA LIGHT

Issue	Date	Description	Prepared	Checked
P	27.05.2021	Preliminary Issue	B. Porter	S. Dove
P1	15.06.2021	Preliminary Issue	B. Porter	S. Dove
P2	22.09.2021	Preliminary Issue	B. Porter	S. Dove
P3	06.10.2021	Updated layout	S. Dove	B. Porter
P4	13.10.2021	Updated layout	S. Dove	B. Porter
P5	21.12.2023	Updated layout	S. Dove	B. Porter

The existing car park is being extended and new lighting is being introduced to light this area. The requirement is to control the spill light on the hedge line of the Eastern and Northern boundaries and keep the illuminance level below 0.2 lux on a horizontal plane and below 0.4 lux on the vertical plane.



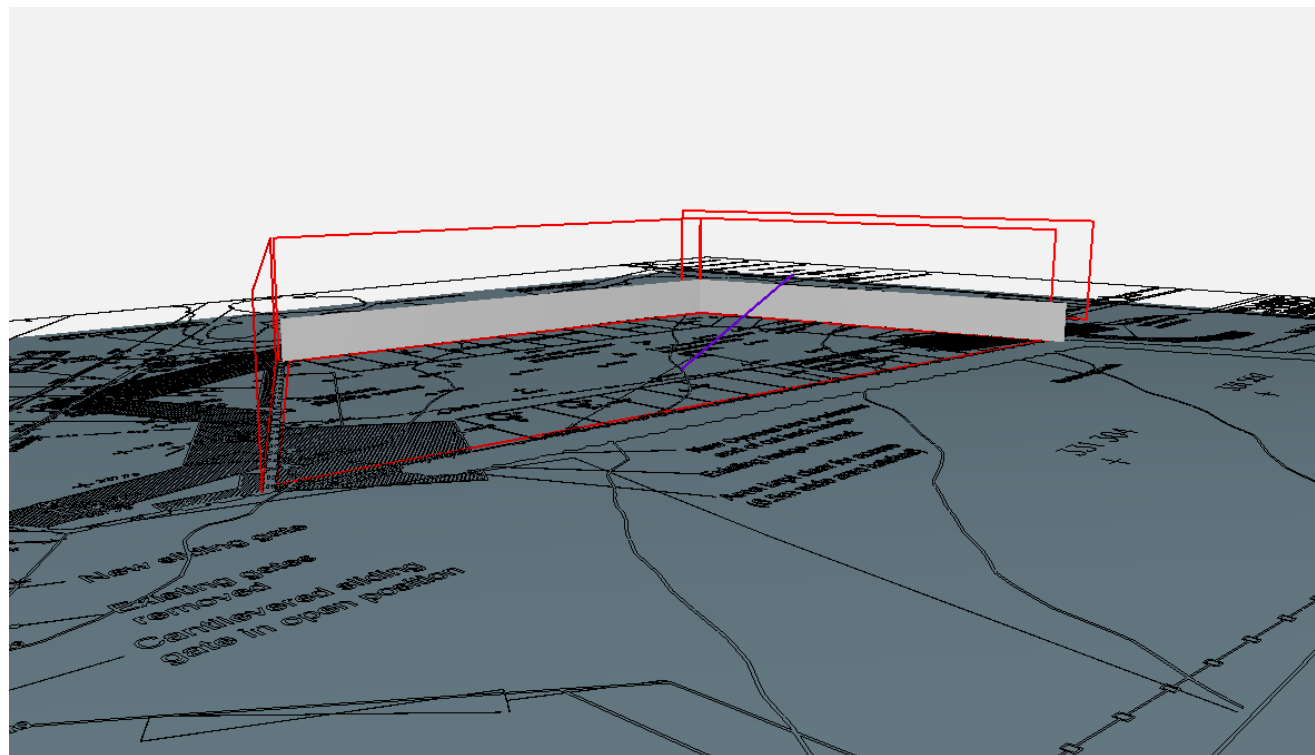
Method of Assessment

Lighting calculation software was utilised to create a computer model of the site in order to assess the proposed installation.

For the basis of the lighting calculations a maintenance factor of 1.0 has been used as recommended in the relevant guidance. This predicts the worse case scenario, eg when the luminaires are new and initially installed, so before any light depreciation from the LED lamps or the luminaires get covered in dirt and dust.

Over time the figures indicated will reduce as the lamps and luminaires all age.

A fence of no less than 2.1 metres is being introduced on the Northern and Eastern boundaries to reduce noise and this has been included in the modelling.

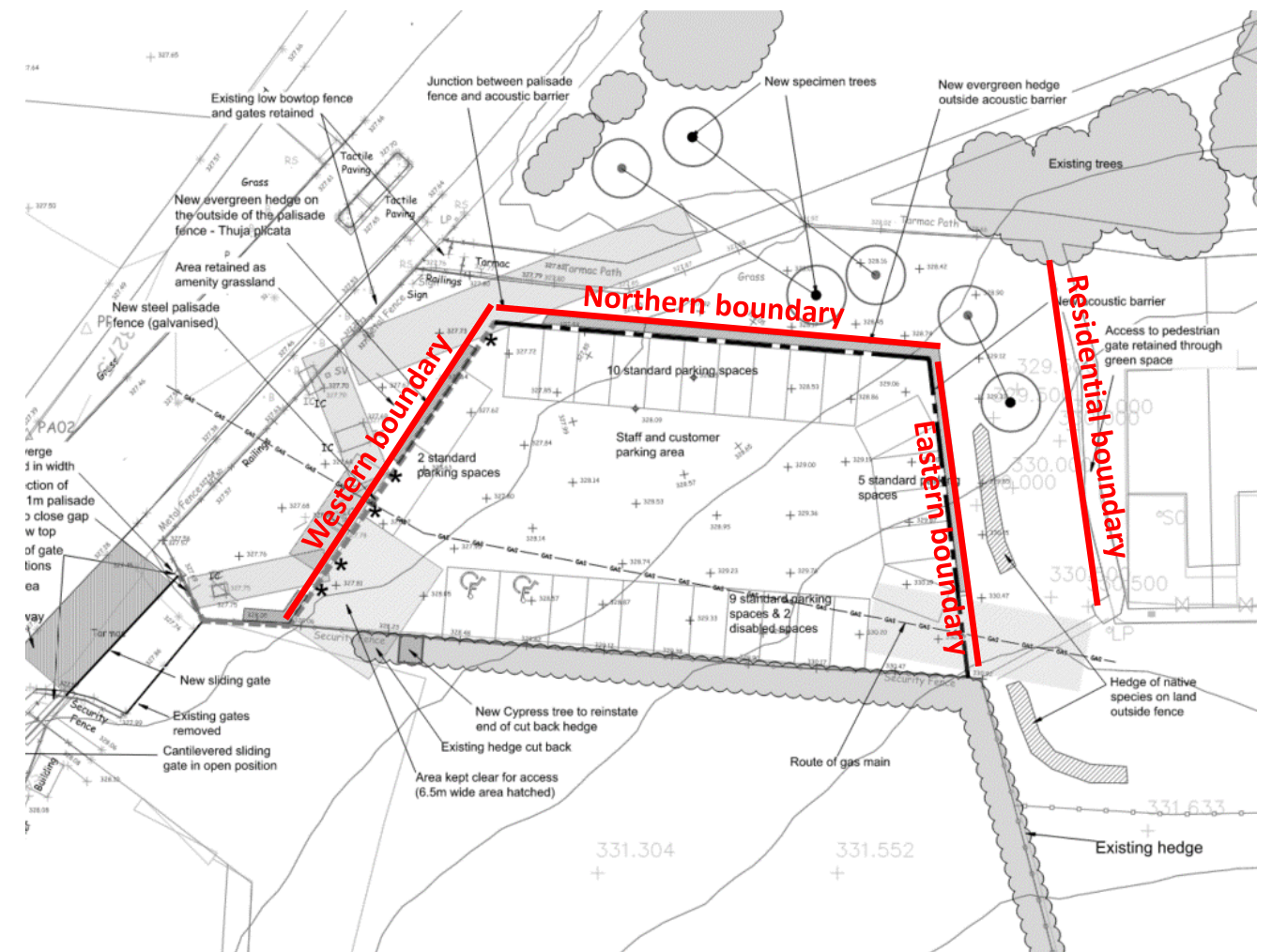


Extract from lighting calculation software (Relux)

Vertical Residential Boundary

To the east of the proposed site are a number of residential properties on 'The Hafod'. A calculation plane has been placed along the boundary of these properties to ensure any light spill from the proposed installation is within the recommended guidance.

Calculation planes have also been placed along the northern, eastern and western boundaries to ensure there is no excessive light spill to these areas.



Location of calculation planes

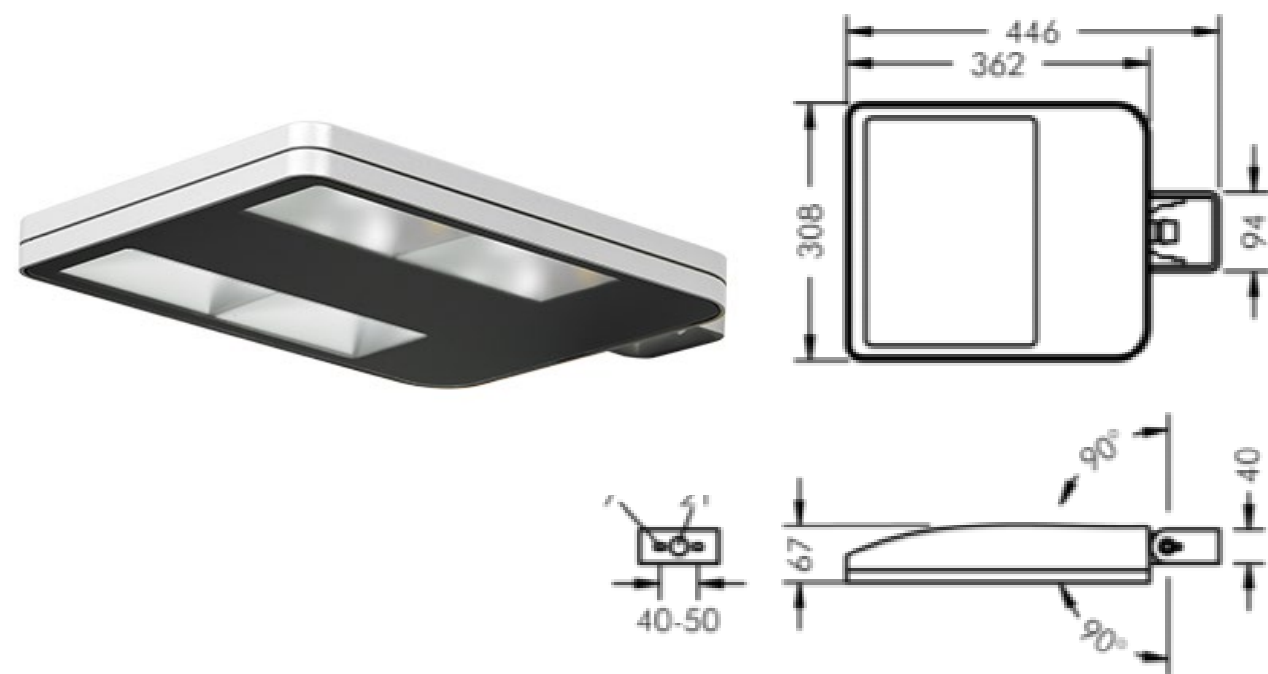
Proposed Installation

The proposal is to install 1no. Meyer Monospace luminaire, mounted on a 5m column.

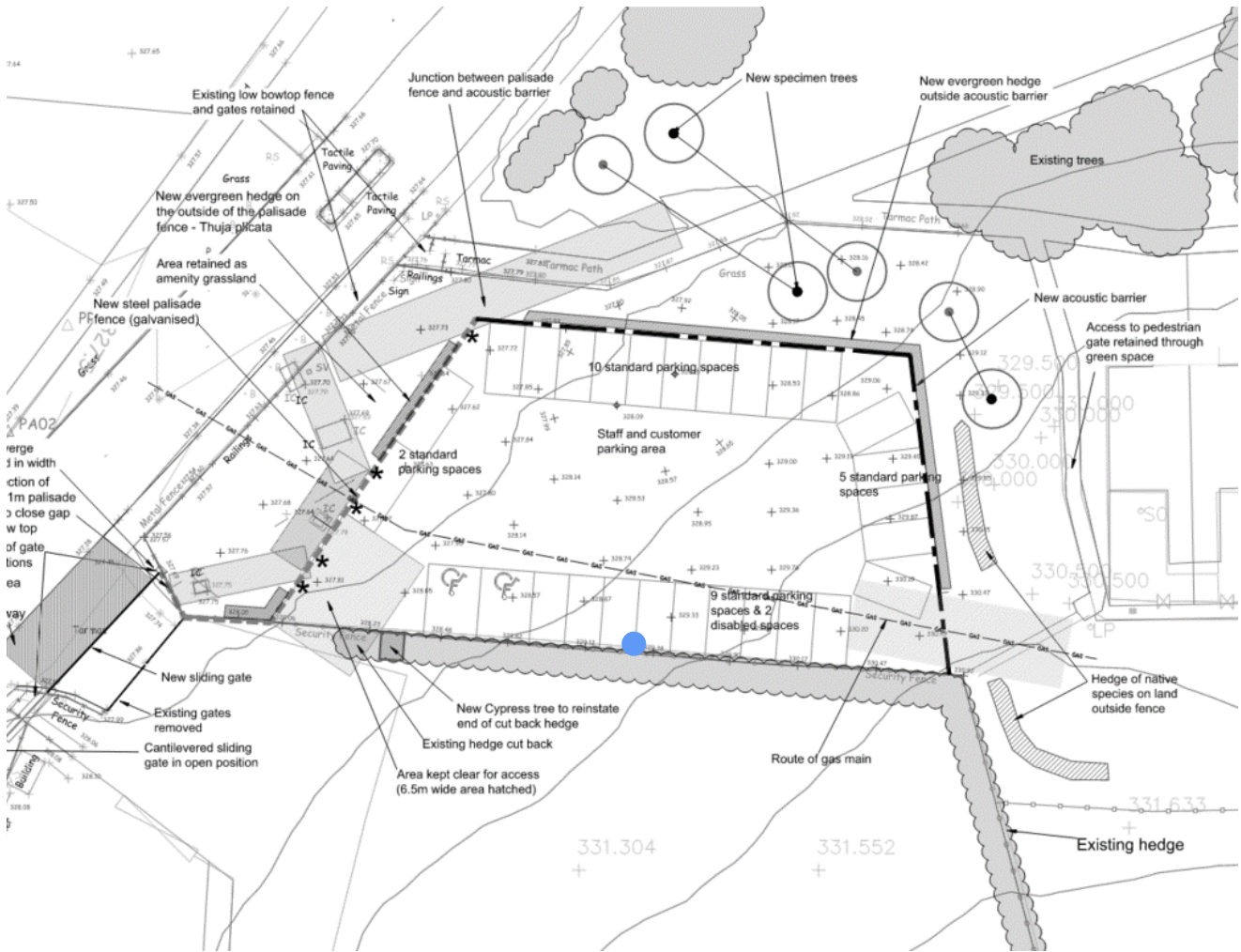
The Meyer luminaire has a flat glass and asymmetric distribution and is designed to be installed in a horizontal orientation, meaning there is no direct upward light.

The luminaire uses LED technology which has no UV component and a warm white colour temperature of 2700K.

A slight downward tilt of 2 degree is to be applied to the luminaire and there are no baffles or louvres used on the luminaire.



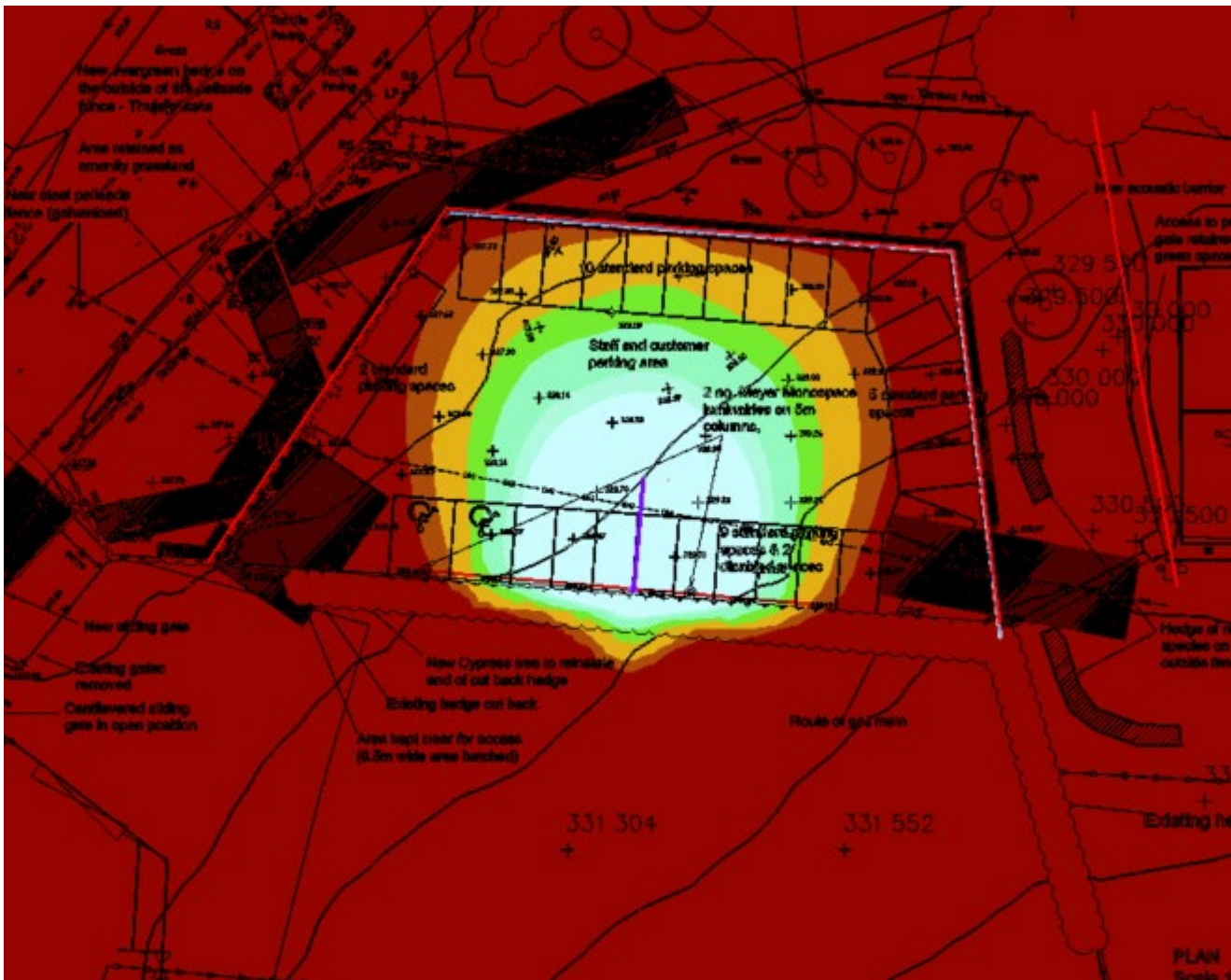
Proposed luminaire



Calculation – Horizontal Illuminance

As can be seen in the calculation results below, the proposed luminaire installation ensures a good spread of light across the site, whilst ensuring no excessive light spill beyond the site boundaries.

The adjacent calculation also shows the upward light component and as can be seen, with the luminaires in the proposed arrangement there is no direct upward light from the luminaires.



Horizontal illuminance plane

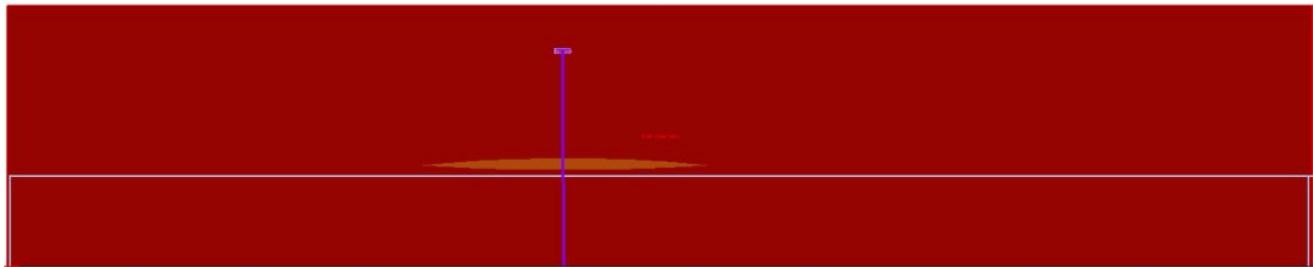


Measuring plane showing no direct upward light

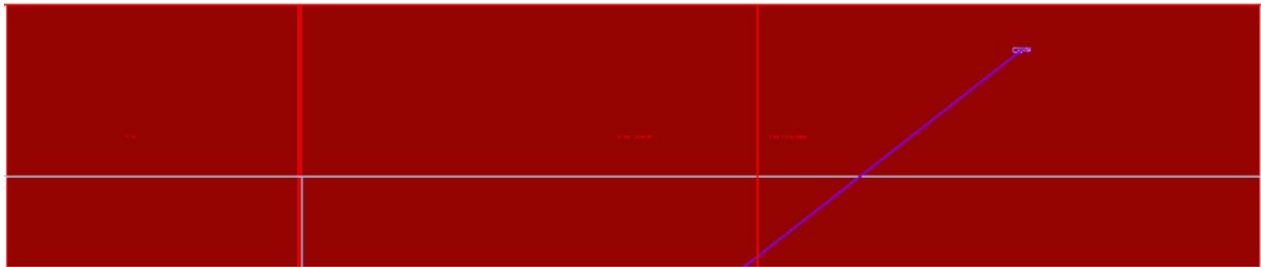


Calculation – Vertical illuminance

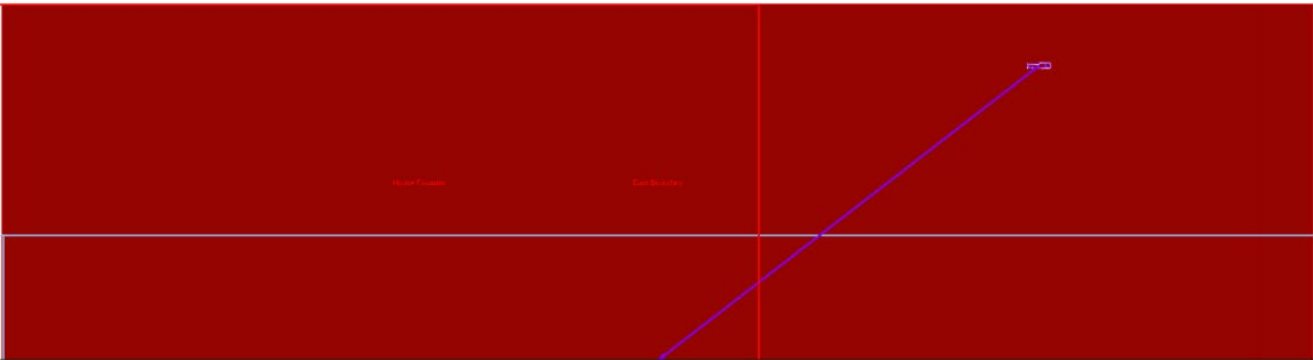
The calculation results for the northern, eastern, western and residential boundaries show there is no excessive light spill over the value of 0.4 lux on the vertical planes.



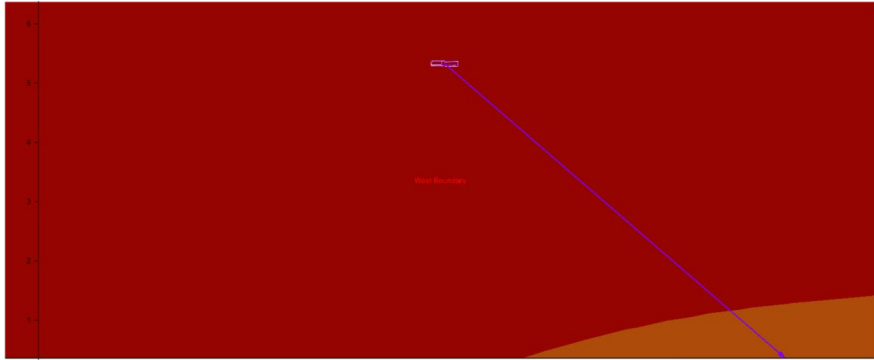
Vertical illuminance plane – Northern boundary (Max – 0.24 lux)



Vertical illuminance plane – Residential boundary (Max – 0.01 lux)



Vertical illuminance plane – Eastern hedge boundary (Max – 0.02 lux)



Vertical illuminance plane – Western hedge boundary (Max – 0.37 lux)



Conclusion

External lighting is considered necessary to allow users to safely access the site and is a key security element within the site.

As indicated on the proceeding pages, the proposed lighting arrangement has been modelled to identify the impact this new lighting installation will have on the external space.

From the calculation results it can be seen that the proposed layout controls the lighting distribution and ensures there is no excessive light trespass beyond the site boundaries.

The vertical light on the Eastern and Northern boundaries is below 0.4 lux and the acoustic fence on these boundaries also ensures the horizontal illuminance is below 0.2 lux.

