

7. Lighting

7.1 Introduction

7.1.1 The lighting assessment of the proposals is contained in Chapter 7 of the Environmental Statement dated September 2007 and the Regulation 19 submission listed under the Supporting Landscape and Visual Information from *fpcr*.

7.1.2 While there has since been a scheme change as reflected in the revised Masterplan dated June 2009 the impacts of this on the original assessment will be minor. Set out below is a list of the material within the original ES chapter which this Supplemental ES supersedes and which now no longer forms part of the assessment together with some correction to Tables 7.1. In addition Figure 7.1.1 replaces Figure 7.1 and there is an additional Figure 7.4.

7.1.3 Appendix 7.1 remains current, while Appendix 7.2 and all its parts are superseded.

7.1.4 Corrections to Table 7.1

Table 7.1: Standards Proposed by ILE (2005) for Limiting Obtrusive Light

OBTRUSIVE LIGHT LIMITATIONS FOR EXTERIOR LIGHTING INSTALLATIONS						
Environmental Zones	Sky Glow ULR (Max %)	Light into Windows Ev (lux) Before curfew	Light into Windows Ev (lux) After curfew	Source Intensity I (kcd) Before curfew	Source Intensity I (kcd) After curfew	Building Luminance L (cd/m ²) Average, Before curfew
E1	0	2	1	2.5	0	0
E2	2.5	5	1	7.5	0.5	5
E3	5	10	2	10	1.0	10
E4	15	25	5	25	2.5	25

Notes to table:

ULR (Upward Light Ratio) is the maximum permitted percentage of luminaire flux that goes directly into the sky;

Ev is Vertical Illuminance in Lux;

I is Light Intensity in Candelas;

L is Luminance in Candelas per square metre; and

Curfew refers to a time when the local planning authority has agreed that the lighting installation should be switched off - typically 11pm - 7am.

7.4 Baseline Conditions

7.4.1 This sub-section described the results of the initial baseline lighting survey undertaken on 3 April 2007 which included information relating to the existing lighting on and surrounding the site and provided data on both levels of illumination (including light spill) and luminance (glare and sky glow) from externally lit sources in the area, including security lighting, highways and street lighting, together with levels of fugitive light loss from the windows of properties.

7.4.2 Following concerns from other parties that impacts from the AONB have been downplayed, two further night-time viewpoints and Monitoring Locations have been added as indicated in **Figure 7.1.1. and Table 7.2.1** These new viewpoints (NV6 and NV7) are shown on **Figure 7.4** and details of the Base line Conditions are given in **Table 7.4.1**.

Table 7.2.1: Description of additional Night-time Viewpoints and Monitoring Locations

Location	Description
NV6	Located within the AONB on the Pilgrims Way just east of Thurnham. This viewpoint benchmarks one of the few long distant views towards the site from a public accessible nighttime viewpoint. However, it should be noted that few pedestrians are liable to be walking along this lane at night and that those driving will be generally lower down with an even more limited view.
NV7	Located at the top of Water Lane at its junction with the Pilgrims Way within the North Downs AONB. This viewpoint benchmarks a further long distant view towards the site from a public accessible nighttime viewpoint. As above it should be noted that few pedestrians are liable to be walking along this lane at night and that those driving will be generally lower down with an even more limited view.

Table 7.4.1: Details of the ILE Environmental Zone Criteria and Baseline Lighting Conditions

Location	ILE Zone Criteria	Baseline Survey Comments
NV6	E1/E2	This location, while situated within an AONB can be seen from this viewpoint looking towards the proposed site to not be an intrinsically "dark landscape". It should also be noted that the M20, with its lines of continuing moving traffic, that will border the proposed development, cannot be seen.
NV7	E1/E2	This location, while situated within an AONB can be seen from this viewpoint looking towards the proposed site to not be an intrinsically "dark landscape". Also, as noted above, there is still no view of the M20, with its lines of continuing moving traffic that will border the proposed development.

7.6 Mitigation Measures

The Lighting Design and Lighting Strategy

- 7.6.6 The strategy for the lighting design for the scheme has used current best practice guidance and technology. It has been designed to be compliant with the minimum lighting requirements indicated in relevant guidance documents, to ensure the safety of employees and security of property, to reduce costs on long-term maintenance, ensure that energy efficiency is maximised, whilst ensuring that light spill, glare and upwards lighting to surrounding receptors are minimised and are in accordance with an E1/E2 Environmental Zone. The Lighting Strategy has therefore been designed to represent best environmental, economical and health and safety value taking into account the above factors.
- 7.6.7 The outline lighting design given in Appendix 7.2 of the ES has been fine tuned to reflect current design thinking two years on as well as meeting the modified Masterplan. The same high quality full cut-off luminaires will be utilized giving a total of c 472 lighting fittings as detailed in Table 7.6 below. The maximum free standing column height will be 12m, while for the Intermodal area 30 luminaires will be mounted on the gantry cranes (6 for each) at a maximum height of 25m. The cap parks will be lit from 6m high columns. Further details on the lighting specification are included in the revised Appendix 7.2.

Table 7.6: Summary of lighting specification proposed for the site

Label	Lamps Type	Quantity	Mounting Height (m)	Installed Light / Direct uplight	Primary Location
A	33,000 lumen (250w) High pressure sodium	27	10	891 K.lumens Zero	Access Roads
B	90,000 lumen (600w) High pressure sodium	139	12	12,510 K.lumens Zero	Loading Areas
C	6,500 lumen (70w) High pressure sodium	171	6	1,112 K.lumens Zero	Car Parking Areas
D	130, 000 lumen (1kw) High pressure sodium	30	25	3,900 K.lumens Zero	Intermodal Area
E	14,000 lumen (150w) High pressure sodium	105	10	1,470 K.lumens Zero	Access Roads
TOTAL		472		19,883 K.lms Zero	

- 7.6.8 Sky glow will be controlled through the use of full horizontal cut-off (HCO) lanterns and all luminaires, with the exception of any low level bollards, will be installed with flat glass to achieve the obtrusive light restrictions in accordance with ILE criteria for the most rigorous E1 Environmental Zone (zero upward light ratio). In addition, the use of low-reflectance black-top on hardstanding areas will be utilised to minimise the upward reflectance of light and restrict any sky glow effects.

While the proposed modifications will alter slightly the number and location of many of the luminaires, it is not believed that the Conclusions drawn in the original ES need any substantial updating apart from the reference to the updated Appendix. However for easy reference, the perceived residual effects have been slightly amended as indicated below:

7.7 Residual Effects

Construction

- 7.7.1 Following the implementation of the best practice techniques, limited working during the hours of darkness and considering the temporary nature of construction activities, the residual effect during the construction phase will be of **neutral to minor negative** significance.

Operation

- 7.7.2 The secondary mitigation measures for lighting are dependent on the establishment and maturity of the proposed landscaping for the scheme. It is recognised that the proposed landscaping will take time to mature and, therefore, the residual effects from lighting will be of greater significance prior to landscaping maturity.

Impact of glare and light spill arising from the site impacting residential properties

- 7.7.3 Properties located on **Thurnham Lane (Close to NV1)**, to the west of the application site, will not experience changes to ambient lighting levels. The closest proposed lighting will be associated with the low level bollard lighting required adjacent to the railway sidings. The closest significantly lit area will be located at the loading area to the north of warehouse Unit 01, at approximately 350m from the nearest property on Thurnham Lane.
- 7.7.4 These properties will be screened from the development by a significant landscape buffer to this aspect of the application site, comprising mounding and woodland planting to form an effective visual screen to the immediate built development beyond. This mounding and planting would conceal views (Note: the closest building, Unit 01, would be set/cut relatively low into this area) of the development, whilst distant views to the very highest part of the gantry crane located in the Intermodal area (proposed at 25m in height) would be screened in the longer term by the maturing of the proposed woodland planting. This screening would prevent any light spill extending beyond the site boundary and would significantly reduce the potential effects of glare.

- 7.7.5 This area is considered to be representative of a borderline E1/E2 Environmental Zone (refer to NV1 – Table 7.4), which is likely to become more indicative of an E2 Environmental Zone due to its proximity to new light sources on the proposed development. It is considered that for **properties on Thurnham Lane** there may be a **minor negative** residual effect from glare and light spill compared to baseline conditions following the implementation of the mitigation measures described above.
- 7.7.6 Properties on the south western site boundary, including those on Fremlins Road and Mallings Drive in Bearsted, will not experience changes to current ambient lighting levels. The nearest proposed lighting will be the low level bollard lighting required adjacent to the railway sidings, but the closest significantly lit area will be the car parking area adjacent to the east of warehouse Unit 01, with an average illuminance of 12 lux from low power luminaires mounted at 6 metres.
- 7.7.7 In addition to the sensitive design of lighting in this area, these properties are already afforded significant screening by the railway line and the topography and vegetation of the land and, therefore, the likelihood of light spill and glare affecting many properties is significantly reduced. Although certain properties have more elevated views, the views of the highest parts of the built development proposals (the roofs and gantry crane) would be generally screened/filtered by a combination of existing and new on and off site planting. No artificial lighting will be located in this part of the site and the warehouse buildings will offer significant screening of artificial light to the north. An unlit green corridor is also proposed in this area.
- 7.7.8 It is considered, therefore, that for properties **in the vicinity of Fremlins Road and Mallings Drive (I)** in Bearsted, there may be a residual effect from glare and light spill of up to **minor negative** significance compared to baseline conditions and following the implementation of the mitigation measures described previously.
- 7.7.9 Properties located on **Roundwell (H)** to the south of the site are unlikely to experience changes to current ambient lighting levels. The nearest proposed lighting installations will be located in the car parking area at the side of warehouse Unit E and will be screened by vegetation.
- 7.7.10 In addition, the majority of these properties would only afford views eastwards towards the landscaping proposals on the boundary and lining the locally elevated access track to Barty Farm/Glenrowan House. It is considered that no residual light spill will affect this area and no glare will be visible from these properties once the screening vegetation is mature.
- 7.7.11 It is considered that for **properties on Roundwell** the residual effect will be of **neutral significance** from glare and light spill compared to baseline conditions and following the implementation of the mitigation measures described previously.

- 7.7.12 The **Barty Farm and Glenrowan House (NV3)** properties will be retained and will not experience significant changes to current ambient lighting levels as demonstrated from the results of the predictive modelling plots. The nearest proposed lighting installations will be located at the car parking area of warehouse Unit E, although both Barty Farm and Glenrowan House will be screened by vegetation. It can be seen from the predictive modelling that the maximum lux level in the vicinity of these properties in the direction of the nearest light source will be 0.1 lux.
- 7.7.13 The Barty Farm and Glenrowan House properties would experience close uninterrupted views to the east and south east towards the proposed development. Limited views may also be possible towards the north. Existing planting in the vicinity of these properties would be reinforced with further landscape framework proposals. While most artificial lighting sources will be screened by the nearest vegetation and light trespass levels will be minimal, it is however possible that residual sources of glare will be visible from these properties once the screening vegetation is mature.
- 7.7.14 It is considered therefore that for the retained **Barty Farm and Glenrowan House properties** there may be a **minor negative** residual effect from glare and light spill compared to current baseline conditions and following the implementation of the mitigation measures described previously.
- 7.7.15 Properties on **Crismill Road (G)** will not experience changes to current ambient lighting levels as demonstrated from the results of the predictive modelling plots. It can be seen from the predictive modelling that the maximum lux level immediately to the north of these properties in the direction of the nearest light source will be 0 lux. The nearest proposed lighting installations will be located at the car parking area at warehouse Unit E as well as highways lighting on the access road. This will be screened by retained, new and enhanced landscaping and planting. Minimum artificial lighting is proposed for the south side of warehouse Unit E and this building will screen light sources associated with the Intermodal area and the loading areas from such residential properties.
- 7.7.16 In addition, these properties will be separated from the proposed development by a significant landscape swathe (combining the conserved Common Wood with new tree and woodland planting) that, once mature, would provide an effective visual screen to the majority of the built development in this direction. Screening and temporary fencing would be incorporated into these landscape proposals to assist in the initial screening of the built development, where this is required.
- 7.7.17 Based on Table 7.3, it is considered that for **properties on Crismill Road** there may be a **neutral to minor negative** residual effect from glare and light spill compared to current baseline conditions and following the implementation of the mitigation measures described previously.
- 7.7.18 Properties in the vicinity of **Woodcut Farm (D)** will be in close proximity to new sources of lighting, including highways lighting proposed for the access road (within 50m) and security lighting for the car park (within 75m) adjacent to the southern façade of Unit D, as well as car parking (within 100m) adjacent to the southern facade of Unit C.

- 7.7.19 Properties in the vicinity of Woodcut Farm will not experience significant changes to current ambient lighting levels although results of the predictive modelling plots suggest that the maximum lux level immediately to the north of these properties in the direction of the nearest light source will be 0.4 lux. This prediction does not take into account the topography and screening proposed. Units C and D will be set significantly lower than properties in the vicinity of Woodcut Farm and, therefore, lighting installations may not be viewed in many instances and the effects of light spill and glare on residential receptors will be reduced. In addition, properties in the vicinity of Woodcut Farm would benefit from woodland planting proposals to the development boundary, which would provide additional screening of these new artificial light sources from the properties.
- 7.7.20 It is considered therefore that for **properties in the vicinity of Woodcut Farm** there may be a residual effect from glare and light spill of up to **minor negative** significance compared to baseline conditions and following the implementation of the mitigation measures described previously.
- 7.7.21 The **Chestnuts (K)** property is likely to experience changes to current ambient lighting conditions as there may be some residual light spill from the application site into the boundary of this property, as demonstrated by the results of the predictive modelling plots. Vertical illuminance levels have been predicted for light spill along the boundary of this property which indicates that the maximum illuminance level will be 3.9 lux along the eastern boundary. However, this prediction does not take into account the proposed vegetative screening along the site boundary in this location. Also, louvres could be fitted to reduce light spill in the vicinity of Chestnuts.
- 7.7.22 The Chestnuts property would be buffered by a strip of landscape and planting proposals to the north, east and west of the property, but views to the proposed built development units beyond these areas would be possible and this landscaping would not offer total screening of the development.
- 7.7.23 It is considered therefore that for the **Chestnuts property** there may be a **minor to moderate negative** residual effect in terms of glare and light spill, although glare and light spill will be controlled through the stringent best practice lighting design.

Impact of glare on the road users, cyclists and pedestrians near the site

- 7.7.24 Overall, the installation of artificial lighting to a currently unlit area is likely to affect the setting of the current night time scene and views of this area in the short term. However, in the long term, the controlled and well designed lighting specification, retaining light spill within the site boundary where possible and controlling the effects of glare through the use of well directed light fittings (flat glass and full cut off principle), the height and orientation of buildings, the landscape mounding and the establishment of the landscape planting framework, will all reduce the overall impact on road users and cyclists / pedestrians to a residual effect of **neutral to minor negative** significance.

Impact on the AONB

7.7.25 As can be seen from the existing viewpoints NV6 and NV7, public views of the site from the AONB are very limited, and where they are, the view is not of a totally “dark landscape”. Therefore the proposed installation of artificial lighting is unlikely to greatly affect the setting of the current night time scene and views of this area. The controlled and well designed lighting specification, retaining light spill within the site boundary where possible and controlling the effects of glare through the use of well directed light fittings (flat glass and full cut off principle), the height and orientation of buildings, the landscape mounding and the establishment of the landscape planting framework, will all reduce the overall impact on the AONB to a residual effect of **neutral to minor negative** significance.

Increase in sky glow

7.7.26 The potential impacts of sky glow will be minimised by implementing the recommended mitigation measures, including the installation of horizontal cut off lanterns with flat glass which are optimised and well controlled and directed to negate the effects of the upward loss of light.

7.7.27 Due to these measures, any direct upward light, which produces the vast majority of sky glow, will be negligible while due to the keeping of light levels to the minimum required standards will ensure that any upward reflected light is also kept to a minimal. It is therefore believed that any sky glow (which will be most noticeable during misty and low cloud conditions) will be a residual effect of **neutral to minor negative** significance.

Table 7.8 Summary Impact Table for Lighting Issues

Potential Impact	Nature of Impact (Permanent or Temporary)	Significance (Major, Moderate or Minor) (Positive or Negative)	Mitigation / Enhancement Measures	Residual Effects (Major, Moderate or Minor) (Positive or Negative)
Construction				
Potential disturbance from lighting associated with plant and construction vehicles	Temporary	Minor Negative	Specified working hours not extending significantly into hours of darkness (finishing at 6pm), careful selection of the location of temporary floodlights and construction compound;	Neutral
Impact of light spill and glare from floodlighting upon sensitive receptors particularly during the winter months	Temporary	Minor to Moderate Negative	Lighting to be switched off when not required for construction activities, security or health and safety; The programme of works will take into account the location of sensitive receptors, by restricting working hours, careful selection of the constructors compound and through the careful control and direction of lighting;	Minor Negative
Impact of light spill and glare from the contractor's compound upon sensitive receptors	Temporary	Minor Negative	Avoid temporary lighting in the vicinity of areas of ecological interest (refer to Chapter 8 Ecology); Light spill will be minimised by avoiding poorly sited lights on the boundary of the proposed development;	Neutral
Impact of light spill and glare from poorly sited security lighting on the boundary of the development upon sensitive receptors	Temporary	Minor to Moderate Negative	Use modern floodlights with appropriate shields; Positioning lights to <70 degrees and directing them away from the site boundaries and into non-sensitive parts of the centre of the site where possible;	Neutral to Minor Negative
Impact of glare from any illuminated advertisements	Temporary	Minor Negative	Any illuminated advertising installed to follow ILE (2005) guidance; and Retain existing vegetation screening where possible (new vegetative screening associated with the Landscaping Strategy will not have matured sufficiently to be considered as mitigation).	Neutral to Minor Negative
Impact of lights at height associated with construction of structures upon sensitive receptors	Temporary	Minor Negative		Neutral to Minor Negative
Operation				

Sky Glow	Temporary	Neutral to Moderate Negative (worse case)	It is proposed that all major luminaires will be of the horizontal cut-off design that will ensure that the Upward Light Ratio (ULR) of the proposed installation is zero. Therefore, while the installed lighting within the proposed development would be a definite increase within the overall area, due to careful design the direct up-light escaping into the wider area, that is the main component of sky glow, would be negligible.	Neutral to Minor Negative
Light trespass	Permanent – at night	Neutral to Major Negative (worse case)	Due to the careful design and layout of the lighting of the development which would incorporate the appropriate use of equipment types, the light trespass values around the area will be kept well within the ILE limits of 1 lux at the windows of existing residential properties surrounding the site.	Neutral to Minor Negative (worse case)
Source Intensities	Permanent - at night	Neutral to Major Negative (worse case)	For receptors that would obtain high level, open and/or panoramic views of the development, the use of horizontal cut-off luminaires for all the lighting will ensure that few if any “spots of light” would be seen of any intensity that would produce glare or nuisance.	Minor to Moderate Negative (worse case)
Building luminance	Permanent - at night	Neutral to Moderate Negative (worse case)	It is not envisaged that any elements within the site will be purposely floodlit so this aspect is not applicable, although there may be some limited views of the lit container stacks in the Intermodal Area from some transient locations.	Minor to Moderate Negative (worse case)