

Appendix 3.3

LIGHTING ASSESSMENT 2015



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Fort Halstead, Lighting Assessment Report

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1 EXECUTIVE SUMMARY

- 1.1 This Baseline Lighting Assessment report is provided as an Appendix to the Environmental Statement (ES) for the purposes of the Outline Planning Application for the Fort Halstead redevelopment. It provides an assessment of the existing baseline lighting environment of the Site and surrounding area in the context of the proposals for the Development.
- 1.2 A day and night time assessment was carried out between the 22-25th October 2014. The information obtained from the various viewpoints and adjacent locations formed the basis of the baseline lighting assessment.
- 1.3 The existing conditions of the Site is assessed to be Environmental Zone E2, which is comparable to a rural village, as defined below:

Obtrusive Light Limitations – ILP UK Recommendations						
Environmental Zone	Sky Glow ULR (Max) %	Light Trespass (into windows) Ev lux		Source Intensity (I) kCd		Building Luminance L (Cd/m ²)
		Pre-curfew	Post-curfew	Pre-curfew	Post-curfew	Pre-curfew
E2 – Low district brightness. Rural, small village, relatively dark urban location	2.5	5	1	7.5	0.5	5

Table 1-1 Environmental Zone E2

Note: The Environmental Zone E2 definition and parameters, has been extracted from the Obtrusive Light Limitations for exterior lighting installations – general observers - Institution of Lighting Professionals UK Recommendations 2011 table of Environmental Zones.

- 1.4 The existing Site, although well illuminated, is well screened from all directions by the boundary woodland and vegetation. Direct views of the existing Site lighting are therefore limited, and only from specific viewpoints are glimpses of the Site lighting possible.
- 1.5 Moderate levels of sky glow above the Site are clearly visible in the form of an ‘orange’ aura against the surrounding dark skies. It is likely that the Development will result in reduced levels of sky glow due to the better lighting design and luminaires that would be used resulting in a reduction in direct upward light from that that is provided from the present lighting installation
- 1.6 The overall impact of the Development’s lighting design and installation would be based on the best practice design guides and Sevenoaks District Council lighting requirements. The Development is therefore considered to be an improvement on the existing levels of sky glow, therefore providing **minor beneficial** impacts at most viewpoints.
- 1.7 The impact of the Development’s lighting in terms of light intrusion and luminaire intensity are considered to be **negligible** to **minor beneficial** at most of the viewpoints assessed and identified within the assessment.

1.8 The Development's lighting would be required to comply with National best practice design guides and Local Planning Policies¹, which:

- function well and add to the overall quality of the area, not just for the short term but over the lifetime of the development;
- establish a strong sense of place, using streetscapes and buildings to create attractive and comfortable places to live, work and visit;
- optimise the potential of the Site to accommodate development, create and sustain an appropriate mix of uses (including incorporation of green and other public space as part of developments) and support local facilities and transport networks;
- respond to local character and history, and reflect the identity of local surroundings and materials, while not preventing or discouraging appropriate innovation;
- create safe and accessible environments where crime and disorder, and the fear of crime, do not undermine quality of life or community cohesion;
- be designed as an integrated part of any related development scheme;
- be low energy lighting is used;
- utilise the alignment of lamps and provision of shielding minimises spillage and glow in order to safeguard the night sky;
- have a lighting intensity no greater than that required to provide adequate illumination;
- preserve or enhances the character or appearance of any Conservation Area which may be affected. Proposals to floodlight building facades, shop fronts, signs etc. must be sensitive to the character or appearance of the Conservation Area with lights carefully positioned to avoid overspill;
- adversely affect Areas of Outstanding Natural Beauty or in other areas of open countryside will not be permitted unless the preceding criteria are satisfied and the lighting is essential for safety or security reasons for the facility in question.

¹ National Planning Policy Framework 2012.

2 INTRODUCTION

- 2.1 This Baseline Lighting Assessment report is provided as an Appendix to the Environmental Statement (ES) for the purposes of the Outline Planning Application (OPA) for the proposed redevelopment of Fort Halstead (hereafter referred to as ‘the Development’) near Sevenoaks, in Kent. This report assesses the existing lighting arrangements at the Site, which is currently occupied by Defence Science and Technology Laboratory (DSTL) and QinetiQ. This report provides an assessment of the existing baseline lighting environment in the Study Area indicated within **Appendix B**, in the context of the proposals for the development. The Study Area is consistent with the Landscape and Visual Assessment (LVIA) and covers an area that extends 7.5km from the centre of the Development.
- 2.2 This Baseline Lighting Assessment considers the existing lighting installation at the Site in relation to obtrusive light and visual obtrusion in respect of Environmental Lighting Zones as defined by the Institution of Lighting Professionals – Guidance Notes for the Reduction of Obtrusive light. This report assesses the ‘obtrusiveness’ of the existing Site lighting from various vantage points external to the Site in technically measurable terms as a ‘baseline’ study.
- 2.3 This Baseline Lighting Assessment aims to set out a baseline for development of a Lighting Strategy for the Development so that the impact of any new lighting will be equal or an improvement on the existing lighting environment.
- 2.4 The Site is centred on national grid reference TQ 4975 5925. The boundary area of the Site is indicated within **Appendix E**.
- 2.5 The lighting assessment study area covers the Site, indicated within **Appendix B**, and extends approximately 7.5km to include distant views of the Site. The Site covers an area of 62.7 Ha.
- 2.6 Throughout this report, use is made of standard lighting terminology to describe lighting types, quality, and impact. These terms are explained within **Appendix A**.
- 2.7 This report is structured as follows:
- Methodology.
 - Baseline lighting environment.
 - This section describes the existing baseline lighting environment, providing a review of the existing lighting baseline from both a day and night-time perspective from representative viewpoints. The section also identifies the existing lighting sources and types within the area.
 - Summary and conclusion.
 - This section summarises the existing baseline lighting environment and predicts the proposed impacts on the representative viewpoints as a result of the Development lighting.

3 METHODOLOGY

3.1 The following methodology was adopted to carry out the baseline lighting assessment at the Site:

- Undertake lighting technical assessment in accordance with the Institution of Lighting Professionals Guidance on Undertaking Environmental Lighting Impact Assessments ILP:PLG04, 2013.
- Consultation was undertaken with Waterman Energy, Environment and Design² and LDA Design³ to agree the methodology of assessment for the project and to understand the project.
- A Site visit was undertaken between the 22-25th October 2014 to ascertain the context of the study area by day and night. This included describing existing sources of illumination within the existing Site and the adjacent surrounding environment.
- An assessment from the coordinated viewpoints was undertaken in accordance with LDA Design selected photo viewpoints, and as discussed with Waterman Energy, Environment and Design, including the measuring of existing illumination levels.
- An appraisal of the existing lighting systems was carried out, with an assessment of the anticipated significant impacts of the new lighting upon the selected viewpoints. The assessment was carried out based on the magnitude of change as indicated by the Parameter Plans within **Appendices C and D**, and the lighting design principles and strategies to be adopted to form the lighting proposals for the Development.

3.2 A Site assessment was carried out between the 22 and 25th October 2014. The information obtained from the various viewpoints and adjacent locations was sufficient to clearly illustrate the local situation. This assessment is, therefore, based on the data obtained and evaluated at accessible points, Site photographs and other images.

3.3 Climatic conditions at the time of the Site assessment are defined within each viewpoint assessment, within **Section 6 and 7**.

3.4 The below equipment was used:

- Canon EOS 500D digital SLR camera, utilising a 55mm and 75mm lens;
- Canon lighting tripod;
- Macam illuminance / luminance light meter (Serial No: 5117) – calibrated by BSRIA Instrument Solutions, 2nd July 2014, Certificate No: STD65899AL (Copy available on request).

3.5 The images (included within **Section 6 and 7**) are taken from the co-ordinated viewpoint locations as defined within **Table 4.4** Viewpoint Locations. The images are not 'stitched' panoramic scenes. They are used to provide context to the lighting assessment.

3.6 Day time camera settings were left as standard and the photos were taken in landscape mode, with auto white balance. No post-processing of day or night images has been undertaken, other than:

- de-skewing;
- cropping to letterbox format; and
- reduction of JPEG sizes for printing purposes within the Word document.

² Waterman Energy, Environment and Design, Project EIA Coordinators. Various telephone discussions and email correspondence during October 2014 to understand the project and Lighting Assessment viewpoints.

³ LDA Design, Project Landscape Architects. Various telephone discussions and email correspondence during October 2014 to ascertain specific viewpoints or receptors that they advised should be included, and to identify any key issues or risks associated with the viewpoints.

- 3.7 No changes to Gamma parameters were made.
- 3.8 Lighting levels were taken and recorded at each viewpoint location; Lighting levels were taken in accordance with Lighting Guide 04 – Guidance on Undertaking Environmental Lighting Impact Assessments⁵, and recorded based upon 2m x 2m and 5m x 5m grids with an average lighting level being calculated⁶. The average illumination levels are stated within **Table 4.2 Existing Site Illumination Site Illumination Levels**, and **Section 6 and 7**, within each viewpoint. The illuminance level measured was taken at 1000mm above ground level.
- 3.9 Sixteen representative viewpoints were selected to accord with the viewpoints to be assessed in the LVIA. The viewpoints were derived from the LVIA assessment. In coordination with LDA Design, the sixteen identified viewpoints were reviewed and a hierarchy applied to the viewpoints in terms of the more critical viewpoints for use within the Baseline Lighting Assessment.
- 3.10 For the purposes of the Lighting Assessment, eight viewpoints were considered to be most sensitive to change in terms of lighting and were therefore identified as being more critical. The remaining eight viewpoints were considered to be less subject to change with regards to lighting and therefore less critical. All sixteen viewpoints have been assessed during both day and night time hours in terms of lighting and are provided within **Section 6** and **Section 7** of this report. Refer to **Appendix B** and **Table 4.2** for Site and viewpoint location plans.

⁵ Institution of Lighting Professionals, Professional Lighting Guide 04, Guidance on Undertaking Environmental Lighting Impact Assessments, ILP, PLG04, 2013, Section 16.

⁶ Institution of Lighting Professionals, Professional Lighting Guide 04, Guidance on Undertaking Environmental Lighting Impact Assessments, ILP, PLG04, 2013, Section 16.1.1.

4 BASELINE LIGHTING ENVIRONMENT

4.1 Existing Facilities at Fort Halstead

4.1.1 The Site and land is currently used by QinetiQ, a private defence research company, and Defence Science and Technology Laboratory (DSTL), which provide scientific and technical research to the Ministry of Defence.

4.1.2 The Site currently consists of:

- Car parking areas;
- Access roads;
- Office and admin buildings;
- Laboratories;
- Workshops;
- Gatehouses;
- Plant and service areas;
- Green open areas.

4.2 Existing Landscape by Day

4.2.1 The Site is located on the crest of the Kentish North Downs, overlooking the town on Sevenoaks which is 4km south of the Site. The Site lies within the Green Belt and the Kent Downs Area of Outstanding Natural Beauty (AONB), north west of the M25. The Site offers partial views of Canary Wharf in the North, and Sevenoaks to the south.

4.2.2 The Site ground level falls away rapidly to the southeast from approximately 175m AOD (above ordnance datum) to 120m AOD, towards the town of Sevenoaks. The lowest area of the Site is located in the northern area and is 160m AOD. The Site contours increase towards the centre of the Site, rising to a highest point of 220m AOD⁷. The centre of the Site levels to a relatively flat gradient. The southern and northern areas of the Site decrease in height to 190m AOD in the north, and 120m AOD along the southern Site boundary.

4.2.3 The Site boundary is largely surrounded by mature dense woodland providing substantial screening of the Site. From the entrance road along Crow Drive, the Visitors Reception and police check point building can be seen (refer to **Figure 4.1**). Glimpses of the Site buildings beyond the police check point are possible from short range views. Again, the West Gate entrance offers views through the mesh wire gate into the Site (refer to **Figure 4.2**), however only the Security Gatehouse and adjacent marquee is visible. No buildings are visible from outside of the Site.

4.2.4 Although the Site is located at a higher elevation than most of its surroundings, the Site is well screened from the surrounding area, even in winter, with limited visible views of the Site owing to dense perimeter vegetation.

⁷ JTP Topography Layout, drawing ref: DWG 002 Topography, rev 0.



Figure 4.1 Fort Halstead Main Entrance Road, Crow Drive (Viewpoint 1)



Figure 4.2 Fort Halstead West Entrance Road, Star Hill Road (Viewpoint 4)

- 4.2.5 The main access route into the Site is from Crow Drive, off the A224 to the north of the Site. There is also a rear 'workers' entrance via the West Gate Entrance from Star Hill Road.
- 4.2.6 A 3m high security fence surrounds the Site with a barbed wire anti-climb top. A further inner security fence is visible within specific areas.
- 4.2.7 To the immediate south of the Site in a secluded position along Lime Pit Lane is North Downs Business Park containing numerous commercial units as well as a Hanson Cement Works. Slightly further afield located at approximately 0.7km is the M25 highway which curves to the east and south boundary of the Site. The A224 roadway is located inbetween the M25 and the Site.
- 4.2.8 The village of Knockholt Pound is located 0.8km to the northwest of the Site, with Halstead located 1.5km further north. There are a small number of residential properties and farm houses located along Old London Road, Star Hill Road and Crow Drive which surround the Site. 1.6km to the southeast of the Site is the village of Otford. The largest conurbation is Sevenoaks which is located approximately 4km to the southeast of the Site.
- 4.2.9 Beyond the Site perimeter woodland, there are areas of predominant agricultural farmland with access roads to farm buildings and residential properties.

4.3 Existing Landscape by Night

- 4.3.1 By night, the Site remains well screened, with very limited direct views into the Site from its surroundings due to the predominant screening from the surrounding woodland. The nearby M25 motorway, and the A224, as well as the North Downs Business Park are much more prominent during

the hours of darkness than the Fort Halstead Site. The M25 motorway provides a distinctive corridor of illumination clearly visible from the Site,

- 4.3.2 The lighting columns located along Crow Drive were all active and clearly visible during the hours of darkness. The columns utilise post top type low pressure sodium lamp sources giving the appearance of an orange light. However there are a number of luminaires which appeared to utilise a low pressure sodium lamp giving a white light output which differed to the others. A number of high output floodlights were also visible located adjacent the police check point although these are not visible within **Figure 4.3**. The post top mounted luminaires provide no control of direct upward light.



Figure 4.3 Fort Halstead main entrance night time view

- 4.3.3 From the Main Entrance along Crow Drive (**Figure 4.3**), minimal lighting is visible within the Site. However the main entrance car park (on the right among the trees) and the access road along Crow Road are illuminated, albeit some of the luminaires did not appear to be active, assumed to be faulty.
- 4.3.4 The Site buildings and roadways are not visible from outside of the Site boundary. However minimal light sources within the Site are partially visible where gaps within the vegetation occur, allowing a line of sight depending on the observers view point location within this immediate viewpoint area. Glimpses of the odd light source are visible depending on the observer's position. A group of four floodlights are also located on the west of the entrance/exit road on Star Hill Road.
- 4.3.5 The West Gate Entrance is well illuminated to assist the CCTV installed at this location. Three high output floodlights mounted to 10-12m lighting columns were active illuminating the immediate gate entrance. A twin head lighting column is shown at the forefront of the view (refer to **Figure 4.4**) illuminating the junction from Star Hill Road into the Site's West Gate Entrance access road.



Figure 4.4 West Entrance Gate off Star Hill Road

- 4.3.6 From this viewpoint at the west gate entrance, the only visible lighting are the Site's access road lighting columns; no lighting sources or building lighting are visible within the Site and the Site remains in darkness.
- 4.3.7 Star Hill Road adjoining the West Gate Entrance is not illuminated along this section of roadway from the A224 junction roundabout right into Knockholt Pound. As the road routes away from the Site's West Gate Entrance in both directions, the road is in darkness.
- 4.3.8 Further afield, from the southern boundary of the Site, along Star Hill Road, vast amounts of lighting outside of the Site is clearly visible. A section of the M25 highway lighting is visible in the medium range view, as is the roadway lighting along the A224 and B2211. Lighting sources can be seen within all directions from both building lighting and roadway/vehicle lighting, with higher concentrations visible towards the towns of Dunton Green and Sevenoaks. Sky glow is particularly noticeable towards Sevenoaks, with a lighting aura visible against a dark night sky background.
- 4.3.9 The roundabout junction at the B2211, A224 and Star Hill Road intersection 0.7km from the Site is well illuminated, although a number of the lighting columns are faulty and were not working at the time of the lighting assessment.
- 4.3.10 Transitory lighting forms a large part of the lighting environment visible within all directions, specifically from transitory vehicles along parts of the M25 in the distant view, and vehicles heading along Star Hill Road past the Site.
- 4.3.11 From distant viewpoint locations, such as viewpoints 11 and 12 which are 2.5km away, the existing Site appears in darkness, with small glimpses of existing lighting visible from lighting located at the edges of the Site through gaps within the vegetation. The lighting sources located along the A224 road adjacent

Polehill Road are partially visible from the viewpoints located to the east, such as viewpoints 10, 11, 12 and 13 (as described within Section 6 and 7).

- 4.3.12 From the northern viewpoints, such as viewpoints 7 and 8, large areas of the existing Site appear to be in darkness with only sky glow above the Site visible. However, building N2 within the existing Site is visible.
- 4.3.13 Views towards the Site from south and southeast viewpoints, the chalk rock face of the redundant quarry adjacent the North Downs Business Park is clearly visible as a result of illumination from the North Downs Business Park floodlights mounted to the two storey buildings.
- 4.3.14 Although direct views of the existing Site lighting is limited, significant orange sky glow above the Site can be clearly witnessed from the edge of Dunton Green (viewpoint 10) against the predominantly dark night sky, as indicated within **Figure 4.6**.
- 4.3.15 It is considered this sky glow is a result of the existing roadway and car park light spill reflected off the ground level back into the night sky. The orange colour of sky glow is typical of the out-dated low pressure sodium lamp and lighting types utilised across the Site. Due to the elevated location of the Site and the surrounding dark skies, the levels of sky glow appear more obvious.

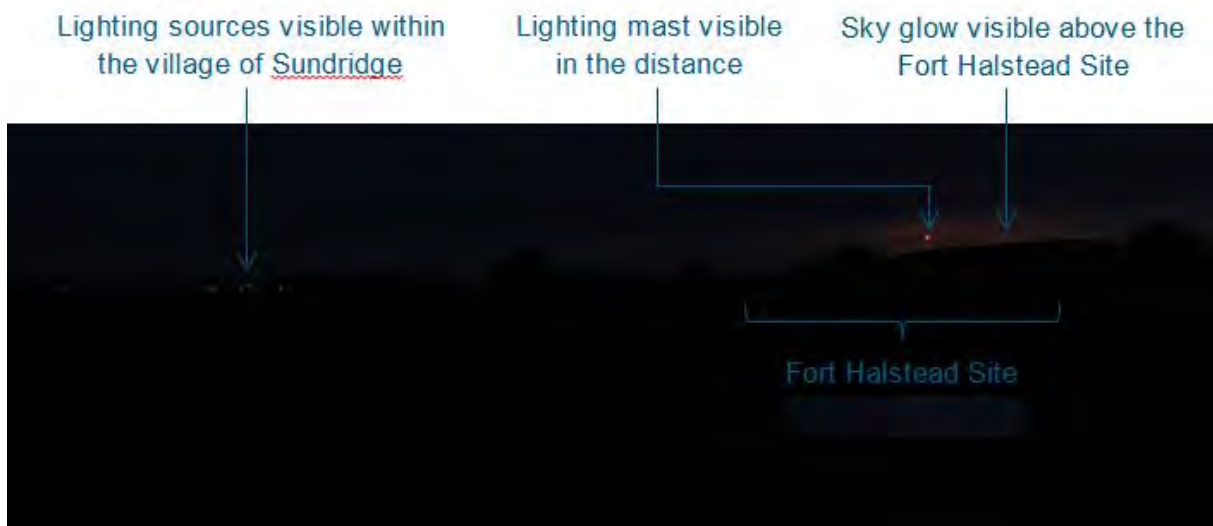


Figure 4.5 Fort Halstead and surrounding area lighting visible from Viewpoint 11, Fackenden Lane looking south west

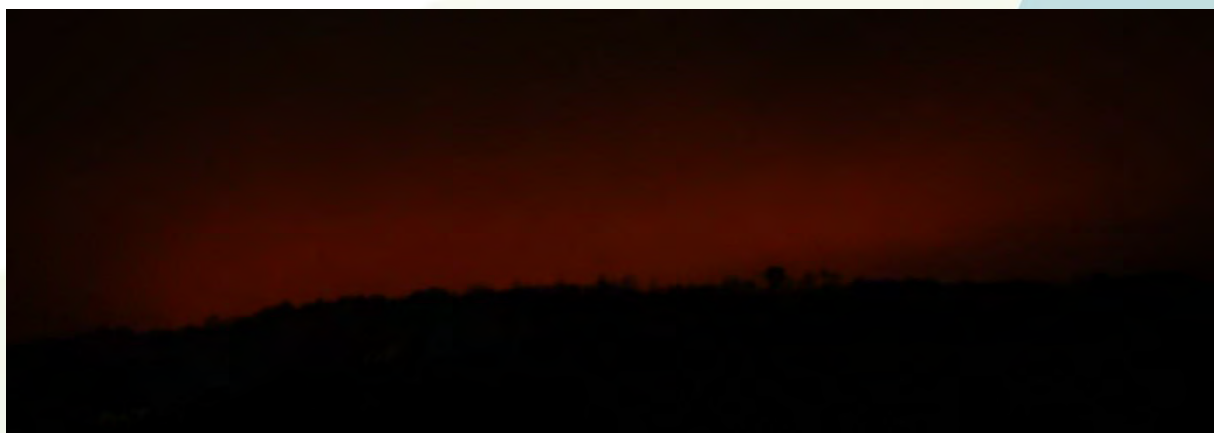


Figure 4.6 Visible sky glow from Viewpoint 10, the edge of Dunton Green, on the Darent Valley Path, looking north

4.4 Existing Site Lighting

4.4.1 The existing Site is well populated with lighting sources. Illumination is provided by the following lighting types:

West Gate Entrance (Star Hill Road Junction)

- 3No 10-12m lighting columns utilising high output floodlights angled at zero degrees with flat glass lens;
- 4No 8m lighting columns utilising 70W high pressure sodium (SON) floodlights angled at approximately 10 degrees;
- Building mounted low output floodlight (no lamp at the time of the assessment).



Main Gate Area (Crow Road)

- 10-12m lighting columns utilising high output floodlights angled at zero degrees with flat glass lens;
- 6m lighting columns with low output floodlights.



General Roadway Access Routes Within the Site

- Lanterns utilising high pressure sodium (SON) lamps mounted to 4m lighting columns with opaque diffuser, although there are a number of lanterns with clear diffuser (right hand photo);
- 5-6m lighting columns utilising road lighting lanterns with 70W high pressure sodium (SON) lamps (left hand photo);




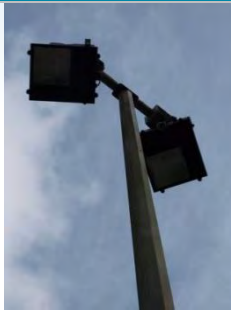

Car Park Areas		
<ul style="list-style-type: none"> 10-12m lighting columns utilising high output floodlights with what appear to be symmetric lenses angled at zero degrees; 		
Building Perimeter Lighting		
<ul style="list-style-type: none"> Building mounted 2D bulkhead luminaires utilising low output lamps; Small low output building mounted floodlights angled at approximately ten degrees. 		

Table 4-1 Existing Site Lighting Types

- 4.4.2 The existing roadway and building mounted lighting appears to be controlled via time clock and photo cells mounted integral within the luminaires. There appears to be a mixture of lamp sources used within the Site, ranging from low pressure sodium (orange in appearance, SON lamp types) to high pressure sodium (SON) utilising 'white' light sources, low and high output floodlights and low output 2D compact fluorescent bulkheads fixed vertically to the building exterior.
- 4.4.3 The existing lighting within the Site is dated and appears to have been replaced on an ad-hoc basis which explains the mixture of the lamp sources and varying lighting types. Some of the installed luminaires, which look to have been installed at a more recent time period in relation to some of the lighting, utilise modern full light cut off optics, which offers greater lighting control resulting in lower levels of upward light.
- 4.4.4 In some areas, such as the main car park at the Main Entrance off Crow Drive, vegetation is over hanging the lighting columns and floodlights obscuring the output of the floodlights.
- 4.4.5 The boundary security fence line is not illuminated. However the Main Entrance and West Gate Entrances are well illuminated to assist the security personnel and CCTV systems.
- 4.4.6 There is no visible aviation lighting mounted to the boiler house chimney stacks which are the highest structures within the Site.
- 4.4.7 Although access to the Site was not possible during hours of darkness, DSTL is a 24 hour organisation. The existing buildings within the Site are all of single and two storey height with a limited number of three storey buildings, with some typical office type buildings with glazing. It can therefore be anticipated that there would be moderate levels of internal light spill into the external environment due to the uncontrolled type of lighting used on the Site.
- 4.5 Existing Site Illumination Levels**
- 4.5.1 The existing Site illumination levels recorded during the Site assessment are provided within **Table 4-2**.

4.5.2 As detailed within Section 3, the lighting levels were taken in accordance with Lighting Guide 04 – Guidance on Undertaking Environmental Lighting Impact Assessments⁸, and recorded based upon 2m x 2m and 5m x 5m grids with an average lighting level being calculated⁹. The average illumination levels are stated within **Table 4-2**. The illuminance level measured was taken at 1000mm above ground level.

View Point No.	Viewpoint Location	Existing Site Illumination Levels
1	View from Crow Drive looking south west	0.4 lux
2	View from Crow Drive/footpath SR97 looking south west	4.55 lux
3	View from footpath SR172 looking north along Crow Road	0.26 lux
4	View from Star Hill Road looking east	44.5 lux
5	View from footpath SR172 looking south	0.13 lux
6	View from junction of Morants Court Road/Polehill (A224), on the North Downs Way, looking north	14.23 lux
7	View from Otford Lane looking south	0.06 lux (Moonlight)
8	View from Footpath SK690 to the north of Knockholt Pound looking south	0.08 lux (Moonlight)
9	View from the edge of Dunton Green, on the Darent Valley Path, looking north	N/A
10	View from the edge of Dunton Green, on the Darent Valley Path, looking north	0.05 lux (Moonlight)
11	View from Fackenden Lane looking south west	0.2 lux (Moonlight)
12	View from footpath SR60, near Otford Mount, looking south west	0.03 lux (Moonlight)
13	View from Otford Mount, on the North Downs Way, looking west	0.19 lux (Moonlight)
14	View from junction of London Road/Argyle Road, within Sevenoaks, looking north west	27.21 lux
15	View from Knole Park/Footpath SU18, on the south-eastern edge of Sevenoaks, looking north west	N/A
16	Views from southern edge of Ide Hill/Footpath SR236, looking north	0.03 lux (Moonlight)

Table 4-2 Existing Site Illumination Levels

4.6 Lighting Obtrusion

4.6.1 There are many publications and organisations providing advice on controlling light pollution with the Campaign for Dark Skies (CfDS) and the Council for the Protection of Rural England (CPRE) being particularly active in raising public awareness of the problems. However these groups have not, as yet,

⁸ Institution of Lighting Professionals, Professional Lighting Guide 04, Guidance on Undertaking Environmental Lighting Impact Assessments, ILP, PLG04, 2013, Section 16.

⁹ Institution of Lighting Professionals, Professional Lighting Guide 04, Guidance on Undertaking Environmental Lighting Impact Assessments, ILP, PLG04, 2013, Section 16.1.1.

issued technical guidance notes and it is currently understood this information will not be forthcoming. However, technical guidance is provided from the Commission International de l'Eclairage (CIE) and the Institution of Lighting Professionals (ILP) which are recognised as technically correct publications for designers and planners alike.

4.6.2 The ILP publication 'Guidance Notes for the Reduction of Light Pollution¹⁰' is now cited by many UK local authorities as a best practice recommendation, as do the CPRE and the CfDS. The ILP guidance note lists five environmental zones for lighting control and these, together with typical area examples, are shown within **Table 4-3 Obtrusive Light Limitations**.

4.6.3 The current recommendations are set out in **Table 4-3 Obtrusive Light Limitations** (ILP: Guidance on Undertaking Environmental Lighting Impacts Assessments, 2013). The existing Site lighting environment can therefore be assessed and categorised into the below criteria.

Obtrusive Light Limitations – ILE UK Recommendations						
Environmental Zone	Sky Glow ULR (Max) %	Light Trespass (into windows) Ev lux		Source Intensity (I) kCd		Building Luminance L (Cd/m ²)
		Pre-curfew	Post-curfew	Pre-curfew	Post-curfew	Pre-curfew
E0 – protected dark lighting environment, i.e. UNESCO Starlight Reserves, IDA Dark Sky Parks	0	0	0	0	0	0
E1 – Intrinsically dark landscapes, National Parks, Area of Outstanding Natural Beauty (AONB)	0	2	1	2.5	0	0
E2 – Low district brightness. Rural, small village, relatively dark urban location	2.5	5	1	7.5	0.5	5
E3 – Medium district brightness Small town centres or urban location	5	10	2	10	1.0	10
E4 – High district brightness areas Town / city centres with high night-time activity levels	15	25	5	25	2.5	25
ULR – Upward Light Ratio of Installation (maximum permitted 5 of luminaire f lux for total installation going directly skywards. Ev – vertical illuminance in lux (Lumens per square m) – measured on glazing at centre of window. I – Light source intensity Candelas (Cd). L – Luminance in Candelas per square m (Cd/m ²). Curfew – The time after which more stringent requirements (for control of obtrusive light) will apply; often a condition of use of lighting by the Local Planning Authority. If not otherwise stated, 23:00hrs is suggested by the ILP.						

Table 4-3 Obtrusive Light Limitations

4.6.4 Based upon the Site assessment, the existing Site can be classified in terms of its ILE environmental zone by relating the levels of sky glow, light trespass and luminaire intensity to the data defined within **Table 4-3 Obtrusive Light Limitations**.

4.6.5 The existing Site can therefore be defined based on our observations and assessment as falling within Environmental Zone E2, which is defined as low district brightness similar to a rural / small village location.

¹⁰ ILP, Guidance Notes for the Reduction of Light Pollution, ref: PLG04, 2013.

4.6.6 Refer to **Section 6** for further details on lighting criteria values.

4.7 Lighting Impacts of Wildlife

4.7.1 Refer to **Chapter 12: Ecology and Nature Conservation** of the Environmental Statement for an assessment of the impacts of the Development's artificial lighting on wildlife. As specifically identified within **Chapter 12**, ten bat roosts have been identified within the Site, nine of which are within buildings / structures¹¹.

4.7.2 The Ecology Appraisal identifies the woodland areas towards the northwest and mid-south of the Site has the potential for roosting bats¹², with one confirmed bat roost in a tree towards the northern boundary¹³.

4.7.3 The bat activity survey found that the northern, north-eastern and southern woodland areas, as well as a corridor along the main access road within the Site are used for foraging bats¹⁴.

4.7.4 Bats are protected by the Wildlife and Countryside Act (1981) and the Conservation of Habitats and Species Regulations 2010. This makes it illegal to kill, injure, capture or disturb bats, obstruct access to bat roosts or damage/destroy bat roosts. Lighting in the vicinity of a bat roost causing disturbance could constitute an offence. There is no legislation relating directly to lighting impacts on bats; however, there is a guidance document produced by the Bat Conservation Trust (BCT).

4.7.5 The BCT guidance states that no bat roost (including access points) should be directly illuminated. If it is considered necessary to illuminate an area known to be used by roosting bats, the lights should be positioned to avoid the sensitive areas. It also states that the height of lighting should be as low as possible. The times during which the lighting is active should be limited to provide some dark periods.

4.7.6 Roads or track ways in areas important for foraging bats should contain stretches left unlit to avoid isolation of bat colonies. These unlit stretches should be 10 metres in length either side of commuting route.

4.7.7 Lighting in relation to bats is not specifically mentioned in national planning policies and therefore does not have a specific implication for the Site. However regional and local planning documents do have specific policies relating to the protection of the landscape and the environment. Therefore the Development should comply with the planning policy or provide suitable mitigation for any potential impacts of the proposed lighting. Any potential impacts on wildlife and bats are discussed within **Chapter 12: Ecology and Nature Conservation**.

4.7.8 Where tungsten halogen lamps are to be utilised either during the construction or operational phases, these luminaires shall be equipped with glass covers to provide greater UV filtration characteristics to detract insects and in-turn foraging bats. Tungsten lamps should be avoided where possible to maintain a natural foraging habitat for bats.

4.8 Viewpoints

4.8.1 The viewpoints assessed as part of the Baseline Lighting Assessment are listed below.

¹¹ Chapter 12: Ecology and Nature Conservation.

¹² Figure 3: 2014 Trees Recorded with Bat Roosting Potential, Drawing Ref: EED12715-102_GR_PSR_3A.

¹³ Figure 4: 2014 Trees Recorded with Bat Roosting Potential, Drawing Ref: EED12715-102_GR_PSR_4A.

¹⁴ Figure 7: 2014 Trees Recorded with Bat Roosting Potential, Drawing Ref: EED12715-102_GR_PSR_7A.

View Point No.	Viewpoint Location	Viewpoint Distance From Site (Direct Distance)	Viewpoint Relative Height Above Ordnance Datum (AOD)
1	View from Crow Drive looking south west	Site Boundary	170m
2	View from Crow Drive/footpath SR97 looking south west	Site Boundary	200m
3	View from footpath SR172 looking north along Crow Road	200m	143m
4	View from Star Hill Road looking east	Site Boundary	213m
5	View from footpath SR172 looking south	Site Boundary	211m
6	View from junction of Morants Court Road/Polehill (A224), on the North Downs Way, looking north	600m	105m
7	View from Otford Lane looking south	400m	175m
8	View from Footpath SK690 to the north of Knockholt Pound looking south	1.1km	177m
9	View from the edge of Dunton Green, on the Darent Valley Path, looking north	1.8km	77m
10	View from the edge of Dunton Green, on the Darent Valley Path, looking north	1.4km	85m
11	View from Fackenden Lane looking south west	2.6km	132m
12	View from footpath SR60, near Otford Mount, looking south west	2.7km	141m
13	View from Otford Mount, on the North Downs Way, looking west	3.4km	150m
14	View from junction of London Road/Argyle Road, within Sevenoaks, looking north west	4.8km	142m
15	View from Knole Park/Footpath SU18, on the south-eastern edge of Sevenoaks, looking north west	5.8km	151m
16	Views from southern edge of Ide Hill/Footpath SR236, looking north	6.6km	192m

Table 4-4 Viewpoint Locations (taken from the LVIA)

4.8.2 Heights from receptor positions to the Site have been assessed from Ordnance Survey (OS) maps and Global Positioning System data (GPS). They are indicated to the nearest metre.

4.8.3 Distances are quoted to the nearest part of the Site boundary measured using GPS. Heights, bearings and other information have been taken from OS maps and Google Earth.

5 National and Local Authority Planning Policies

5.1 National Planning Policies

5.1.1 National Planning Policy Framework¹⁵

5.1.2 National Planning Policy identifies that by encouraging good design, planning policies and decisions should limit the impact of light pollution from artificial light on local amenity, intrinsically dark landscapes and nature conservation.

¹⁵ National Planning Policy Framework 2012.

- 5.1.3 It also identifies that pollution is anything that affects the quality of land, air, water or soils, which might lead to an adverse impact on human health, the natural environment or general amenity. Pollution can arise from a range of emissions, including smoke, fumes, gases, dust, steam, odour, noise and light.

National Planning Policy Framework 2012	
Policy Ref.	Description
Good Design	<p>“The Government attaches great importance to the design of the built environment. Good design is a key aspect of sustainable development, is indivisible from good planning, and should contribute positively to making places better for people.</p> <p>It is important to plan positively for the achievement of high quality and inclusive design for all development, including individual buildings, public and private spaces and wider area development schemes.</p> <p>Local and neighbourhood plans should develop robust and comprehensive policies that set out the quality of development that will be expected for the area. Such policies should be based on stated objectives for the future of the area and an understanding and evaluation of its defining characteristics. Planning policies and decisions should aim to ensure that developments:</p> <ul style="list-style-type: none"> • will function well and add to the overall quality of the area, not just for the short term but over the lifetime of the development; • establish a strong sense of place, using streetscapes and buildings to create attractive and comfortable places to live, work and visit; • optimise the potential of the Site to accommodate development, create and sustain an appropriate mix of uses (including incorporation of green and other public space as part of developments) and support local facilities and transport networks; • respond to local character and history, and reflect the identity of local surroundings and materials, while not preventing or discouraging appropriate innovation; • create safe and accessible environments where crime and disorder, and the fear of crime, do not undermine quality of life or community cohesion; and • are visually attractive as a result of good architecture and appropriate landscaping. <p>Local planning authorities should consider using design codes where they could help deliver high quality outcomes. However, design policies should avoid unnecessary prescription or detail and should concentrate on guiding the overall scale, density, massing, height, landscape, layout, materials and access of new development in relation to neighbouring buildings and the local area more generally.”</p>

Table 5-1 National Planning Policy Framework 2012

5.2 Local Policies

5.2.1 Kent Downs Management Plan¹⁶

5.2.1.1 The Kent Downs Management Plan identifies the tranquillity and remoteness of the Kent Downs, making specific reference to a 20% loss in tranquil areas due to urban sprawl, traffic and light pollution¹⁷.

5.2.1.2 The Management Plan further identifies that the 2003 CPRE survey documents the loss of dark night skies over the last 20 years through badly designed and sited night lighting.

¹⁶ Kent Downs AoNB Management Plan 2014-2019, 2nd revision, April 2014.

¹⁷ Kent Downs AoNB Management Plan 2014-2019, 2nd revision, April 2014, Section 3.3, CPRE data.

5.2.2 Sevenoaks District Council, Local Development Framework¹⁸

5.2.2.1 The Sevenoaks District Council Local Development Framework (LDF) identifies a number of general principles to which all types of development would be expected to comply. These principles in relation to artificial lighting are defined below:

Sevenoaks District Council Local Development Framework Polices	
Policy Ref.	Description
EN1	“Proposals for all forms of development and land use must comply with the policies set out in this Plan, unless there are overriding material considerations. The following criteria will be applied in the consideration of planning applications: The proposed development including any changes of use does not have an adverse impact on the privacy and amenities of a locality by reason of form, scale, height, outlook, noise or light intrusion or activity levels including vehicular or pedestrian movements.”
EN27	<p>“The design of shopfronts should accord with the guidance given in LDF Appendix 6 unless material considerations justify a departure from these principles.</p> <p>Whilst outdoor lighting is important for civic amenity and public safety, including crime prevention, it can be intrusive and cause unnecessary pollution, especially in the countryside. Poorly designed and badly aligned lights are responsible for spillage and “glow” which blurs the separation between town and countryside and introduces a suburban character into remote areas. Urban environments also suffer from insensitive lighting to buildings, signs and transport infrastructure. The results are ugliness, visual pollution, waste of electricity and the unnecessary emission of greenhouse gases. Floodlit facades are often over lit to counter overspill from adjacent street lights, whilst signs and shop windows have a major impact on the night time scene. Street lights both on building facades and which line streets themselves are often insensitively or wrongly positioned damaging the architectural character of particular buildings or the location. Sports floodlighting can be similarly intrusive especially for nearby residential properties. The Local Planning Authority will normally expect to see a report from the Institute of Lighting Engineers justifying the lighting scheme and appraising its impact in order to assist in the assessment of particular proposals. A lighting impact appraisal will always be required where the scheme is in or may affect an Area of Outstanding Natural Beauty or is in other open countryside. Planning conditions will be imposed where appropriate regulating lighting intensity, directional shielding and hours of use.”</p>
EN31	<p>“Where a lighting proposal requires planning permission the following criteria should be complied with:</p> <ol style="list-style-type: none"> 1) Lighting is designed as an integrated part of any related development scheme; 2) Low energy lighting is used; 3) The alignment of lamps and provision of shielding minimises spillage and glow in order to safeguard the night sky; 4) The lighting intensity is no greater than that required to provide adequate illumination; 5) The proposal preserves or enhances the character or appearance of any Conservation Area which may be affected. Proposals to floodlight building facades, shop fronts, signs etc. must be sensitive to the character or appearance of the Conservation Area with lights carefully positioned to avoid overspill; 6) Proposals to floodlight sports fields, golf courses, driving ranges, business premises and arenas will not be permitted if they would result in a significant loss of privacy or amenity for nearby residential properties; 7) Proposals for lighting schemes in or which may affect Areas of Outstanding Natural Beauty or in other areas of open countryside will not be permitted unless the preceding criteria are satisfied and the lighting is essential for safety or security reasons for the facility in question.”
NR10	“Proposals for all forms of development should minimise pollution of the environment through careful design and layout of any buildings or land uses. Potentially polluting activities must comply with the

¹⁸ Sevenoaks District Council, Local Development Plan, July 2008.

	following criteria: <ul style="list-style-type: none"> The need to control any noxious emissions, or noise, dust, vibration, light or heat (Clause No3)."
FH1	"Land at Fort Halstead is identified on the Proposals Map as a Major Developed Site under Policy GB5. It is currently used for both housing and research and development. Development of the Site will be subject to the following limitations: <ul style="list-style-type: none"> Lighting must minimise its effect on the surrounding area and the night sky in accordance with Policy EN31 (Clause No7)."
Appendix 6 – Shop Fronts and Advertisements	"The following guidelines elaborate Local Plan Policies EN27 and EN28A and EN28B concerning shopfronts and advertisements. <p>Many shop fronts are disfigured by a clutter of long stemmed projecting lamps or crude internally lit box fascia's and projecting signs. If a fascia or sign is to be lit it must be discreet. The form of illumination must be unobtrusive and must not detract from the character of the building."</p>

Table 5-2 Sevenoaks District Council Local Development Framework Policies

5.2.3 Sevenoaks District Council, Development Management Policies¹⁹

5.2.3.1 Section 2.17 of the Sevenoaks Development Management Policies document states that insensitive lighting can cause light pollution. Sevenoaks District, which is a predominantly rural area, is sensitive to light pollution through sky glow which can affect the tranquillity of the countryside and have a negative impact upon biodiversity.

5.2.3.2 The Validation of Planning Application document states that:

External lighting can have significant impacts on people's enjoyment of their homes, the countryside and on the night sky. Where such lighting is proposed applications should include details of the number, type (e.g. wall mounted or free-standing columns), location and intensity of any lighting installation proposed and the hours when the lighting would be switched on. A lighting impact study may be required for floodlighting proposals particularly for sports grounds or developments close to residential buildings or for sites within the open countryside.

5.2.3.3 Kent Development Control Officers Group has also produced a validation table which outlines the information requirements for Kent County Council development applications. An extract of the requirements in terms of lighting is provided below.

Local Information Requirements for Kent County Council Development Applications				
Information Item	Policy Drivers	Relevant Proposals	Location Criteria	Item Content
Lighting Impact Study / Details of Lighting Scheme	Local Development Framework Policies on lighting and pollution impacts	Major category development, and any other minor development proposals involving external lighting, including sports floodlighting, car parks, security, amenity and architectural lighting.	Any urban, suburban or rural Site.	Full details of any external lighting should be submitted with the planning application, to include details of the number, type and height of luminaires, location and intensity of the installation and the proposed hours of use. A Lighting Impact Study will be required for most floodlighting proposals and especially for sports grounds or developments close to housing or within open countryside. Applications for sports lighting should include lux contour details indicating any spill of light outside of the Site onto adjacent properties or highways.

Table 5-3 Local Information Requirements for Kent County Council Development Applications

¹⁹ Sevenoaks Development Management Plan Policies, Draft.

5.2.4 **Sevenoaks District Council, Allocations and Development Management Plan²¹**

5.2.4.1 Although the Sevenoaks District Council, Allocations and Development Management Plan (ADMP) is currently not approved or adopted by the Local Authority it incorporates lighting policy EN5. It is likely that the Development lighting will be assessed against these criteria. An extract of the requirements of the ADMP in terms of lighting provided below.

Sevenoaks District Council, Allocations and Development Management Plan	
Policy Ref.	Description
EN5 Outdoor Lighting	<p>“Proposals for lighting that affect the outdoor environment which meet the following criteria will be permitted:</p> <ul style="list-style-type: none"> a) the proposal would be integrated within a wider related development scheme; b) any impact on the night sky would be minimised through time-limited and user activated lighting, the alignment of lamps, provision of shielding and selection of appropriate lighting type and intensity; c) there would be no harmful impact on privacy or amenity for nearby residential properties; d) the proposal would preserve or enhance the character or appearance of any Heritage Asset which may be affected; e) any potential impacts on wildlife would be avoided or adequately mitigated where avoidance is not possible; and f) where proposals affect Areas of Outstanding Natural Beauty or open countryside, it can be demonstrated that the lighting is essential for safety or security reasons. <p>Where these criteria are met, proposals incorporating the use of low energy lighting will be encouraged.”</p>

Table 5-4 Sevenoaks District Council, Allocations and Development Management Plan

²¹ Sevenoaks District Council, Allocations and Development Management Plan, November 2013.

6 LIGHTING ASSESSMENT – CRITICAL LIGHTING VIEWPOINTS

6.1 Introduction

- 6.1.1 The following assessment summarises the existing lighting environment at the Site and its current associated impacts upon the identified viewpoints. The viewpoints identified within this section are considered to be of greater relevance and importance due to the magnitude of change at the viewpoint, with regards to lighting.
- 6.1.2 A further summary of the impacts of the proposed lighting associated with the Development is provided relevant to each viewpoint.
- 6.1.3 A description of the existing baseline lighting environment is given at the start of each viewpoint. This describes any sources of existing lighting as well as identifying the location of the viewpoint. The sensitivity of the viewpoint is also considered and summarised with regards to its receptor, and the likely magnitude of change.
- 6.1.4 An assessment of the Development's lighting is provided at each viewpoint. The assessment of impacts for the proposed lighting is based upon the Parameter Plans as indicated within **Appendices C and D** and industry recognised guidelines and standards for lighting such environments, and also similar previous project experience.
- 6.1.5 It should be noted that this Baseline Lighting Assessment report is provided as an Appendix to the Environmental Statement for the purposes of the Outline Planning Application for the Development. There is currently no proposed detailed lighting design information for the Development. It is anticipated the detailed lighting design strategy will be produced during the detailed design stage. Therefore, for the purposes of this Lighting Assessment, the impacts of the Development's lighting (as defined by the lighting strategy and design principles set out in Section 8) upon the identified viewpoints is based upon the professional judgement following the application of best design practices, standards, guidance documents and the Sevenoaks District Council lighting policies that will be applied to the lighting design.
- 6.1.6 Any adverse impacts which are identified during the operational phase are further assessed. To reduce the significance of adverse impacts, mitigation strategies are proposed. The mitigation strategies are specifically identified relevant to each viewpoint, with the aim of reducing the overall significance.
- 6.1.7 The likely residual impacts of the proposed lighting, taking into account the mitigation strategies identified, are assessed.

6.2 Lighting Assessment Criteria

- 6.2.1 An appraisal of the impacts of the lighting at each of the identified viewpoints is assessed based on the significance criteria as denotes within the ILP Professional Lighting Guide, Guidance on Undertaking Environmental Lighting Assessments (PLG04, 2013), as outlined below:

- Major Beneficial;
- Moderate Beneficial;
- Minor Beneficial;
- No Impact;
- Negligible;
- Minor Adverse;
- Moderate Adverse;
- Major Adverse.

6.2.2 The likely impacts of the Development's operational lighting (as defined by the outline lighting strategy and design principles) from each viewpoint was assessed in terms of both summer and winter impacts. Typically, due to the dense woodland in some areas of the Site, the winter impacts in terms of lighting would be considered to be the 'worst case scenario'.

6.2.3 A summary of the significance criteria is provided within **Table 6.1 Impact Criteria** below.

Nature	Ref	Level	Description	Impacts / Remedial Needs
Positive	1	Major beneficial impact	Significant improvement in night environment and / or reductions in glare, light spill and sky glow etc.	Creating a safer environment from a security aspect; Creating a safer environment from a health and safety point of view, contributing to reducing the number of accidents along roadways, footpaths and the environment in general.
	2	Moderate beneficial impact	Noticeable improvement in night environment and / or reductions in glare, light spill and sky glow etc.	Creating a safer environment from a security aspect; Creating a safer environment from a health and safety point of view, contributing to reducing the number of accidents along roadways, footpaths and the environment in general.
	3	Minor beneficial impact	Slight improvement in night environment and / or reductions in glare, light spill and sky glow etc.	Creating a safer environment from a security aspect; Creating a safer environment from a health and safety point of view, contributing to reducing the number of incidents along roadways, footpaths and the environment in general.
Neutral	4	Negligible	No significant impact or overall impact balancing out.	The proposed lighting, during both the construction and operational phases of the development, does not have either positive or negative impact upon the lighting environment or its receptors.
	5	No impact	The proposed lighting is assessed as having no impact upon the viewpoint or its receptors.	No impact / remedial strategies required.
Negative	6	Minor adverse impact	Slight increase in lighting levels increasing the Site visibility, glare, and sky glow etc.	Develop appropriate levels and type of mitigation.
	7	Moderate Adverse	The impact gives rise to some concern but it is likely to be tolerable in the short-term (e.g. during the construction phase); mitigation to reduce the impact should be sought or the issue will require a value judgement as to its acceptability.	Loss of an access route / a recreational opportunity over the long term.
	8	Major Adverse	The impact is large scale, giving rise to great concern; it should be considered unacceptable and requires mitigating, compensating or a significant change to the development if no alternative is available. If no mitigation is possible then the impact will require a value judgement as to its acceptability.	Loss of numerous access routes / multiple recreational opportunities over the long term.

Table 6-1 Impact Criteria (ILP:PLG04, 2013; Institution of Lighting Professionals; Guidance on Undertaking Environmental Lighting Impact Assessments)

6.2.4 **Table 6.1** is based upon the standard format for the evaluation of various lighting related impacts, but has been adapted for the use of lighting²². The magnitude of any change and its overall significance was assessed; in some circumstances magnitude and significance may not be linked, for example increased lighting levels may be major but, if the local sensitivity to light is low, the significance may be low.

6.2.5 The impacts of the proposed lighting have been categorised based on the below criteria as defined by the Institution of Lighting Professionals (ILP), Guidance Notes for the Reduction of Obtrusive Light (GN01:2011):

- Sky glow upward light ratio (ULR).
- Light intrusion (light intrusion into windows).
- Luminaire intensity.

6.2.6 **Sky Glow**

6.2.7 Sky glow, or upward light ratio, is the level of light spill which is either directed upwards into the night sky in the form of light spill or light pollution. Sky glow is often witnessed by the brightening of the night sky above developed urban areas.

Sky Glow Control	E0	E1	E2	E3	E4
Upward light ratio	0%	0%	2.5%	5%	15%

Table 6-2 Sky Glow Values

6.2.8 The ILP Guidance Note for the reduction of Light Pollution sets out maximum ULR values for the four, previously mentioned, environmental zones, as indicated within **Table 4-3**.

6.2.9 The ratio, formerly known as upward waste light ratio (UWLR) is expressed for the complete installation, and not individual luminaires, with this maximum value representing the limit of luminous flux, which is projected directly into the sky from all the luminaires. This percentage figure does not include light reflected upwards from the ground or from adjacent buildings or structures and although no technical recommendations have been published as guidance on the likely limiting value of this light, this report provides a baseline calculated assessment of the combined upward content to compare with the Development's proposals.

6.2.10 **Light Intrusion**

6.2.11 Light intrusion is often caused by excessive, or misdirected obtrusive artificial light which passes beyond the boundaries of the Site for which it is intended, into other areas. Light intrusion is often the spilling of light beyond the boundary of the property or area being lit. Light intrusion may result in artificial lighting sources entering areas which are not required to be illuminated, i.e. misdirected light sources which allow light to enter through a window of a nearby property.

Light Intrusion Control	E0	E1	E2	E3	E4
Pre curfew (lux)	0	2	5	10	25

²² ILP:PLG04, 2013; Institution of Lighting Professionals (ILP formerly ILE); Guidance on Undertaking Environmental Lighting Impact Assessments (Guide 04).

Light Intrusion Control	E0	E1	E2	E3	E4
Post curfew (lux)	0	0	1	2	5
Curfew	The time after which more stringent requirements for the control of obtrusive light will apply; often a condition of use of lighting by the Local Planning Authority. If not otherwise stated, 23:00hrs is suggested by the ILP.				

Table 6-3 Light Intrusion Values

6.2.12 The ILP Guidance Note for the reduction of light pollution considers the intrusive impact of light entering through windows and sets out suggested maximum permitted values of light measured as vertical illuminance, in lux, at windows.

6.2.13 These maximum values need to take account of existing ambient trespassing light and should not be assumed to be the permissible additional limits from a new installation. Curfew is a time after which stricter requirements (for control of obtrusive light) will apply and is often a condition of use of the lighting installation imposed by a local government controlling authority.

6.2.14 **Luminaire Intensity**

6.2.15 Luminaire intensity is light emitted from a lighting source in a particular direction, also referred to as glare. For the purpose of this assessment, luminaire intensity is often defined as the magnitude of direct views of the lighting source(s).

Light Source Intensity	E0	E1	E2	E3	E4
Pre curfew (cd)	0	2,500	7,500	10,000	25,000
Post curfew (cd)	0	0	500	1,000	2,500

Table 6-4 Luminaire Intensity Values

6.2.16 When considering luminaire intensity or glare it is necessary to look inwards from the surrounding environment observer locations to each of the light sources in turn. The orientation of each source towards any inwards viewpoint, the distribution characteristics of each luminaire and the lamp within each luminaire will determine the value of source intensity, sometimes referred to by planners as direct light, towards that viewpoint. The ILP and Commission International de L'Eclairage (CIE) Guidance on limiting intensity values are for individual luminaire assessment and are represented in candela values in **Table 6.4**.

6.3 Viewpoint 1

Location:	View from Crow Drive looking south west	
GPS Coordinate:	X: 550395	Y: 160215
Distance to Site:	Site Boundary	
Viewpoint height above ordnance datum:	170m	
Conditions:	Cloudy skies, slight wind.	
Night Time lux Level:	0.4 lux	

6.3.1 Viewpoint 1 – Existing Lighting Baseline



Figure 6.1 Viewpoint 1, Crow Drive, Day Time View



Figure 6.2 Viewpoint 1, Crow Drive, Night Time View

- 6.3.1.1 This viewpoint is located on Crow Drive, which is the main entrance roadway into the Site.
- 6.3.1.2 This viewpoint is located adjacent a small woodland area to the east and south-east of the viewpoint. The woodland provides screening of views towards Polehill Road. To the south-west of the viewpoint, the winding access road into the Site is clearly visible.
- 6.3.1.3 Crow Drive is illuminated in areas by low pressure sodium post top mounted luminaires, utilising a mixture of orange and white sodium lamp types. However the immediate area surrounding the viewpoint location is not directly illuminated and the only visible lighting is that resulting from light spill from other areas of Crow Drive. The average illumination level recorded at this viewpoint was 0.4 lux,

which is significantly lower than the illumination level required by British Standard (refer to **Table 8.1 Illumination Levels**).

- 6.3.1.4 A number of high output floodlights are visible in the medium range view. These floodlights provide an increased lighting level at the Main Gatehouse. A small amount of internal building lighting is also visible through the windows of the reception building.
- 6.3.1.5 The receptors at this viewpoint would be motorists using the access road in and out of the Site, pedestrians using the adjacent footpath and the residents within the nearby Armstrong Close.
- 6.3.2 **Viewpoint 1 – Impact of the Development**
- 6.3.2.1 The Parameter Land Use Plans indicated within **Appendices C and D**, indicate this viewpoint would be located adjacent the existing woodland. Views towards the employment area may be possible, although the existing woodlands and green infrastructure areas may provide some screening. The employment area is likely to have some form of building mounted security and access lighting, as well as façade mounted illuminated signage to any industrial or commercial type buildings.
- 6.3.2.2 It is also anticipated new lighting would be provided along this roadway as part of the Development. As identified by Local Planning Policies within **Section 5**, any new proposed lighting would be required to comply with the identified policy references, specifically EN31.
- 6.3.2.3 Any new roadway lighting would be required to have zero upwards light output, and comply with BSEN 13201-2:2003 Roadway Lighting Performance, which stipulates the levels of acceptable glare requirements and Kent County Council lighting requirement policies for adoption.
- 6.3.2.4 New lighting along the Site access roadway would be an improvement on the existing lighting environment which has dark, non-uniform areas; however motorist and pedestrians using the roadway would experience light intrusion and luminaire intensity impacts. Sky glow associated within the Development would typically not be visible as this viewpoint is within short range of the Site, therefore resulting in **negligible** effects.
- 6.3.2.5 The magnitude of change at this viewpoint is considered to be beneficial in terms of the Development based on the outline lighting strategy and design principles set out in Section 8.

Period	Sky Glow ULR (Upward Light Ratio)	Light Intrusion	Luminaire Intensity
Summer Months:	Negligible	Minor Adverse	Minor Adverse
Winter Months:	Negligible	Minor Adverse	Minor Adverse

Table 6-5 Viewpoint 1, Impact of the Development Lighting

6.4 Viewpoint 2

Location:	View from Crow Drive/Footpath	
GPS Coordinate:	X: 550155	Y: 159680
Distance to Site:	Within Site Boundary	
Viewpoint height above ordnance datum:	200m AOD	
Conditions:	Cloudy skies, slight wind.	
Night Time lux Level:	4.55 lux	

6.4.1 Viewpoint 2 – Existing Lighting Baseline



Figure 6.3 Viewpoint 2, Crow Drive, Day Time View

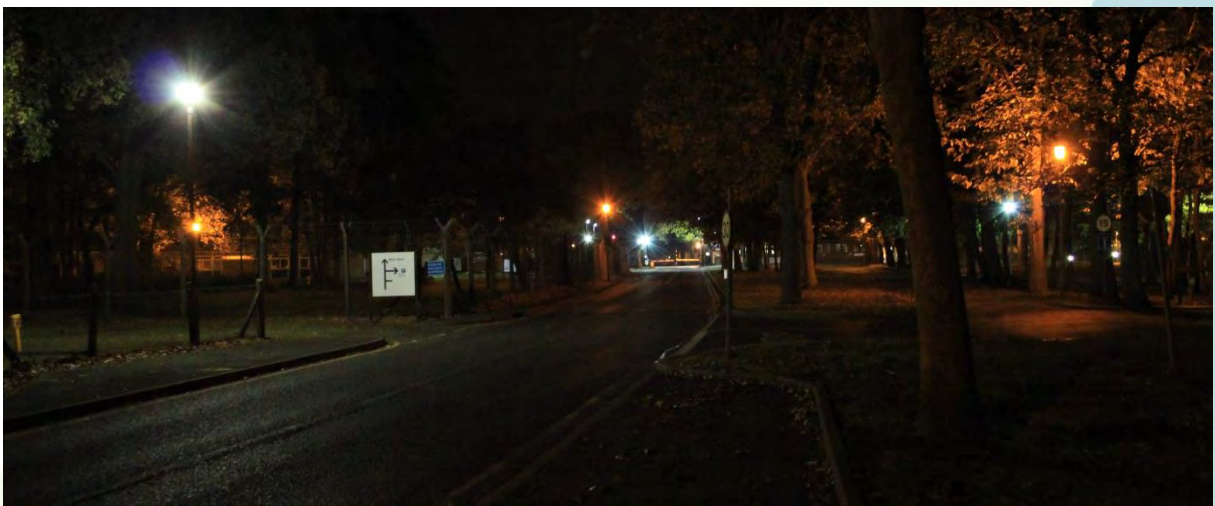


Figure 6.4 Viewpoint 2, Crow Drive, Night Time View

6.4.1.1 This viewpoint is located on Crow Drive, which is the main entrance roadway into the Site. The viewpoint is adjacent the visitors car park area, 200m from the Fort Halstead main Gatehouse. Approximately 150m to the west (right) of this viewpoint are the residential properties located on Armstrong Close, although these properties have limited direct views towards this viewpoint.

- 6.4.1.2 There are a number of mature deciduous tree's obscuring views towards the Site and the wider environment.
- 6.4.1.3 Crow Drive is illuminated by low pressure sodium post top mounted luminaires, utilising a mixture of orange and white sodium lamp types. The roadway luminaires have no light control resulting in direct upwards light spill. The average illumination level recorded at this viewpoint was 4.55 lux, which is slightly lower than the illumination level required by British Standard (refer to **Table 8-1 Illumination Levels**). As represented within **Table 8-1**, there are dark areas along Crow Drive and the existing lighting is not uniform.
- 6.4.1.4 A number of high output floodlights are visible in the medium range view. These floodlights provide an increased lighting level at the Main Gatehouse. A small amount of internal building lighting is also visible through the windows of the reception building.
- 6.4.1.5 The receptors at this viewpoint would be motorists using the access road in and out of the Site, pedestrians using the adjacent footpath and the residents within the nearby Armstrong Close.
- 6.4.2 **Viewpoint 2 – Impacts of the Development**
- 6.4.2.1 The Parameter Land Use Plans indicated within **Appendices C and D**, indicate this viewpoint being located adjacent the employment area. The employment area is indicated as being up to three storeys (16m max) in height. The west of the viewpoint is represented as residential developable areas of up to two storeys (10m max) in height (refer to **Appendix D** for Proposed Building Heights). To the south of this viewpoint, the Parameter Plans indicate the potential location of an energy centre which may have a flue of up to 25m high.
- 6.4.2.2 The employment area is likely to have some form of building mounted security and access lighting, as well as façade mounted illuminated signage to any industrial or commercial type buildings.
- 6.4.2.3 It is also anticipated new lighting would be provided along this roadway as part of the Development. As identified by Local Planning Policies within **Section 5**, any new proposed lighting would be required to comply with the identified policy references, specifically EN31.
- 6.4.2.4 Any new roadway lighting would be required to have zero upwards light output, and comply with BSEN 13201-2:2003 Roadway Lighting Performance, which stipulates the levels of acceptable glare requirements and Kent County Council lighting requirement policies for adoption.
- 6.4.2.5 New lighting along the Site access roadway would be an improvement on the existing lighting environment, reducing luminaire intensity on the users of the roadway, and reducing the contribution towards sky glow. However, sky glow associated within this Site will typically only be visible from distant viewpoints, and will therefore not be visible from this viewpoint, resulting in **no impact**.
- 6.4.2.6 The magnitude of change at this viewpoint is considered to be beneficial in terms of the Development based on the outline lighting strategy and design principles set out in Section 8. However, the impacts of the Development operational phase lighting are considered to be **minor beneficial** at this viewpoint during both summer and winter periods in terms of light intrusion and luminaire intensity.

Period	Sky Glow ULR (Upward Light Ratio)	Light Intrusion	Luminaire Intensity
Summer Months:	No Impact	Minor Beneficial	Minor Beneficial
Winter Months:	No Impact	Minor Beneficial	Minor Beneficial

Table 6-5 Viewpoint 2, Impact of the Development Lighting

6.5 Viewpoint 3

Location:	View from footpath SR172 looking north	
GPS Coordinate:	X: 549915	Y: 158621
Distance to Site:	200m	
Viewpoint height above ordnance datum:	143m AOD	
Conditions:	Partial cloudy skies, slight wind.	
Night Time lux Level:	0.26 lux	

6.5.1 Viewpoint 3 – Existing Lighting Baseline



Figure 6.3 Viewpoint 3, Footpath SR172, Day Time View

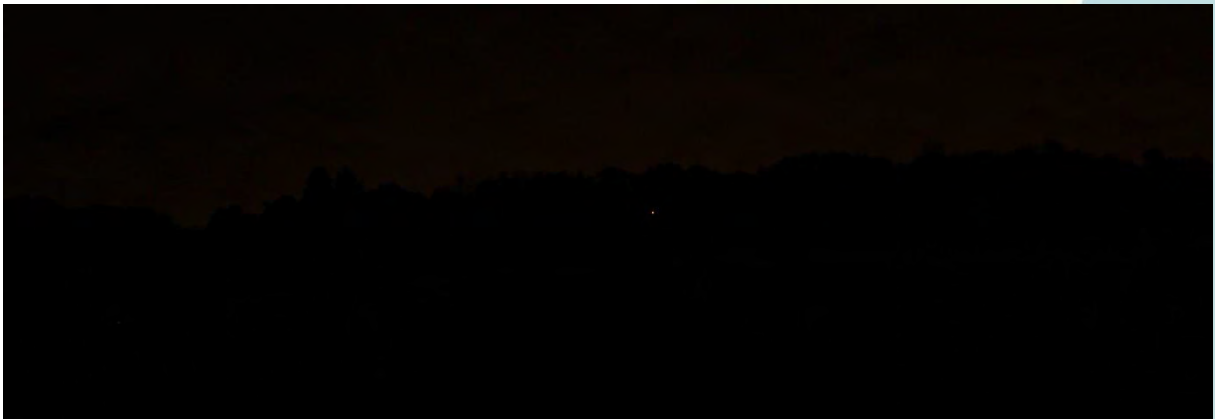


Figure 6.6 Viewpoint 3, Footpath SR172, Night Time View

- 6.5.1.1 This viewpoint is located on footpath SR172 looking north and upwards towards the Site. The footpath is located upon pastoral farmland. Star Hill Road is located approximately 35m to the south of the viewpoint. A private residential property is located approximately 180m to the west (left) of the viewpoint on Star Hill Road, although the property is screened behind a row of trees.

- 6.5.1.2 The southern boundary security fence is visible in the medium range view, as well as the Site woodland within the Site boundary. Further afield, a corridor of the M25 is clearly visible, as well as the A224 and associated roundabout junction, and buildings within the village of Dunton Green and Otford.
- 6.5.1.3 The viewpoint is located at 143m AOD; however the contours of the land increase towards the Site, with the Site perimeter security fence being at approximately 175m AOD. The contours continue to increase within the Site boundary to reach an approximate highest point of 205m. Therefore, no buildings or structures within the Site are visible as they are obstructed by the hillside.
- 6.5.1.4 Star Hill Road to the south of the viewpoint is not illuminated, however transitory light spill from vehicles using the road spills into the local environment.
- 6.5.1.5 There are no lighting sources within the proximity of this viewpoint. There is one light source visible within the Site boundary through gaps within the vegetation. The visible areas of the Site are therefore in darkness. To the east (right) of the view, the chalk rock face is visible as a result of the light spill from North Downs Business Park. The illumination level recorded was therefore comparable to that of moon light on a clear night, at 0.26 lux.
- 6.5.1.6 Although the Site or its associated lighting is not visible, sky glow as a result of the Site lighting is visible.
- 6.5.1.7 The receptors at this viewpoint would be walkers using the footpath and the ancient woodland and grasslands supporting protected species. However it is unlikely there would be walkers using the footpath during hours of darkness.

6.5.2 Viewpoint 3 – Impacts of the Development

- 6.5.2.1 The Parameter Land Use Plans indicated within **Appendices C** and **D**, indicate this viewpoint to have views of the green infrastructure areas in the short range view. The Parameter Plan also indicates the existing woodland within the southern side of the Site would be retained, therefore providing screening of the Development.
- 6.5.2.2 The Parameter Land Use Plan indicated within **Appendix D** identifies a number of buildings within the employment area (QinetiQ) that would be retained. As indicated within **Section 8**, some of the existing low pressure sodium lighting will be retained. Sky glow as a result of the Site lighting is likely to remain albeit envisaged to be reduced, and the ‘orange’ sky glow currently visible above the Site is likely to become of a ‘whiter’ glow.
- 6.5.2.3 During winter periods when vegetation is less dense, due to the contours of the land, it is anticipated views of the QinetiQ areas would be obscured by the hillside and woodland. However the level of sky glow from the Site would be visible depending upon the night ambient conditions.
- 6.5.2.4 The magnitude of change at this viewpoint is considered to be negligible, as the Parameter Land Use Plan within **Appendix C**, indicates the southern areas of the Development to be green infrastructure, with the existing woodland retained. Therefore, the impact of the Development lighting are considered to have **no impact** at this viewpoint during summer and winter periods in terms of sky glow, light intrusion and luminaire intensity.

Period	Sky Glow ULR (Upward Light Ratio)	Light Intrusion	Luminaire Intensity
Summer Months:	No Impact	No Impact	No Impact

Period	Sky Glow ULR (Upward Light Ratio)	Light Intrusion	Luminaire Intensity
Winter Months:	No Impact	No Impact	No Impact

Table 6-6 Viewpoint 3, Impact of the Development Lighting

6.6 Viewpoint 4

Location:	View from Star Hill Road looking southwest along Crow Road		
GPS Coordinate:	X: 549059	Y: 158857	
Distance to Site:	Within Site boundary		
Viewpoint height above ordnance datum:	213m AOD		
Conditions:	Cloudy skies, slight wind.		
Night Time lux Level:	44.5 lux		

6.6.1 Viewpoint 4 – Existing Lighting Baseline



Figure 6.7 Viewpoint 4, View from Star Hill Road, Day Time View

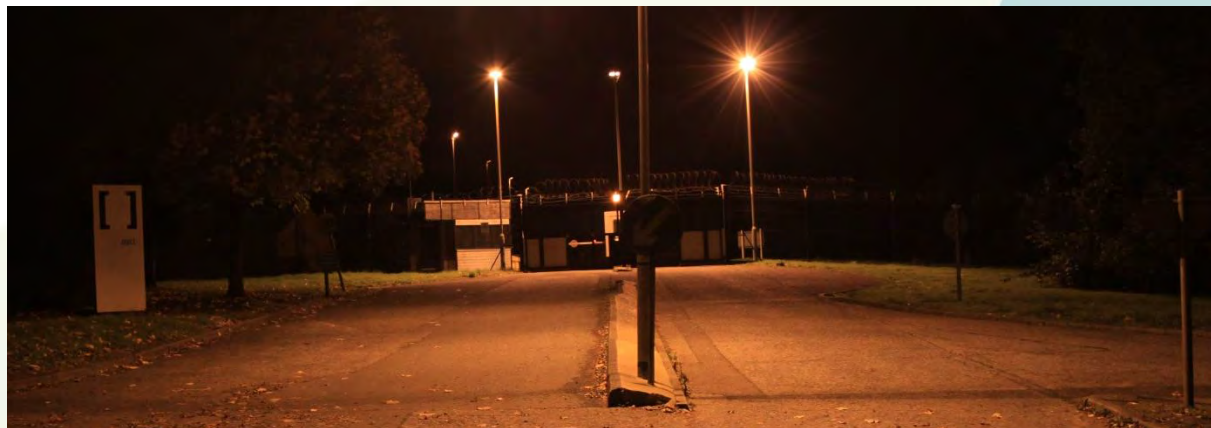


Figure 6.8 Viewpoint 4, View from Star Hill Road, Night Time View

- 6.6.1.1 This viewpoint is located on Star Hill Road, opposite the West Gate Entrance. This entrance to the Fort Halstead Site is used by employees only, with all visitors entering via the Main Entrance. Approximately 50m to the north of the viewpoint is the crest of the roadway hill.
- 6.6.1.2 To the southeast of the viewpoint, although not visible, are Star Hill Road Cottages which have no views of the Site entrance gate. There is dense woodland on both sides of Star Hill Road preventing views into the Site, however where the gap in the woodland occurs at the West Gate Entrance, there are views into the Site.
- 6.6.1.3 From this viewpoint, the security gate at the West Gate Entrance, as well as the boundary security fence, Gatehouse and marquee within the Site boundary are clearly visible. Three lighting columns with mini-floodlights located along the entrance roadway within the Site are visible, as well as three high output floodlights, two of which face towards Star Hill Road illuminating the security gate outside the Site boundary, and the other floodlight faces into the Site. There is also a column mounted CCTV camera facing towards the Site entrance gate and Star Hill Road.
- 6.6.1.4 The higher level of illumination is provided at the West Gate Entrance to facilitate the CCTV system and Gatehouse in identifying approaching vehicles. The illumination levels recorded at this viewpoint ranged from 2.5 lux to 132 lux, with an average illumination of 44.5 lux.
- 6.6.1.5 Star Hill Road is not illuminated. However there is a twin head 8-10m lighting column located at the end of the West Gate entrance roadway adjacent to Star Hill Road, providing illumination to the Entrance junction.
- 6.6.1.6 The receptors at this viewpoint would be motorists using Star Hill Road and Crow Road.

6.6.2 Viewpoint 4 – Impact of the Development

- 6.6.2.1 The Parameter Land Use Plans indicated within **Appendices C and D**, indicate this viewpoint to have views of the green infrastructure areas in the short range view, including informal recreation and wildlife areas. The medium range view is towards the proposed employment areas, specifically the retained buildings, however it is considered the green infrastructure and retained woodland areas will shield any views of the buildings.
- 6.6.2.2 During winter periods when vegetation is less dense, it is unlikely that this viewpoint will provide any views of the proposed employment area and its associated external lighting
- 6.6.2.3 As indicated within **Section 8.4 Access Road Lighting**, in order to comply with Road Lighting Standards, it is anticipated new lighting would be provided along the roadway within the Site boundary as part of the Development works and at the Star Hill Road junction. As identified by Local Planning Policies within **Section 5**. All new proposed lighting would be required to comply with the identified policy references within **Section 5**, specifically EN31.
- 6.6.2.4 The new roadway lighting would be required to have zero upwards light output, and comply with BSEN 13201-2:2003 Roadway Lighting Performance Requirements, which stipulates the required illumination levels for this classification²³ of road and the levels of acceptable glare.

²³ Classification of road to be confirmed during detailed lighting design.

- 6.6.2.5 New lighting along Crow Road would be an improvement on the existing lighting environment, reducing luminaire intensity on the users of the roadway, and reducing the contribution towards sky glow. However, sky glow associated within this Site will typically only be visible from distant viewpoints, and will therefore not be visible from this viewpoint, resulting in **no impact**.
- 6.6.2.6 The magnitude of change at this viewpoint is considered to be minor beneficial. Therefore, the impacts of the Development operational phase lighting are considered to be **minor beneficial** at this viewpoint during summer periods in terms of light intrusion and luminaire intensity. However during winter periods where views of the employment area lighting may be visible, the impacts are considered to be **negligible**.

Period	Sky Glow ULR (Upward Light Ratio)	Light Intrusion	Luminaire Intensity
Summer Months:	No Impact	Minor Beneficial	Minor Beneficial
Winter Months:	No Impact	Minor Beneficial	Negligible

Table 6-7 Viewpoint 4, Impact of the Development Lighting

6.7 Viewpoint 5

Location:	View from footpath SR172 looking south	
GPS Coordinate:	X: 549372	Y: 159299
Distance to Site:	Site Boundary	
Viewpoint height above ordnance datum:	211m	
Conditions:	Cloudy skies, slight wind.	
Night Time lux Level:	0.13 lux	

6.7.1 Viewpoint 5 – Existing Lighting Baseline



Figure 6.9 Viewpoint 5, Footpath SR172 Day Time View



Figure 6.10 Viewpoint 5, Footpath SR172 Night Time View

6.7.1.1 This viewpoint is located on footpath SR172, within the woodland area 211m from the Site's central-northern boundary.

- 6.7.1.2 190m from the viewpoint are a small number of private bungalow properties. The rear of the properties faces towards the viewpoint and Site boundary. However the woodland provides substantial screening of the existing Site, and no lighting or buildings are visible.
- 6.7.1.3 Approximately 10m to the east of the viewpoint, within the Site boundary, is a small single storey brick structure. The structure appears to be a storage or plant enclosure. A fluorescent bulkhead luminaire is mounted to the external face of the building, and was active at the time of survey.
- 6.7.1.4 The receptors at this viewpoint would be walkers using the footpath through the woods, and the residents of the bungalows facing the Site.
- 6.7.2 **Viewpoint 5 – Impact of the Development**
- 6.7.2.1 The Parameter Land Use Plans indicated within **Appendices C and D**, indicate this viewpoint would be located within approximately 20m of the proposed residential areas. Although the surrounding woodland would provide screening of the Development, this viewpoint would have partial views of the rear of residential properties. It is unlikely this viewpoint would have views of the residential street lighting, although gaps within the properties may provide glimpses.
- 6.7.2.2 Sky glow and luminaire intensity impacts associated within the Development lighting would be partially visible at this viewpoint through gaps within the surrounding woodland. The residential lighting would be visible, however it would typically consist of views of internal property lighting, and luminaire intensity as a result of the private external security floodlights.
- 6.7.2.3 Sky glow and luminaire intensity would be more visible during winter months when vegetation is less dense. It is therefore considered the impact of the Development lighting at this viewpoint would be **minor adverse**.
- 6.7.2.4 The magnitude of change at this viewpoint is considered to be beneficial in terms of the Development based on the outline lighting strategy and design principles set out in Section 8.

Period	Sky Glow ULR (Upward Light Ratio)	Light Intrusion	Luminaire Intensity
Summer Months:	Minor Adverse	Minor Adverse	Negligible
Winter Months:	Minor Adverse	Minor Adverse	Negligible

Table 6-9 Viewpoint 5, Impact of the Development Lighting

6.8 Viewpoint 6

Location:	View from Junction of Morants Court Road/Polehill (A224), on North Downs Way, looking north	
GPS Coordinate:	X: 550159	Y: 158266
Distance to Site:	600m	
Viewpoint height above ordnance datum:	105m	
Conditions:	Overcast/cloudy skies	
Night Time lux Level:	14.23 lux	

6.8.1 Viewpoint 6 – Existing Lighting Baseline



Figure 6.11 Viewpoint 6, View from Morants Court Road/Polehill (A224), Day Time View

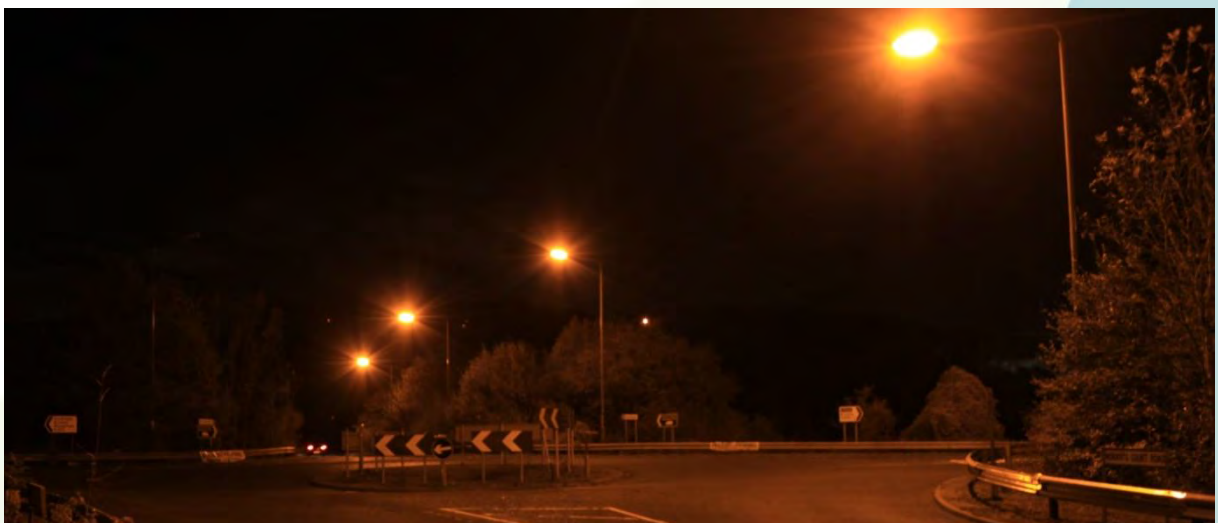


Figure 6.12 Viewpoint 6, View from Morants Court Road/Polehill (A224), Night Time View

- 6.8.1.1 This viewpoint is located on Morants Court Road, adjacent the roundabout junction on the A224 (just the bridge over the M25). The south exit of the roundabout leads immediately onto the bridge over the M25 motorway which is illuminated. The Site is 600m north of the viewpoint, visible on the hill side.
- 6.8.1.2 The section of Star Hill Road where it intersects with the A224 roundabout is illuminated by 8-10m lighting low pressure sodium columns. As Star Hill Road exits the roundabout in the direction of the Site, the roadway is not illuminated.
- 6.8.1.3 From this viewpoint, the Site perimeter security fence is visible along the southern side of the Site, as well as the woodland within the Site boundary and in the wider study area. Although not clearly discernible during the day time view, a small building (building X48/X40) located on the hillside is partially visible from this viewpoint. No lighting associated with this building is visible.
- 6.8.1.4 During the night time view, two light sources within the Site are partially visible through gaps within the vegetation. These light sources appear to be low pressure sodium lamps associated with the Site roadway lighting. The remainder of the Site appears to be that of predominant darkness. Transitory lighting is visible from vehicles moving along Star Hill Road as it routes around the Site.
- 6.8.1.5 From this viewpoint, sky glow in form of an orange aura above the Site is visible.
- 6.8.1.6 The immediate foreground of this viewpoint is well illuminated during the night time view. A number of 8-10m lighting columns are positioned on all outer sides of the roundabout junction provide a uniform level of lighting. The illumination levels recorded at this viewpoint averaged 14.23 lux.
- 6.8.1.7 The receptors at this viewpoint would be motorists using the roundabout junction and Star Hill Road heading northwest.
- 6.8.2 **Viewpoint 6 – Impact of the Development**
- 6.8.2.1 The Parameter Land Use Plans indicated within **Appendices C** and **D**, indicate this viewpoint to have views of the green infrastructure areas in the medium range view. Due to the topography of the land, the Development would be screened behind the hillside, green woodland and the retained buildings.
- 6.8.2.2 During winter periods when vegetation is less dense, it is likely the medium range view will remain screened by the woodland and the retained buildings. Views into the Development will be unlikely.
- 6.8.2.3 Although the Development and its associated lighting are likely to be obscured, sky glow above the Development would be visible. As part of the Development, new external lighting would be an improvement on the existing lighting environment by use of luminaires with improved light control in reducing the direct upward lighting and colour rendering, which would assist in reducing overall levels of sky glow. The sky glow is also likely to appear as a more ‘whiter’ aura, making the sky glow less obtrusive depending upon the night ambient conditions.
- 6.8.2.4 Due to the levels of existing lighting at the A224 roundabout junction, it is considered the Development will have **no impact** on the receptors at this viewpoint.
- 6.8.2.5 The magnitude of change at this viewpoint is considered to be negligible. Therefore, the impacts of the Development lighting are considered to have **no impact** at this viewpoint during summer and winter periods in terms of light intrusion and luminaire intensity. However during summer and winter periods the impacts are considered to be **minor beneficial** in terms of sky glow as a result of the likely reduced amounts of visible sky glow.

Period	Sky Glow ULR (Upward Light Ratio)	Light Intrusion	Luminaire Intensity
Summer Months:	Minor Beneficial	No Impact	No Impact
Winter Months:	Minor Beneficial	No Impact	No Impact

Table 6-8 Viewpoint 6, Impact of the Development Lighting

6.9 Viewpoint 7

Location:	View from Otford Lane looking south	
GPS Coordinate:	X: 549909	Y: 160413
Distance to Site:	400m	
Viewpoint height above ordnance datum:	175m AOD	
Conditions:	Overcast/cloudy skies, light rain at times	
Night Time lux Level:	0.06 lux (Moonlight)	

6.9.1 Viewpoint 7 – Existing Lighting Baseline



Figure 6.13 Viewpoint 7, View from Otford Lane looking south, Day Time View

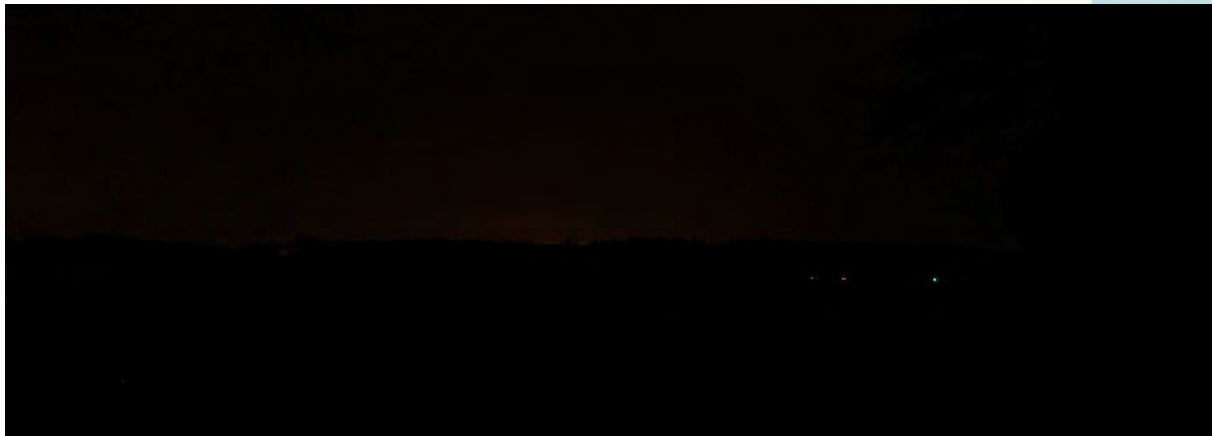


Figure 6.14 Viewpoint 7, View from Otford Lane looking south, Night Time View

6.9.1.1 This viewpoint is located on Otford Lane, at the driveway entrance to Danehill Farm. Otford Lane is a semi-rural country lane with residential properties along its route, albeit many of the properties are set back from the roadside.

6.9.1.2 To the east, Otford Lane passes Crow Drive, which is the Main Entrance into the Site. To the west, Otford Lane leads into the village of Halstead.

- 6.9.1.3 There is no street lighting along the entire route of Otford Lane. Residential property lighting, as well as some driveway lighting is visible along Otford Lane. The average illumination level recorded at this viewpoint was 0.06 lux, which is comparable to that of moonlight on a cloudy night.
- 6.9.1.4 The Site is located 400m to the south of this viewpoint. A mature woodland belt screens the entire Site at ground level; however the rooftop of building N2 and the two Boiler House chimney stacks are just about discernible above the woodland tree tops.
- 6.9.1.5 It should be noted that the lighting assessment was carried out at ground level. Views from the upper storey windows of the adjacent properties facing the Site on Otford Lane may offer more direct views of the Site and its associated lighting.
- 6.9.1.6 During the night time view, no direct views of lighting within the Site are visible. However sky glow above the Site in terms of an orange aura is clearly visible. The light sources visible within the night time view are associated with Danehill Farm.
- 6.9.1.7 The receptors at this viewpoint would be nearby residents along Otford Lane, particularly the properties on the south side of Otford Lane facing towards the Site.
- 6.9.2 **Viewpoint 7 – Impact of the Development**
- 6.9.2.1 The Parameter Land Use Plans indicated within **Appendices C** and **D**, indicate this viewpoint to have medium range views of the existing woodland and green infrastructure areas.
- 6.9.2.2 During winter periods when vegetation is less dense, it is likely the Site will become more visible through the vegetation, however direct views of the Development would be limited. It is considered the Development lighting will not be directly visible, however the light sources associated with the residential developable area may be partially visible through any gaps within the vegetation.
- 6.9.2.3 Sky glow above the Development would be visible. As part of the Development, the new external lighting would be an improvement on the existing lighting environment by use of luminaires with improved light control and colour rendering, which would assist in reducing overall levels of sky glow. The sky glow is also likely to appear as a more ‘white’ aura, making the sky glow less obtrusive.
- 6.9.2.4 The magnitude of change at this viewpoint is considered to be negligible. However during summer and winter periods the impacts are considered to be **minor beneficial** in terms of sky glow as a result of the likely reduced amounts of visible sky glow.

Period	Sky Glow ULR (Upward Light Ratio)	Light Intrusion	Luminaire Intensity
Summer Months:	Minor Beneficial	Negligible	Negligible
Winter Months:	Minor Beneficial	Negligible	Negligible

Table 6-9 Viewpoint 7, Impact of the Development Lighting

6.10 Viewpoint 8

Location:	View from Footpath SK690 to the north of Knockholt Pound looking south	
GPS Coordinate:	X: 548507	Y: 160192
Distance to Site:	1.1km	
Viewpoint height above ordnance datum:	176m	
Conditions:	Cloudy skies, no wind. Light rain during the night time assessment.	
Night Time lux Level:	0.08 lux (Moonlight)	

6.10.1 Viewpoint 8 – Existing Lighting Baseline



Figure 6.15 Viewpoint 8, Footpath SK690, Day Time View



Figure 6.16 Viewpoint 8, Footpath SK690, Night Time View

- 6.10.1.1 This viewpoint is located on a public footpath within a field, adjacent Halstead Lane. There is a residential property within 65m of this viewpoint to the north, and a further residential property 250m to the southwest.
- 6.10.1.2 There is no street lighting along Halstead Lane. Residential property lighting, as well as some driveway lighting is visible along Halstead Lane. The average illumination level recorded at this viewpoint was 0.08 lux, which is comparable to that of moonlight on a cloudy night.
- 6.10.1.3 The Site is located 1.1km to the southwest of this viewpoint. A mature woodland belt screens the entire Site; however building N2 and the Boiler House chimney stacks protrude above the woodland tree tops.

- 6.10.1.4 During the night time view, lighting sources within the Site can be glimpsed through gaps within the vegetation.
- 6.10.1.5 The receptors at this viewpoint would be walkers and nearby residents along Halstead Lane.
- 6.10.2 **Viewpoint 8 – Impact of the Development**
- 6.10.2.1 The Parameter Plans indicated within **Appendices C** and **D**, indicate this viewpoint would have medium range views of the existing woodland and green infrastructure areas.
- 6.10.2.2 During winter periods when vegetation is less dense, it is likely the Site may become more visible through the vegetation, however direct views of the Development lighting would be limited. It is considered the light sources associated with the residential developable area may be partially visible through gaps within the vegetation.
- 6.10.2.3 Sky glow above the Development would be visible. As part of the Development, the new external lighting would be an improvement on the existing lighting environment by use of luminaires with improved light control and colour rendering, which would assist in reducing overall levels of sky glow. The sky glow is also likely to appear as a more ‘white’ aura, making the sky glow less obtrusive.
- 6.10.2.4 The magnitude of change at this viewpoint is considered to be negligible.

Period	Sky Glow ULR (Upward Light Ratio)	Light Intrusion	Luminaire Intensity
Summer Months:	Negligible	Minor Adverse	Negligible
Winter Months:	Negligible	Minor Adverse	Negligible

Table 6-10 Viewpoint 8, Impact of the Development Lighting

6.11 Viewpoint 10

Location:	View from Hale Recreation Ground, Twitton, looking east	
GPS Coordinate:	X: 551461	Y: 158902
Distance to Site:	1.4km	
Viewpoint height above ordnance datum:	85m AOD	
Conditions:	Cloudy skies, no wind. Light rain during the night time assessment.	
Night Time lux Level:	0.05 lux (Moonlight)	

6.11.1 Viewpoint 10 – Existing Lighting Baseline



Figure 6.17 Viewpoint 10, View from Hale Recreation Ground, Twitton, Day Time View

Sky glow visible above the
Fort Halstead Site

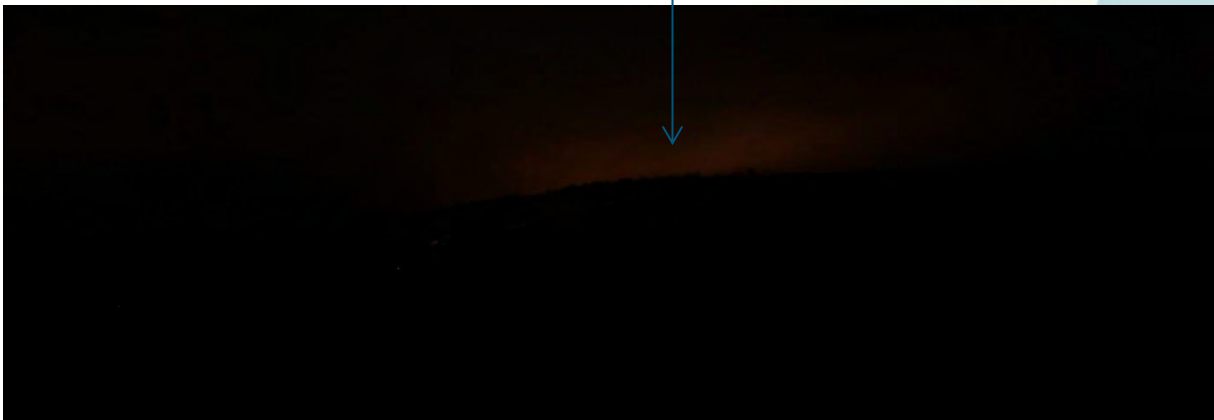


Figure 6.18 Viewpoint 10, View from Hale Recreation Ground, Twitton, Night Time View

6.11.1.1 This viewpoint is located at the recreation ground at the end of Hale Lane, Twitton. Hale Lane is residential area of Twitton. The Site is 1.4km due west of this viewpoint.

6.11.1.2 Approximately 40m to the east of this viewpoint are the residential properties of Hale Lane, although the properties are not facing towards the Site, albeit the end houses have side windows overlooking the recreation ground with views of the Site.

- 6.11.1.3 Located 250m from this viewpoint, between the viewpoint and the Site, is a railway line which is in frequent use. Further 0.8km west towards the Site is the M25 motorway, although the motorway is obscured by the topography of the land and the vegetation.
- 6.11.1.4 This viewpoint offers clear open views of the Site located on the hillside, although the Site is screened by the mature dense woodland. The ground level of the Site is obscured, and no buildings or structures are visible. The Site perimeter security fence is partially visible on the sloping hillside.
- 6.11.1.5 During the night time view, scattered lighting associated with residential properties in the line of sight towards the Site is visible. To the east (right) of the view, the chalk quarry is visible as a result of the light spill from North Downs Business Park. Transitory lighting is partially visible through gaps within the vegetation from vehicles moving along the A224. Lighting associated with the Site is not visible. Transitory lighting from trains is also visible on a reasonably frequent basis.
- 6.11.1.6 The average illumination level recorded at this viewpoint was 0.05 lux, which is comparable to that of moonlight on a cloudy night.
- 6.11.1.7 Sky glow above the Site is clearly visible in the form of an orange aura in the night sky and was prominent due to the prevailing night time conditions following rain.
- 6.11.1.8 To the east of this viewpoint, light spill into the recreation ground from both the street lighting along Hale Road, and the private residential lighting is visible. At the time of survey, an external security floodlight mounted to the apex of the end property provided significant light spill into the viewpoint area, and also adverse luminaire intensity.
- 6.11.1.9 The receptors at this viewpoint would be nearby residents along Hale Lane, particularly the properties located at the end of the Lane nearest to the recreation ground. Users of the recreation ground are also receptors, although it is unlikely there would be frequent use of the recreation ground during the hours of darkness.
- 6.11.2 **Viewpoint 10 – Impact of the Development**
- 6.11.2.1 The Parameter Land Use Plans indicated within **Appendices C and D**, indicate this viewpoint to have long range views towards the east of the Development. The viewpoint would have views of the existing woodland and green infrastructure areas to the east of the Site.
- 6.11.2.2 The employment areas to the east of the Site, which are indicated within **Appendix D** as being up to three storeys (16m max) are unlikely to be visible at ground level, however the energy centre, specifically its associated flue, would be partially visible during winter periods when vegetation is less dense. This may result in partial views of lighting through upper storey windows of the buildings.
- 6.11.2.3 Sky glow above the Development would be visible. As part of the Development, the new external lighting would be an improvement on the existing lighting environment by use of luminaires with improved light control and colour rendering, which would assist in reducing overall levels of sky glow. The sky glow is also likely to appear as a more ‘white’ aura, making the sky glow less obtrusive.
- 6.11.2.4 The magnitude of change at this viewpoint is considered to be negligible. Therefore, the impacts of the Development lighting are considered to be **negligible** at this viewpoint during summer and winter periods in terms luminaire intensity, with **no impacts** in terms of light intrusion due to the distance from Site. However during summer and winter periods the impacts are considered to be **minor beneficial** in terms of sky glow as a result of the likely reduced amounts of visible sky glow.

Period	Sky Glow ULR (Upward Light Ratio)	Light Intrusion	Luminaire Intensity
Summer Months:	Minor Beneficial	No Impact	Negligible
Winter Months:	Minor Beneficial	No Impact	Negligible

Table 6-11 Viewpoint 10, Impact of the Development Lighting

6.12 Viewpoint 12

Location:	View from footpath SR60, near Otford Mount, looking south west	
GPS Coordinate:	X: 552842	Y: 160202
Distance to Site:	2.7km	
Viewpoint height above ordnance datum:	141m AOD	
Conditions:	Cloudy skies, slight wind.	
Night Time lux Level:	0.03 lux (Moonlight)	

6.12.1 Viewpoint 12 – Existing Lighting Baseline



Figure 6.19 Viewpoint 12, View from footpath SR60, near Otford Mount, Day Time View

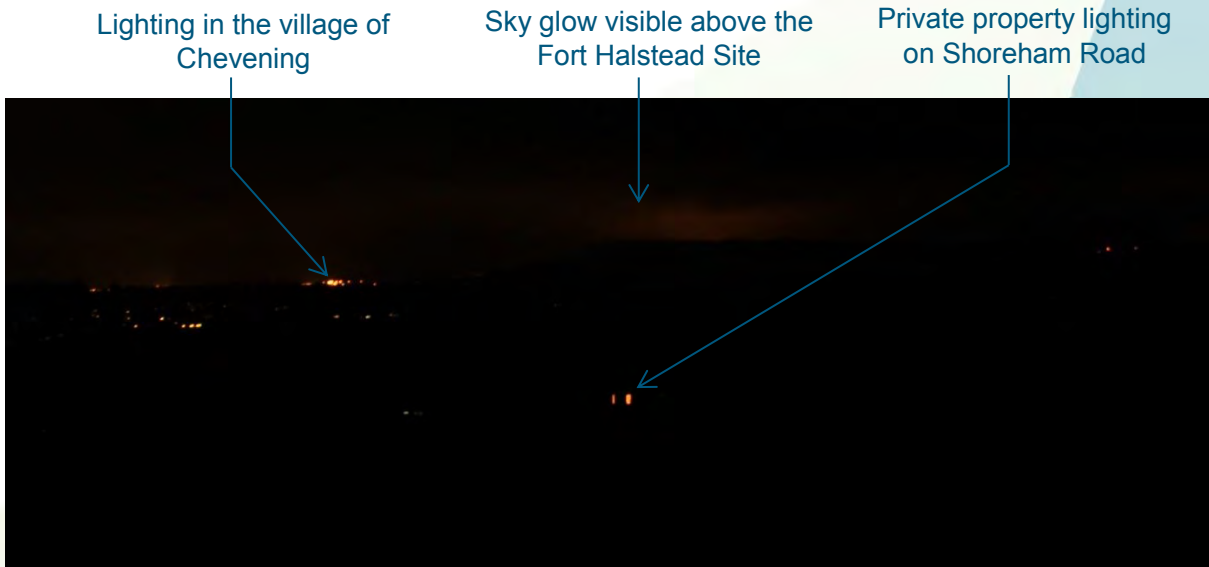


Figure 6.20 Viewpoint 12, View from footpath SR60, near Otford Mount, Night Time View

6.12.1.1 This viewpoint is located on public footpath SR60, near to Otford Mount, which is a hilltop adjacent the viewpoint. This viewpoint is 2.7km east of the Site.

- 6.12.1.2 The viewpoint is surrounded by pastoral farm land. The A225 Shoreham Road is approximately 350m west of the viewpoint. Along the roadway are a number of large residential properties, with views towards the Site. Approximately 80m further to the east of the viewpoint is Otford Mount, which offers elevated views across Otford, Twitton and Shoreham.
- 6.12.1.3 This viewpoint offers clear open views of the Site located on the hillside, although the Site is 2.7km north-west and well screened by the mature dense woodland. The ground level of the Site is obscured, although some chimneys and buildings A10 and A28 are visible. The land between this viewpoint and the Site is low lying agricultural land, with the viewpoint being at 140m AOD.
- 6.12.1.4 During the night time view, the A225 Shoreham Road is more visible compared to the day time view. Transitory vehicle lighting can be partially seen through gaps within the vegetation. A railway line located beyond the Shoreham Road is also now visible as a result of the transitory train lighting.
- 6.12.1.5 Two orange lighting sources located within the Site are visible through gaps within the Site's eastern boundary vegetation. It is likely these lighting sources are the low pressure sodium street lights located at the Crow Drive, Otford Lane and A224 Polhill Road junction. The remainder of the Site appears in relative darkness.
- 6.12.1.6 Residential lighting associated with the properties along Shoreham Road is clearly visible. Further afield, this viewpoint offers wide open views towards the towns of Greatness, Riverhead and Sevenoaks beyond where vast amounts of lighting is clearly visible, as well as sky glow above these towns.
- 6.12.1.7 The average illumination level recorded at this viewpoint was 0.03 lux, which is comparable to that of moonlight on a cloudy night.
- 6.12.1.8 From this viewpoint, sky glow above the Site is clearly visible as a distinctive orange aura.
- 6.12.1.9 The receptors at this viewpoint would be walkers although it is unlikely there would be use of the footpath during the hours of darkness.
- 6.12.2 **Viewpoint 12 – Impact of the Development**
- 6.12.2.1 The Parameter Land Use Plans indicated within **Appendices C and D**, indicate this viewpoint to have long range views towards the south east of the Development and the retained QinetiQ area. The viewpoint would have views of the existing woodland and green infrastructure areas to the east of the Site.
- 6.12.2.2 The new employment park to the east of the Site is indicated within **Appendix D** as being up to three storeys (16m max). Due to the elevated height of the viewpoint and open unobstructed views, the energy centre flue and employment area buildings of three storey height may be visible from this viewpoint, specifically during winter periods. However the viewpoint is located 2.7km from the Development, and the viewpoint currently has views buildings A10 and A28. This may result in partial views of lighting through upper storey windows of the buildings.
- 6.12.2.3 Sky glow above the Development would be visible. As part of the Development, the new external lighting would be an improvement on the existing lighting environment by use of luminaires with improved light control and colour rendering, which would assist in reducing overall levels of sky glow. The sky glow is also likely to appear as a more 'whiter' aura, making the sky glow less obtrusive.
- 6.12.2.4 The magnitude of change at this viewpoint is considered to be **minor adverse**. Therefore, the impact of the Development lighting at this viewpoint in terms of luminaire intensity is considered to be **negligible**

during summer periods, and **minor adverse** during winter periods due to possible views of the Developments employment area lighting sources.

6.12.2.5 The impact in terms of light intrusion are considered to be **negligible** during summer and winter periods, and **minor beneficial** in terms of sky glow during summer and winter periods.

Period	Sky Glow ULR (Upward Light Ratio)	Light Intrusion	Luminaire Intensity
Summer Months:	Minor Beneficial	Negligible	Negligible
Winter Months:	Minor Beneficial	Negligible	Minor Adverse

Table 6-12 Viewpoint 12, Impact of the Development Lighting

6.13 Viewpoint 16

Location:	Views from southern edge of Ide Hill/Footpath SR236, looking north	
GPS Coordinate:	X: 548607	Y: 152130
Distance to Site:	6.6km	
Viewpoint height above ordnance datum:	192m AOD	
Conditions:	Cloudy skies, no wind. Light rain during the night time assessment.	
Night Time lux Level:	0.03 lux (Moonlight)	

6.13.1 Viewpoint 16 – Existing Lighting Baseline



Figure 6.21 Viewpoint 16, Views from southern edge of Ide Hill/Footpath SR236, Day Time View



Figure 6.22 Viewpoint 16, Views from southern edge of Ide Hill/Footpath SR236, Night Time View

- 6.13.1.1 This viewpoint is located on public footpath SR236, within an agricultural field. The footpath is accessed from Camberwell Lane, Ide Hill. Immediately adjacent the viewpoint is the residential properties of Camberwell Lane. The upper storey windows of the Camberwell Lane properties facing north would have clear open views towards the Site, although the Site is not clearly discernible.
- 6.13.1.2 From this viewpoint, the Site is 6.6km north. The Site is visible in **Figure 6.17** on the horizon, slightly to east of the centre of the view. Owing to the 6.6km distance from Site, this viewpoint does not offer any clear view although the Site is not easily discernible.

- 6.13.1.3 The medium range view from this viewpoint is that of mature woodland and farmland. A small number of residential and agricultural type properties are visible. No buildings or structures located at the Site are visible.
- 6.13.1.4 During the night time view, lighting sources associated with the residential and agricultural properties are visible in the medium range view. From this viewpoint, the Site appears in darkness, with no directly visible light sources. Sky glow in the form of an orange aura from the direction of the Site appears to be significantly noticeable due to the distant view and surrounding dark skies and the ambient conditions that night, following the rain.
- 6.13.1.5 The quarry in the direction of the Site is visible as a result of the light spill from North Downs Business Park lighting installation.
- 6.13.1.6 Light spill from the Camberwell Lane street lighting column, internal light spill through windows and private external security lighting from the rear of residential properties located adjacent this viewpoint is apparent at the viewpoint location.
- 6.13.1.7 It should be noted that the lighting assessment was carried out at ground level. Views from the upper storey windows of the adjacent properties facing the Site may offer more elevated views of the Site and its associated lighting. It is considered there are three properties within Camberwell Lane with windows facing towards the Site.
- 6.13.1.8 The average illumination level recorded at this viewpoint was 0.03 lux, which is comparable to that of moonlight on a cloudy night.
- 6.13.1.9 The receptors at this viewpoint would be walkers and residents of the adjacent properties. It is unlikely there would be frequent use of the footpath during the hours of darkness.
- 6.13.2 **Viewpoint 16 – Impact of the Development**
- 6.13.2.1 The Parameter Land Use Plans indicated within **Appendices C** and **D**, indicate this viewpoint to have long range views towards the south of the Development. Due to the 6.6km distance to Site, this viewpoint would only have partial views of the existing woodland and green infrastructure areas on southern boundary of the Site.
- 6.13.2.2 It is considered that from this viewpoint, there would be no discernible views of any of the Developments due to the 6.5km distance, although the chimney flue may be visible. The upper storey windows of the residential properties located adjacent the viewpoint facing north, may have more elevated views of the Development; however it is considered they would still not have direct views of any of the Developments lighting.
- 6.13.2.3 Sky glow above the Development would be visible. As part of the Development, the new external lighting would be an improvement on the existing lighting environment by use of luminaires with improved light control and colour rendering, which would assist in reducing overall levels of sky glow. Sky glow is also likely to appear as a more ‘white’ aura above the Development compared to the current ‘orange’ aura. A ‘white’ aura in terms of sky glow is considered to be less visible and obtrusive.
- 6.13.2.4 The magnitude of change at this viewpoint is considered to be negligible. Therefore, the impact of the Development lighting are considered to be **negligible** at this viewpoint during summer and winter periods in terms luminaire intensity, with **no impact** in terms of light intrusion due to the distance from Site. However during summer and winter periods the impact are considered to be **minor beneficial** in terms of sky glow as a result of the likely reduced amounts of visible sky glow.

Period	Sky Glow ULR (Upward Light Ratio)	Light Intrusion	Luminaire Intensity
Summer Months:	Minor Beneficial	No Impact	Negligible
Winter Months:	Minor Beneficial	No Impact	Negligible

Table 6-13 Viewpoint 16, Impact of the Development Lighting

7 LIGHTING APPRAISAL – LESS CRITICAL LIGHTING VIEWPOINTS

7.1 Introduction

7.1.1 The following appraisal summarises the assessment of the existing lighting environment at the Site and its associated impact upon the identified viewpoints. The viewpoints identified within this section are considered to be of less relevance and importance due to the magnitude of change at the viewpoint, with regards to lighting.

7.2 Viewpoint 9

Location:	View from the edge of Dunton Green, on the Darent Valley Path, looking north	
GPS Coordinate:	X: 550537	Y: 157114
Distance to Site:	1.8km	
Viewpoint height above ordnance datum:	77m	
Conditions:	Cloudy skies, slight wind.	
Night Time lux Level:	N/A	

7.2.1 Viewpoint 9 – Existing Lighting Baseline



Figure 7.5 Viewpoint 9, Dunton Green Day Time View

- 7.2.1.1 A representative night time photo was not taken due to difficulty in accessing this viewpoint during hours of darkness.
- 7.2.1.2 A night time assessment of this viewpoint was carried out based on the judgement of the daytime assessment. It is considered this viewpoint would be of low importance in terms of lighting as the viewpoint is located at the edge of a field adjacent to a disused railway and on a public footpath 1.8km from the Site.
- 7.2.1.3 Existing sky glow above the Site is likely to be visible from this viewpoint. The Development lighting would incorporate improved photometry, luminaires, lighting control and lighting design compared to the existing Site lighting, resulting in an improvement in the levels and appearance of the existing Site sky glow.

7.2.1.4 The impacts of sky glow and luminaire intensity are therefore considered to be **minor beneficial** at this viewpoint. Due to the remote location of the viewpoint, it is likely there will be an infrequent use of this road during the hours of darkness.

7.2.2 Viewpoint 9 – Impact of the Development

7.2.2.1 An overview of the Development’s lighting Impacts at this viewpoint is outlined below.

Period	Sky Glow ULR (Upward Light Ratio)	Light Intrusion	Luminaire Intensity
Summer Months:	Minor Beneficial	No Impact	Minor Beneficial
Winter Months:	Minor Beneficial	No Impact	Minor Beneficial

Table 7-3 Viewpoint 9, Impact of the Development Lighting

7.3 Viewpoint 11

Location:	View from Fackenden Lane looking south west	
GPS Coordinate:	X: 552947	Y: 160781
Distance to Site:	2.6km	
Viewpoint height above ordnance datum:	132m	
Conditions:	Cloudy skies, slight wind.	
Night Time lux Level:	0.2 lux (Moonlight)	

7.3.1 Viewpoint 11 – Existing Lighting Baseline



Figure 7.6 Viewpoint 11, Fackenden Lane, Day Time View

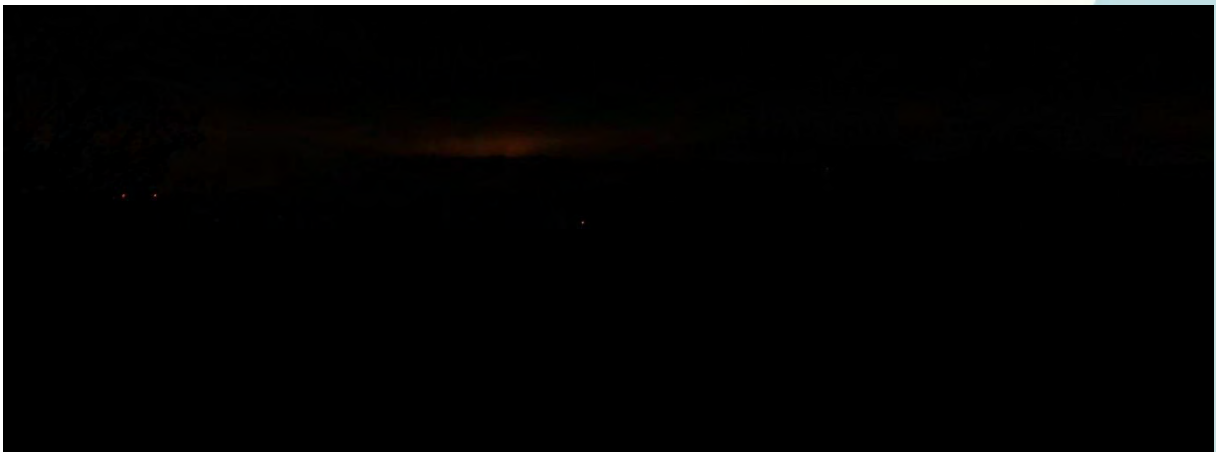


Figure 7.7 Viewpoint 11, Fackenden Lane, Night Time View

7.3.1.1 Views towards the Site are limited, as the roadside vegetation obstructs the view. However where there are openings within the roadside vegetation, the Site perimeter woodland is clearly visible, albeit the Site is 2.6km to the south-west. The Site appears in mainly darkness; however scattered light sources are visible through gaps within the substantial woodland buffer.

7.3.1.2 Sky glow above the Site is clearly visible as an orange aura above the Site. The Development lighting would incorporate improved photometry, luminaires, lighting control and lighting design compared to the existing Site lighting, resulting in an improvement in the levels and appearance of the existing Site sky glow.

7.3.1.3 The impacts of sky glow are therefore considered to be **minor beneficial** at this viewpoints. Due to the remote location of the viewpoint, it is likely there will be an infrequent use of this road during the hours of darkness.

7.3.2 Viewpoint 11 – Impact of the Development

7.3.2.1 An overview of the Development’s lighting impact at this viewpoint is outlined below.

Period	Sky Glow ULR (Upward Light Ratio)	Light Intrusion	Luminaire Intensity
Summer Months:	Minor Beneficial	Negligible	No Impact
Winter Months:	Minor Beneficial	Negligible	No Impact

Table 7-4 Viewpoint 11, Impact of the Development Lighting

7.4 Viewpoint 13

Location:	View from Otford Mount, on the North Downs Way, looking west	
GPS Coordinate:	X: 553761	Y: 159687
Distance to Site:	3.4km	
Viewpoint height above ordnance datum:	150m	
Conditions:	Cloudy skies, slight wind.	
Night Time lux Level:	0.19 lux (Moonlight)	

7.4.1 Viewpoint 13 – Existing Lighting Baseline



Figure 7.8 Viewpoint 13, Otford Mount, Day Time View

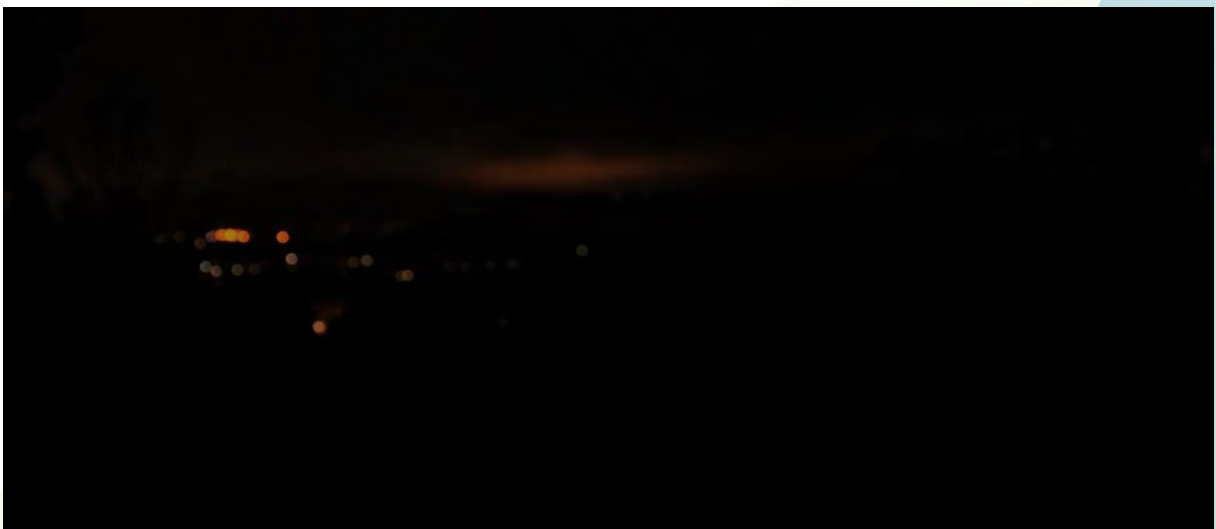


Figure 7.9 Viewpoint 13, Otford Mount, Night Time View

7.4.1.1 An assessment of this viewpoint was carried out and it is considered this viewpoint would be of low importance in terms of lighting as the viewpoint is located on a remote footpath 3.4km from the Site.

7.4.1.2 Views towards the Site are obstructed by vegetation along most of the route, with very few openings. Minimal amounts of lighting is visible within the Site from this viewpoint. Due to the remote location, it is likely there will be very infrequent use of this footpath during the hours of darkness.

7.4.2 Viewpoint 13 – Impact of the Development

7.4.2.1 An overview of the Development’s lighting impact at this viewpoint is outlined below.

Period	Sky Glow ULR (Upward Light Ratio)	Light Intrusion	Luminaire Intensity
Summer Months:	Negligible	Negligible	No Impacts
Winter Months:	Negligible	Negligible	No Impacts

Table 7-5 Viewpoint 13, Impact of the Development Lighting

7.5 Viewpoint 14

Location:	View from junction of London Road/Argyle Road, within Sevenoaks, looking north west	
GPS Coordinate:	X: 552785	Y: 154978
Distance to Site:	4.8km	
Viewpoint height above ordnance datum:	142m	
Conditions:	Cloudy skies, slight wind.	
Night Time lux Level:	27.21 lux	

7.5.1 Viewpoint 14 – Existing Lighting Baseline



Figure 7.10 Viewpoint 14, London Road, Sevenoaks, Day Time View



Figure 7.11 Viewpoint 14, London Road, Sevenoaks, Night Time View

7.5.1.1 An assessment of this viewpoint was carried out and it is considered this viewpoint would be of low importance in terms lighting as the viewpoint is located 4.8km from the Site, in the centre of Sevenoaks Town Centre. Views towards the Site are mostly obstructed by buildings; however glimpses of the Site are possible through gaps within the buildings during the day.

7.5.1.2 The environment surrounding this viewpoint is very well illuminated by street lighting columns, vast amounts of transitory lighting, internal building light spill, and private external lighting. There are also

the intense lights within the traffic light signals, which by nature are a prominent lighting source from this viewpoint. During the night time view, the Site is not visible against the dark background and night sky.

7.5.1.3 Additionally, adjacent this viewpoint to the east (right) is a new development under construction. This development is likely to provide increased levels of lighting and lighting sources visible from this viewpoint.

7.5.2 Viewpoint 14 – Impact of the Development

7.5.2.1 An overview of the Development's lighting impact at this viewpoint is outlined below.

Period	Sky Glow ULR (Upward Light Ratio)	Light Intrusion	Luminaire Intensity
Summer Months:	No Impacts	No Impacts	No Impacts
Winter Months:	No Impacts	No Impacts	No Impacts

Table 7-6 Viewpoint 14, Impact of the Development Lighting

7.6 Viewpoint 15

Location:	View from Knole Park/Footpath SU18, on the south-eastern edge of Sevenoaks, looking north west	
GPS Coordinate:	X: 553697	Y: 154419
Distance to Site:	5.8km	
Viewpoint height above ordnance datum:	151m	
Conditions:	Cloudy skies, slight wind.	
Night Time lux Level:	N/A	

7.6.1 Viewpoint 15 – Existing Lighting Baseline



Figure 7.12 Viewpoint 15, Knole Park, Day Time View

- 7.6.1.1 A representative night time photo was not taken due to restricted access into the National Trust site outside of operating hours.
- 7.6.1.2 An assessment of this viewpoint was carried out during the day and it is considered this viewpoint would be of low importance in terms of lighting as the viewpoint is located 5.7km from the Site, with no clear views of the Site. The Site is completely obstructed by the woodland vegetation.

7.6.2 Viewpoint 15 – Impact of the Development

- 7.6.2.1 An overview of the Development's lighting impact at this viewpoint is outlined below.

Period	Sky Glow ULR (Upward Light Ratio)	Light Intrusion	Luminaire Intensity
Summer Months:	No Impact	No Impact	No Impact
Winter Months:	No Impact	No Impact	No Impact

Table 7-7 Viewpoint 15, Impact of the Development Lighting

8 LIGHTING DESIGN CONSIDERATIONS

8.1 Introduction

8.1.1 The following section outlines the considered lighting for the Development in respect of:

- Statutory and operational requirements during the operational phase.
- Statutory and operational requirements for operation and maintenance.
- The design of an appropriate lighting scheme, including the review of environmental considerations associated with the provision of artificial lighting.

8.1.2 Detailed lighting strategies for the Site should be developed by the Project Lighting Consultant during the design stage for each phase of the Development. As part of the detailed lighting design, due regard should be given to the ecological constraints, as well as the lighting requirements of the Site, with specific reference to the below standards and guidelines.

8.1.3 The proposed lighting requirements for the Development would be required to comply the following standards and guidance documents:

- UK Parliament, 1990; The Environmental Protection Act 1990;
- Clean Neighbourhoods Act (Section 102) and Environment Act 2005 (Sections 79, 80, and 82);
- BS-EN 12464-2:2014; Lighting of work places - Outdoor work places;
- BS 5489:2003 Part 1; Code of Practice for the design of Road Lighting;
- BS-EN 13201:2003 Parts 1-4; Road Lighting;
- Chartered Institute of Building Services Engineers (CIBSE) Lighting Guide 6:1992; Outdoor Environment;
- Institution of Lighting Professionals (ILP formerly ILE); Guidance Notes for the reduction of Light Pollution;
- Sevenoaks District Council, Development Management Policies;
- Sevenoaks District Council, Policy EN31, Outdoor Lighting;
- Sevenoaks District Council, Policy EN5, Outdoor Lighting;
- Manual for Streets, DCLG 2007;
- Lighting in the Countryside, DCLG1997;
- National Planning Policy Framework;
- Bat Conservation Trust (Version 3, May 2009); ILE Bats and Lighting in the UK.

8.1.4 Areas of the Site, such as the QinetiQ area, are identified as being retained, which are located on the south-western side of the Development. Areas to be retained include the Scheduled Monument and QinetiQ. Some of the existing lighting within the QinetiQ area will be retained as part of the Development, with new lighting systems proposed.

8.1.5 The perimeter security fence will be removed as part of the Development. A new security fence is proposed surrounding the QinetiQ area.

8.2 Operational Lighting

8.2.1 This section covers the Development's operational lighting and also considers the provision of lighting to the access roads.

8.2.2 The following Design Standards would be applied within the design stage to ascertain the most appropriate method for illuminating the Development:

- UK Parliament, 1990; The Environmental Protection Act 1990 (as amended by the Clean Neighbourhoods and Environmental Act 2005), specifically 79 and 80;
- BS-EN 12464-2:2014; Lighting of work places - Outdoor work places;
- BS 5489:2003 Part 1; Code of Practice for the design of Road Lighting;
- BS-EN 13201:2003 Parts 1-4; Road Lighting;
- Chartered Institute of Building Services Engineers (CIBSE) Lighting Guide 6:1992; Outdoor Environment;
- Institution of Lighting Professionals (ILP formerly ILE); Guidance Notes for the reduction of Light Pollution;
- Sevenoaks District Council, Development Management Policies;
- Bat Conservation Trust (Version 3, May 2009); ILE Bats and Lighting in the UK;
- HSE: HSG 38, 1997 - Health and Safety Guide 38 – Lighting at Work.

8.2.3 In accordance with the standards and guidelines, the illuminance levels outlined in **Table 8.1** have been specified to provide indicative lighting levels for the Development which would be used to give an outline understanding of the expected illumination levels.

8.2.4 The proposed lighting should be considered in respect of the landscape designations as detailed below, in order to provide the most appropriate level of lighting:

- Construction of up to 450 residential dwellings;
- A village centre comprising a shop and community facilities such as a café, community building, and children's nursery;
- A new employment area including a new business unit complex;
- A new upto 80 bed hotel;
- QinetiQ's continued operation within a new consolidated research and development facility to the south-west of the Fort;
- A Historic Interpretation Centre associated with and use of a number of a number of buildings in the Fort for commercial workshops; and
- Retention of existing important habitats and creation of new green infrastructure providing Sustainable Urban Drainage (SuDS), public open space, and biodiversity benefits.

8.2.5 As defined within **Section 8.5**, light spill from private residential dwelling lighting has been considered during the assessment, however there is no recognised industry lighting guidance or regulations which stipulates the peak values for private residential lighting. Residential lighting levels are therefore not included within **Table 8.1 Development Illumination Levels**; however residential lighting would not be active continuously like roadway, street or industrial lighting, i.e. intermittent use only.

Publication	Horizontal Illuminance	
	Average	Minimum lux / Uniformity
Development Site Access Roads		
BS 5489-1:2013 - Code of practice for the design of road lighting Part 1: Lighting of roads and public amenity areas, Class S4 ²⁴	5 lux	1 lux
Proposed Car Park Areas		

²⁴ Lighting class of roadway to be confirmed by during detailed lighting design.

BS 5489-1:2013 - Code of practice for the design of road lighting Part 1: Lighting of roads and public amenity areas	5 lux	0.25 Uo
Pedestrian Circulation Areas		
BS EN 12464-2:2014 Lighting of work places – Part 2: Outdoor Work Places – Walkways exclusively for pedestrians (Ref: 5.1.1)	5 lux	0.25 Uo
Industrial Areas		
Short-term handling of large units and raw materials, loading and unloading of solid bulk goods (Ref: 5.7.1)	20 lux	0.25 Uo
Continuous handling of large units and raw materials, loading and unloading of freight, lifting and descending location for cranes, open loading platforms (Ref: 5.7.2)	50 lux	0.4 Uo

Table 8-1 Development Illumination Levels

8.3 Design Strategy

8.3.1 The design would incorporate the illuminance levels specified within **Table 8.1 Development Illumination Levels**, but would be subject to further detailed design during the design stage. Whilst the design addresses the strict light control, no compromise would be made in respect of safety in the health, safety and welfare of operatives and visitors.

8.3.2 Light pollution can take differing forms and is a very subjective matter. Measures to reduce light pollution would be considered during the Development design. Examples of these are:

- Including as standard LED light sources to reduce overall lighting requirements by improving colour definition;
- Limiting upward light by specifying lighting units which emit no upward light as standard;
- Recommending and designing lighting levels to meet the lowest possible lighting levels required as standard;
- Providing as uniform design as possible.

8.3.3 The light limitation issues to be addressed when trying to achieve the values detailed in **Table 4.1 Obtrusive Light** centre on sky glow, luminaire intensity and light intrusion. These issues can be addressed by the selection of luminaires that would neither project light upwards nor throw too much light directly on to objects (thereby reflecting back upwards). The aiming and selection of luminaires with good reflectors would reduce overspill and line of sight intensity.

8.4 Road Junction Lighting

8.4.1 The proposed lighting requirements for the junction at the Crow Drive/A224 and the West Gate Entrance/Star Hill Road are subject to detailed design as to the lighting type and illumination level requirements. It is anticipated the junction lighting will be improved and the use of traffic light signals would be used at the proposed junction.

8.4.2 The existing main access from the A224 junction is provided with 8-10m lighting columns. However the existing junction lighting is currently undergoing a trial 'switch off' period by the local authority. Access road from Star Hill Road is illuminated at the Site entrance only. Star Hill Road remains unlit as it routes away from the existing Gatehouse entrance.

8.4.3 The Site junction road would require lighting to improve visibility of hazards and assist with the safe movement of vehicles, particularly the entrance from Star Hill Road. The junction to the Site would be

provided with luminaires complete with suitably controlled light distribution and a high quality optical control system. This would include the use of a flat glass bowl luminaires which would provide an accurately controlled, low obtrusive light installation and a total light cut-off above the horizontal in line with obtrusion values stated within **Table 4-3 Obtrusive Light Limitations**.

8.5 Private Residential Lighting

- 8.5.1 Although light spill from residential property internal lighting has been considered during the assessment, the proposed residential internal lighting cannot be fully controlled or mitigated. It is anticipated there will be light spill through private property windows, as well as light intrusion as a result of direct views of the lighting sources through windows from within the Site only.
- 8.5.2 Private external property lighting, such as building mounted security floodlights will also contribute towards levels of light spill. This cannot be mitigated unless covenants are put in place by the local council; however private external lighting is typically only required for short periods, typically for security requirements.
- 8.5.3 Full 'white' lighting is required at the entrance to the Site, around the Guard House to aid CCTV monitoring and security checks.

9 RESIDUAL IMPACTS AND CONCLUSION

9.1 An assessment of the current baseline lighting environment at the Site has been assessed in the preceding sections of this report. An overview of the impacts of the Development lighting has also been assessed. The proposed impacts are based upon the design principles and requirements detailed within Section 8, and the Proposed Parameter Plans as indicated within **Appendices C and D**.

9.2 Existing Lighting Environment

9.3 The existing Site, although very well screened in all directions from the wider environment is well illuminated by use of low pressure sodium lighting columns, floodlights and street lighting luminaires.

9.4 From the wider environment, minimal lighting sources within the Site can be seen. The only visible lighting sources occur where gaps within the vegetation allow views into the Site. Although the wider environment is a rural area, it is well populated with scattered lighting sources and sky glow, with lighting within the towns of Otford, Dunton Green, Halstead and Sevenoaks further afield visible.

9.5 Sky glow is clearly visible above the Site as an orange aura, as identified within **Section 6**. The existing Site is assessed as an E2 zone, which is comparable to a rural small village as identified in **Table 9-1**.

Obtrusive Light Limitations – ILE UK Recommendations						
Environmental Zone	Sky Glow ULR (Max) %	Light Trespass (into windows) Ev lux		Source Intensity (I) kCd		Building Luminance L (Cd/m ²)
		Pre-curfew	Post-curfew	Pre-curfew	Post-curfew	Pre-curfew
E2 – Low district brightness. Rural, small village, relatively dark urban location	2.5	5	1	7.5	0.5	5

Table 9-1 E2 Environmental Zone Classification

9.6 Development Lighting Environment

9.7 It should be noted that there are currently no detailed proposed lighting plans available for the Development. The impact of the Development's lighting is therefore based upon industry recognised best practices, guidelines and standards applicable for lighting such environments as detailed within Section 8, and also similar previous project experience.

9.8 A summary of the Development's lighting is provided below.

Lighting Impact of the Development				
VP No.	Period	Sky Glow ULR (Upward Light Ratio)	Light Intrusion	Luminaire Intensity
1	Summer Months:	Negligible	Minor Adverse	Minor Adverse
	Winter Months:	Negligible	Minor Adverse	Minor Adverse
2	Summer Months:	No Impact	Minor Beneficial	Minor Beneficial
	Winter Months:	No Impact	Minor Beneficial	Minor Beneficial

Lighting Impact of the Development				
VP No.	Period	Sky Glow ULR (Upward Light Ratio)	Light Intrusion	Luminaire Intensity
3	Summer Months:	No Impact	No Impact	No Impact
	Winter Months:	No Impact	No Impact	No Impact
4	Summer Months:	No Impact	Minor Beneficial	Minor Beneficial
	Winter Months:	No Impact	Minor Beneficial	Negligible
5	Summer Months:	Minor Adverse	Minor Adverse	Negligible
	Winter Months:	Minor Adverse	Minor Adverse	Negligible
6	Summer Months:	Minor Beneficial	No Impacts	No Impacts
	Winter Months:	Minor Beneficial	No Impacts	No Impacts
7	Summer Months:	Minor Beneficial	Negligible	Negligible
	Winter Months:	Minor Beneficial	Negligible	Negligible
8	Summer Months:	Negligible	Minor Adverse	Negligible
	Winter Months:	Negligible	Minor Adverse	Negligible
9	Summer Months:	Minor Beneficial	No Impact	Minor Beneficial
	Winter Months:	Minor Beneficial	No Impact	Minor Beneficial
10	Summer Months:	Minor Beneficial	No Impacts	Negligible
	Winter Months:	Minor Beneficial	No Impacts	Negligible
11	Summer Months:	Minor Beneficial	Negligible	No Impact
	Winter Months:	Minor Beneficial	Negligible	No Impact
12	Summer Months:	Minor Beneficial	Negligible	Negligible
	Winter Months:	Minor Beneficial	Negligible	Minor Adverse
13	Summer Months:	Negligible	Negligible	No Impacts
	Winter Months:	Negligible	Negligible	No Impacts
14	Summer Months:	No Impacts	No Impacts	No Impacts
	Winter Months:	No Impacts	No Impacts	No Impacts
15	Summer Months:	No Impact	No Impact	No Impact
	Winter Months:	No Impact	No Impact	No Impact
16	Summer Months:	Minor Beneficial	No Impacts	Negligible
	Winter Months:	Minor Beneficial	No Impacts	Negligible

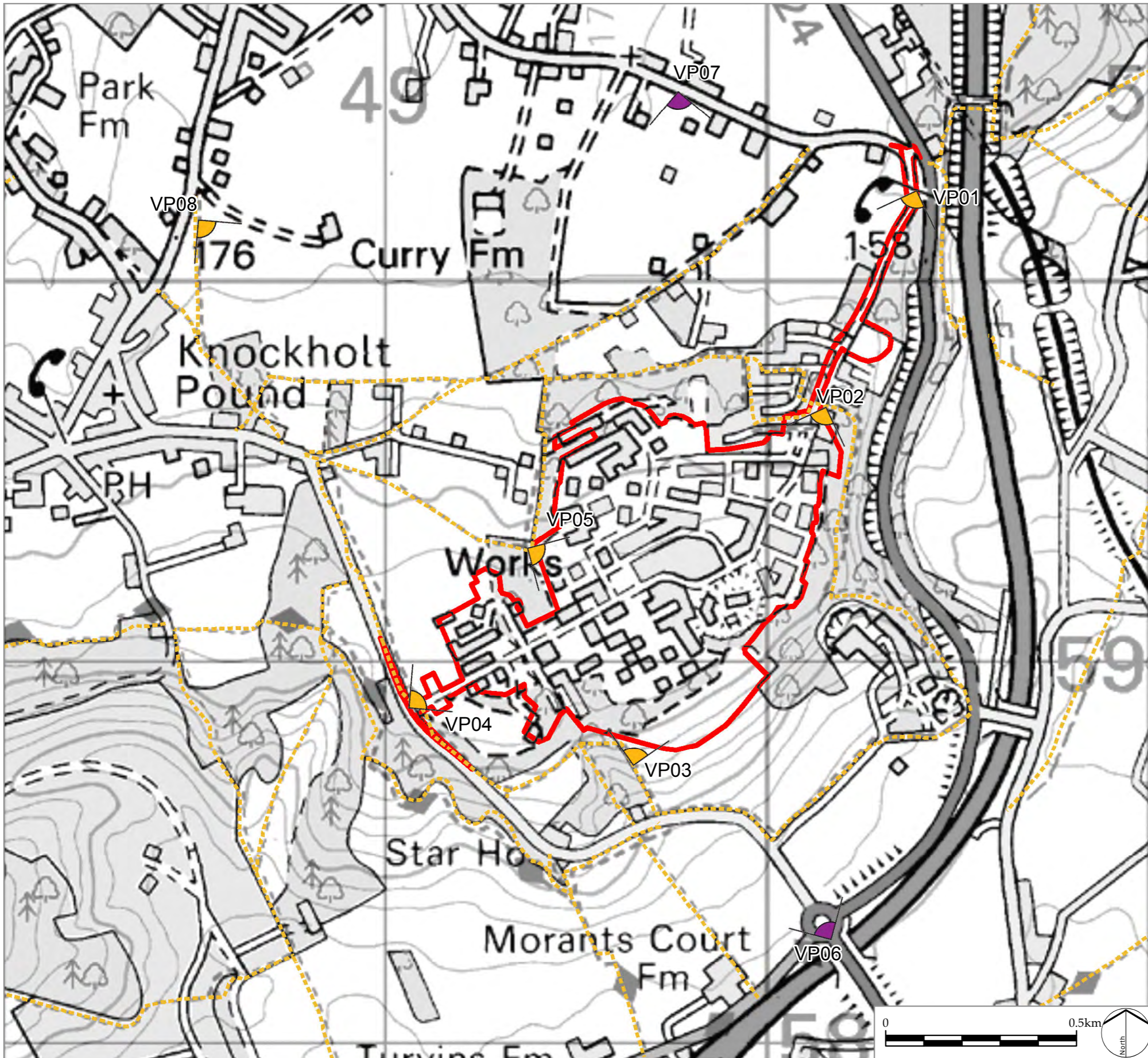
Table 9-2 Lighting Impacts of the Development

9.9





As identified within **Table 9-2 Lighting Impacts of the Development**, the significance of impacts in terms of sky glow ranges from **negligible** to **minor beneficial**; the Impacts in terms of light intrusion range from **negligible** to **minor beneficial**; and the impacts in terms of luminaire intensity range from **minor adverse** to **minor beneficial**.

- 9.10 Viewpoint 12 has been assessed as **minor adverse** in terms of luminaire intensity during winter periods. This impact is a result of this viewpoint having possible direct views of the three storey buildings and its associated lighting.
- 9.11 The impacts of sky glow are likely to be **minor beneficial** from all viewpoints located outside of the Site. This is a result of the Development's lighting being an improvement on the existing lighting environment through the use of improved photometry, luminaires and design. By complying with the Standards and Regulations, and use of suitable luminaires as identified within **Section 8** and also providing lighting to the required illumination levels sky glow from direct upward light is likely to significantly reduce. The visible sky glow is likely to become more of a 'whiter' aura rather than 'orange' aura which is considered to be more obtrusive.
- 9.12 To assist in reducing the levels of light pollution, the lighting systems at the Development would be required to comply with the national and local authority planning policies as identified within **Section 5**. The policies identified would assist in minimising any direct upward illumination and reduce any light spill and glare from the Development.
- 9.13 Finally, based upon the information available at the time of assessment, this Baseline Lighting Assessment indicates that the overall artificial lighting impacts associated within the Development would not have any significant adverse impacts upon the surrounding environment and it's identified receptors.

AOD	A vertical datum used by an ordnance survey as the basis for deriving altitudes on maps. A spot height may be expressed as AOD for 'above ordnance datum'.
Atmospheric Conditions (for Aura / Sky Glow)	The amount of particle pollution and presence of moisture and other gases in the atmosphere. Light is scattered by the particles and that coming back to an observer below causes the veiling impact of Sky Glow.
Aura	Localised halo of light above a lit area, caused by direct upward light or reflections from the ground and other surfaces. More obvious where light units are grouped relatively close together and / or of high power.
Ballast	A ballast is located internally within a luminaire and forms part of the lighting control gear. The ballast regulates the light output of the luminaire.
Curfew	The time after which stricter requirements (for the control of obtrusive light) will apply. Often a condition of use of lighting applied by the local planning authority.
Colour Rendering Index (CRI)	Ability of a light source to match colours in comparison with a full spectrum light source such as daylight or a tungsten lamp. On a scale of 0 – no colour matching, 100 – full colour matching.
Environmental Zone E0 – E4	A classification method developed by the ILP to match appropriate lighting controls to the local environment e.g. an E0 UNesco Starlight Reserve, IDA Dark Sky Parks, E1 Zone is an area of outstanding natural beauty (ANOB) and an E4 Zone a City Centre area.
LED	Light emitting diode.
Lighting Illuminance	The illuminance or light level is the amount of light energy reaching a given point on a defined surface area, namely the luminous flux (i.e. lumens) per square meter. Illuminance is measured in lux.
lux	The lux is the unit of illuminance and luminous emittance, measuring luminous flux per unit area. It is equal to one lumen per square metre. In photometry, this is used as a measure of the intensity, as perceived by the human eye, of light that hits or passes through a surface.
Sky Glow	Wide area of night sky scattering direct and indirect upward light back to an observer. Depends on atmospheric conditions and the amount of upward light. Very typical above urban areas.
SON	High-pressure sodium discharge lamp. Typically golden orange light or whiter light, but more modern versions available in a 'whiter' output. Very poor CRI of 25.
SOX	Low pressure sodium discharge lamp. Orange light, essentially monochromatic, identifying only yellow colour with all others rendered as shades of grey. CRI 0.
ULOR	Upward light output ratio.
Uniformity (U _o)	The uniformity of illumination is the lowest calculated illuminance and the average illuminance of the working plane. Uniformity is calculated to ensure the lighting design provides a uniform illuminance in line with the required standards.



LEGEND

-  Fort Halstead Development Area
-  Viewpoint Location
-  Viewpoint Location (from which AVR will be prepared)
-  Public Rights of Way

Viewpoint No.	Location	Distance from Site
01	View from Crow Drive looking south-west	-
02	View from Crow Drive/footpath SR97 looking south-west	-
03	View from footpath SR172 looking north	-
04	View from Starhill Road looking east	-
05	View from footpath SR172 looking south	-
06	View from junction of Morants Court Road/Polehill (A224), on the North Downs Way, looking north	300m
07	View from Otford Lane looking south	400m
08	View from Footpath SK690, to the north of Knockholt Pound, looking south	1km
09	View from the edge of Dunton Green, on the Darent Valley Path, looking north	1.4km
10	View from Hale Recreation Ground, Twitton, looking east	1.4km
11	View from Fackenden Lane looking south west	2.5km
12	View from footpath SR60, near Otford Mount, looking south west	2.5km
13	View from near Otford Mount, on the North Downs Way, looking west	3.5km
14	View from junction of London Road/Argyle Road, within Sevenoaks, looking north-west	4.5km
15	View from Knole Park/Footpath SU18, on the south-eastern edge of Sevenoaks, looking north-west	5.7km
16	Views from southern edge of Ide Hill/Footpath SR236, looking north	6.5km

B	Additional viewpoint from Otford Mount added in response to SDC comment. Updated red line.	PL 06/10/2014
A	Additional viewpoints added in response to Consultee comments	PL 11/09/2014
REV.	DESCRIPTION	APP. DATE

LDĀ DESIGN

PROJECT TITLE
FORT HALSTEAD

DRAWING TITLE
Figure SK002: Scoping Viewpoints - Inset

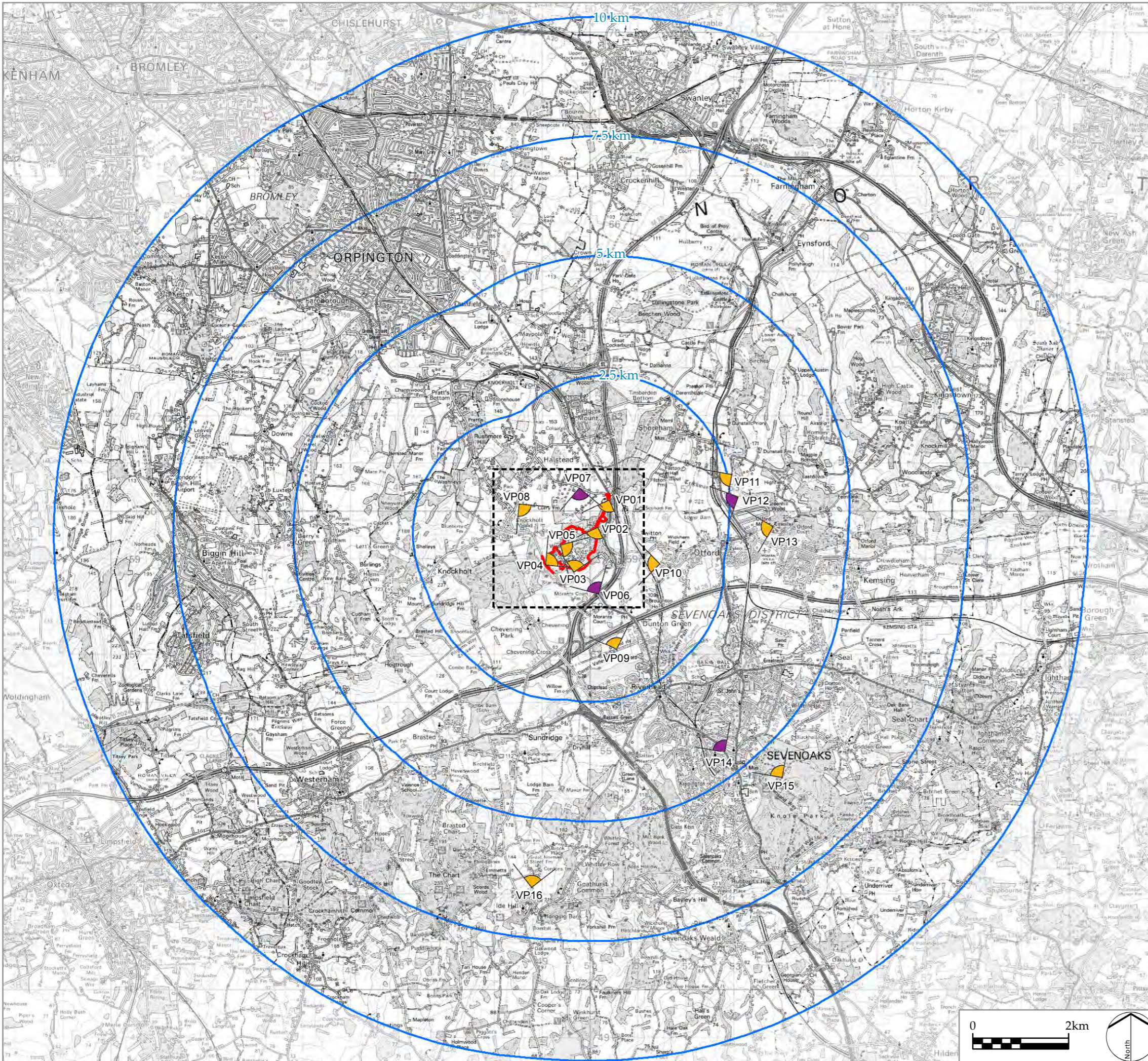
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STATUS	Final	APPROVED RT

DWG. NO. 3903_SK002




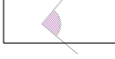

No dimensions are to be scaled from this drawing.
All dimensions are to be checked on site.
Area measurements for indicative purposes only.

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Sources: Ordnance Survey



LEGEND

-  Fort Halstead Development Area
-  2.5 km, 5 km, 7.5km and 10km Radii around Fort Halstead Development Area
-  Photoviewpoint Location
-  Photoviewpoint Location (from which AVR will be prepared)
-  Inset plan boundary - Figure SK002

Viewpoint No.	Location	Distance from Site
01	View from Crow Drive looking south-west	-
02	View from Crow Drive/footpath SR97 looking south-west	-
03	View from footpath SR172 looking north	-
04	View from Starhill Road looking east	-
05	View from footpath SR172 looking south	-
06	View from junction of Morants Court Road/Polehill (A224), on the North Downs Way, looking north	300m
07	View from Otford Lane looking south	400m
08	View from Footpath SK690, to the north of Knockholt Pond, looking south	1km
09	View from the edge of Dunton Green, on the Darent Valley Path, looking north	1.4km
10	View from Hale Recreation Ground, Twitton, looking east	1.4km
11	View from Fackenden Lane looking south west	2.5km
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15	View from Knole Park/Footpath SU18, on the south-eastern edge of Sevenoaks, looking north-west	5.7km
16	Views from southern edge of Ide Hill/Footpath SR236, looking north	6.5km

REV.	DESCRIPTION	APP. DATE
B	Additional viewpoint from Otford Mount added in response to SDC comment. Updated red line.	PL 06/10/2014
A	Additional viewpoints added in response to Consultee comments	PL 11/09/2014

LD A DESIGN

PROJECT TITLE
FORT HALSTEAD

DRAWING TITLE
Figure SK001: Scoping Viewpoints

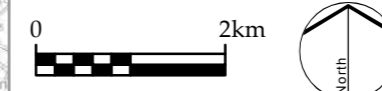
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Key

- Application boundary c. 62.70 Ha
- Applicant's land ownership boundary c. 132.38 Ha
- Residential developable area c. 12.83 Ha
- Employment c. 13.05 Ha
- Mixed use c. 0.26 Ha
- Public square c. 0.29 Ha
- Hotel c. 0.60 Ha
- Community use c. 0.09 Ha
- Scheduled monument c. 2.19 Ha
- Green space
- Existing woodland
- Buildings to be retained
- Indicative Proposed Roads
- Indicative boundary fence to QinetiQ's demise

Rev	Date	Description	Drawn	Chkd
D10	15.01.15	Work-in-progress update	PM	PM
D9	13.01.15	Work-in-progress update	PM	PM
D8	10.12.14	Work-in-progress update	PM	PM
D7	09.12.14	Work-in-progress update	PM	PM
D6	18.11.14	Work-in-progress update	PM	PM
D5	24.09.14	Work-in-progress update	ECC	PM
D4	24.09.14	Work-in-progress (DCC) issued	ECC	PM
D3	20.08.14	Application boundary changed, issued to design team and DCC	ECC	PM
D2	21.07.14	Issued to design team	ECC	PM
D1	14.07.14	Issued to design team	ECC	PM

Drawing Status: **WORK IN PROGRESS**

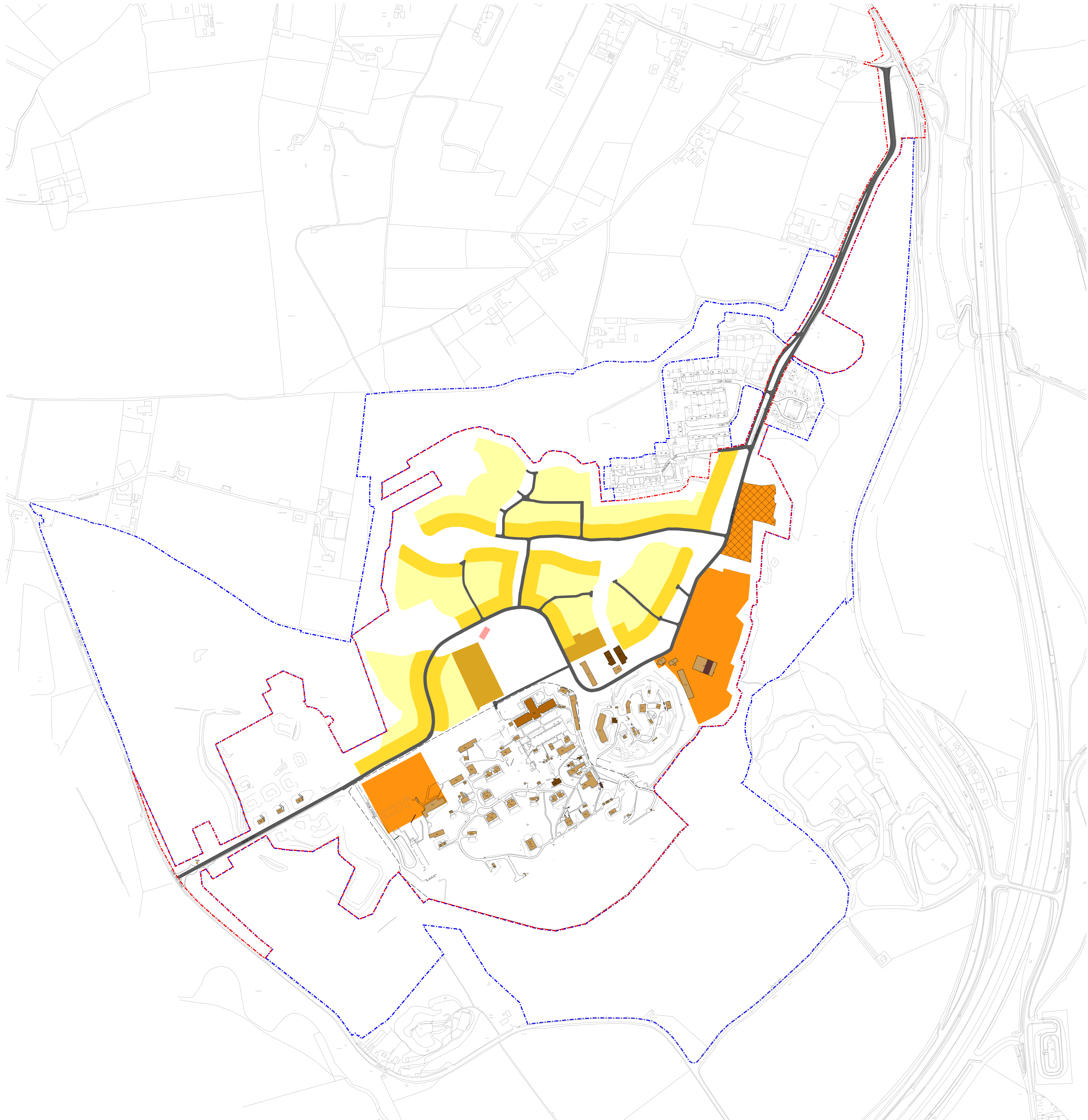
Client: **Armstrong (Kent) LLP**

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 W: www.jtp.co.uk

Project: **Fort Halstead**

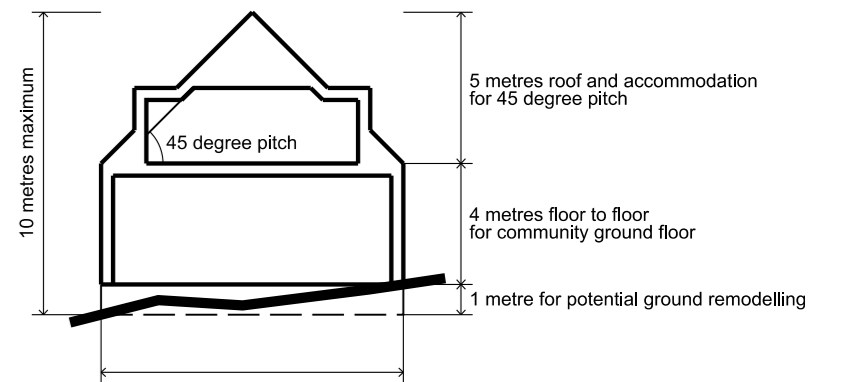
Drawing Title: **Parameter Plan
 Land Use**

Scale @ A0: 1: 2500 Job Ref: 00556A
 Drawing No. 00556A_PP_01 Revision D10
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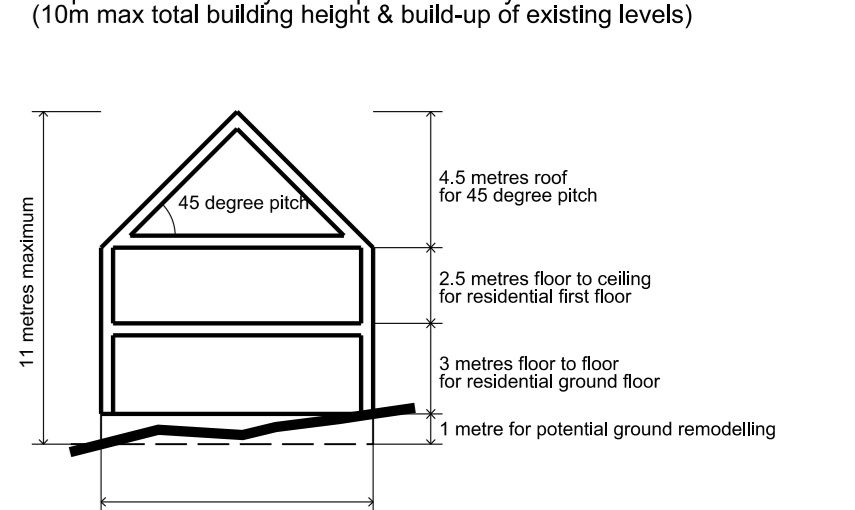


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- Key**
- - - Application boundary
 - - - Applicant's land ownership boundary
 - Existing building heights: 1 storey
 - Existing building heights: 1.5 storeys
 - Existing building heights: 2 storeys
 - Existing building heights: 3 storeys
 - Proposed Community use: Up to 1.5 storeys (10m maximum total building height & build-up of existing levels)
 - Proposed Residential: Up to 2 storeys (11m maximum total building height & build-up of existing levels)
 - Proposed Residential: Up to 2.5 storeys (11.5m maximum total building height & build-up of existing levels)
 - Proposed Mixed Use & Hotel: Up to 2.5 storeys (12.5m maximum total building height & build-up of existing levels)
 - Proposed Employment: Up to 3 storeys (16m maximum total building height & build-up of existing levels)
 - Potential energy centre/laboratory uses flue zone - not more than 10% of zone can be above the 16m building line (22m maximum total height & build-up of existing levels)
 - Indicative proposed roads
 - - - Indicative boundary fence to QinetiQ's demise

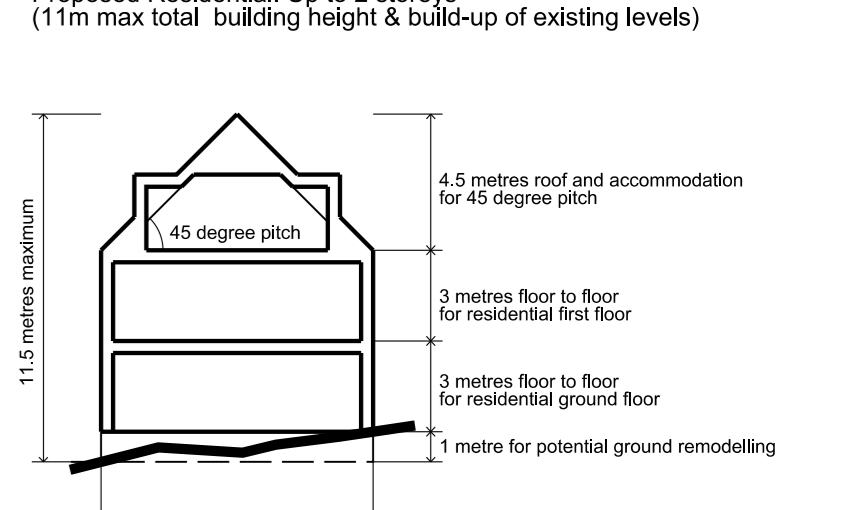
Example proposed building height sections



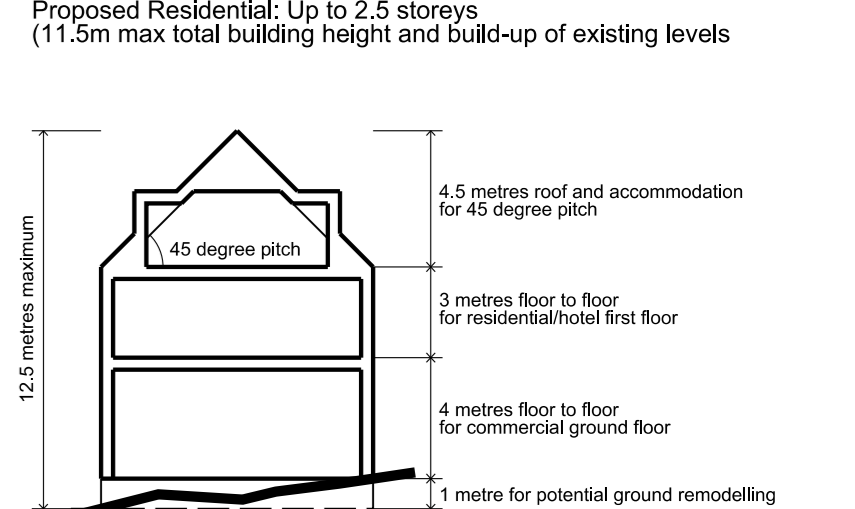
Proposed Community use: Up to 1.5 storeys (10m max total building height & build-up of existing levels)



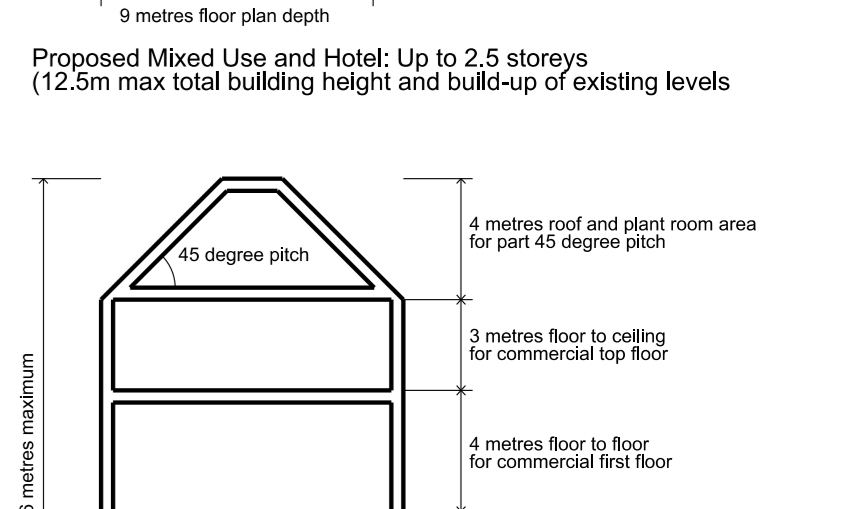
Proposed Residential: Up to 2 storeys (11m max total building height & build-up of existing levels)



Proposed Residential: Up to 2.5 storeys (11.5m max total building height & build-up of existing levels)



Proposed Mixed Use and Hotel: Up to 2.5 storeys (12.5m max total building height & build-up of existing levels)



Proposed Employment: Up to 3 storeys (16m max total building height & build-up of existing levels)

Rev	Date	Description	Drawn	Check
D11	15.01.15	Work in progress update	PM	PM

WORK IN PROGRESS

Client
Armstrong (Kent) LLP

Project
Fort Halstead

Drawing Title
**Parameter Plan
 Proposed Building Heights**

Scale @ A0 1: 2500 Job Ref. 00556A

Drawing No. 00556A_PP_03 Revision D11



Scale Bar

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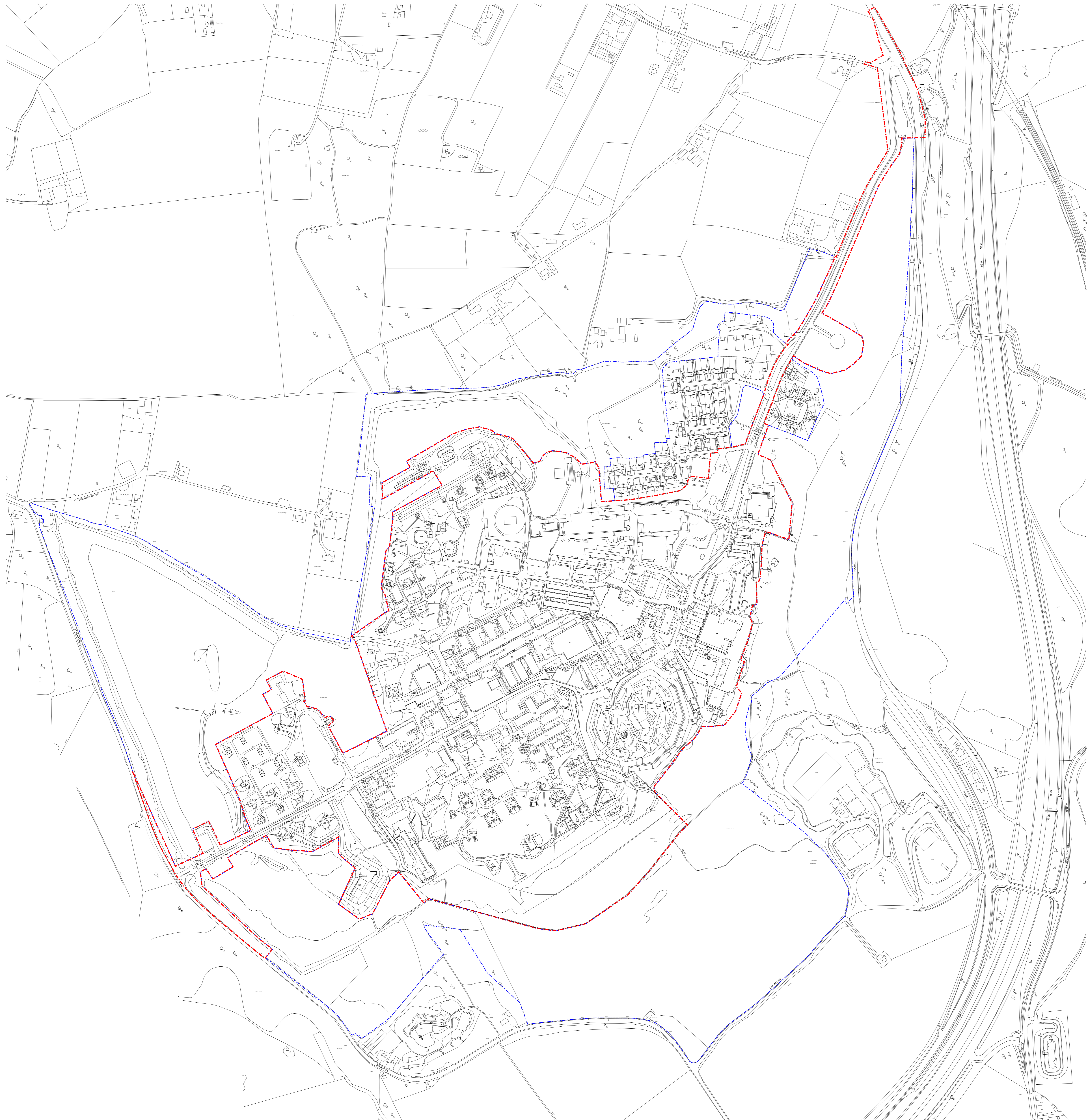
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Key

--- Application boundary

Rev	Date	Description	Drawn	Chkd
D6	30.10.14	PBA junction comments incorporated	PM	PM
D5	16.08.14	Further CBRE comments incorporated	PM	PM
D4	15.08.14	CBRE comments incorporated	PM	PM
D3	23.07.14	CBRE comments incorporated	PM	PM
D2	23.07.14	CBRE comments and PBA visibility splays added	PM	PM
D1	22.03.14	Final Issue	PM	PM

Drawing Status: **WORK IN PROGRESS**

Client: **Armstrong (Kent) LLP**

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Project: **Fort Halstead**

Drawing Title: **Red Line Boundary Drawing**

Scale @ A0: 1:2500 Job Ref: 00556A

Drawing No. 00556A_SK102 Revision: D6

Scale Bar: 0 20 40 60 80 100m

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Existing view



Wireframe overlay

ISSUED BY	Oxford	t: 01865 887050	
DATE	December 2014	DRAWN	SG
PAGE SIZE	420mm x 297mm	CHECKED	SD
STATUS	Draft	APPROVED	PL

DWG. NO. 3903_013

PROJECT TITLE
FORT HALSTEAD

DRAWING TITLE
Figure 11: Wireframe Visualisations

Viewpoint 6: View from junction of Morants Court Road/Polehill (A224), on the North Downs Way, looking north

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Proposed employment area (Qinetiq headquarter building) - screened by perimeter woodland

No development on scarp slope

Proposed employment area - screened by perimeter woodland



Annotated wireframe overlay

These visuals are based upon photographically derived data with spot heights at 5m intervals and do not precisely model small scale changes in landform or sharp breaks in slope.

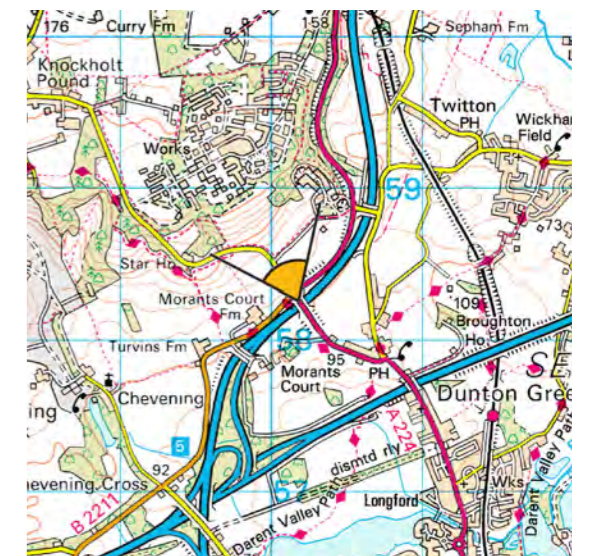
The three dimensional model of the development is indicative and is not based on an accurate design.

No dimensions are to be scaled from this drawing.
All dimensions are to be checked on site.
Area measurements for indicative purposes only.

Location Plan: © Crown copyright and database rights 2014. Ordnance Survey 100030848.

VIEWPOINT INFORMATION

Grid Reference:	550180, 158259
Elevation (AOD):	109m
Viewer Height:	1.6m
Viewing Distance:	300mm
Angle (width):	75°, buildings occupy - 47°
Camera & Lens:	Digital SLR, 50mm
Photo date / time:	28/10/2014 13:30
Distance to site boundary:	639m



Location Plan - 1:50,000 scale

ISSUED BY	Oxford	t: 01865 887050
DATE	December 2014	DRAWN SG
PAGE SIZE	420mm x 297mm	CHECKED SD
STATUS	Draft	APPROVED PL

DWG. NO. 3903_013

PROJECT TITLE
FORT HALSTEAD

DRAWING TITLE
Figure 11: Wireframe Visualisations

Viewpoint 6: View from junction of Morants Court Road/Polehill (A224), on the North Downs Way, looking north

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Existing view



Wireframe overlay

ISSUED BY	Oxford	t: 01865 887050	
DATE	December 2014	DRAWN	SG
PAGE SIZE	420mm x 297mm	CHECKED	SD
STATUS	Draft	APPROVED	PL

DWG. NO. 3903_013

PROJECT TITLE
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DRAWING TITLE

Figure 11: Wireframe Visualisations

Viewpoint 7: View from Otford Lane looking south

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Proposed employment area - visible above perimeter woodland due to maximum parameters for energy centre / laboratory flue zone

Proposed employment and residential areas - screened by perimeter woodland

Building N2 will be demolished



Annotated wireframe overlay

These visuals are based upon photographically derived data with spot heights at 5m intervals and do not precisely model small scale changes in landform or sharp breaks in slope.

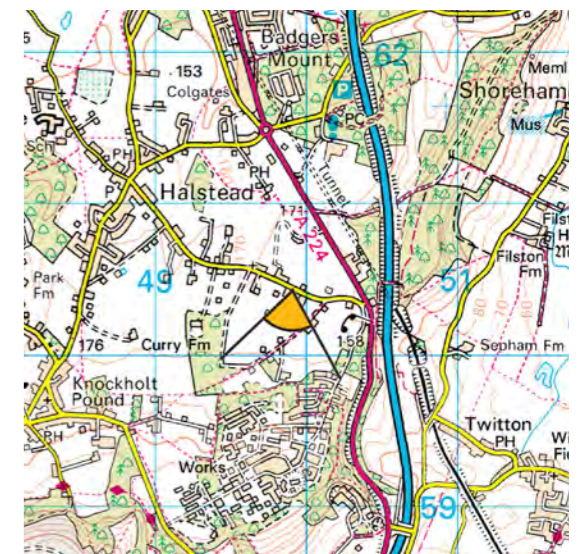
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Location Plan: © Crown copyright and database rights 2014. Ordnance Survey 100030848.

VIEWPOINT INFORMATION

Grid Reference:	549906, 160429
Elevation (AOD):	175m
Viewer Height:	1.6m
Viewing Distance:	300mm
Angle (width):	75°, buildings occupy - 41°
Camera & Lens:	Digital SLR, 50mm
Photo date / time:	28/10/2014 09:35
Distance to site boundary:	424m



Location Plan - 1:50,000 scale

ISSUED BY	Oxford	t: 01865 887050	
DATE	December 2014	DRAWN	SG
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STATUS	Draft	APPROVED	PL

DWG. NO. 3903_013

PROJECT TITLE
FORT HALSTEAD

DRAWING TITLE

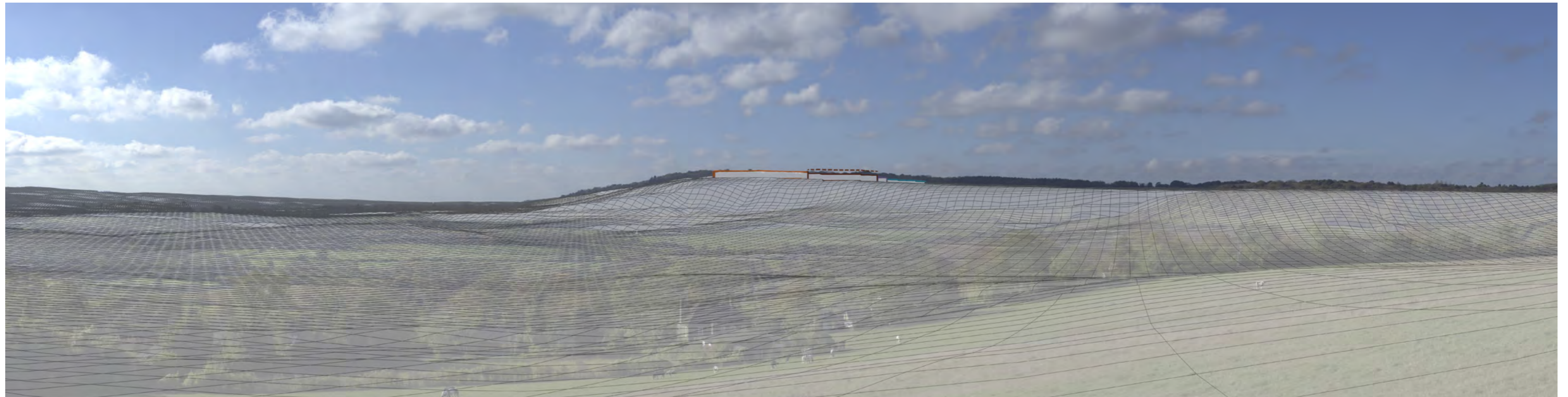
Figure 11: Wireframe Visualisations

Viewpoint 7: View from Otford Lane looking south

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Existing view



Wireframe overlay

ISSUED BY	Oxford	t: 01865 887050	
DATE	December 2014	DRAWN	SG
PAGE SIZE	420mm x 297mm	CHECKED	SD
STATUS	Draft	APPROVED	PL

DWG. NO. 3903_013

PROJECT TITLE
FORT HALSTEAD

DRAWING TITLE

Figure 11: Wireframe Visualisations

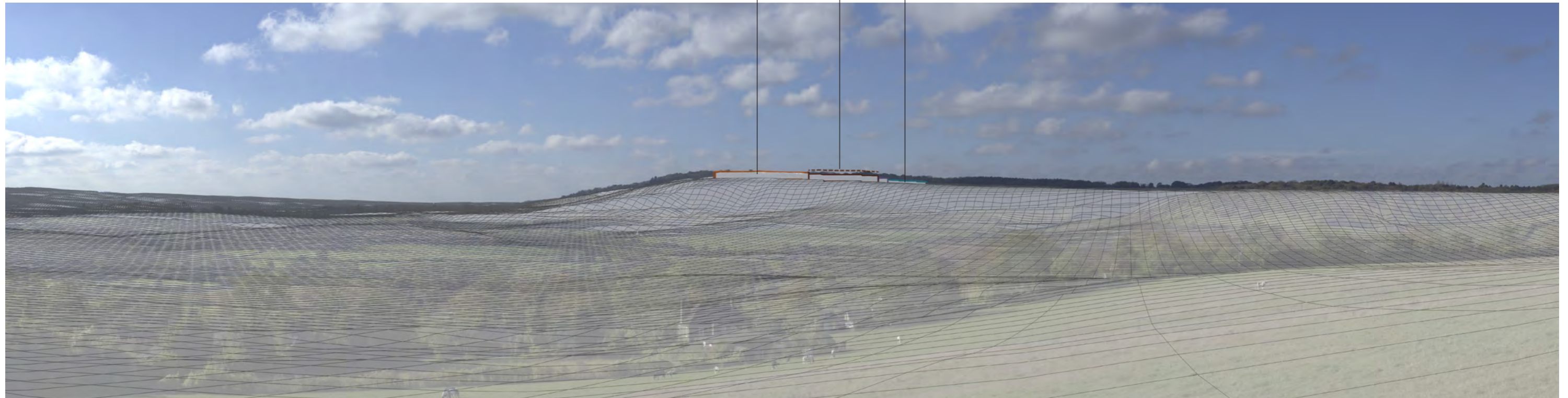
Viewpoint 12: View from footpath SR60,
near Otford Mount, looking south west

X:\JOBS\3903_Fort Halstead OPA\Graphics\Plans_Images\LVA\3903_011_Wireframe Visualisations.indd

Proposed employment area - visible above perimeter woodland due to maximum parameters for energy centre / laboratory flue zone

Proposed employment area - screened by perimeter woodland

Proposed residential area - screened by perimeter woodland



Annotated wireframe overlay

These visuals are based upon photographically derived data with spot heights at 5m intervals and do not precisely model small scale changes in landform or sharp breaks in slope.

The three dimensional model of the development is indicative and is not based on an accurate design.

No dimensions are to be scaled from this drawing.
All dimensions are to be checked on site.
Area measurements for indicative purposes only.

Location Plan: © Crown copyright and database rights 2014. Ordnance Survey 100030848.

VIEWPOINT INFORMATION

Grid Reference: 553091, 160257
 Elevation (AOD): 126m
 Viewer Height: 1.6m
 Viewing Distance: 300mm
 Angle (width): 75°, buildings occupy - 10°
 Camera & Lens: Digital SLR, 50mm
 Photo date / time: 28/10/2014 11:50
 Distance to site boundary: 2.7km



Location Plan - 1:50,000 scale

ISSUED BY	Oxford	t: 01865 887050	
DATE	December 2014	DRAWN	SG
PAGE SIZE	420mm x 297mm	CHECKED	SD
STATUS	Draft	APPROVED	PL

DWG. NO. 3903_013

PROJECT TITLE
FORT HALSTEAD

DRAWING TITLE

Figure 11: Wireframe Visualisations

Viewpoint 12: View from footpath SR60, near Otford Mount, looking south west

X:\JOBS\3903_Fort Halstead\OPA\Graphics\Plans_Images\LVA\3903_011_Wireframe Visualisations.indd



Existing view



Wireframe overlay

ISSUED BY	Oxford	t: 01865 887050	
DATE	December 2014	DRAWN	SG
PAGE SIZE	420mm x 297mm	CHECKED	SD
STATUS	Draft	APPROVED	PL

DWG. NO. 3903_013

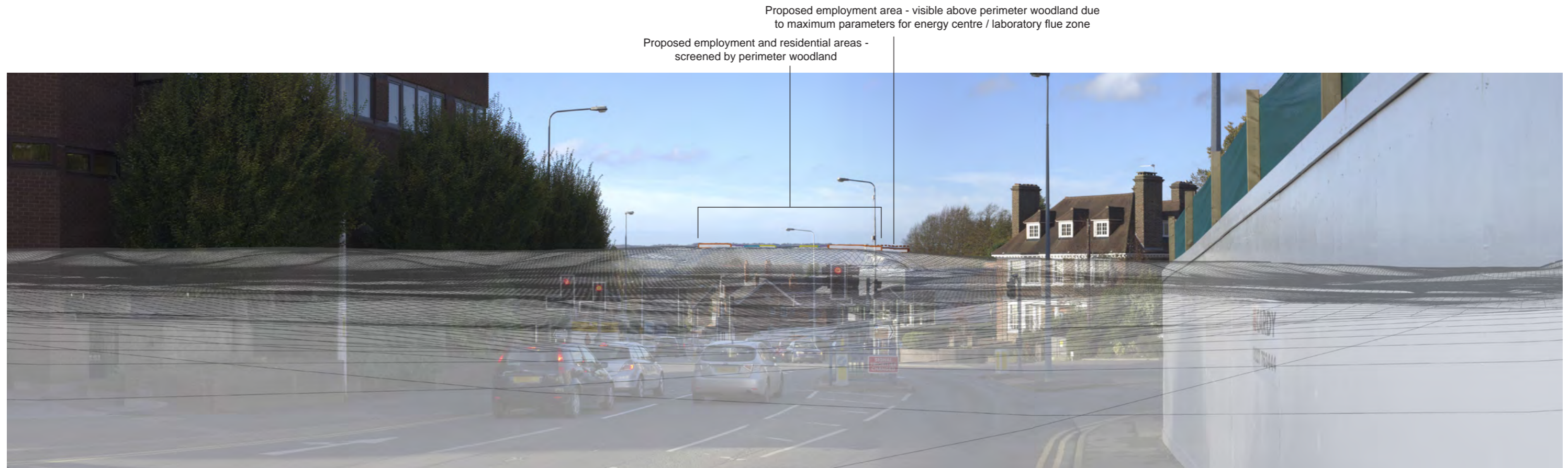
PROJECT TITLE
FORT HALSTEAD

DRAWING TITLE

Figure 11: Wireframe Visualisations

Viewpoint 14: View from junction of London Road/Argyle Road, within Sevenoaks, looking north-west

X:\JOBS\3903_Fort Halstead OPA\Graphics\Plans_Images\LVA\3903_011_Wireframe Visualisations.indd



Annotated wireframe overlay

These visuals are based upon photographically derived data with spot heights at 5m intervals and do not precisely model small scale changes in landform or sharp breaks in slope.

The three dimensional model of the development is indicative and is not based on an accurate design.

No dimensions are to be scaled from this drawing.
All dimensions are to be checked on site.
Area measurements for indicative purposes only.

Location Plan: © Crown copyright and database rights 2014. Ordnance Survey 100030848.

VIEWPOINT INFORMATION

Grid Reference:	552850, 154935
Elevation (AOD):	141m
Viewer Height:	1.6m
Viewing Distance:	300mm
Angle (width):	75°, buildings occupy - 10°
Camera & Lens:	Digital SLR, 50mm
Photo date / time:	28/10/2014 14:30
Distance to site boundary:	4.9km



Location Plan - 1:50,000 scale

ISSUED BY	Oxford	t: 01865 887050
DATE	December 2014	DRAWN SG
PAGE SIZE	420mm x 297mm	CHECKED SD
STATUS	Draft	APPROVED PL

DWG. NO. 3903_013

PROJECT TITLE
FORT HALSTEAD

DRAWING TITLE

Figure 11: Wireframe Visualisations

Viewpoint 14: View from junction of London Road/Argyle Road, within Sevenoaks, looking north-west

Fort Halstead – National Planning Policy & Sevenoaks District Council Planning Policy Documents with reference to Lighting

Policy and Document	Waterman group comment	Document section	Extract text or Hyperlink to the document
National Planning Policy			
National Planning Policy Framework, 2012	Outline key national policy relevant to the assessment.	Para. 125, page 29 Annex 2: Glossary, page 55 Also refer to the following: -	125. By encouraging good design, planning policies and decisions should limit the impact of light pollution from artificial light on local amenity, intrinsically dark landscapes and nature conservation. Pollution: Anything that affects the quality of land, air, water or soils, which might lead to an adverse impact on human health, the natural environment or general amenity. Pollution can arise from a range of emissions, including smoke, fumes, gases, dust, steam, odour, noise and light. <i>Box sync folder location:</i> <i>PB2961 – Fort Halstead</i> ..\E18-Tech Docs\NPP & SDC Docs for Lighting Ass Rep\National Planning Polciy Framework - March 2012 - 2116950.pdf
		Para. 93, page 21	93. Planning plays a key role in helping shape places to secure radical reductions in greenhouse gas emissions, minimising vulnerability and providing resilience to the impacts of climate change, and supporting the delivery of renewable and low carbon energy and associated infrastructure. This is central to the economic, social and environmental dimensions of sustainable development.
		7.. Requiring Good Design Para 56 – 58, page 14 to 15	7. Requiring good design 56. The Government attaches great importance to the design of the built environment. Good design is a key aspect of sustainable development, is indivisible from good planning, and should contribute positively to making places better for people. 57. It is important to plan positively for the achievement of high quality and inclusive design for all development, including individual buildings, public and private spaces and wider area development schemes. 58. Local and neighbourhood plans should develop robust and comprehensive policies that set out the quality of development that will be expected for the area. Such policies should be based on stated objectives for the future of the area and an understanding and evaluation of its defining characteristics. Planning policies and decisions should aim to ensure that developments: <ul style="list-style-type: none"> • will function well and add to the overall quality of the area, not just for the short term but over the lifetime of the development; • establish a strong sense of place, using streetscapes and buildings to create attractive and comfortable places to live, work and visit; • optimise the potential of the site to accommodate development, create and sustain an appropriate mix of uses (including incorporation of green and other public space as part of developments) and support local facilities and transport networks; • respond to local character and history, and reflect the identity of local surroundings and materials, while not preventing or discouraging appropriate innovation; • create safe and accessible environments where crime and disorder, and the fear of crime, do not undermine quality of life or community cohesion; and • are visually attractive as a result of good architecture and appropriate landscaping. 59. Local planning authorities should consider using design codes where they could help deliver high quality outcomes. However, design policies should avoid unnecessary prescription or detail and should concentrate on guiding the overall scale, density, massing, height, landscape, layout, materials and access of new development in relation to neighbouring buildings and the local area more generally.
Local Planning Policy	Briefly outline key adopted local policies relevant to the assessment, including:		
Sevenoaks District Council, Core Strategy Development Plan Document, 2011	Please only reference policies (and not supporting text) that are relevant to your assessment. If no relevant policies, please state this under this heading.	No references to lighting in this document.	
Sevenoaks District Council, Saved Policies of the Sevenoaks District	Please only reference policies (and not supporting text) that are	Outdoor Lighting, page 9	Outdoor Lighting Whilst outdoor lighting is important for civic amenity and public safety, including crime prevention, it can be intrusive and cause unnecessary pollution, especially in the countryside. Poorly designed and badly aligned lights are responsible for spillage and “glow” which blurs the separation between town and countryside and introduces a suburban character into remote

Local Plan, 2007

relevant to your assessment. If no relevant policies, please state this under this heading.

EN31 Policy, page 9

areas. Urban environments also suffer from insensitive lighting to buildings, signs and transport infrastructure. The results are ugliness, visual pollution, waste of electricity and the unnecessary emission of greenhouse gases. Floodlit facades are often over lit to counter overspill from adjacent street lights, whilst signs and shop windows have a major impact on the night time scene. Street lights both on building facades and which line streets themselves are often insensitively or wrongly positioned damaging the architectural character of particular buildings or the location. Sports floodlighting can be similarly intrusive especially for nearby residential properties. The Local Planning Authority will normally expect to see a report from the Institute of Lighting Engineers justifying the lighting scheme and appraising its impact in order to assist in the assessment of particular proposals. A lighting impact appraisal will always be required where the scheme is in or may affect an Area of Outstanding Natural Beauty or is in other open countryside. Planning conditions will be imposed where appropriate regulating lighting intensity, directional shielding and hours of use.

EN31 Where a lighting proposal requires planning permission the following criteria should be complied with:

- 1) Lighting is designed as an integrated part of any related development scheme;
- 2) Low energy lighting is used;
- 3) The alignment of lamps and provision of shielding minimises spillage and glow in order to safeguard the night sky;
- 4) The lighting intensity is no greater than that required to provide adequate illumination;
- 5) The proposal preserves or enhances the character or appearance of any Conservation Area which may be affected. Proposals to floodlight building facades, shop fronts, signs etc. must be sensitive to the character or appearance of the Conservation Area with lights carefully positioned to avoid overspill;
- 6) Proposals to floodlight sports fields, golf courses, driving ranges, business premises and arenas will not be permitted if they would result in a significant loss of privacy or amenity for nearby residential properties;
- 7) Proposals for lighting schemes in or which may affect Areas of Outstanding Natural Beauty or in other areas of open countryside will not be permitted unless the preceding criteria are satisfied and the lighting is essential for safety or security reasons for the facility in question.

[..\E18-Tech Docs\NPP & SDC Docs for Lighting Ass Rep\SDC - SavedLocalPlanPoliciesComposite-ConsistencywithNPPF-AD-Version3.pdf](#)

Saved Local Plan Policies – Consistency with NPPF - (Separate document)

Those policies highlighted in green are consistent with the NPPF and can continue to be afforded full weight in decision making.

Those policies highlighted in orange remain consistent in part with the NPPF and should continue to be applied apart from those parts of the policy which are highlighted which should no longer be given weight.

Those policies highlighted in red are no longer consistent with national planning policy or development has been completed and should no longer be given weight in decision making.

Policy EN31	125 - Conserving and Enhancing the Natural Environment 56 - 58 -Requiring Good Design	prescriptive (para 57). Saved policy EN31 requires lighting to be designed as an integrated part of development, to be no greater intensity than required, and to minimise glow/spillage. For golf courses/sports fields lighting should not	Policy EN31 should continue to be given full weight until superseded by the ADMP.
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	93 - Meeting the challenge of climate change	result in the loss of amenities for residents, and within AONBs/open countryside lighting proposals are not permissible, unless for safety reasons. Proposals should also enhance the character and appearance of an area if proposed within a conservation area. Specific guidance surrounding lighting can be found in Para 125 which encourages limiting impact of light on amenities, intrinsically dark landscapes, and nature conservation areas and encourages good design. EN31 can also be broadly related to para's 56 – 58 which require good design as part of sustainable development and denote that any development should respond to local character and reflect the identity of surroundings. EN31 also calls for lighting to be low energy, which supports the general environmental sustainability principles of the NPPF and is directly relatable to 93.	
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[..\E18-Tech Docs\NPP & SDC Docs for Lighting Ass Rep\SDC-July 2008 - Saved-Local-Plan-Policies-Compendium.pdf](#)

<p>Sevenoaks District Council, Draft Allocations and Development Management Plan, February 2013</p>	<p>Please only reference policies (and not supporting text) that are relevant to your assessment. If no relevant policies, please state this under this heading.</p>	<p>Policy EN 5 – Outdoor Lighting, page 23</p>	<p>Outdoor Lighting</p> <p>2.30 Artificial lighting is essential for reasons of safety and security. However, insensitive lighting can cause what is termed as light pollution. Sevenoaks District, as a predominantly rural area, is sensitive to light pollution through sky glow which can affect the character of the countryside and have a negative impact biodiversity.</p> <p>2.31 External lighting is needed for commercial use and for some community and sports facilities such as floodlit sports pitches. Whilst the lighting has to be adequate for the purpose, it is important that there is no significant nuisance to the amenity of surrounding properties or the wider countryside. This may require the use of planning conditions to limit the times when lighting is used to minimise the disturbance. The use of low energy lighting will be encouraged.</p> <p>Policy EN 5 - Outdoor Lighting Proposals for lighting that affect the outdoor environment which meet the following criteria will be permitted:</p> <ul style="list-style-type: none"> a) the proposal would be integrated within a wider related development scheme; b) any impact on the night sky would be minimised through the alignment of lamps, provision of shielding and selection of appropriate lighting type and intensity c) there would be no harmful impact on privacy or amenity for nearby residential properties; d) the proposal would preserve or enhance the character or appearance of any Heritage Asset which may be affected; e) any potential impacts on wildlife would be avoided or adequately mitigated where avoidance is not possible; and f) f) where proposals affect Areas of Outstanding Natural Beauty or open countryside, it can be demonstrated that the lighting is essential for safety or security reasons. <p>Allocations and Development Management Plan Draft for Submission February 2013</p> <p>..\E18-Tech Docs\NPP & SDC Docs for Lighting Ass Rep\SDC - Feb 2013 - 1 Allocations and Development Management Plan Draft for Submission February 2013.pdf</p>
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Appendix 1 – Replacement of Saved Local Plan Policies

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Once adopted, the Allocations and Development Management Plan DPD and Core Strategy will replace all of the remaining saved policies of the Sevenoaks District Local Plan.

The table below shows a comprehensive list of all of the Saved Local Plan Policies which have not already been replaced by the Core Strategy. The Saved policies continue to form part of the Development Plan and will be used to assess planning applications until such time as the Allocations and Development Management Plan is formally adopted.

The table shows how each remaining saved policy is proposed to be replaced by new Allocations and Development Management policies.

Policy No.	Policy Title	Replacement
EN1	Development Control: General Principles	SC1 - Presumption in favour of Sustainable Development EN1 - Design Principles EN2 - Amenity Protection
EN4A EN4B EN4C	Access for Persons with Disabilities	Adopted Core Strategy Policy SP5 and EN1 - Design Principles.
EN9	Green Spaces and Urban Fringe	GI1 - Green Infrastructure and New Development GI 2 - Loss of Open Space
EN17B	Nature Conservation	GI1 - Green Infrastructure and New Development will supplement Core Strategy Policy SP11 on Biodiversity.
EN23	Conservation Areas	EN4 - Heritage Assets
EN25A EN25B	Archaeology	EN4 - Heritage Assets
EN26	Historic Parks and Gardens	EN4 - Heritage Assets; GI1 - Green Infrastructure and New Development
EN27	Shopfronts	No replacement proposed as adequate guidance included within Adopted Core Strategy SP1 and EN1 Design Principles
EN31	Outdoor Lighting	EN5 - Outdoor Lighting
EN34	Rural Lanes	No replacement proposed as adequate guidance included within Adopted Core Strategy LO8, SP10 and SP11 and EN1 Design Principles; GI1 Green Infrastructure and New Development and GI2 Loss of Open Space

[..\E18-Tech Docs\NPP & SDC Docs for Lighting Ass Rep\SDC - Feb 2013 - 1 Allocations and Development Management Plan Draft for Submission February 2013.pdf](#)

Sevenoaks District Council, Draft Allocations and Development Management Plan, November 2013

Policy EN5, page 24

Outdoor Lighting

2.32 Artificial lighting is essential for reasons of safety and security. However, insensitive lighting can cause what is termed as light pollution. Sevenoaks District, as a predominantly rural area, is sensitive to light pollution through sky glow which can affect the character of the countryside and have a negative impact biodiversity.

2.33 External lighting is needed for commercial use and for some community and sports facilities such as floodlit sports pitches. Whilst the lighting has to be adequate for the purpose, it is important that there is no significant nuisance to the amenity of surrounding properties or the wider countryside. This may require the use of planning conditions to limit the times when lighting is used to minimise the disturbance. The use of low energy lighting will be encouraged.

Policy EN 5 - Outdoor Lighting

Proposals for lighting that affect the outdoor environment which meet the following criteria will be permitted:

a) the proposal would be integrated within a wider related development scheme;

b) any impact on the night sky would be minimised through time-limited and user activated lighting, the alignment of lamps, provision of shielding and selection of appropriate lighting type and intensity;

c) there would be no harmful impact on privacy or amenity for nearby residential properties;

d) the proposal would preserve or enhance the character or appearance of any Heritage Asset which may be affected;

e) any potential impacts on wildlife would be avoided or adequately mitigated where avoidance is not possible; and

f) where proposals affect Areas of Outstanding Natural Beauty or open countryside, it can be demonstrated that the lighting is essential for safety or security reasons.

Where these criteria are met, proposals incorporating the use of low energy lighting will be encouraged.

[..\E18-Tech Docs\NPP & SDC Docs for Lighting Ass Rep\SDC- Nov 2013 - Allocations and Development Management Plan Draft for Submission November 2013 vFinal.pdf](#)

Appendix 1 – Replacement of Saved Local Plan Policies

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The table shows how each remaining saved policy is proposed to be replaced by new Allocations and Development Management policies.

Policy No.	Policy Title	Replacement
EN1	Development Control: General Principles	SC1 - Presumption in favour of Sustainable Development EN1 - Design Principles EN2 - Amenity Protection
EN4A EN4B EN4C	Access for Persons with Disabilities	Adopted Core Strategy Policy SP5 and EN1 - Design Principles.
EN9	Green Spaces and Urban Fringe	G11 - Green Infrastructure and New Development G12 - Loss of Open Space
EN17B	Nature Conservation	G11 - Green Infrastructure and New Development will supplement Core Strategy Policy SP11 on Biodiversity.
EN23	Conservation Areas	EN4 - Heritage Assets
EN25A EN25B	Archaeology	EN4 - Heritage Assets
EN26	Historic Parks and Gardens	EN4 - Heritage Assets; G11 - Green Infrastructure and New Development
EN27	Shopfronts	No replacement proposed as adequate guidance included within Adopted Core Strategy SP1 and EN1 Design Principles
EN31	Outdoor Lighting	EN5 - Outdoor Lighting
EN34	Rural Lanes	No replacement proposed as adequate guidance included within Adopted Core Strategy LOB, SP10 and SP11 and EN1 Design Principles; G11 Green Infrastructure and New Development and G12 Loss of Open Space

[..\E18-Tech Docs\NPP & SDC Docs for Lighting Ass Rep\SDC- Nov 2013 - Allocations and Development Management Plan Draft for Submission November 2013 vFinal.pdf](#)

Guidance	If relevant, provide a summary of key guidance used for the assessment, including, but not necessarily limited to:		
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<p>Sevenoaks District Council, Draft Supplementary Planning Document: Development in the Greenbelt, 2013</p>	<p>Please only reference policies (and not supporting text) that are relevant to your assessment. If no relevant policies, please state this under this heading.</p>	<p>Section 10, Change of use of Green Belt Land, page 26, Recreation, Para10.5 ,</p>	<p>10.5 Where outdoor recreation activities are acceptable in principle, they may still result in unacceptable adverse impacts. The landscape character and the visual amenity of the countryside may be affected as well as other possible impacts from noise, traffic generation, car parking, lighting, and disruption to residential amenity.</p> <p>..\E18-Tech Docs\NPP & SDC Docs for Lighting Ass Rep\SDC - Feb 2013 - Development-in-the-Green-Belt-SPD-Consultation-Draft-final-0313.pdf</p>
<p>For Information, but believe to have been superseded by above documents</p>			
<p>Development Management Draft Policies for Consultation May 2011 Local Development Framework</p>	<p>RHDHV believe this policy or document has been superseded by the EN31 and soon to be adopted EN5 in the Allocation and Development Management Plan</p> <p>The text looks identical to EN5</p>	<p>2. Environment and Climate Change. Outdoor Lighting, page 21</p>	<div style="background-color: #808080; color: white; padding: 5px; text-align: center;"> Environment and Climate Change 2. </div> <p>2.16 Guidance is set out within National Planning Policy and there is no need for a specific local policy.</p> <p>Outdoor Lighting</p> <p>2.17 Artificial lighting is essential for reasons of safety and security. However, insensitive lighting can cause what is termed as light pollution. Sevenoaks District, as a predominantly rural area, is sensitive to light pollution through sky glow which can affect the tranquillity of the countryside and have a negative impact upon biodiversity.</p> <p>2.18 External lighting is needed for commercial use and for some community and sports facilities such as floodlit sports pitches. Whilst the lighting has to be adequate for the purpose, it is important that there is no significant nuisance to the amenity of surrounding properties. This may require the use of planning conditions to limit the times when lighting is used to minimise the disturbance.</p> <div style="border: 1px solid #ccc; background-color: #e0e0e0; padding: 10px; margin: 10px 0;"> <p>Policy ECC1 - Outdoor Lighting</p> <p>Proposals for lighting that affect the outdoor environment will only be acceptable where the following criteria are met:</p> <ul style="list-style-type: none"> a) The proposal is integrated within a wider related development scheme; b) The impact and suitability of the lighting intensity, alignment of lamps and provision of shielding in relation to light pollution and impact upon the night sky is minimised; c) There is no harmful impact on privacy or amenity for nearby residential properties; d) The proposal preserves or enhances the character or appearance of any Heritage Asset which may be affected. e) Any potential impact on wildlife is adequately mitigated. <p>Proposals for outdoor lighting that affect Areas of Outstanding Natural Beauty or open countryside will not be permitted unless the preceding criteria are satisfied and it is demonstrated that the lighting is essential for safety or security reasons.</p> </div> <div style="background-color: #ffcc99; padding: 5px; margin: 10px 0; text-align: center;"> Relevant Local Plan policies to be replaced by Policy ECC1 – EN31 </div> <div style="border: 1px solid #ccc; background-color: #e0f0ff; padding: 10px; margin: 10px 0;"> <p>Consultation Questions</p> <ul style="list-style-type: none"> • Do you feel there are other potential criteria that should be considered when assessing lighting proposals? • Are there any other changes you think to be made to the policy? </div> <p>..\E18-Tech Docs\Sevenoaks DC - draft_dev_man_policies May 2011 contains ECC1 Policy outdoor Lighting.pdf</p>

17 REFERENCE DOCUMENTATION

In preparing this Baseline Lighting Report the following documents have been referenced:

- LDA Landscape Architect Viewpoint Location Plans:
 - 3903_SK001_Scoping_VP_B
 - 3903_SK002_Scoping_VP_Inset_B
- Layout drawings:
 - 00556A_PP_01 - Land Use Rev D10 A0
 - 00556A_PP_02 - Density Rev D9 A0
 - 00556A_PP_03 - Building Heights Rev D11 A0
 - 00556A_PP_04 - Access and Movement Rev D11 A0
 - 00556A_PP_05 - Green Infrastructure Rev D10 A0
 - 00556A_SK102 - Red Line Drawing Rev D6 A0
 - DWG 002 Topography
- Waterman Bat survey drawings:
 - EED12715-102_GR_PSR_3A
 - EED12715-102_GR_PSR_4A
 - EED12715-102_GR_PSR_5A
 - EED12715-102_GR_PSR_6A
 - EED12715-102_GR_PSR_7A
- Other design documents:
 - UK Parliament, 1990; The Environmental Protection Act 1990;
 - Clean Neighbourhoods Act (Section 102) and Environment Act 2005 (Sections 79, 80, and 82);
 - BS-EN 12464-2:2014; Lighting of work places - Outdoor work places;
 - BS 5489:2003 Part 1; Code of Practice for the design of Road Lighting;
 - BS-EN 13201:2003 Parts 1-4; Road Lighting;
 - Chartered Institute of Building Services Engineers (CIBSE) Lighting Guide 6:1992; Outdoor Environment;
 - Institution of Lighting Professionals (ILP formerly ILE); Guidance Notes for the reduction of Light Pollution 2011;
 - CIE 150:2003; Guidance on the Limitation of the Effects of Obtrusive Light from Outdoor Lighting Installations;
 - Sevenoaks District Council, Development Management Policies;
 - Sevenoaks District Council, Policy EN31, Outdoor Lighting;
 - Sevenoaks District Council, Policy EN5, Outdoor Lighting;
 - Manual for Streets, DCLG 2007;
 - Lighting in the Countryside, DCLG1997;
 - National Planning Policy Framework;
 - Bat Conservation Trust (Version 3, May 2009); ILE Bats and Lighting in the UK.