RiverOak Strategic Partners

LVIA Addendum Appendices

TR020002/D6/LV.1.36

Examination Document

Project Name:	Manston Airport Development Consent Order
Application Ref:	TR020002
Submission Deadline:	**6**
Date:	3 May 2019

Memo

To: Planning Inspectorate

From: Wood Plc

Ref: Appendix LV.1.36

Date: 09 April 2019

Re. **Manston Airport DCO Application – LVIA Addendum Appendix A and Appendix B**

At Deadline 3, in support of RiverOak Strategic Partners response to the First Written Questions, a Landscape and Visual Impact Assessment Addendum was submitted. This was Appendix LV.1.36 in *The Appendices to Answers to First Written Questions* (REP3-187). This report referred to the following two appendices:

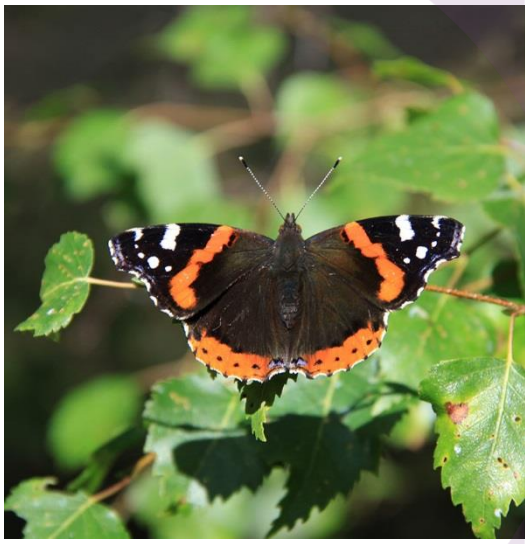
- Appendix A External Lighting Strategy (RPS, 2019); and
- Appendix B Manston Airport Lighting Impact Assessment – Baseline Survey Report (SDS Ltd, 2018).

It has come to our attention that these appendices were omitted in error from the Deadline 3 submission on 15 February 2019. For completeness, the full report containing both appendices are attached here.

RiverOak Strategic Partners

Manston Airport Development Consent Order

Landscape and Visual Impact Assessment Addendum



Wood Environment & Infrastructure Solutions UK Limited – March 2019

Report for

Main contributors

Kate Ward

Issued by

Kate Ward

.....

Approved by

Nick Hilton

.....

Wood

Canon Court
Abbey Lawn
Abbey Foregate
Shrewsbury SY2 5DE
United Kingdom
Tel +44 (0) 1743 342 000

Doc Ref. 40820RR004i1

h:\projects\40820 lon manston airport post application\docs\pre-examination\lighting addendum\40820rr004i1_lvia addendum.docx

Copyright and non-disclosure notice

Third party disclaimer

Management systems

This document has been produced by Wood Environment & Infrastructure Solutions UK Limited in full compliance with the management systems, which have been certified to ISO 9001, ISO 14001 and OHSAS 18001 by LRQA.

Document revisions

No.	Details	Date
i1	Final	07/03/19

Contents

1. Introduction

1.1 Purpose of this report

1.1.1 This report has been prepared as an addendum to the Landscape and Visual Impact Assessment (LVIA) which formed Chapter 11 of the Environmental Statement (ES) for Manston Airport submitted in July 2018. It has been prepared to address Written Questions made by the Examining Authority during the initial stages of the Examination process.

1.1.2 This addendum provides an assessment of the visual impact of the airport on night-time views. It should be noted that night-time visualisations have not been included as they cannot accurately reproduce the likely appearance of night-time lighting in relation to the existing baseline view and would not therefore enhance the understanding of the impacts for the informed decision maker.

1.1.3 The assessment has been carried out with an understanding of:

- the positions of the lighting elements within the development derived from the plans contained within the *External Lighting Strategy* (which forms Appendix A of this addendum);
- the likely visibility of the lighting elements in the views from each viewpoint derived from the wirelines contained within Appendix 11.1 of the ES; and
- an understanding of the existing night-time baseline derived from the night-time photography provided in Figures 11.22 to 11.29 of the ES.

1.1.4 It is this information that has allowed the assessors to employ their professional judgement regarding the likely level of effect associated with night-time lighting visible from each viewpoint. Planning policy

Adopted Thanet Local Plan 2006

1.1.5 Policy EP9 of the Adopted *Thanet Local Plan* 2006[1] relates to light pollution and states that "*Development that includes the provision of new outdoor lighting should be designed to minimise light glare, light trespass, spillage and sky glow so as to preserve residential amenity, the character of the surroundings and prevent disturbance to identified wildlife areas*".

1.1.6 Paragraph 13.65 of the *Thanet Local Plan* defines relevant areas of the district identified by Thanet District Council to which the standards included in the (then) Institution of Lighting Engineers (ILE) *Guidance Notes for the Reduction of Light Pollution* apply as follows:

- Zone E1 comprises the Pegwell Bay Special Landscape Area and the former Wantsum Channel;
- Zone E2 comprises the rest of the rural areas outside built confines except Kent International Airport;
- Zone E3 comprises the urban areas and rural settlements within built confines and Kent International Airport; and
- Zone E4 comprises the amusement area at Margate Seafront.

[1] Thanet District Council. (2006). *Thanet Local Plan*. [online]. Available at https://www.thanet.gov.uk/wp-content/uploads/2018/06/LocalplanOct06v3_2-2-1.pdf

Draft Thanet Local Plan to 2031

1.1.7 The *Draft Thanet Local Plan to 2031*[2] includes Policy SE08 – Light Pollution. The supporting text refers to the Institution of Lighting Professionals (ILP) *Guidance Notes for the Reduction of Obtrusive Light* and defines areas of Thanet which correspond to the Environmental Zones identified in this guidance in Table 15 as follows:

Table 1.1 Environmental Zones and corresponding areas within Thanet

Zone	Surrounding	Lighting Environment	ILP examples	Corresponding areas in Thanet
E0	Protected	Dark	UNESCO starlight reserves, IDA dark sky parks	None
E1	Natural	Intrinsically dark	National Parks, Areas of Outstanding Natural Beauty etc	Landscape Character Areas associated with Pegwell Bay and former Wantsum Channel, and European Marine Sites
E2	Rural	Low district brightness	Village or relatively dark outer suburban locations	Rural areas outside of the built confines Includes Green Wedges
E3	Suburban	Medium district brightness	Small town centres or suburban locations	Urban areas and villages
E4	Urban	High district brightness	Town/city centres with high levels of night time activity	Amusement are at Margate Seafront

1.1.8 Policy SE08 – Light Pollution states that development proposals that require specific lighting in connection with the operation of the proposed development will be permitted if it can be demonstrated that:

1) It has been designed to minimise light glare, light trespass, light spillage and sky glow through using the best available technology to minimise light pollution and conserve energy;

2) There is no adverse impact on residential amenity and the character of the surroundings;

3) There is no adverse impact on sites of nature conservation interest and/or protected and other vulnerable species and heritage assets;

4) There is no adverse impact on landscapes character areas, the wider countryside or those areas where dark skies are an important part of the nocturnal landscape;

5) It does not have an adverse impact on long distance views or from vantage points; and

6) Where appropriate, mitigation measures are proposed.

1.1.9 The policy continues "*In addition a lighting strategy may be required for large developments or for those developments with specific lighting requirements*" and that "*A Landscape and visual Impact Assessment with be required for proposed developments that fall in to the E1 category*."

1.2 Structure of this report

1.2.1 The structure of this report is as follows:

[2] Thanet District Council. (2018). *Draft Local Plan to 2031. Pre-submission version, regulation 19*. [online]. Available at https://www.thanet.gov.uk/wp-content/uploads/2018/11/CD1.1-Draft-Thanet-Local-Plan-Reg-19.pdf

- **Section 2 Methodology**. This includes a schedule of viewpoints considered in the assessment of visual impact on night-time views and confirmation of the assessment methodology;
- **Section 3 Assessment of visual impact on night-time views**. This includes a description of the baseline view at night-time from the twelve viewpoints considered in the assessment and an assessment of the visual effects at night.
- **Section 4 Conclusions.**

1.2.2 The addendum is accompanied by two appendices as follows:

- Appendix A: External Lighting Strategy (prepared by RPS, 2019); and
- Appendix B: Manston Airport Lighting Impact Assessment – Baseline Survey Report (prepared by Services Design Solution Ltd, 2018).

2. Methodology

2.1 Viewpoints used in the addendum

2.1.1 The viewpoints considered in this addendum are those for which night-time photography was obtained in September and October 2017. These viewpoints were selected either due to their proximity to the proposed development or as a result of requests from consultees for their inclusion. The location of these viewpoints is shown on Figures 11.7 and 11.8 of Volume 4 of the ES whilst baseline night-time photographs are presented in Figures 11.22 to 11.29.

2.1.2 The schedule of twelve viewpoints is included in Table 2.1.

Table 2.1 Night-time viewpoint locations

Viewpoint Reference	Viewpoint name	Approximate grid reference	Reason for selection	ES figure reference
Vpt 1	RAF Manston Museum car park	633315, 166524	Included due to its close proximity to the proposed development	Figure 11.22a and 11.22b
Vpt 2	Manston Road	634032, 167145	Included due to its close proximity to the proposed development	Figure 11.23
Vpt 3	Canterbury Road West Public Right of Way (PRoW)	634366, 165089	Included due to its close proximity to the proposed development	Figure 11.24
Vpt 5	A256 Haine Road	635205, 165114	Included due to its close proximity to the proposed development	Figure 11.24
Vpt 6	B2050 western edge of Manston	634619, 166204	Included in the 2017 PEIR	Figure 11.25
Vpt 7	Vincent Road near Flete Farm	634481, 167555	Request for viewpoint to be assessed at night-time made by Thanet District Council	Figure 11.26
Vpt 9	Minster Road, Acol	630872, 166840	Included in the 2017 PEIR	Figure 11.26
Vpt 11	Viking Coastal Trail, Cottingham Road	633107, 164479	Request for viewpoint to be assessed at night-time made by Thanet District Council	Figure 11.27
Vpt 12	A256, Cottington Road Bridge	633790, 164232	Request for viewpoint to be assessed at night-time made by Thanet District Council	Figure 11.27
Vpt 14	Junction of High Street & Shottendane Road, southern Garlinge	633511, 168850	Request for viewpoint to be assessed at night-time made by Thanet District Council	Figure 11.28
Vpt 15	PRoW, Shottendane Road	632531, 168633	Request for viewpoint to be assessed at night-time made by Thanet District Council	Figure 11.28
Vpt 20	North side of bridge at Plucks Gutter	626980, 163458	Included in the 2017 PEIR	Figure 11.29

2.2 Assessment Methodology

2.2.1 The *Guidelines for Landscape and Visual Impact Assessment Third Edition*[3] (hereafter referred to as GLVIA 3) set out considerations for determining the sensitivity of visual receptors which were included in the methodology used for the LVIA as set out in Section 11.7 of the ES. GLVIA 3 does not distinguish between the sensitivity of visual receptors during day-light hours and during the night-time.

2.2.2 In the absence of guidance in GLVIA 3 with regard to the sensitivity of visual receptors at night, a review of the visual sensitivities assigned in Appendix 11.3 of the ES for day-light hours has focused on consideration of:

- Susceptibility to visual change (as set out in Paragraph 6.32 of GLVIA 3) during the hours of darkness as follows:
  - Whether the receptor group at that viewpoint is the same for both day-time and night-time views; and
  - If the receptor group remains the same, whether the activity undertaken is different during the hours of darkness (i.e. residents are primarily resting with their curtains drawn) and whether that affects the extent to which their attention or interest is focussed on the views they experience.
- The value attached to the views experienced (Paragraph 6.37 of GLVIA 3) during the hours of darkness as follows:
  - Whether there is likely to be a change to the value of the view. An appreciation of the landscape and views available is unlikely to be a reason for people using recreational and transport routes at night and is unlikely to be a contributing factor to the quality of the experience of such users. The only exception to this would be if the user was specifically using the route to experience a dark landscape. A review of the viewpoint locations, the Environmental Zones assigned to the viewpoint locations in Table 5.4 of the *Manston Airport Lighting Impact Assessment – Baseline Survey Report* (Appendix B) and the Campaign for Protect Rural England's *Night Blight Mapping* shown in Figure 11.39 of the ES demonstrates that this exception does not apply to the viewpoint locations set out in Table 2.1.

2.2.3 In light of these considerations, in some instances visual receptors will have a lower sensitivity to changes to night-time views than to changes in daytime views.

2.3 Sources of information

2.3.1 This addendum has been informed by the following sources of information:

- The wirelines included in Appendix 11.1 of the ES; and
- Drawings prepared by Abacus and included in the *External Lighting Strategy*[4] which forms Appendix A of this LVIA Addendum.

2.3.2 Reference has also been made to the *Manston Airport Lighting Impact Assessment – Baseline Survey Report*[5] which forms Appendix B of this report. The *Baseline Survey Report* provides a description of

[3] Landscape Institute and Institute of Environmental Management & Assessment (LI and IEMA). (2013). *Guidelines for Landscape and Visual Impact Assessment.* 3rd Ed. Routledge, London and New York.
[4] RPS. (2019). *Manston Airport Development Consent Order External Lighting Strategy*.
[5] Services Design Solution Ltd. (2018). *Manston Airport Lighting Impact Assessment – Baseline Survey Report*

the light sources present at each of the viewpoints set out in Table 2.1 and levels of horizontal and vertical illuminance at each. The report also provides a summary of the Environmental Zone assigned to each viewpoint location.

2.3.3 The conclusion of the *Manston Airport Lighting Impact Assessment – Baseline Survey Report* is that the site is located within an Environmental Zone E3, with the immediate surrounding areas being classified as Environmental Zone E2 (as defined in Table 1.1 above).

2.4 Limitations

2.4.1 Given the outline status of the proposed airport related business development within the 'Northern Grass' area, the lighting design for this area has been based on an indicative layout as illustrated in Annex B of the RPS *External Lighting Strategy*. This layout in based on the maximum design parameters with regard to height and gross floor area of built form and proximity to adjacent sensitive visual receptors. The assessment is based on an indicative lighting design for the airport related business development which is compliant with the thresholds for ILP Environmental Zone E2. This should be considered the maximum parameter for lighting within this area and will be reflected in the design guide to be submitted to the Examiner at deadline 4. Details of ILP Environmental Zones thresholds and means of compliance with such thresholds is provided in the *External Lighting Strategy* in Appendix A.

3. Assessment of visual impact on night-time views

3.1 Assessment of the visual effects of lighting on aircraft

3.1.1 Consideration has been given to the potential effects of lighting on aircraft (including navigational lights, take-off and landing lights and anti-collision beacon lights) landing at and taking off from Manston Airport during the hours of darkness. At Year 10 there would be the equivalent of two flights an hour increasing to approximately four flights an hour by Year 20 between 0700 and 2300. Given the seasonal differences in day light hours it is anticipated that aircraft lighting would be visible in a dark environment for approximately two hours in the summer months (between approximately 2100 and 2300) increasing to a maximum of approximately 8.5 hours during the winter months (between approximately 1530-2300 and 0700-0800).

3.1.2 The intermittent frequency of aircraft landing at or taking off from the airport and the brevity of the period during which aircraft would be visible in receptors views before moving out of the view results in there being no potential for significant visual effects to occur.

3.2 Viewpoint 1 Manston Road close to RAF Manston Museum

Baseline

3.2.1 The baseline night-time view is shown in Figures 11.22a and 11.22b of the ES (Volume 4). This illustrates existing light sources associated with and surrounding the passenger terminal within the existing non-operational airport. There are isolated points of light from a small number of the windows at the properties site along Manston Court Road.

3.2.2 The *Manston Airport Lighting Impact Assessment – Baseline Survey Report* considered this viewpoint as being within Environmental Zone E3.

Assessment

Visual receptor sensitivity

3.2.3 Visual receptor groups at or close to this viewpoint during the day-time are recreational receptors visiting the museum. The visual receptor sensitivity was therefore assessed as Medium during day-light hours (Appendix 11.3 of the ES).

3.2.4 Reference to the website for the RAF Manston History Museum[6] and the Spitfire and Hurricane Memorial Museum[7] indicates that the museums close at 4pm throughout the year. Consequently, visual receptors at Viewpoint 1 during the hours of darkness are likely to be people at their place of work.

3.2.5 Paragraph 6.34 of GLVIA3 notes that visual receptors likely to be less susceptible to change include "*people at their place of work, whose attention may be focussed on their work or activity, not on their*

[6] http://www.rafmanston.co.uk/
[7] https://www.spitfiremuseum.org.uk/visiting

surroundings". They are also likely to place limited value on the views available. As such, the visual sensitivity of receptor groups at or close to this viewpoint during the night-time is assessed as Low.

Description of changes to night-time views

3.2.6 Reference to the wireline included in Appendix 11.1 of the ES and the drawings included in the *External Lighting Strategy* (Appendix A of this report) indicates that lighting on 15m and 10m high masts around Lorry Parks I and J (also referred to in the masterplan as the Airside Car Park and Storage Area) and wall mounted lighting on the northern facades of the Cargo Facilities would be visible beyond the unlit attenuation ponds and Manston Road. Lighting on 25m high masts to the west of the terminal building would also be visible to the south of any lighting introduced along the southern edge of the proposed airport-related business development. These light sources would coalesce to illuminate the middle ground of the view and the structures and components of the airport proposed within it beyond a foreground which would remain dark. The proximity of this viewpoint to the site and the extent of the night-time view in which changes would take place will inevitably give rise to a High magnitude of visual change. When combined with the Low sensitivity of the limited number of visual receptors who may experience this change, the level of visual effect would be Not Significant.

3.3 Viewpoint 2 Manston Road

Baseline

3.3.1 The night-time baseline shown in Figure 11.23 shows that the principal concentration of light is at and around the passenger terminal building and includes several lighting columns with associated localised sky glow. Other sources of light are window illumination at some of the properties sited alongside Manston Court Road in the middle distance and some low-level lighting at the base of the radar tower.

3.3.2 The *Manston Airport Lighting Impact Assessment – Baseline Survey Report* considered this viewpoint as being within Environmental Zone E2.

Assessment

Visual receptor sensitivity

3.3.3 Visual receptor groups close to this viewpoint are residential receptors in properties on the western side of Manston Road. The visual receptor sensitivity assigned in Appendix 11.3 Viewpoint Assessment of the ES was High for day-time views.

3.3.4 When considering the sensitivity to changes to their night-time views for this receptor group, the activity of receptors in their home at night is likely to alter from the day-time (i.e. resting with their curtains drawn) and the extent to which residents' attention is likely to be focussed on their views at night is likely to be lower than in day-light hours. As a consequence, the sensitivity of receptors at or close to this viewpoint at night is assessed as Medium.

Description of changes to night-time views

3.3.5 The indicative lighting layout for the proposed airport-related business development indicates the potential for lighting on 8m high masts to be located on land to the east of the buffer zone which itself would contain a low mound with shrub and tree planting. There is potential for light sources on these elevated masts to be occasionally visible above the intervening landscaped mound to the

immediate east of this viewpoint depending on their final siting and height within this part of the site. It is also likely that there would be an increase in sky glow from across the site above a retained dark foreground. The magnitude of visual change to night-time views is likely to be Low which, when combined with Medium sensitivity receptors would result in an effect that it Not Significant

3.4 Viewpoint 3 Canterbury Road West PRoW

Baseline

3.4.1 The baseline night-time view is shown in Figure 11.24. This shows a dark foreground with the highway lighting from the lighting column adjacent to the properties and illuminating highway signage the only sources of light in the view. There are no views of light sources within the current non-operational airport or any sky glow in a northerly direction. The current Jentex site on the northern site of Canterbury Road West is lit with various type of lighting and light sources.

3.4.2 The *Manston Airport Lighting Impact Assessment – Baseline Survey Report* considered this viewpoint as being within Environmental Zone E2.

Assessment

Visual receptor sensitivity

3.4.3 Visual receptor groups at or close to this viewpoint include northbound users of the footpath, residents in properties along the southern side of Canterbury Road West and vehicular receptors travelling along Canterbury Road West. The visual receptor sensitivity (as assigned in Appendix 11.3 Viewpoint Assessment of the ES) was High for users of the PRoW and residents and Medium for vehicular receptors during day-light hours.

3.4.4 When considering the sensitivity to changes to their night-time views for these receptor groups, the activity of receptors in their home at night is likely to alter from the day-time (i.e. resting with their curtains drawn) and the extent to which residents' attention is likely to be focussed on their views at night is likely to be lower than in day-light hours. As a consequence, the sensitivity of receptors at or close to this viewpoint at night is assessed as Medium.

3.4.5 For vehicular and recreational receptors, their activity is likely to remain unchanged from the day-time although the PRoW is unlikely to be heavily frequented during the hours of darkness. The value walkers and motorists place on their night-time view is likely to be lower than in the day-time with appreciation of the landscape unlikely to be a motive for using the route at night with users attention focused on their immediate surroundings. As a consequence, the sensitivity these receptor groups at night would be lower than in day-light hours (i.e. Medium for the limited number of users of the PRoW and Low for vehicular receptors).

Description of changes to night-time views

3.4.6 Reference to the wireline for Viewpoint 3 in Appendix 11.1 of the ES indicates that all built structures proposed within the site would be sited below the intervening landform formed by the bund along the northern side of Canterbury Road. This has the consequence that the proposed lighting within the site would also not be visible from this viewpoint. The exception is any additional lighting required within the fuel store which occupies the current Jentex site although this is likely to be incremental to that which is already present as part of the baseline.

3.4.7 The proposed lighting across the site would contribute to a low level of sky glow above the dark horizon. A Low magnitude of change is predicted for vehicular receptors travelling eastbound or westbound along Canterbury Road West and residents in properties along the southern side of the road as a result of additional lighting within the Jentex site whilst a Negligible magnitude of change is predicted for users of the PRoW as a consequence of the presence of sky glow to the north. For all receptors at or close to this viewpoint, visual effects at night-time would be Not Significant.

3.5 Viewpoint 5 A256 Haine Road

Baseline

3.5.1 The existing night-time view is shown in Figure 11.24. This shows a foreground lit by highway lighting along Canterbury Road West with a dark middle ground in the direction of the site. Domestic lights associated with housing in the northern part of Cliffs End and on the southern edge of Manston are visible to the west.

3.5.2 The *Manston Airport Lighting Impact Assessment – Baseline Survey Report* considered this viewpoint as being within Environmental Zone E2

Assessment

Visual receptor sensitivity

3.5.3 Visual receptor groups experiencing views at or close to this viewpoint are westbound vehicular receptors travelling along Canterbury Road West. The visual receptor sensitivity (as assigned in Appendix 11.3 Viewpoint Assessment of the ES) was assessed as Medium during day-light hours.

3.5.4 A review of the likely receptor group and activity of those receptors at or close to this viewpoint during the hours of darkness has identified that these are likely to remain the same as during day-light hours. However, the value motorists place on their views at night is likely to be lower with the appreciation of the landscape not the primary concern. As a consequence, the sensitivity of vehicular receptors to changes to their night-time views is assessed as Low.

Description of changes to night-time views

3.5.5 All proposed structures within the site would be screened by intervening landform as illustrated in the wireline for Viewpoint 5 in Appendix 11.1 of the ES. As such all lighting proposed within the airport would also be screened by the landform with the CAT III approach lights which are the closest form of lighting to this viewpoint set into the ground. The increase in sky glow beyond a lit foreground would lead to a Negligible magnitude of visual change. Visual effects on night-time views would be Not Significant.

3.6 Viewpoint 6 B2050 western edge of Manston

Baseline

3.6.1 The baseline night-time view is presented in Figure 11.25. This shows a cluster of light sources close to the existing passenger terminal within the non-operational site located in the middle-ground. Other light sources are associated with the residential properties on Manston Court Road and on top of the telecommunications tower west of Manston Road.

3.6.2 The *Manston Airport Lighting Impact Assessment – Baseline Survey Report* considered this viewpoint as being within Environmental Zone E2.

Assessment

Visual receptor sensitivity

3.6.3 Visual receptor groups located at or close to this viewpoint include residential receptors in four properties (Jubilee Cottages) on the western edge of Manston. The visual receptor sensitivity (as assigned in Appendix 11.3 Viewpoint Assessment of the ES) was High during day-light hours.

3.6.4 At night-time, the activity of residents in their home would alter from the day-time (i.e. primarily resting with their curtains drawn) and the extent to which residents' attention is likely to be focussed on their views at night is likely to be lower than in day-light hours. As a consequence, the sensitivity of receptors at or close to this viewpoint at night is assessed as Medium.

Description of changes to night-time views

3.6.5 Visual effects on night-time views would be incremental with regularly spaced lighting within the passenger car park extending to the fore of existing light sources which are the existing focus of the view. These would extend southwards in front of the proposed business aviation hangers beyond a retained dark foreground. The design of luminaries would direct light downwards with the consequence that whilst the lower facades of structures beyond the passenger car park may be visible, the apparent massing and scale of the proposed built form is likely to be lower than in day-light hours. Light sources at aprons to the south of the cargo facilities may be partially visible between or above proposed mid-ground structures. This incremental change to the middle-ground of views would give rise to a Medium magnitude of change to the night-time views of a limited number of resident (at the four properties which comprise Jubilee Cottages) which would be Not Significant.

3.6.6 The magnitude of visual would be lower for the remaining residents at Manston as a result of properties either being oriented away from the site or having sufficient foreground screening to limit views towards the site.

3.7 Viewpoint 7 Vincent Road near Flete Farm

Baseline

3.7.1 The baseline night-time view is shown in Figure 11.26. This shows a dark fore, middle and background to the central part of the view with light sources present to the southwest clustered along Manston Road. The most notable of these is the radar tower within the application site with its red warning light on the top.

3.7.2 The *Manston Airport Lighting Impact Assessment – Baseline Survey Report* considered this viewpoint as being within Environmental Zone E2.

Assessment

Visual receptor sensitivity

3.7.3 Visual receptor groups located at or close to this viewpoint are vehicular receptors using Vincent Road. The visual receptor sensitivity (as assigned in Appendix 11.3 Viewpoint Assessment of the ES) was Medium during day-light hours.

3.7.4 A review of the likely receptor group and activity of those receptors at or close to this viewpoint during the hours of darkness has identified that this is likely to remain the same as during day-light hours. However, the value motorists place on their views at night is likely to be lower with the appreciation of the landscape not the primary concern. As a consequence, the sensitivity of vehicular receptors to changes to their night-time views is assessed as Low.

Description of changes to night-time views

3.7.5 The wireline for Viewpoint 7 included in Appendix 11.1 shows that built form associated with the proposed airport related business development within the 'Northern Grass' area would be visible and would screen views of structures proposed within the airport to the south. Any lighting introduced along the northern edge of the 'Northern Grass' area would be visible as would any lighting proposed further to the south which may be framed between buildings along the northern edge, the exact layout of which is not known as a consequence of the outline status of the application for this area. These light sources would be visible above a currently dark horizon leading to an increase in lighting in the night-time view. The foreground of the view would continue to be dark and the magnitude of visual change is predicted to be Medium. Combined with the Low sensitivity of receptors at night, this would give rise to visual effects which would be Not Significant.

3.8 Viewpoint 9 Minster Road, Acol

Baseline

3.8.1 The baseline night-time view is presented in Figure 11.26. Highway lighting along the western side of Minster Road provides a lit foreground and a well-lit middle-ground beyond a dark agricultural field. Numerous light sources along the western boundary of the Cummings Power Generation complex and wall mounted light sources on the façade contribute to this well-lit middle-ground alongside additional light sources associated with other industrial units within Manston Business Park to the south. There are no views of light sources within the current non-operational airport.

3.8.2 The *Manston Airport Lighting Impact Assessment – Baseline Survey Report* considered this viewpoint as being within Environmental Zone E3.

Assessment

Visual receptor sensitivity

3.8.3 Visual receptor groups located at or close to this viewpoint are residential properties located in Acol. The visual receptor sensitivity (as assigned in Appendix 11.3 Viewpoint Assessment of the ES) was assessed as High during day-light hours.

3.8.4 At night-time, the activity of residents in their home would alter from the day-time (i.e. primarily resting with their curtains drawn) and therefore the extent to which residents' attention is likely to

be focussed on their views at night is likely to be lower than in day-light hours. The sensitivity of receptors at or close to this viewpoint at night is assessed as Medium.

Description of changes to night-time views

3.8.5 The existing industrial units within the Manston Business Park screen all views of the proposed structures within the Manston Airport site as illustrated in the wireline for this viewpoint included in Appendix 11.1. Consequently, no proposed light sources would be visible in night-time views with the proposed development contributing to a slight increase to the existing levels of sky glow already generated by lighting within the Manston Business Park. This incremental change would be Negligible and visual effects at night would be Not Significant.

3.9 Viewpoint 11 Viking Coastal Trail, Cottingham Road

Baseline

3.9.1 The baseline night-time photograph in Figure 11.27 shows a dark foreground and horizon with very few light sources visible. The exceptions are a small cluster of lights at Red Cottages. There are no views of light sources within the current non-operational airport

3.9.2 The *Manston Airport Lighting Impact Assessment – Baseline Survey Report* considered this viewpoint as being within Environmental Zone E2.

Assessment

Visual receptor sensitivity

3.9.3 Visual receptor groups located at or close to this viewpoint include residents at Dyas farm and receptors traveling along the minor road which forms part of the Regional Cycle Route (RCR) 15 (Viking Coastal Trail). The visual receptor sensitivity was assessed as High for day-light hours.

3.9.4 A review of the likely receptor group and activity of those receptors at or close to this viewpoint during the hours of darkness has identified that this is likely to remain the same as during day-light hours albeit the route is unlikely to be heavily frequented at night. Cyclists are likely to place greater emphasis on their immediate surroundings in the direction of travel at night and the value cyclists place on their night-time view is likely to be lower than in the day-time with appreciation of the landscape unlikely to be a motive for using the route at night. The sensitivity of receptors would be Medium.

Description of changes to night-time views

3.9.5 The wireline for Viewpoint 11 included in Appendix 11.1 of the ES indicates that there would be no views of any of the built elements proposed within the site due to the topography of the rising southern face of the plateau allied with the woodland in around Throne Farm. There would consequently be no views of any light sources within the site. The only change to the night-time view would be an increase in sky glow above a section of the horizon leading to a Negligible magnitude of visual change. Visual effects on night-time views would therefore be Not Significant.

3.10 Viewpoint 12 A256 Cottington Road Bridge

Baseline

3.10.1 The night-time baseline photograph is shown in Figure 11.27. This shows high levels of light sources along the main 'A' roads and junctions within the view, with highways lighting columns visible both below and above the horizon. Elsewhere there are limited sources of light visible, with lighting at Thorne Farm a single light source to the west. There are no views of light sources within the current non-operational airport.

3.10.2 The *Manston Airport Lighting Impact Assessment – Baseline Survey Report* considered this viewpoint as being within Environmental Zone E2.

Assessment

Visual receptor sensitivity

3.10.3 Visual receptor groups at or close to this viewpoint are vehicular receptors (drivers and their passengers) travelling northbound on the A256. The visual receptor sensitivity (as assigned in Appendix 11.3 Viewpoint Assessment of the ES) was assessed as Low during day-light hours.

3.10.4 A review of the likely receptor group and activity of those receptors at or close to this viewpoint during the hours of darkness has identified that these are likely to remain the same as during day-light hours. However, the value motorists place on their views at night is likely to be lower with the appreciation of the landscape not the primary concern. Consequently, the sensitivity continues to be Low.

Description of changes to night-time views

3.10.5 The wireline in Appendix 11.1 of the ES indicates that lighting on 25m high columns to the south of the 20m high cargo facilities would be visible as a series of regularly spaced light sources just above a dark section of the horizon to the west of the Cliffsend Roundabout. A cluster of lights around the Aircraft Recycling Hangars may also be evident in night-time views. Other lighting within the site would either be screened by vegetation around Thorne Farm, by built form proposed within the site or would be lower in height (10-15m) and therefore susceptible to screening by the edge of the plateau.

3.10.6 Given the baseline view in the road network in the middle-ground is well-lit, the magnitude of change is assessed as Low and visual effects would be Not Significant.

3.11 Viewpoint 14 Junction of High Street & Shottendane Road, southern Garlinge

Baseline

3.11.1 The night-time baseline view is presented in Figure 11.28 of the ES which shows isolated sources of light above or close to the horizon beyond a dark foreground. The telecommunications mast west of Manston Road has light sources with a red warning on the top whilst light from the tall lighting columns within the Defence Fire Training and Development Centre site are visible either side of the mast. Further to the left of the view, occasional light sources associated with individual properties and farmsteads are visible.

3.11.2 The *Manston Airport Lighting Impact Assessment – Baseline Survey Report* considered this viewpoint as being within Environmental Zone E2.

Assessment

Visual receptor sensitivity

3.11.3 This viewpoint is representative of residential receptors on the southern edge of Margate. The visual receptor sensitivity (as assigned in Appendix 11.3 Viewpoint Assessment of the ES) was assessed as High for day-time views.

3.11.4 At night-time, the activity of residents in their home would alter from the day-time (i.e. primarily resting with their curtains drawn) and therefore the extent to which residents' attention is likely to be focussed on their views at night is likely to be lower than in day-light hours. The sensitivity of receptors at or close to this viewpoint at night is assessed as Medium.

Description of changes to night-time views

3.11.5 Indicative lighting designs for the 'Northern Grass' area indicate that lighting introduced within this area, particularly along the eastern and northern perimeters, would be visible in the night-time views from this viewpoint. Whilst the dark foreground of the baseline view would be maintained, the level of individual light sources close to or above the horizon would be increased beyond those associated with individual properties and farmsteads which are present in the view to the north of the telecommunications mast and lighting columns within the Defence Fire Training and Development Centre site.

3.11.6 Lighting on 25m high columns at aprons to the south and west of the air traffic control tower may also be visible as a small cluster of lights just above the horizon in the same section of view as the lighting columns within the closer Defence Fire Training and Development Centre site.

3.11.7 All other proposed light sources within the Manston Airport site such as those to the north and south of the cargo facilities are highly likely to be screened by either the proposed built form within the site or as a consequence of the height of the proposed columns north of the cargo facilities (10-15m) which makes them susceptible to screening by the intervening landform as indicated by the wireline in Appendix 11.1.

3.11.8 Given the baseline view in which distant light sources are already visible and that the dark foreground would be maintained, the magnitude of change is assessed as Low and visual effects would be Not Significant.

3.12 Viewpoint 15 PRoW, Shottendane Road

Baseline

3.12.1 The night-time baseline view presented in Figure 11.28 of the ES shows relatively few sources of light above or close to the horizon beyond a dark foreground. Woodchurch Farm buildings and yard are lit features in the middle-distance whilst beyond the farm, a red warning light and upper lit section of the lattice tower of the telecommunications mast to the west of Manston Road is visible. Further east, individual light sources associated with isolated farmsteads and properties located to the north of Manston Airport are discernible in the view.

3.12.2 The *Manston Airport Lighting Impact Assessment – Baseline Survey Report* considered this viewpoint as being within Environmental Zone E2.

Assessment

Visual receptor sensitivity

3.12.3 This view is representative of views from PRoW TM39 which is unlikely to be heavily frequented during the hours of darkness. The visual receptor sensitivity (as assigned in Appendix 11.3 Viewpoint Assessment of the ES) was High for day-time views.

3.12.4 A review of the likely receptor group and activity of those receptors at or close to this viewpoint during the hours of darkness has identified that these are likely to remain the same as during day-light hours albeit the footpath is unlikely to be heavily frequented at night. Walkers are likely to place greater emphasis on their immediate surroundings in the direction of travel at night and the value they place on their night-time view is likely to be lower than in the day-time with appreciation of the landscape unlikely to be a motive for using the route at night. The sensitivity of receptors would be Medium.

Description of changes to night-time views

3.12.5 The wireline for this viewpoint included in Appendix 11.1 of the ES indicates that all proposed built structures within Manston Airport would be screened by a combination of topography and middle-ground built form and vegetation. Even the most elevated light sources on 25m high masts would be screened by the middle-ground elements when compared against the wireline using the 20m high cargo facilities, air traffic control tower and the aircraft recycling hangars as a proxy. There may be some sky glow above a section of the horizon. The magnitude of visual change to night-time views is assessed as Negligible and effects would be Not Significant.

3.13 Viewpoint 20 North side of bridge at Plucks Gutter

Baseline

3.13.1 The baseline night-time view is shown in Figure 11.29 of the ES. This shows a dark fore and middle-ground with the line of regularly spaced highway lighting columns along the A299 between the Monkton Roundabout and Minster Roundabout to the west of Manston Airport visible in the distance. Some sky glow is also evident in the direction of the coastal conurbations. Light sources within Cliffs End are discernible towards the east (right-hand side) of the view.

3.13.2 The *Manston Airport Lighting Impact Assessment – Baseline Survey Report* considered this viewpoint as being within Environmental Zone E2.

Assessment

Visual receptor sensitivity

3.13.3 Visual receptor groups at or close to the viewpoint include residential receptors at Plucks Gutter and receptors travelling north along Gore Street. The visual receptor sensitivity (as assigned in Appendix 11.3 Viewpoint Assessment of the ES) is High (residents) and Medium (vehicular receptors) for day-time views.

3.13.4 At night-time, the activity of residents in their home would alter from the day-time (i.e. primarily resting with their curtains drawn) and therefore the extent to which residents' attention is likely to be focussed on their views at night is likely to be lower than in day-light hours. The sensitivity of residential receptors at or close to this viewpoint at night is therefore assessed as Medium.

3.13.5 For vehicular receptors, their activity remains unchanged during the hours of darkness although the value motorists place on their views at night is likely to be lower with the appreciation of the landscape not the primary concern. As a consequence, the sensitivity of vehicular receptors to changes to their night-time views is assessed as Low.

Description of changes to night-time views

3.13.6 Reference to the wirelines contained within Appendix 11.1of the ES indicates that in night-time views, proposed light sources on 15m and 25m high masts close to the aprons to the south of the cargo facilities and aircraft recycling hangars (Aprons 1 to 6) would be visible above the crest of the plateau which forms the horizon of the view. This would increase the horizontal field of view in which individual light sources are present to the east of the regularly spaced highway lighting along the A299 and into stretches of existing dark horizon. There may also be an increase in sky glow above the horizon. Given the baseline view in which there is already the presence of lighting above the horizon and sky glow from the coastal conurbations, this increase would give rise to a Low magnitude of change to the night-time view and effects would be Not Significant.

4. Conclusions

4.1.1 A summary of the assessment of the visual impact of the airport on night-time views is provided in Table 4.1.

Table 4.1 Summary of night-time visual effects

Viewpoint reference	Viewpoint name	Visual receptor sensitivity to changes to night-time views	Magnitude of visual change to night-time views	Significance
Vpt 1	RAF Manston Museum car park	Low	High	Not Significant
Vpt 2	Manston Road	Medium	Low	Not Significant
Vpt 3	Canterbury Road West Public Right of Way (PRoW)	Medium (residents and users of PRoW) Low (vehicular receptors)	Low (residents and vehicular receptors) Negligible (users of PRoW)	Not Significant
Vpt 5	A256 Haine Road	Low	Negligible	Not Significant
Vpt 6	B2050 western edge of Manston	Medium	Medium	Not Significant
Vpt 7	Vincent Road near Flete Farm	Low	Medium	Not Significant
Vpt 9	Minster Road, Acol	Medium	Negligible	Not Significant
Vpt 11	Viking Coastal Trail, Cottingham Road	Medium	Negligible	Not Significant
Vpt 12	A256, Cottington Road Bridge	Low	Low	Not Significant
Vpt 14	Junction of High Street & Shottendane Road, southern Garlinge	Medium	Low	Not Significant
Vpt 15	PRoW, Shottendane Road	Medium	Negligible	Not Significant
Vpt 20	North side of bridge at Plucks Gutter	Medium (residents) and Low (vehicular receptors)	Low	Not Significant

4.1.2 The assessment of visual effects on night-time views indicates that the impact of the Proposed Development on views from all twelve locations would be not significant. A number of factors contribute to these conclusions as follows:

- Whilst a high magnitude of change is predicted for Viewpoint 1 (the RAF Manston Museum car park), the sensitivity of receptors at this viewpoint at night (i.e. workers) is assessed as low.
- For a number of the viewpoints (5, 9, 11 and 15) there are no direct views of light sources proposed within the Manston Airport site. From these viewpoints changes to views would be associated with an increase in sky glow above the horizon. The magnitude of change is assessed to be negligible from these viewpoints
- For the remaining viewpoints, it is considered likely that there would be direct views of lighting sources proposed within the site. However, in these scenarios, the lighting would either be too distant (as in the case of Viewpoint 20 at Plucks Gutter), have a more limited presence being

partially screened (such as at Viewpoint 2, 7 and 14) or would be introduced into a view which already contains various levels of lighting with the consequence that effects would be incremental (as shown at viewpoints 3, 6 and 12).

- The lighting scheme has been designed to achieve compliance with the International Commission on Illumination (CIE) Guide *CIE 150:2003 Guide on the limitation of the effects of obtrusive light from outdoor lighting installations* for Environmental Zone E2. As noted in Section 2.3, the conclusion of the *Manston Airport Lighting Impact Assessment – Baseline Survey Report* is that the site is located within an Environmental Zone E3, with the immediate surrounding areas being classified as Environmental Zone E2.

4.1.3 The lighting strategy contained within Appendix A sets out the methods that will be used to achieve compliance with the thresholds defined for Environmental Zones E2. Appendices A and B of the *External Lighting Strategy* provide details of indicative lighting designs for the airport and business park respectively. In addition, the appendices to the lighting strategy also provide calculations which demonstrate the performance of the lighting deigns in relation to the thresholds for Environmental Zone E2. These calculations indicate that the lighting design for the business park is fully compliant with the criteria for Environmental Zone E2 whilst the lighting design for the airport complies with all criteria except for that relating post-curfew luminaire intensity. The residential properties that could potentially be affected by this non-compliance are identified in the lighting strategy which also contains proposals for the mitigation of these effects through additional landscaping measures. As such, the lighting strategy and its appendices demonstrate that lighting designs for both the airport and the business park are compliant with the requirements of Environmental Zone E2.

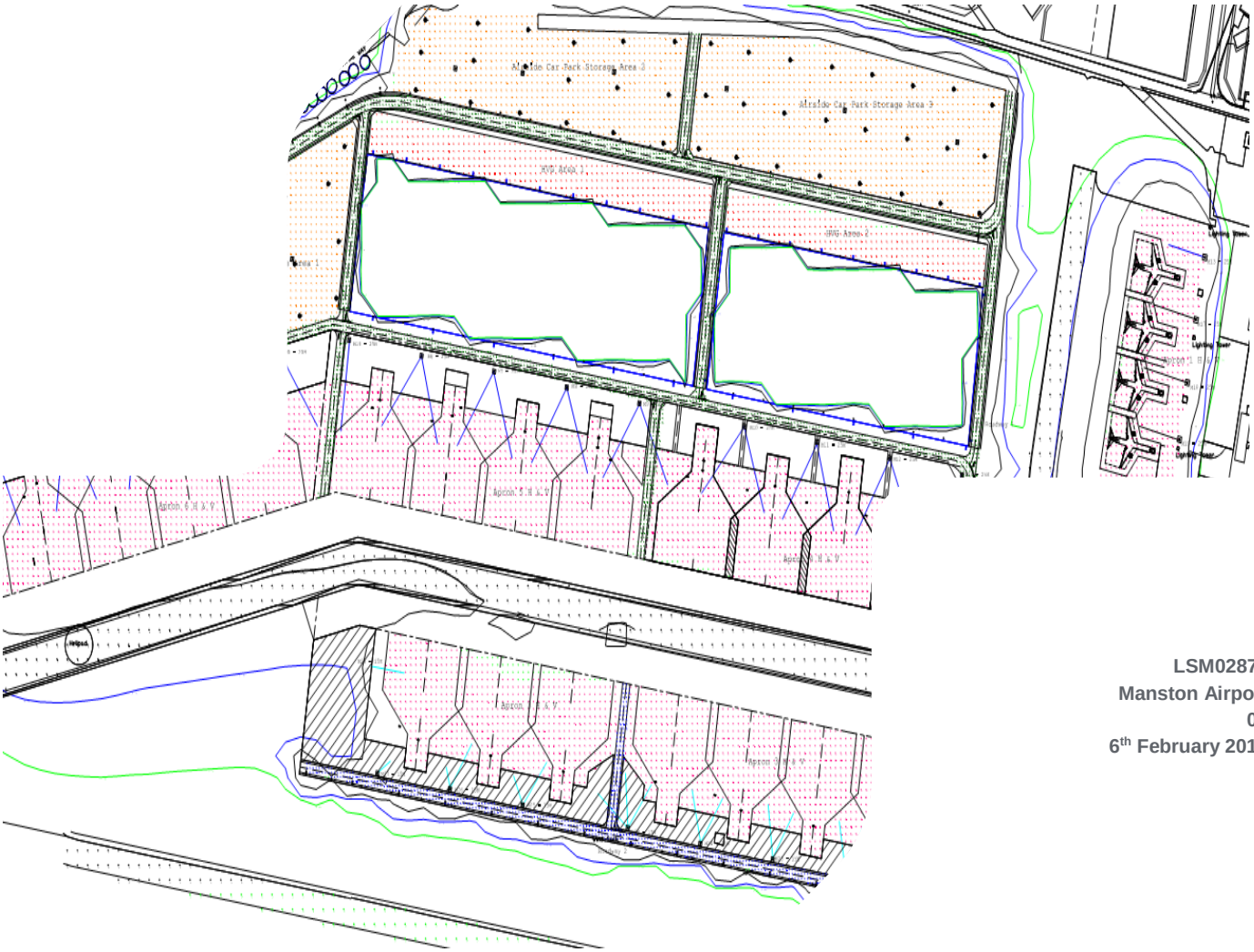
4.1.4 To conclude, this LVIA Addendum provides an assessment of the visual impact of the airport on night-time views from twelve viewpoints within the LVIA study area. No significant effects are predicted.

Appendix A
External Lighting Strategy (RPS, 2019)

MANSTON AIRPORT
DEVELOPMENT CONSENT ORDER

REGULATION 5 (2) (o)
THANET DISTRICT COUNCIL

External Lighting Strategy



LSM02874
Manston Airport
02
6th February 2019

Document status					
Version	**Purpose of document**	**Authored by**	**Reviewed by**	**Approved by**	**Review date**
A	REGULATION 5 (2) (o) THANET DISTRICT COUNCIL	Simon Bourke	Martin McKay	Chris Johnson	31st Jan 19

Prepared by:

RPS

Simon Bourke
Operational Director - Building Services

E simon.bourke@rpsgroup.com

Prepared for:

RSP

Contents

1 INTRODUCTION

This report describes a method of achieving compliance with the Planning Conditions associated with the Manston Airport Development Consent Order.

This report describes a lighting strategy that can achieve compliance with the external lighting planning requirements, along with supporting calculations and examples of the types of luminaires that will be used.

The external lighting for the airport described in this report covers the following areas:

- Access lighting to the airport and aprons and car parks – but excludes the runway lighting and lighting associated with aircraft landing and aircraft take off.
- Business Park access lighting and car park lighting.

2 TARGET LEVELS

The Lighting Impact Assessment –Baseline Survey Report prepared by Services Design Solutions sets out the requirements that the lighting design should comply with.

The site is classified as an E3 zone, in accordance with the Thanet District Council 2006 Adopted Development Plan, which states "*Zone E3 comprises the urban areas and rural settlements within built confines (as identified by Policy CC1), and Kent International Airport (as identified by Policy EC2)*".

The E3 zone is derived from the Institute of Lighting Professionals Guidance Notes for the Reduction of Obtrusive Light GN01:2011 Table 1 which is repeated below:

Table 1 – Environmental Zones

Zone	Surrounding	Lighting Environment	Examples
E0	Protected	Dark	UNESCO Starlight Reserves, IDA Dark Sky Parks
E1	Natural	Intrinsically dark	National Parks, Areas of Outstanding Natural Beauty etc
E2	Rural	Low district brightness	Village or relatively dark outer suburban locations
E3	Suburban	Medium district brightness	Small town centres or suburban locations
E4	Urban	High district brightness	Town/city centres with high levels of night-time activity

To achieve compliance, the lighting design should not exceed the levels provided in table 2,

Table 2 – Obtrusive Light Limitations for Exterior Lighting Installations – General Observers

Environmental Zone	Sky Glow ULR [Max %] (1)	Light Intrusion (into Windows) E_v [lux] (2)		Luminaire Intensity I [candelas] (3)		Building Luminance Pre-curfew (4)
		Pre-curfew	Post-curfew	Pre-curfew	Post-curfew	Average, L [cd/m^2]
E0	0	0	0	0	0	0
E1	0	2	0 (1*)	2,500	0	0
E2	2.5	5	1	7,500	500	5
E3	5.0	10	2	10,000	1,000	10
E4	15	25	5	25,000	2,500	25

3 PROPOSED LIGHTING LEVELS

Whilst the Planning requirements are for the lighting to comply with Environmental Zone E3: Medium district brightness, well inhabited rural and urban settlements, the lighting design seeks to provide lighting levels which are less obtrusive.

Airport Lighting

The scheme has been assessed against the requirement of the Institute of Lighting Professionals Guidance Notes for the Reduction of Obtrusive Light GN01:2011 Environmental Zone E2: low district brightness, village or relatively dark outer suburban areas.

The luminaires proposed use high efficiently low energy LED lamp sources and the luminaires optics selected to distribute the majority of their light output in the required direction of use.

By carefully controlling cut off angles the luminaires minimise any upward light pollution to less than 2.5% of luminaire flux for the total installation that goes directly into the sky.

Lighting levels are minimised with higher lighting levels only used where they are needed to comply with the relevant industry or aviation standards such as for the airport aprons.

The lighting design will comply with the pre-curfew vertical illumination limit of 5 Lux on the facade of adjacent properties to minimise any obtrusive light for the neighbours of the airport.

The lighting design will comply with the post curfew vertical illumination limit of 1 Lux on the facade of adjacent properties to minimise any obtrusive light for the neighbours of the airport.

Due to the height and direction of a limited amount of the airport apron luminaires the recommended luminous intensity post curfew, typically after 11pm, of 500 candelas is exceeded at some of the neighbouring residences on Bell-Davis Drive, Beamount Close and Tollemache Close. These results and mitigation measures are discussed later in this report.

Drawings showing the lighting levels, the proposed luminaire locations and quantities are included in Appendix A.

Business Park Lighting

The scheme has been designed to achieve compliance with the Institute of Lighting Professionals Guidance Notes for the Reduction of Obtrusive Light GN01:2011 Environmental Zone E2: low district brightness, village or relatively dark outer suburban areas.

The luminaires use high efficiently low energy LED lamps and the luminaires are designed to shine their light down, and by carefully controlling cut off angles the luminaires minimise any upward light pollution to less than 2.5% of luminaire flux for the total installation that goes directly into the sky.

The lighting design will comply with the pre-curfew vertical illumination limit of 5 Lux on the facade of adjacent properties to minimise any obtrusive light for the neighbours of the business park..

The lighting scheme comply with the vertical illumination limit of 1 Lux on the facade of adjacent properties to minimise any obtrusive light for the neighbours of the business park.

Drawings showing the lighting levels, the proposed luminaire locations and quantities are included in Appendix B.

4 PROPOSED LUMINAIRES

All the luminaires used will be low energy, using LED lamps as the lighting sources.

The luminaires will be:

- mounted on lighting columns at various heights with different quantities of luminaires used depending on the location of the column and the specific area to be lit.
- wall mounted on the building façade.

Airport

There are three types of luminaires used. The use and locations and brief details are provided in the table below, with further details of the luminaires provided in Appendix C.

Abacus product reference	Luminaire type	Image	Locations used
ARTE Series floodlight	Bracket mounted LED floodlight		Lighting roadways and access paths and service yards mounted on buildings between 8m and 10m above ground level with the light directed towards the service yard centre of the site.
AAA-LUX AL floodlights	Equipped with high-quality LED lamps and optics. The high-quality optics illuminate with excellent uniformity whilst producing minimal stray light.		Located at airport aprons directing light towards the apron on columns. Luminaires are provided with hoods to prevent obtrusive glare issues where required. Mounted on lighting columns at either 15m or 25m in height or fixed to the facades of buildings at 22m height.
VELA Series floodlights	Pole mounted wide area distribution luminaire with low upward light ratio		Located at the perimeter of vehicle storage/parking areas, mounted on 15m height lighting columns.
AL62000 Series	Pole mounted LED road luminaire with selectable distribution optics to suit the required application area.		Lighting roadways and access paths and service yards mounted on lighting columns at 8m above ground. Luminaires are positioned away from buildings and with the light output directed back towards the centre of the site.

Indicative quantities for the Airport and the arrangement is shown on the lighting drawing in Appendix A, with the with the approximate luminaire quantities shown below:

19 x 25m Masts Carrying the Following AAA-Lux LED Floodlights
M1 - M5 ..... 2 x AL90 / SB / 1375W
1 x AL710 / 700W
M6 - M12 ... . 2 x AL90 / SB / 1375W
M13 - M19 ... 1 x AL90 / SB/ 1375W

8 x 15m Masts Carrying the Following AAA-Lux LED Floodlights
M20 - M24 .... 2 x AL90 / 1375W
M25..... 1 x AL90 / SB / 1375W
1 x AL90 / 1375W
M26 & M27... 2 x AL90 / SB / 1375W

4 x Wall mounted AAA-Lux LED Floodlights
W1 - W4..... 1 x AL90 / SB / 1375W
Mounted at 22m high

20 x Wall Mounted Arte LED Floodlights
A .....1 x AL21102 / 300 / A3 / 4K
Mounted at 10m high
Stub Bracket

20 x Wall Mounted LED Lanterns
B .....1 x AL62014 / 2 / 190 / 4K
Mounted at 10m high
Stub bracket
Lantern: 5°

24 x 15m Masts Carrying the Following Vela LED Floodlights
C ....2 x AL7002 / 400W

44 x 10m Columns Carrying the Following Lanterns
D .....1 x AL62003 / 1 / 80 / 4K
Bracket projection: 0.5m
Bracket: +5° / Spigot: +0° / Lantern: -5°

20 x 10m Masts Carrying the Following Wall Mounted LED Lanterns
E .....1 x AL62014 / 2 / 190 / 4K
1 x AL62003 / 2 / 80 / 4K
Twin stub bracket
Bracket: +10° / Spigot: +0° / Lantern: 0°

2 x 10m Masts Carrying the Following Wall Mounted LED Lanterns
F.....2 x AL62003 / 2 / 120 / 4K
Twin bracket projection 0.5m
Bracket: +5° / Spigot: +0° / Lantern: 0°

15x 10m Masts Carrying the Following Wall Mounted LED Lanterns
G.....1 x AL62007 / 2 / 140 / 4K
Stub bracket
Bracket: +0° / Spigot: +0° / Lantern: 0°

71 x 10m Masts Carrying the Following Wall Mounted LED Lanterns
H.....2 x AL62007 / 2 / 140 / 4K
Twin bracket projection 0.5m
Bracket: +5° / Spigot: +0° / Lantern: 0°

11x 10m Masts Carrying the Following Wall Mounted LED Lanterns
I.....1 x AL62003 / 2 / 95 / 4K
Stub bracket
Bracket: +0° / Spigot: +0° / Lantern: 0°

Business Park

There are two types of luminaires used. The use and locations and brief details are provided in the table below, with further details of the luminaires provided in Appendix C.

Abacus product reference	Luminaire type	Image	Locations used
AL21102	Bracket mounted LED floodlight		Lighting roadways and access paths and service yards mounted on building facades between 8m and 10m above ground level with the light directed towards the service yard centre of the site.
AL62000 Series	Pole mounted LED road luminaire with selectable distribution optics to suit the required application area.		Lighting roadways and access paths and service yards mounted on lighting columns at 8m above ground level Luminaires are positioned away from buildings and with the light output directed back towards the centre of the site.

Indicative quantities for the business park and the arrangement is shown on the lighting drawing in Appendix B, with the approximate luminaire quantities shown below:

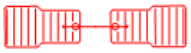
LIGHTING EQUIPMENT

22x 8m Columns Each Carrying the Following Luminaires:-
1 x AL610002 / 60 / 4K
Post Top

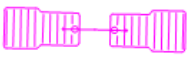
84x 8m Columns Each Carrying the Following Luminaires:-
1 x AL610002 / 80 / 4k
Post top

11x 8m Columns Each Carrying the Following Luminaires:-
1 x AL610003 / 60 / 4K
Post Top

21x 8m Columns Each Carrying the Following Luminaires:-
1 x AL610003 / 80 / 4k
Post top



10x 8m Columns Each Carrying the Following Luminaires:-
2 x AL610003 / 60 / 4K
Twin Bracket
Bracket Projection 0.5



6x 8m Columns Each Carrying the Following Luminaires:-
2 x AL610003 / 80 / 4k
Twin Bracket
Bracket Projection 0.5

1x 8m Columns Each Carrying the Following Luminaires:-
2 x AL21102 / 90 / S1S112
Twin Bracket

50x 10m Wall mounted Luminaires:-
1x AL21102 / 120 / S1S112

144x 10m Wall mounted Luminaires:-
1x AL21102 / 90 / S1S112

5 COMPLIANCE RESULTS

An outline lighting scheme has been undertaken to demonstrate how compliance can be achieved or where areas of non-compliance may occur, how appropriate mitigation measures can be provided.

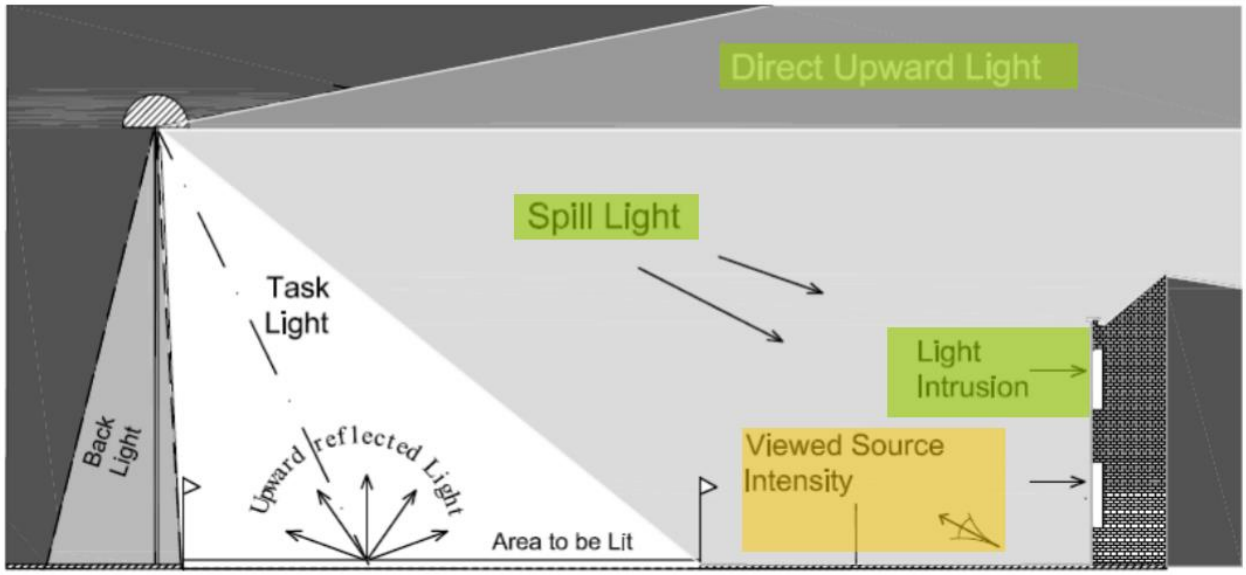
The table below indicates the results of the lighting design when measured against table 2 of the Institute of Lighting Professionals Guidance Notes for the Reduction of Obtrusive Light GN01:2011.

Assessment Location	Light Intrusion (into Windows) Ev (Lux)		Luminaire Intensity I (candelas) I	
	Pre-Curfew	Post Curfew	Pre-Curfew	Post Curfew
Bell-Davies Drive 1 & 2	0.7	0.7	4619	4619
Bell-Davies Drive 3 & 4	0.9	0.9	4633	4633
Bell-Davies Drive 5 & 6	0.1	0.1	4653	4653
Bell-Davies Drive 9 & 10	0.3	0.3	4667	4667
Bell-Davies Drive 11 & 12	0.3	0.3	4678	4678
Beamount Close 6, 7, 8	0.5	0.5	4450	4450
Tollemache Cl 14	0.5	0.5	4504	4504
Tollemache Cl 10 &12	0.6	0.6	3821	3821

Key	Cell colour
Achieves Compliance	
Fails Compliance	

These results are shown pictorially below using an overmark of figure 1 from the Institute of Lighting Professionals Guidance Notes for the Reduction of Obtrusive Light GN01:2011.

Figure 1 – Types of obtrusive light



Measures to mitigate the effects are discussed in Section 5 below.

6 MITIGATION MEASURES

The results of the outline lighting scheme calculations indicate that the Luminaire Intensity criterion is not met in relation to some of the residences on Bell-Davis Drive, Beamount Close and Tollemache Close. The results show that, at these locations, the following luminaires do not comply with the Environmental Zone E2 post-curfew Luminaire Intensity threshold of 500 candelas.

The calculation results indicate that the following luminaires do not meet the criteria for some of the neighbouring residences on Bell-Davis Drive, Beamount Close and Tollemache Close. These are:

- Ref 2 Apron 1 AAA Lux luminaire mounted on 25 metre lighting column
- Ref 3 Apron 1 AAA Lux luminaire mounted on 25 metre lighting column
- Ref 370 Apron 3 AAA Lux luminaire mounted on 15 metre lighting column
- Ref 371 Apron 3 AAA Lux luminaire mounted on 15 metre lighting column
- Ref 372 Apron 3 AAA Lux luminaire mounted on 15 metre lighting column

Suitable mitigation measures to limit the luminous intensity from these luminaires will include the following strategies;

- Introduction of Landscaping measures to obscure the luminaires from the residences
- Improvement in luminaire technology and optics
- Lighting control strategies

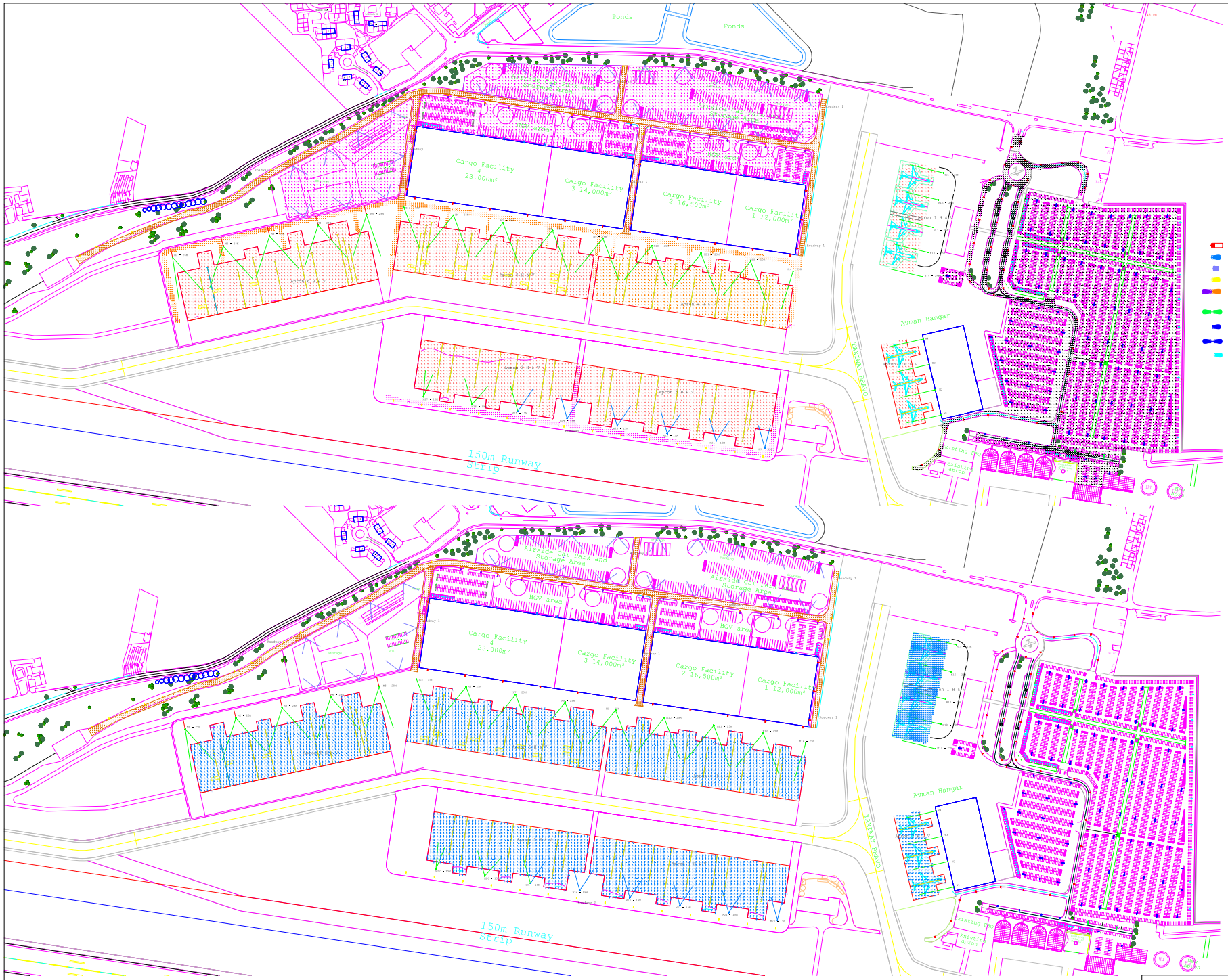
The landscaping strategy would consist of the introduction of additional landscape planting between the potentially affected residences and the relevant luminaires. Existing mature boundary planting is proposed to be retained on the western boundary adjacent to Spitfire Way with further enhancement through additional screen planting of predominantly native species to provide a continual vegetated boundary. Planting would consist of a mix of evergreen and deciduous varieties for seasonal interest, prevent roasting birds and provide year round screening to the neighbouring residential properties. Where space allows earth bunding is proposed to be introduced to provide immediate enclosure at lower level and boost the height of planting to reduce the length of time needed for screening to become effective. The planting belts are intended to be typically between 25-30m deep where space allows and reducing down to 15-20m in more confined areas with bunds in the region of 1-2m high. The need to retain and respect existing planting in some areas will limit the extent of earth bunds. Further details of the landscape strategy to mitigate these effects is provided in the Design Guide.

Alternatively, the development of LED luminaire and their optics is continuing to develop and the luminaires the current scheme is based on may be superseded by newer variants which have improved optic or glare shields to limit obtrusive light luminous intensity.

A third strategy would be to utilise lighting control strategies to limit the impact of these luminaires, including dimming or selected switching of the luminaires to provide a reduced level of illumination to the apron during post curfew hours.

Appendix A

Lighting Layout Airport



Abacus®
Leaders in Lighting

ABACUS LIGHTING LTD.
Sutton-in-Ashfield, Nottinghamshire
NG17 5FT England
Tel: (+44) 01623 511111
Fax: (+44) 01623 552133
Email: light@abacuslighting.com
Home page: www.abacuslighting.com

Lighting Project: Horizontal Illuminance Levels

Title: Manston Airport

Design Ref: LS23939-4

Design By: Rebecca Houchin

Date: 31/1/2019 | Scale: 1:2000 @ A0

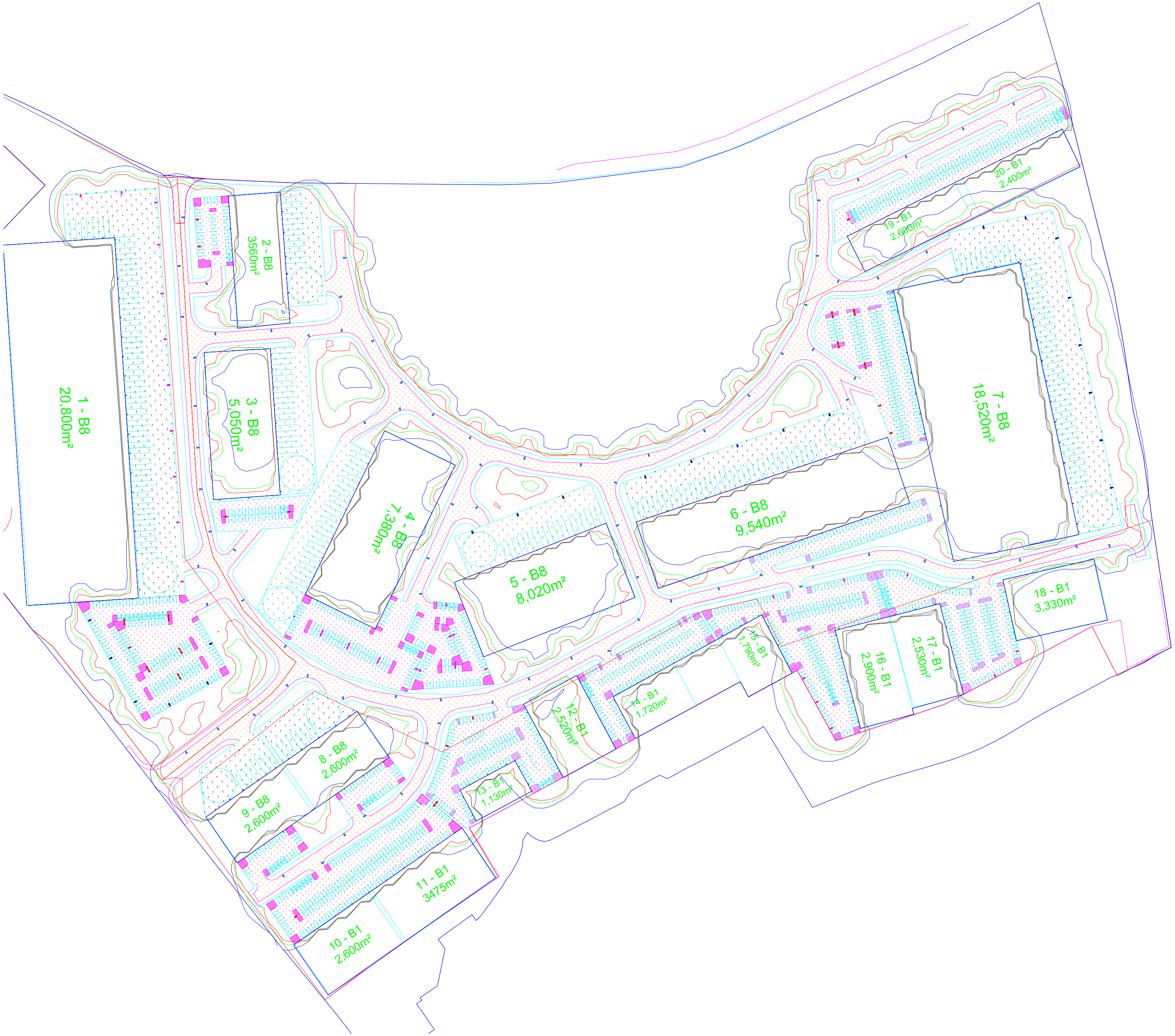
Revision(s) From Previous Design:
New DWG layout
Reduce sky glow
Add the overflow carpark and roadway

ISO 9001 : ISO 14001
OHSAS 18001

Appendix B

Lighting Layout Business Park

Abacus®
Leaders in Lighting



LIGHTING EQUIPMENT

22x 8m Columns Each Carrying the Following Luminaires:-
1 x AL610002 / 60 / 4K
Post Top

84x 8m Columns Each Carrying the Following Luminaires:-
1 x AL610002 / 80 / 4k
Post top

11x 8m Columns Each Carrying the Following Luminaires:-
1 x AL610003 / 60 / 4K
Post Top

21x 8m Columns Each Carrying the Following Luminaires:-
1 x AL610003 / 80 / 4k
Post top

10x 8m Columns Each Carrying the Following Luminaires:-
2 x AL610003 / 60 / 4K
Twin Bracket
Bracket Projection 0.5

6x 8m Columns Each Carrying the Following Luminaires:-
2 x AL610003 / 80 / 4k
Twin Bracket
Bracket Projection 0.5

1x 8m Columns Each Carrying the Following Luminaires:-
2 x AL21102 / 90 / S1S112
Twin Bracket

50x 10m Wall mounted Luminaires:-
1x AL21102 / 120 / S1S112

144x 10m Wall mounted Luminaires:-
1x AL21102 / 90 / S1S112

HORIZONTAL ILLUMINANCE LEVELS

Main Road
Average Horizontal Illuminance (E.av): 23 Lx
Minimum Horizontal Illuminance (E.min): 6 Lx
Uniformity Ratio (E.min / E.av): 0.26

Unit 2 Access Road
Average Horizontal Illuminance (E.av): 21 Lx
Minimum Horizontal Illuminance (E.min): 6 Lx
Uniformity Ratio (E.min / E.av): 0.27

Unit 1 Service Yard
Average Horizontal Illuminance (E.av): 21 Lx
Minimum Horizontal Illuminance (E.min): 6 Lx
Uniformity Ratio (E.min / E.av): 0.29

Unit 1 Car park
Average Horizontal Illuminance (E.av): 21 Lx
Minimum Horizontal Illuminance (E.min): 6 Lx
Uniformity Ratio (E.min / E.av): 0.29

Unit 2 Service Yard
Average Horizontal Illuminance (E.av): 20 Lx
Minimum Horizontal Illuminance (E.min): 5 Lx
Uniformity Ratio (E.min / E.av): 0.25

Unit 2 Car park
Average Horizontal Illuminance (E.av): 23 Lx
Minimum Horizontal Illuminance (E.min): 6 Lx
Uniformity Ratio (E.min / E.av): 0.25

Unit 3 Service Yard
Average Horizontal Illuminance (E.av): 20 Lx
Minimum Horizontal Illuminance (E.min): 5 Lx
Uniformity Ratio (E.min / E.av): 0.25

Unit 3 Car park
Average Horizontal Illuminance (E.av): 24Lx
Minimum Horizontal Illuminance (E.min): 11Lx
Uniformity Ratio (E.min / E.av): 0.45

Unit 4 Service Yard
Average Horizontal Illuminance (E.av): 20 Lx
Minimum Horizontal Illuminance (E.min): 5 Lx
Uniformity Ratio (E.min / E.av): 0.25

Unit 4 Car park
Average Horizontal Illuminance (E.av): 23Lx
Minimum Horizontal Illuminance (E.min): 6 Lx
Uniformity Ratio (E.min / E.av): 0.25

Unit 5 Service Yard
Average Horizontal Illuminance (E.av): 20 Lx
Minimum Horizontal Illuminance (E.min): 5 Lx
Uniformity Ratio (E.min / E.av): 0.25

Unit 5 Car park
Average Horizontal Illuminance (E.av): 21 Lx
Minimum Horizontal Illuminance (E.min): 6 Lx
Uniformity Ratio (E.min / E.av): 0.27

Unit 6 Service Yard
Average Horizontal Illuminance (E.av): 20 Lx
Minimum Horizontal Illuminance (E.min): 8 Lx
Uniformity Ratio (E.min / E.av): 0.36

Unit 6 Car park
Average Horizontal Illuminance (E.av): 24 Lx
Minimum Horizontal Illuminance (E.min): 7Lx
Uniformity Ratio (E.min / E.av): 0.28

Unit 7 Service Yard
Average Horizontal Illuminance (E.av): 22x
Minimum Horizontal Illuminance (E.min): 6x
Uniformity Ratio (E.min / E.av): 0.27

Unit 7 Car park
Average Horizontal Illuminance (E.av): 24 Lx
Minimum Horizontal Illuminance (E.min): 7 Lx
Uniformity Ratio (E.min / E.av): 0.29

Unit 8 Service Yard
Average Horizontal Illuminance (E.av): 24Lx
Minimum Horizontal Illuminance (E.min): 6Lx
Uniformity Ratio (E.min / E.av): 0.27

Unit 8 Car park
Average Horizontal Illuminance (E.av): 21 Lx
Minimum Horizontal Illuminance (E.min): 8Lx
Uniformity Ratio (E.min / E.av): 0.37

Unit 9 Service Yard
Average Horizontal Illuminance (E.av): 22Lx
Minimum Horizontal Illuminance (E.min): 6 Lx
Uniformity Ratio (E.min / E.av): 0.27

Unit 9 Car park
Average Horizontal Illuminance (E.av): 20 Lx
Minimum Horizontal Illuminance (E.min): 5 Lx
Uniformity Ratio (E.min / E.av): 0.25

Unit 10+11 Car park
Average Horizontal Illuminance (E.av): 20 Lx
Minimum Horizontal Illuminance (E.min): 5 Lx
Uniformity Ratio (E.min / E.av): 0.25

Unit 13 Car park
Average Horizontal Illuminance (E.av): 22 Lx
Minimum Horizontal Illuminance (E.min): 7 Lx
Uniformity Ratio (E.min / E.av): 0.32

Unit 12+14 Car park
Average Horizontal Illuminance (E.av): 21 Lx
Minimum Horizontal Illuminance (E.min): 7 Lx
Uniformity Ratio (E.min / E.av): 0.33

Unit 15-16 Car park
Average Horizontal Illuminance (E.av): 22 Lx
Minimum Horizontal Illuminance (E.min): 6 Lx
Uniformity Ratio (E.min / E.av): 0.27

Unit 17-18 Car park
Average Horizontal Illuminance (E.av): 21 Lx
Minimum Horizontal Illuminance (E.min): 7 Lx
Uniformity Ratio (E.min / E.av): 0.33

Unit 19-20 Car park
Average Horizontal Illuminance (E.av): 20 Lx
Minimum Horizontal Illuminance (E.min): 5 Lx
Uniformity Ratio (E.min / E.av): 0.25

Grid Intervals 5m ,3m
Grid Values in Lux
Contours Values 3, 2 & 1 Lux

Maintanace Factor: 0.90
Location: Medium Pollution
Cleaning Intervals: 18 Months

SKY GLOW Calculation (UWLR) 2%

LLOYD'S REGISTER · LRQA
ISO 9001 · ISO 14001
OHSAS 18001

ABACUS LIGHTING LTD.
Sutton-in-Ashfield, Nottinghamshire
NG17 5FT England
Tel: (+44) 01623 511111
Fax: (+44) 01623 552133
Email: light@abacuslighting.com
Home page: www.abacuslighting.com

Lighting Project: Horizontal Illuminance Levels
Title: Manston Buisness Park
Design Ref: LS23984-4
Design By: Rebecca Houchin
Date: 30/1/2019
Scale: 1:1000 @ A0

Revision(s) From Previous Design:
Lighting amended to reduce over spill outside of boundary
Reduce Sky Glow below 2.5%

All illuminance values are the result of computer calculations, based upon precisely positioned luminaires in a fixed relationship to each other and to the area under examination. In practice the values may vary due to tolerances on luminaires, luminaire positioning, reflection properties and electrical supply.

Appendix C

Proposed luminaire types

AL-Series LED
AL60, AL90, AL180, AL700
IP65

Abacus®
Leaders in Lighting

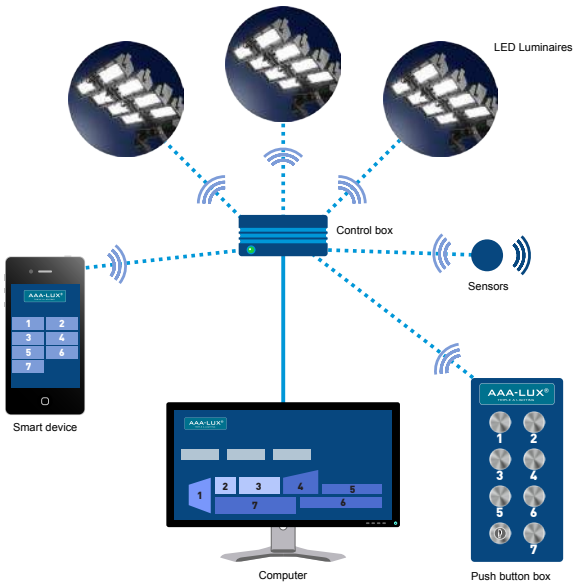
High quality LED area floodlight with wireless control system available in a variety of distributions to suit large area lighting.

Benefits

- Wireless control simplifies operation for ease of use
- Centrally monitor and adjust power consumption
- Control system enables efficient planning of maintenance
- No re-lamping costs
- Instant startup allows the light to be switched on and off as and when required, thus saving energy costs by reducing power consumption from wasted light
- Flexible dimming down to 10% for low use and security giving substantial energy savings over conventional HID lamps
- Increased system efficiency by reducing wasted light

AAA-LUX light management system

The system can be remotely monitored from a central location via computer. Wireless push button boxes or proximity sensors at entry gates can send information to the control box to activate the lights or alternatively smart devices can be used to give the same control. These signals are fed into the system and will activate the desired pre-programmed lighting scenes. In case of emergency, all lights can be switched to maximum at the central console. The facility manager can analyse the energy consumption of the system, and optimize between lighting level and energy costs. With a remote access module, an installer can access the system and inspect the luminaires and light management system. Based on luminaire data, maintenance can be scheduled.



Technical features

- Controllable via smart devices, touch screen or wireless switch box
- Mounting height 12-45m
- 3 phase as standard
- Single phase option available
- Marine grade as standard
- Die cast aluminium polyester powder coated body with integrated heat sink and flexible bracket mount
- Lenses installed behind toughened flat glass for maximum integrity of the lenses
- High powered 1.375kW luminaire (AL60, AL90, AL180)
- High powered 0.690kW luminaire (AL700)
- Dimmable in accordance with EN12193
- Highly efficient optics

Lighting distribution

- Available in 60°, 90°, 180° distributions

Colour

- Black

Applications

- Large area
- Ports & terminals
- Airports
- Car parks

Lighting control & AL-Series

When different zones of a site require full lighting levels and others need to be dimmed at different times through the dark hours, the dimmed zones can be brought back up to full lighting levels instantly for emergencies or to allow maximum dimming duration between working time of the zones. This saves energy, keeps running costs low and increases the level of site security.

Energy saving - Total-cost-of-ownership

- Dimmed to the right level
- Switched on when needed
- Short ROI

Conventional luminaires are based on Metal Halide (MH) or High Pressure Sodium (HPS) lamps. These sources have a start-up and cooling period and cannot be dimmed. Over lifetime these lamps suffer from significant lumen depreciation, which means that new installations over-illuminate the area every night by approximately 40%. Even areas with no activity, but camera surveillance only, are illuminated at full power with MH or HPS light sources. With the AAA-LUX lighting management system luminaires are set at the requested illumination level. Areas with no human activities are dimmed to camera level, increasing energy savings above 70%. Beside this, the projected 15 year lifetime reduces lamp replacements costs as well. In many cases, our TCO model calculates breakeven times below 3 years.

Easy replacement

- Direct 400VAC connection
- Wireless control
- No complicated bracketry

Electrically the luminaire will be connected to existing 400 VAC electrical installations. Even the existing light switches can remain in place. However, in case of new installation, cabling costs are significantly lower. First, the product has no in-rush of start-up current, resulting in a much simpler cabling layout and also, fuses can have a lower rating. Secondly, with the wireless control of the luminaires no extra control cabling is needed.

AL-Series LED
AL60, AL90, AL180, AL700
IP65

Abacus®
Leaders in Lighting

Technical data

AL60, AL90, AL180	Minimum	Typical	Maximum	Unit
Voltage input	370	400	430	VAC
Power factor at 20%-100%	0.90	0.98		
Frequency	45		60	Hz
Standby power		5		W
Colour temperature		5200		K
Colour rendering index	70	80		
Weight		28		kg
Ingress protection		IP65		
Electrical insulation class		I		
Frontal surface		0.26 C_w = 1		
Expected lifetime at Tamb = 25°C		60,000	100,000	hrs
Power consumption at 100% Standard - Heavy Duty High Temperature		 1375 1200	 1425 1250	 W W
Current Standard - Heavy Duty High Temperature		At 400VAC 3.5 3.2	At 375VAC 3.9 3.5	 A A
Operating temperature Standard - Heavy Duty High Temperature	 -20 -20		 40 50	 °C °C
Luminous efficacy * Standard - Heavy Duty High Temperature	 103.3 114.1	 113.1 117.2	 140 140	 lm/W lm/W

** Based on the AL90*

AL700	Minimum	Typical	Maximum	Unit
Voltage input	370	400	430	VAC
Power factor at 20%-100%	0.90	0.98		
Frequency	45		60	Hz
Standby power		5		W
Colour temperature		5200		K
Colour rendering index	70	80		
Weight		17		kg
Ingress protection		IP65		
Electrical insulation class		I		
Frontal surface		0.26 C_w = 1		
Expected lifetime at Tamb = 25°C		60,000	100,000	hrs
Power consumption at 100% Standard - Heavy Duty High Temperature		 700 600	 725 625	 W W
Current Standard - Heavy Duty High Temperature		At 400VAC 1.7 1.5	At 375VAC 1.8 1,6	 A A
Operating temperature Standard - Heavy Duty High Temperature	 -20 -20		 40 50	 °C °C
Luminous efficacy * Standard - Heavy Duty High Temperature	 109.7 114.8	 11.38 117.9	 140 140	 lm/W lm/W

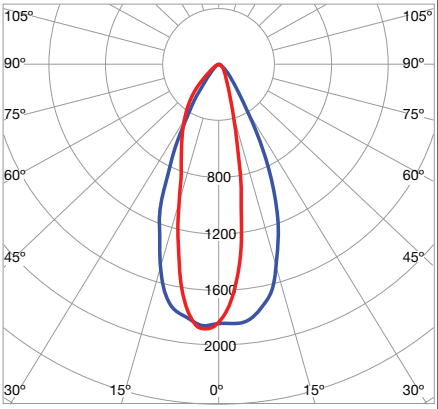
** Based on the AL710*

DocID: datasheet-aaalux-al-series:20170308

AL-Series LED
AL60, AL90, AL180, AL700
IP65

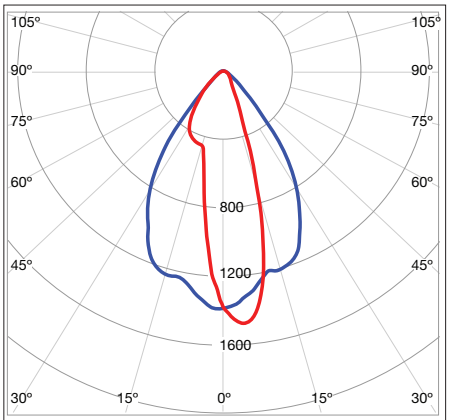
Abacus®
Leaders in Lighting

Polar intensity



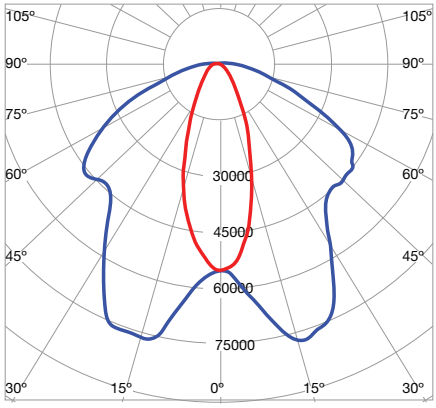
cd/klm
C0 - C180
C90 - C270

AL60
Lamp: 8 LED Modules



cd/klm
C0 - C180
C90 - C270

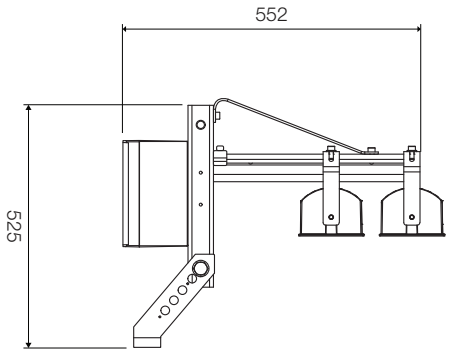
AL90
Lamp: 8 LED Modules



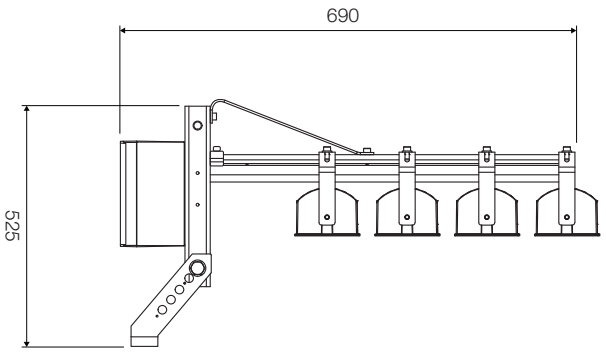
cd/klm
C0 - C180
C90 - C270

AL180
Lamp: 8 LED Modules

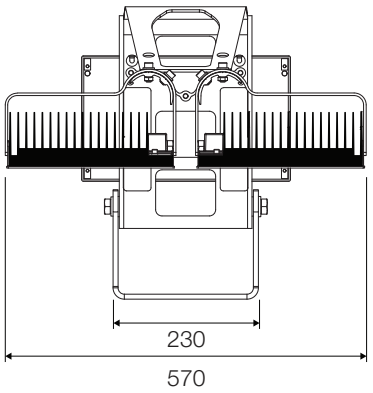
Dimensions (mm)



4 module



8 module



AL62000 Series
IP66
IK09

Abacus®
Leaders in Lighting

An aerodynamic road lighting luminaire designed to integrate perfectly into urban spaces. With its modular construction, upgrades and replacements of key components such as; power supply, light engine and LED modules, ensure the luminaire takes full advantage of technological improvements.

Available in two body sizes and offering 10 standard lumen packages, from 1,450 to 19,350 lumens, the AL62000 Series comes with six different optics to suit a wide variety of lighting scenarios.

With a lifetime of >65,000 hours (L80B10) combined with an efficacy of >112 lm/W, the AL62000 Standard series keeps operating and maintenance costs to an absolute minimum. With the Premium version, this is increased to a lifetime of >150,000 hours (L80B10) combined with an efficacy of > 125 lm/W.

Constructed from lightweight die cast aluminium, the body is powder coated for protection against oxidisation in even in the harshest of conditions. The lower cover is made of ASA plastic, which has a proven long lifetime in environments with fast, frequent and significant changes in temperature.

Cooling fins create a large upper surface area which prolongs the lifespan of the luminaire by providing excellent heat transfer, even in ambient temperatures in excess of 50˚C.

IP66 is achieved with the help of FIPFG (formed in place foam gaskets) technology, by ensuring the correct formation of the seal, the luminiare enjoys a high level of protection from the environment.

Benefits

- Easily maintained
- Durable die cast aluminium housing
- Flexibility with vertical or horizontal spigot mounting
- Multiple optics
- -40˚C to +40˚C

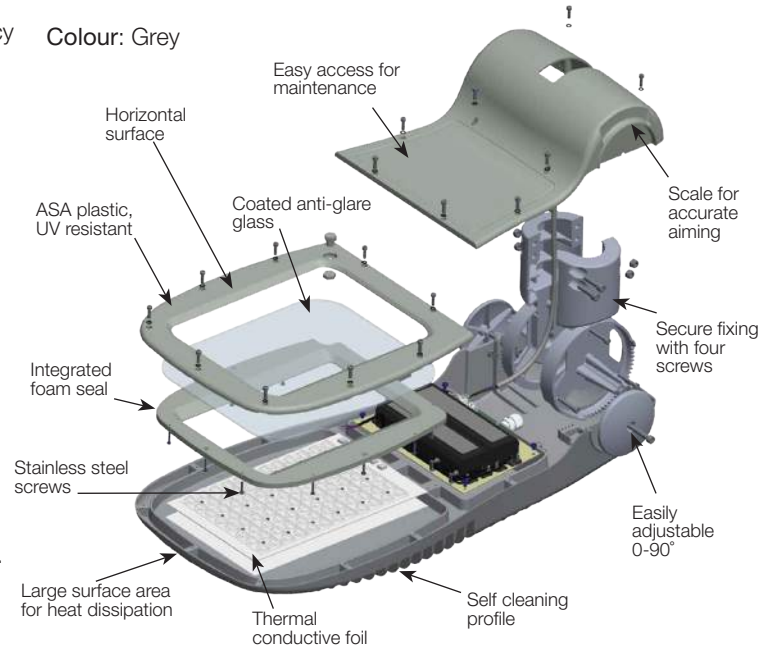
Key technical features

- Controls; Dali, 1-10V, RF or PLC (specify at enquiry)
- Efficacy up to 112 lm/W
- Integrated 5 level dimming module (optional)
- Protection against overheating
- Constant light output (optional)
- Time-dependant luminous flux control
- Power reduction; flexible luminous flux
- IP66 and IK09 rated
- Colour temperature 4000K as standard (options available)
- CRI ≥70
- Power supply 220Vac - 277Vac
- Standard surge protection 4kV (10kV option available)
- Solar options available in 26W and 56W

Applications

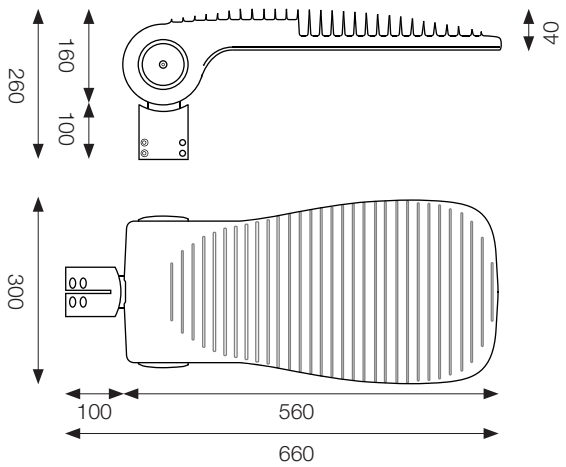
- Road
- Rail
- Open area
- Amenity

Colour: Grey

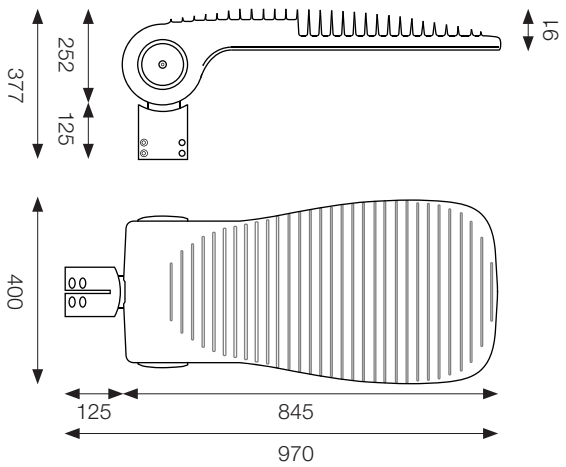


Dimensions (mm)

Body type #1



Body type #2

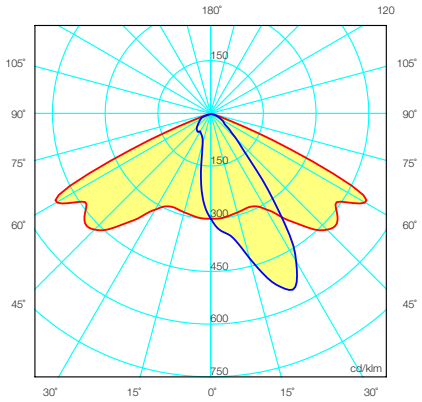


DocID: datasheet-cerus-AL2000-20171107

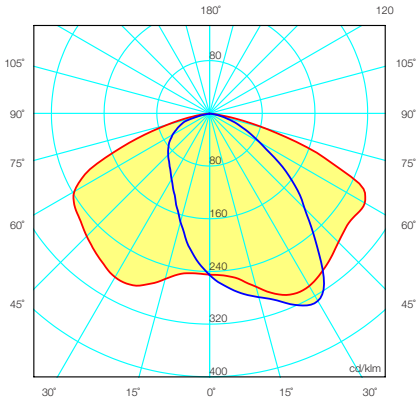
AL62000 Series
IP66
IK09

Abacus®
Leaders in Lighting

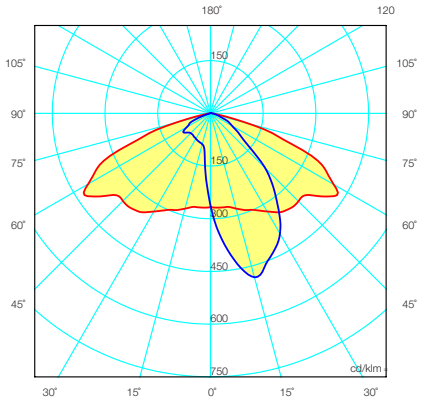
Optics



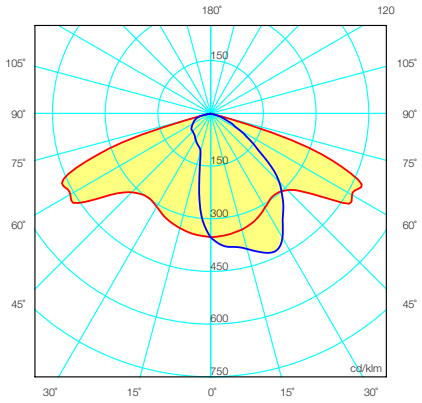
(000) Suitable for larger distance between poles and high mounting installations



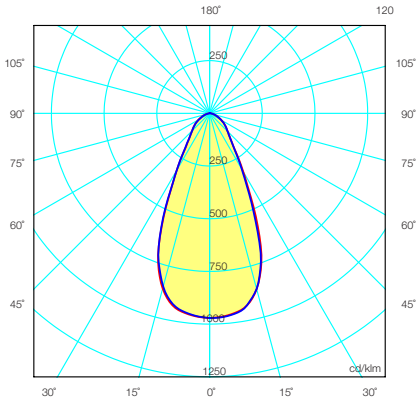
(001) Suitable for wider roadways with smaller distances between poles



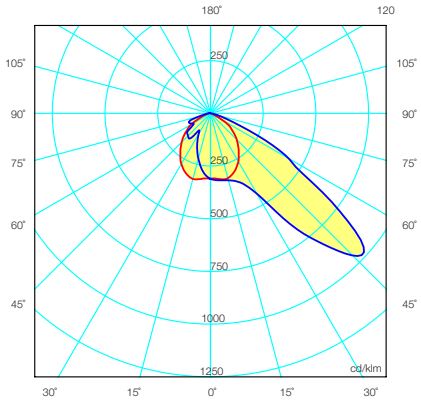
(002) Suitable for narrower roadways across roads, cycling and pedestrian areas



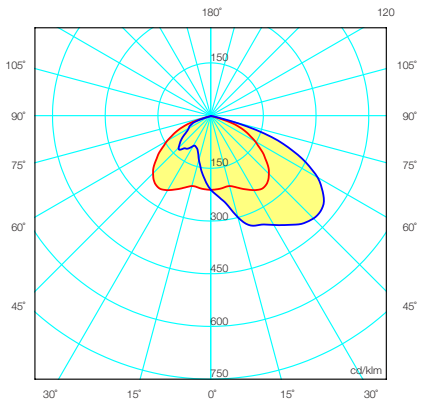
(100) Suitable for parking spaces and pedestrian crossings



(101) Suitable for parking spaces and small distance between poles



(010) Suitable for larger distance between poles and high mounting installations. Higher uniformity factor



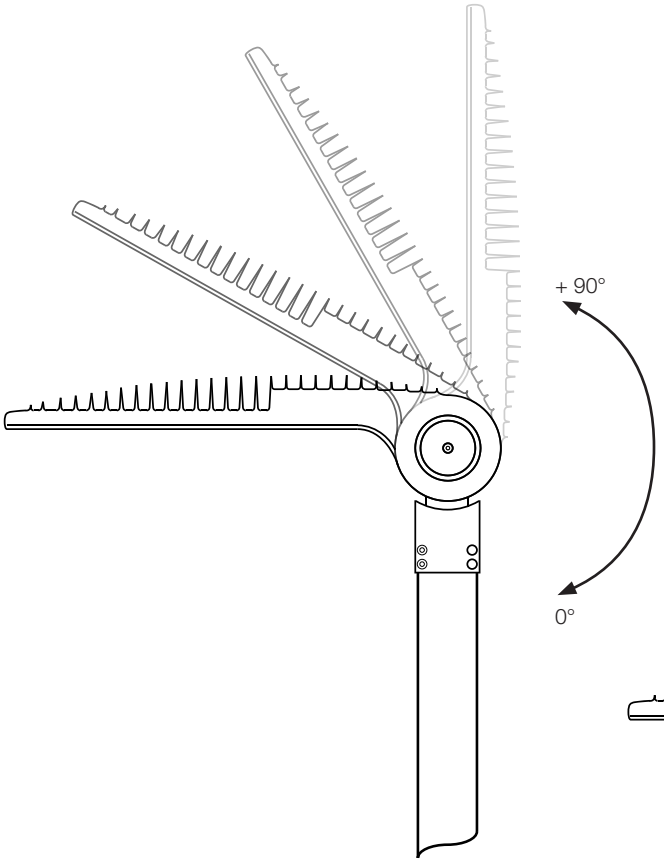
(110) Suitable for wide roadways and parking spaces with smaller distances between poles

AL62000 Series
IP66
IK09

Abacus®
Leaders in Lighting

Technical Specification	Body type 1	Body type 2
Lifetime L80B10	> 65,000 hours	
Supply voltage	220Vac - 240Vac 50,60Hz	
LED	8-24	48-96
Power (W)	15 - 80	80 - 220
Light flux (lm)	1,200 - 5,100	7,530 - 15,540
Power factor	> 0.96	
CCT	4,000 - 4,500K; 4 Step McAdam (6,000K or 3,800K upon request)	
Factor of colour rendering CRI	≥ 70	
Mechanical strength	IK09	
Protection class	IP66	
Additional surge protection	4kV (class II) standard; (10kV (class I) optional)	
Operating temperature	-40˚C to +55˚C	
Weight	7kg	15kg
EPA rating	0.0552m²	0.0862m²
Dimensions (mm)	660 x 300 x 260	970 x 400 x 377
Mounting	60mm pole (adaptor required for other columns dimensions)	
Tilt	-10˚ to +15˚ (horizontal and vertical installation)	
Certificates	IEC 60529:2001; EN 60598-1:2008; cl.9.2.2 & 9.2.7; IEC 60598-2-3 (Third edition):2002 +A1:2011 used in conjunction with IEC 60598-1 (Seventh edition): 2008; IEC 60598-26:1994+A1:1996 used in conjunction with IEC 60598-1:2008; EC 62031:2008 (First edition); CE; ENEC; ZIK	
Guarantee	5 years on electrical, 10 years on mechanical	
Wireless control	Optional	

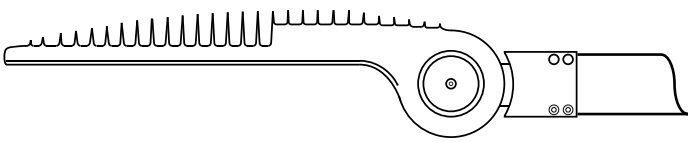
Installation



The rotor enables both side and post top mounting of the luminaire on a 60mm diameter pole. Angular adjustments can be made between 0-90° in ± 5° increments. A security system within the rotor mechanism prevents unintentional tilting, thus preventing possible damage occuring during installation or maintenance of the light fitting.

To provide maximum security and robustness of installation, four screws are used to fix the light fitting to the pole.

Mounting pole: ø60 mm (adapter available for other dimensions)
Tilt: 0 - 90°, step ± 5°
Weight: Body type 1: 7 kg
Body type 2: 15 kg



AL62000 Series
IP66
IK09

Abacus®
Leaders in Lighting

Luminaire code	LED type	Luminaire Wattage (W)	Luminaire - Lumen output (lm)	Number of LEDs	Body type	Light distribution type	Weight (kg)	Wind area (m^2)
AL62001	Standard	15	1450	8	1	(000) Suitable for larger distance between poles and high mounting installations	7	0.0552
		30	2850	12	1		7	0.0552
		40	3800	24	1		7	0.0552
		60	5820	24	1		7	0.0552
		80	8400	24	1		7	0.0552
		80	8490	48	2		15	0.0862
		95	10500	80	2		15	0.0862
		120	11450	48	2		15	0.0862
		140	14900	80	2		15	0.0862
		190	19350	96	2		15	0.0862
AL62002	Standard	15	1450	8	1	(001) Suitable for wider roadways with smaller distances between poles	7	0.0552
		30	2850	12	1		7	0.0552
		40	3800	24	1		7	0.0552
		60	5820	24	1		7	0.0552
		80	8400	24	1		7	0.0552
		80	8490	48	2		15	0.0862
		95	10500	80	2		15	0.0862
		120	11450	48	2		15	0.0862
		140	14900	80	2		15	0.0862
		190	19350	96	2		15	0.0862
AL62003	Standard	15	1450	8	1	(002) Suitable for narrower roadways across roads, cycling and pedestrian areas	7	0.0552
		30	2850	12	1		7	0.0552
		40	3800	24	1		7	0.0552
		60	5820	24	1		7	0.0552
		80	8400	24	1		7	0.0552
		80	8490	48	2		15	0.0862
		95	10500	80	2		15	0.0862
		120	11450	48	2		15	0.0862
		140	14900	80	2		15	0.0862
		190	19350	96	2		15	0.0862
AL62004	Standard	15	1450	8	1	(100) Suitable for parking spaces and pedestrian crossings	7	0.0552
		30	2850	12	1		7	0.0552
		40	3800	24	1		7	0.0552
		60	5820	24	1		7	0.0552
		80	8400	24	1		7	0.0552
		80	8490	48	2		15	0.0862
		95	10500	80	2		15	0.0862
		120	11450	48	2		15	0.0862
		140	14900	80	2		15	0.0862
		190	19350	96	2		15	0.0862

AL62000 Series
IP66
IK09

Abacus®
Leaders in Lighting

Luminaire code	LED type	Luminaire Wattage (W)	Luminaire - Lumen output (lm)	Number of LEDs	Body type	Light distribution type	Weight (kg)	Wind area (m^2)
AL62005	Standard	15	1450	8	1	(101) Suitable for parking spaces and small distance between poles	7	0.0552
		30	2850	12	1		7	0.0552
		40	3800	24	1		7	0.0552
		60	5820	24	1		7	0.0552
		80	8400	24	1		7	0.0552
		80	8490	48	2		15	0.0862
		95	10500	80	2		15	0.0862
		120	11450	48	2		15	0.0862
		140	14900	80	2		15	0.0862
		190	19350	96	2		15	0.0862
AL62006	Standard	15	1450	8	1	(010) Suitable for larger distance between poles and high mounting installations. Higher uniformity factor	7	0.0552
		30	2850	12	1		7	0.0552
		40	3800	24	1		7	0.0552
		60	5820	24	1		7	0.0552
		80	8400	24	1		7	0.0552
		80	8490	48	2		15	0.0862
		95	10500	80	2		15	0.0862
		120	11450	48	2		15	0.0862
		140	14900	80	2		15	0.0862
		190	19350	96	2		15	0.0862
AL62007	Standard	15	1450	8	1	(110) Suitable for wide roadways and parking spaces with smaller distances between poles	7	0.0552
		30	2850	12	1		7	0.0552
		40	3800	24	1		7	0.0552
		60	5820	24	1		7	0.0552
		80	8400	24	1		7	0.0552
		80	8490	48	2		15	0.0862
		95	10500	80	2		15	0.0862
		120	11450	48	2		15	0.0862
		140	14900	80	2		15	0.0862
		190	19350	96	2		15	0.0862

ARTE FLOOD
AL21102

Abacus®
Leaders in Lighting

IP66
Class I

A bracket mounted LED floodlight offering superior light quality with significant energy savings. Ideal for use in large area or sports applications.

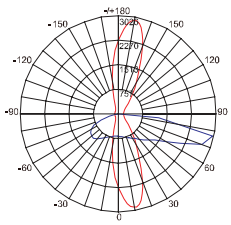
Benefits

- Upgradeable and replaceable LED modules allow for ease of maintenance and low costings
- Worldwide safety, eco-friendly and photometrics standard compliant
- Shorter payback period based on most competitive ownership cost and operating cost

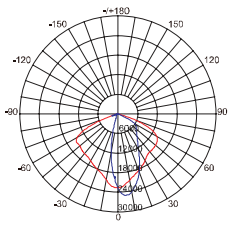
Photometric Guide

Optical pattern

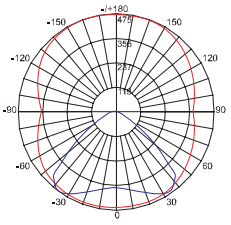
Lens Code: A3L112



Lens Code: A7M111



Lens Code: S1S112



Luminous intensity Unit :	cd/klm
CRI :	>70
CCT :	5000±300K

Light distribution & LENS Kit Options:	A3L112 (Type III) A7M111 (Type VII) S1S112 (Type IV)

Features

- Die-cast aluminium housing
- Extruded aluminium heatsink
- Polycarbonate plastic optics lens
- LED light source: CREE or Lumileds
- LED drivers: Philips
- Modular design, 14 LEDs each module
- Multiple dimming options including: 0-10V Dimming for Energy Savings, DALI for remote monitoring and reporting and networking or Integrated Dynadim for hassle free, wireless dimming
- Top quality LED light source and LED electronic driver

Colour

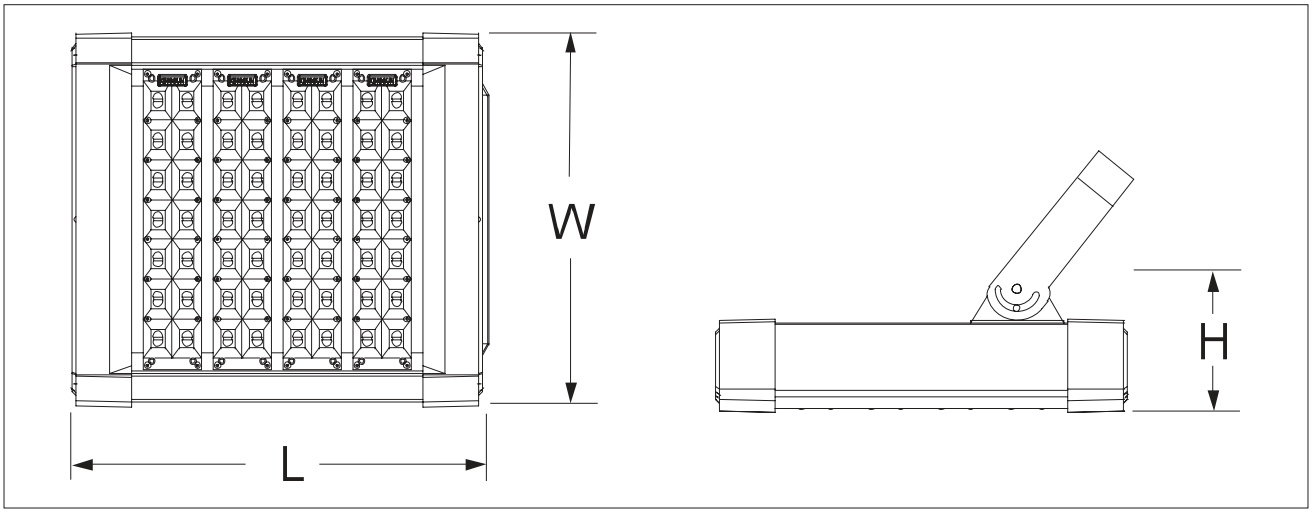
- Black

Applications

- Area
- Sport

Dimensions (mm)

Dimensions listed in information table



ARTE FLOOD
AL21102

Abacus®
Leaders in Lighting

IP66
Class I

	Nominal Power (W)	System Power (W)	LED Modules	Lumen Output at 5000K (lm)	Driver Efficiency	Dimensions (mm)
AL21102 / 30	30	33	1 x 14	3100	>91%	L229 x W330 x H259
AL21102 / 60	60	62	2 x 14	5800	>91%	L253 x W330 x H259
AL21102 / 90	90	93	3 x 14	8800	>91%	L315 x W330 x H259
AL21102 / 120	120	123	4 x 14	12300	>92%	L337 x W330 x H259
AL21102 / 150	150	155	5 x 14	15500	>92%	L439 x W330 x H259
AL21102 / 180	180	185	6 x 14	18500	>92%	L501 x W330 x H259
AL21102 / 210	210	216	7 x 14	21600	>92%	L563 x W330 x H259
AL21102 / 240	240	246	8 x 14	24600	>92%	L635 x W330 x H259
AL21102 / 270	270	277	9 x 14	27700	>92%	L687 x W330 x H259
AL21102 / 300	300	308	10 x 14	30800	>92%	L749 x W330 x H259

Operating Temperature & Humidity:	-35°C ~ 50°C / ≤95%	Input Voltage Options:	AC 220-240V AC 120-277V AC 347-480V
Power Factor:	> 0.95		

VELA LED
AL7000 Series
IP66

Abacus
Leaders in Lighting

Benefits

- Ease of maintenance and replacement of parts due to the modular construction
- Effective light control and low light output ratio (ULOR) with the design of the outer body and canopy

Technical features

- Various wattages available between :196W - 609W
- 250W driver (IP67)
- Colour temperature: 5000K
- CRI: 70
- Cree / Philips Lumileds
- Single phase 230V
- Single plug and play high quality connector for power and controls
- Running current: 700 mA
- Lumens per watt circa 102.5+lm / W
- 1-10V dimming available as standard
- Three distribution types available: narrow, medium, wide
- Low upward light output ratio (ULOR)
- Die cast aluminium black LED modules
- 3mm sheet aluminium outer body
- Polyester power coated body as standard, finished silver (RAL 9006)
- Mounting bracket options: under slung or over slung
- Modular construction

Applications

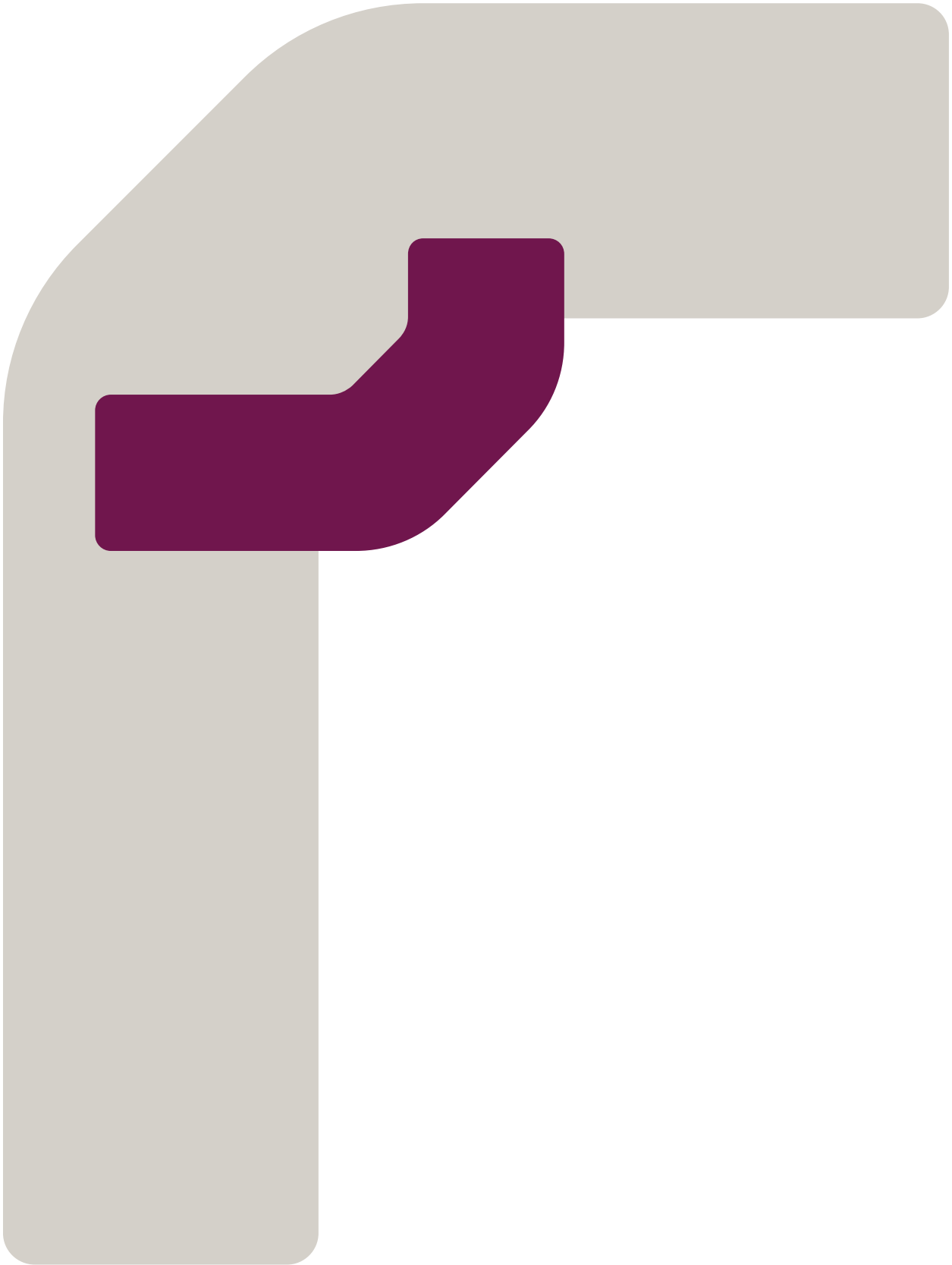
- Area
- Sport

Colour

- Silver (RAL 9006)

Code	Wattage (W)	Lumen Output (lm)	Number of LED Modules	Number of LEDs	Beam Distribution	Efficacy	Drivers	Effective Projection Area	Weight (kg)
AL7001	396	42059	2	48	Narrow	106.2	2 x 250W (On the fitting)	0.328	27
AL7002	396	41428	2	48	Medium	104.6	2 x 250W (On the fitting)	0.328	27
AL7003	394	40787	2	48	Wide	103.5	2 x 250W (On the fitting)	0.328	27
AL7004	609	64957	3	72	Narrow	106.7	3 x 250W (Remote)	0.23	31.4
AL7005	609	63008	3	72	Medium	103.5	3 x 250W (Remote)	0.23	31.4
AL7006	609	61118	3	72	Wide	100.4	3 x 250W (Remote)	0.23	31.4
AL7007	196	20516	1	24	Wide	104.7	1 x 250W (On the fitting)	0.246	16
AL7008	396	44036	1	24	Extra Narrow	111.2	1 x 250W (On the fitting)	0.328	27

REPORT



www.rpsgroup.com

Appendix B
Manston Airport Lighting Impact Assessment – Baseline Survey Report (SDS Ltd, 2018)

SDS Exeter
info@sdsolution.co.uk
01392 444 105
Services Design Solution Ltd
6 Kew Court, Rydon Lane,
Pynes Hill, Exeter, EX2 5AZ

Manston Airport

Lighting Impact Assessment – Baseline Survey Report

Manston Airport

Lighting Impact Assessment – Baseline Survey Report

Project: 04138L

Current revision: 0.2

Date of issue: 14.02.18

Prepared by: Bonnie Brooks MSc CEng MCIBSE MSLL

Rev	Date	Changes	Author	Checked
0.1	31.01.18	First Issue	Bonnie Brooks	Nigel Orpin
0.2	14.02.18	Revisions to Amec Foster Wheeler /Woods Comments	Bonnie Brooks	Nigel Orpin

Contents

1. INTRODUCTION

1.1. Scope of the Report

Services Design Solution have been commissioned by Amec Foster Wheeler/ Woods to undertake a Lighting Impact Assessment for the proposed development on land at Manston Road, Manston, Ramsgate.

The aims and purpose of the proposed development are to reopen and develop Manston Airport into a dedicated air freight facility, which also offers passenger, executive travel and aircraft engineering services.

The aim of the Lighting Impact Assessment is to provide an assessment of the impact of the external lighting from the proposed development on the existing landscape and sensitive receptors.

Within this report the proposed land take area will be referred to as the 'site'.

1.2. Structure of the Report

This report has been broken down into the following sections:

Section 2 – Outlines the relevant legislation, planning policy and guidance

Section 3 – Summarises the guidance for environmental zone classification and limiting parameters

Section 4 – Describes the methodology of the baseline lighting survey

Section 5 – Contains the baseline lighting appraisal of the considered viewpoints and survey locations

Section 6 – Provides recommendations and concludes the baseline survey report

1.3. Site Location

The application site is on the existing site of Manston Airport, west of the village of Manston and north east of the village of Minster, in Kent. The town of Margate lies approximately 5km to the north of the site and Ramsgate approximately 4km to the east. Sandwich Bay is located approximately 4 - 5km to the south east. The northern part of the site is bisected by the B2050 (Manston Road), and the site is bounded by the A299 dual carriageway to the south and the B2190 (Spitfire Way) to the west. The existing site access is from the junction of the B2050 with the B2190.

The site covers an area of approximately 296ha (732 acres) and comprises a combination of existing buildings and hardstanding, large expanses of grassland, and some limited areas of scrub and/or landscaping. This includes the 2,748m long, 60m wide runway, which is orientated in an east-west direction across the southern part of the site. The existing buildings are clustered along the east and north west boundaries of the site.

For full site location details refer to the Preliminary Environmental Information Report and Environmental Statement.

2. Legislation, Planning and Policy Guidance

2.1. Legislative Background

Light pollution was introduced within the Clean Neighbourhoods and Environment Act (2005) as a form of statutory nuisance under the Environmental Protection Act (the 'EPA', 1990), which was amended in 2006 to include the following nuisance definition:

> *"(fb) artificial light emitted from premises so as to be prejudicial to health or nuisance."*

Although light was described as having the potential to cause statutory nuisance, no prescriptive limits or rules were set for impact assessment purposes. Guidance Notes for the Reduction of Obtrusive Light produced by the Institute of Lighting Professionals (ILP) has, therefore, been referred to for the purposes of this assessment.

Guidance produced by Defra, Statutory Nuisance from Insects & Artificial Light (2006) on s101to s103 of the Clean Neighbourhoods and Environment Act (2005) has also been referred to which places a duty on local authorities to ensure that their areas are checked periodically for existing and potential sources of statutory nuisances - including nuisances arising from artificial lighting. Local authorities must take reasonable steps to investigate complaints of such nuisances from artificial light. Once satisfied that a statutory nuisance exists or may occur or recur, local authorities must issue an abatement notice (in accordance with s80(2) of the EPA 1990), requiring that the nuisance cease or be abated within a set timescale.

It should be noted that this act does not apply to artificial light emitted from certain premises, which are used for transport purposes, or where high light levels are required for safety and security reasons. The listed exempt premises include Airports.

2.2. Planning Policy Context

The National Planning Policy Framework (NPPF) states that the purpose of the planning system is to contribute to the achievement of sustainable development and constitute the Government's view on what sustainable development in England means in practice for the planning system. A principal concept contained within the NPPF is the presumption in favour of sustainable development and with regard to artificial lighting, the NPPF states:

> *"…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…"*

2.2.1 Draft Airports National Policy Statement (NPS): new runway capacity and infrastructure at airports in the South East of England

Paragraph 4.66 states:

> *"The construction and use of airports infrastructure has the potential to affect people's health, wellbeing and quality of life. Infrastructure can have direct impacts on health because of traffic, noise, vibration, air quality and emissions, light pollution, community severance, dust, odour, polluting water, hazardous waste and pests."*

Reference is also made to the assessment of lighting impacts in Paragraph 5.185, 5.192, 5.214, 5.228, 5.231, 5.234 and 5.345.

2.2.2 Local Policy

The site is located within the administrative boundary of Thanet District Council. The following policy documents have been reviewed when preparing this document:

- Thanet Development Plan- online version (accessed January 2018)
- Proposal Map/ 2006 Local Plan- referenced by the Development Plan
- Draft Thanet Local Plan to 2031 Preferred Options Consultation (January 2015)
- Policy SP05- Manston Airport

Chapter 13 of the Development Plan addresses light pollution and highlights that:

> *"The rural landscape in Thanet is gently undulating, generally very open, and largely devoid of trees and other significant vegetation. Poor outdoor lighting could therefore have a substantial adverse effect on the character of the area well beyond the site on which it is located."*

It also describes the environmental lighting zones, and how these should be applied to the different areas within the Thanet district. It refers to the limits contained in the Guidance Notes for the Reduction of Obtrusive Light, which are described in 2.4.1 and are shown in Section 3 of this report. It refers to policies CC1, CC2, EC2, EP9, which have also been reviewed. This information has been used to aid in the classification of environmental zones for the site and surrounding viewpoint locations. Refer to section 5.6 of this report for further detail.

Policy EP09 states that:

> *"Development that includes the provision of new outdoor lighting should be designed to minimise light glare, light trespass, spillage and sky glow so as to preserve residential amenity, the character of the surroundings and prevent disturbance to identified wildlife areas.*
>
> *Proposals that are unacceptable in these respects, or which exceed the following maximum limits, will not be permitted."*

The maximum limits are from the Guidance Notes for the Reduction of Obtrusive Light, which are shown in Section 3 of this report.

2.3. International Guidance

2.3.1 Commission Internationale De L'Eclairage (CIE) 150: Guide on the Limitation of the Effects of Obtrusive Light from Outdoor Lighting Installations

The purpose of CIE 150 is to aid in formulating guidelines for assessing the environmental effects of exterior lighting and to provide limits for relevant lighting parameters to control the obtrusive effects of exterior lighting to tolerable levels. CIE 150 also refers to the potentially adverse effects of exterior lighting on both natural and man-made environments.

2.3.2 CIE 126: Guidelines for Minimising Sky Glow (1997)

This document gives general guidance for lighting designers and policy makers on the reduction of sky glow. The report gives recommendations about maximum permissible values for exterior lighting installations. These values are regarded as limiting values. Lighting designers should strive to meet the lowest criteria for the design. Practical implementation of the general guidance is left to national regulations.

2.4. National Guidance

2.4.1 Institute of Lighting Professionals (ILP) (2011) Guidance Notes for the Reduction of Obtrusive Light (the 'ILP Guidance Notes')

The ILP has proposed lighting guidance and criteria for local authorities with a recommendation that these are incorporated at the local plan level. The ILP Guidance Notes define various forms of light pollution and describe a series of environmental zones. The ILP Guidance Notes provide suitable criteria against which the effects of artificial lighting can be assessed. This assessment has been based upon these criteria.

2.4.2 Institute of Lighting Professionals (ILP) (2013) PLG 04 Guidance on Undertaking Environmental Lighting Impact Assessments

The aim of this guidance is to outline good practice in lighting design and provide practical guidance on the production and assessment of lighting impacts within new developments.

3. Environmental Zone Classification and Parameters

All standards consulted in section 2 are nationally recognised documents, (some internationally, also) which deal with all design issues associated with external lighting.

3.1. Environmental Zoning

The CIE Standards, the CIBSE and the Society of Light & Lighting guidance documents all apply a common Environmental Zoning system, which is summarised in Table 3.1 below.

TABLE 3.1: ENVIRONMENTAL ZONES

Zone	Surrounding	Lighting Environment	Examples
E0	Protected	Intrinsically dark	UNESCO Starlight Reserves, IDA Dark Sky Parks
E1	Natural	Dark	National Parks, Areas of Outstanding Natural Beauty etc.
E2	Rural	Low District brightness	Village or relatively dark outer suburban locations
E3	Suburban	Medium district brightness	Small town centres or suburban locations
E4	Urban	High district brightness	Town/City centres with high levels of night-time activity

3.2. Obtrusive Light Limitation for Exterior Lighting Installations

The ILP Guidance Notes for the Reduction of Obtrusive Light provide guidelines and threshold values applicable to each Environmental Zone, which are reproduced in Table 3.2 below.

TABLE 3.2 : OBTRUSIVE LIGHT LIMITATIONS FOR EXTERIOR LIGHTING INSTALLATIONS – GENERAL OBSERVERS

Environmental Zone	Sky Glow ULR (max %) (i)	Light Intrusion into Windows E_v (Lux) (ii)		Luminaire Intensity I (K candelas) (iii)		Building Luminance L (cd/m²) (iv)
		Pre-curfew	Post curfew	Pre-curfew	Post-curfew	Pre-curfew
E0	0	0	0	0	0	0
E1	0	2	0(1*)	2.5	0	0
E2	2.5	5	1	7.5	0.5	5
E3	5.0	10	2	10	1	10
E4	15	25	5	25	2.5	25

(i) Upward light ratio of the installation – maximum permitted percentage of luminaire flux for the total installation that goes directly into the sky. (ii) Vertical illuminance measured flat at the glazing at the centre of the window. (ii) Light intensity in kilo candelas. (iv) Luminance in candelas per square metre (cd/m2). (*) From public road lighting installations only.

4. Assessment Methodology and Significance Criteria

4.1. Scope of Assessment

The existing baseline conditions on site and in the surrounding area have been surveyed and assessed.

The extent of the study area for this assessment includes the Site, its immediate surroundings and the key sensitive receptors which may be subject to a change in the existing lighting conditions. Sensitive receptors may include local residents, ecological receptors, the night-time amenity, and road users.

4.2. Methodology for Baseline Lighting Survey

Day and night-time site visits were undertaken on 16 and 17 October 2017 to ascertain the current baseline lighting conditions. A record was made of the types of lighting installations present or light sources visible, within the Site, the surrounding area and at the selected viewpoint/ survey locations.

The weather conditions on the 16th were dry with clear skies during the day, with high winds developing in the evening. On the 17th the weather was dry with some cloud. The moon phase was a Waning Cresent.

Night-time measurements and photographs were taken between 10pm and 1 am on each night.

Natural ambient light from moon light will have an additive effect to the lighting levels measured during the survey depending on the phase of the moon and sky conditions. The typical level of illuminance at ground level from a full moon on a clear night in the UK is 0.35 lux.

The viewpoint and survey locations were selected to establish the current lighting conditions within the site and surrounding area.

Night time viewpoint locations were chosen that correspond to the Landscape and Visual Impact Assessment (LVIA) Chapter of the Environmental Statement as these have been identified to represent sensitive receptors and locations requested by consultees during statutory consultation. Night-time photography from these viewpoints is included in the suite of figures which accompany Chapter 11 Landscape and Visual Impact Assessment of the Environmental Statement. These are denoted by the prefix VP, and are listed in Table 4.1.

TABLE 4.1: VIEWPOINT SURVEY LOCATIONS		
Survey Location Reference	**GPS Coordinates**	**Survey Location Description**
VP01	TR 33315 66524	RAF Manston Museum car park– From low grassed mound on southern side of the museum carpark.
VP02	TR 34032 67145	Field gate opposite bungalows on Manston Road- From the area of hardstanding and gateway on the western side of Manston Road opposite the northern most bungalows.
VP03	TR 34366 65101	Cantebury Road West, west of Jentex site- From the public footpath which follows the western side of a cluster of properties on the southern side of Canterbury Road West and to the west of Cliff View Road.
VP05	TR 35190 65116	Cantebury Road West, south-western corner of consented Manston Green housing development - From the north side of Canterbury Road West to the west of the roundabout of the A256
VP06	TR 34619 66204	B2050, western edge of Manston- From the western side of the B2050, edge of field opposite properties
VP07	TR 34481 67555	Vincent Road near Flete Farm - From grass verge on southern side of Vincent Road to the west of Vincent Farm
VP09	TR 30872 66840	Minster Road, Acol – Opposite the southernmost group of properties on Minster Road
VP11	TR 33107 64479	Grinsell Hill, north-east Minster- From the northern side of the junction between Grinsell Hill and Thorne Road (crossroads with Cottington Road and Ebbsfleet Lane North)
VP12	TR 33790 64232	A256 Cottington Road Bridge – From the grassed bridge embankment between the A256 and Cottington Link Road.
VP14	TR 33496 68881	Junction of Highstreet and Shottendane Road, Southern Garlinge – From the edge of the field on the southern side of the junction of High Street and Shottendane Road.
VP15	TR 32530 68639	Junction of Minster Road and Shottendane Road, southern Westgate - From the entrance to the public footpath (gap in hedgerow) to the west of the junction between Shottendane Road and Minster Road.
VP20	TR 26980 63458	North side of bridge at Plucks Gutter - From the hardstanding on the eastern side of Gore Street immediately north of the bridge.

Survey locations were chosen in conjunction with the project ecologist in relation to sensitive ecological receptor locations. Refer to the Ecological Reports for further detail. These locations are denoted by the prefix E, and are listed in Table 4.2.

TABLE 4.2: ECOLOGICAL RECEPTOR SURVEY LOCATIONS

Survey Location Reference	GPS Coordinates	Survey Location Description
E01	TR 33315 66524	Within northern area of site- along bat activity transect 1
E02	TR 33877 66889	Within northern area of site- along bat activity transect 1
E03	TR 34014 67125	Within northern area of site- along bat activity transect 1
E04	TR 34371 66897	Within northern area of site- along bat activity transect 1
E05	TR 34201 66608	Within northern area of site- along bat activity transect 1
E06	TR 34600 65749	Within south-western area of site – along bat activity transect 3
E07	TR 34883 65685	Within south-western area of site – along bat activity transect 3
E08	TR 34978 65512	Within south-western area of site – along bat activity transect 3
E09	TR 31619 66110	Within south-eastern area of site – along bat activity transect 4
E10	TR 32254 66096	Within south-eastern area of site – along bat activity transect 4

Refer to Appendix A for a plan showing the locations of the LVIA viewpoint locations, and Appendix B for a plan showing the ecological receptor survey locations.

Measurements of point illuminance were recorded at each of the survey locations. These were recorded horizontally on the ground at each location, and at 1.5m in the vertical plane in the four compass directions, North, South, East and West. Measurements were taken using a calibrated Konica Minolta T-10A Illuminance Meter (Serial no: 30014456/ 20012926).

5. Environmental Baseline

5.1. Assessment of Existing Environmental Zone

An assessment has been made of the existing Environmental Zone(s) by considering the baseline lighting conditions within the site, and at each survey location, and reviewing the Thanet District Council Development Plan and Proposals Map of the 2006 Adopted Local Plan.

5.2. Baseline Conditions within the Site and Surrounding Area

The site is currently lit, however a large proportion of the lighting that is installed on the site is now redundant, and not operational. A large amount of lighting, including the run-way lighting has been removed from the site.

The MOD MT Sanction building in the south of the site, which appears to be outside of the application boundary has building mounted sodium floodlights and red warning lights that are installed and operational.

There are operational building mounted metal halide floodlights on the western elevation of the passenger terminal building, which is currently being used by the site security team. The mast mounted floodlights outside the passenger terminal appear to be redundant, and were not operational at the time of the survey.

There are column mounted sodium floodlights in the car parking area to the South Site entrance, approx. 5 in number, that were operational. These floodlights are visible from a number of the LVIA viewpoints and are quite prominent on the landscape as they appear to potentially be aimed in obtrusive directions with a high tilted angle.

There is also a large number of column mounted floodlights within the hard-standing areas close to the entrance of the South Site. These appear to be redundant and are therefore not visible at night, however they are visible in the day from a number of the LVIA viewpoints.

There is a Radar Tower and Air Traffic Control Compound in the North Site which have red warning lights.

There is column mounted sodium street lighting to the footpath and lane to the west of the properties along Manston Court Road which border the Northern Site. There is also some lighting mounted on the garages in this area.

Figure 5.1-5.2- shows the redundant mast mounted floodlights to the west of the terminal building

Figure 5.3-5.4- shows some of the floodlighting to the western elevation of the passenger terminal building

Figure 5.5-5.6- shows some of the column mounted floodlighting to the hard-standing within the entrance area to South Site

Figure 5.7-5.8- shows some of the column mounted floodlighting to the hard-standing within the entrance area to South Site

Figure 5.9-5.10- shows some of the column mounted floodlighting to the hard-standing within the entrance area to South Site

Figure 5.11- 5.12- shows the column mounted sodium street lighting to the footpath and lane to the west of the properties along Manston Court Road, which border the Northern Site

Figure 5.13- shows the column mounted sodium street lighting to the footpath and lane to the west of the properties along Manston Court Road, which border the Northern Site

Figure 5.14- shows an example of the lighting mounted to the garages situated along the lane to the west of the properties along Manston Court Road, which border the Northern Site

The following sections contain further detail of the lighting conditions at each survey location. Sections 5.4 and 5.5 list the measurements of illuminance recorded at each location.

5.3. Lighting Appraisal of Viewpoint Locations

A brief description is given below of the light sources present at each viewpoint or survey location.

5.3.1 Viewpoint 1

The RAF Manston Museum carpark is lit by a column mounted flood light, and there is building mounted lighting to the perimeter of the museum building. Manston Road, adjacent to the carpark is un-lit.

There is a direct view of the site, with high pressure sodium and metal halide lighting visible on the site, close to the entrance. The flood lighting in the car park, which can be seen during the day, were not switched on at night. Manston Road, which divides the site, is also unlit.

5.3.2 Viewpoint 2

There is no lighting at this location, and the adjacent Manston Road is unlit. There are some building mounted lights associated with the domestic bungalows along Manston Road, and there are some floodlights, lighting the garage forecourt on Manston Road.

5.3.3 Viewpoint 3

Canterbury Road West is lit with column mounted street lighting, utilising a combination of high pressure sodium and fluorescent sources. The Jantex site is also lit, with various types of lighting and light sources present. Not all of the lighting within the site was operational at the time of the survey. Some lighting may be operated by sensors or timeclocks, or may be redundant.

Figure 5.15- shows Cantebury Road West facing east along the road, with the Jentex site shown on the left hand side

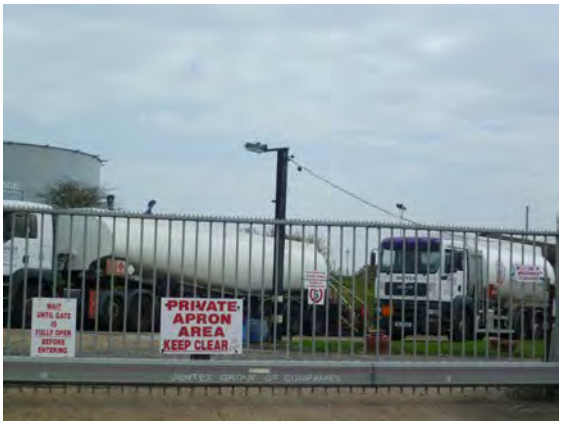


Figure 5.16- shows the Jentex site entrance along Cantebury Road West

Figure 5.17- shows the public footpath along Cantebury Road West where Viewpoint 3 is located

Figure 5.18- shows Cantebury Road West facing west along the road

5.3.4 Viewpoint 5

Canterbury Road West is lit with column mounted street lighting, utilising a combination of high pressure sodium and fluorescent sources. The lighting along this section of road appears to be in poor condition, with a number of luminaires that were not operational at the time of the survey.

5.3.5 Viewpoint 6

B2050 Manston Road is lit with column mounted street lighting.

5.3.6 Viewpoint 7

The road adjacent to this point is un-lit.

5.3.7 Viewpoint 9

The majority of Minster Road, is not lit. However, high pressure sodium street lighting is present along the section of road adjacent to the properties. There was a column mounted luminaire close the point of measurement.

5.3.8 Viewpoint 11

Grinsell Hill, the adjacent junction and road are un-lit. The only light source present at this location is from intermittent vehicular headlights.

5.3.9 Viewpoint 12

No street lighting present on roads directly adjacent to this location.

5.3.10 Viewpoint 14

The roads and junction adjacent to this point are un-lit.

5.3.11 Viewpoint 15

Shottendane Road adjacent to this location is un-lit.

5.3.12 Viewpoint 20

Gore Street adjacent to this location is un-lit.

5.3.13 Ecological Receptor Location 1

This is in close proximity to Viewpoint 3, adjacent to the RAF Museum Carpark.

5.3.14 Ecological Receptor Location 2

The Radar Tower building within the Northern Site is near to this location, and has three operational building mounted 2D fluorescent luminaires. There is also an entrance to Charles River Laboratory on the opposite side of the road, which has column mounted sodium lighting. These installations caused a small amount of light spill at this location. The adjacent section of Manston Road is unlit.

5.3.15 Ecological Receptor Location 3

This location is un-lit. There is a small amount of lighting to the properties opposite along Manston Road, however these do not cause any light spill to the survey location. The adjacent section of Manston Road is unlit.

5.3.16 Ecological Receptor Location 4

This location is un-lit.

5.3.17 Ecological Receptor Location 5

There is a small amount of light spill at this location from lighting to the footpath and lane to the west of the properties along Manston Court Road.

5.3.18 Ecological Receptor Locations 6-8

Each of these locations are un-lit with no light spill from artificial lighting.

5.3.19 Ecological Receptor Location 9

This location was adjacent to a Sub Station, which had two building mounted sodium bulkhead lights.

5.3.20 Ecological Receptor Location 10

This location was unlit, with only intermittent vehicular head lights from Spitfire Way causing any light spill.

5.4. Measurements of Illuminance at Viewpoint Survey Locations

Table 5.1 summarises the levels of illuminance recorded at each viewpoint survey location.

TABLE 5.1 : VIEWPOINT SURVEY LOCATIONS - LEVELS OF ILLUMINANCE RECORDED					
Survey Location Reference	Horizontal Illuminance at Ground level	Vertical Illuminance at 1.5m			
		N	E	S	W
VP01	0.03	0.09	0.13	0.03	0.10
VP02	0.02	0.04	0.02	0.02	0.03
VP03	0.31	0.62	0.21	0.03	0.02
VP05	12.47	0.40	7.66	7.19	10.47
VP06	0.00	0.02	0.18	0.05	0.04
VP07	0.02	0.02	0.02	0.03	0.03
VP09	10.21	4.74	0.26	0.23	11.12
VP11	0.00	0.00	0.02	0.00	0.00
VP12	0.02	0.01	0.01	0.00	0.00
VP14	0.02	0.04	0.02	0.02	0.03
VP15	0.02	0.00	0.02	0.01	0.00
VP20	0.00	0.00	0.00	0.00	0.00

5.5. Measurements of Illuminance at Ecological Receptor Survey Locations

Table 5.2 summarises the levels of illuminance recorded at each survey location.

TABLE 5.2 : ECOLOGICAL RECEPTOR LOCATIONS - LEVELS OF ILLUMINANCE RECORDED					
Survey Location Reference	Horizontal Illuminance at Ground level	Vertical Illuminance at 1.5m			
		N	E	S	W
E01	0.03	0.09	0.13	0.03	0.10
E02	0.17	0.60	0.20	0.28	0.29
E03	0.00	0.00	0.00	0.02	0.00
E04	0.00	0.01	0.00	0.00	0.00
E05	0.27	0.06	0.70	0.27	0.02
E06	0.00	0.00	0.00	0.01	0.01
E07	0.00	0.02	0.03	0.01	0.00
E08	0.00	0.01	0.02	0.01	0.0
E09	2.34	0.014	4.61	17.30	0.15
E10	0.00	0.00	0.02	0.00	0.00

5.6. Review of Thanet District Council Development Plan and Proposals Map/ 2006 Adopted Local Plan

Paragraph 13.65 of the Thanet Development Plan states:

> *It is for the Local Planning Authority to identify the relevant areas of the District to which the different standards would apply, and these zones are identified on the Proposals Map by way of reference to other policy areas. Thus in this Plan:*
>
> - *Zone E1 comprises the Pegwell Bay Special Landscape Area and the former Wantsum Channel (as identified in Policy CC2);*
> - *Zone E2 comprises the rest of the rural areas outside built confines (as identified by Policy CC1); except Kent International Airport (as identified by Policy EC2);*
> - *Zone E3 comprises the urban areas and rural settlements within built confines (as identified by Policy CC1), and Kent International Airport (as identified by Policy EC2); and*
> - *Zone E4 comprises the amusement area at Margate Seafront (as identified by Policy T7).*

Figure 5.19 from the proposals map shows the designated zone for Kent International Airport, and the Urban and Village confines. This map and its designations have been considered when assigning the environmental lighting zones to each viewpoint.

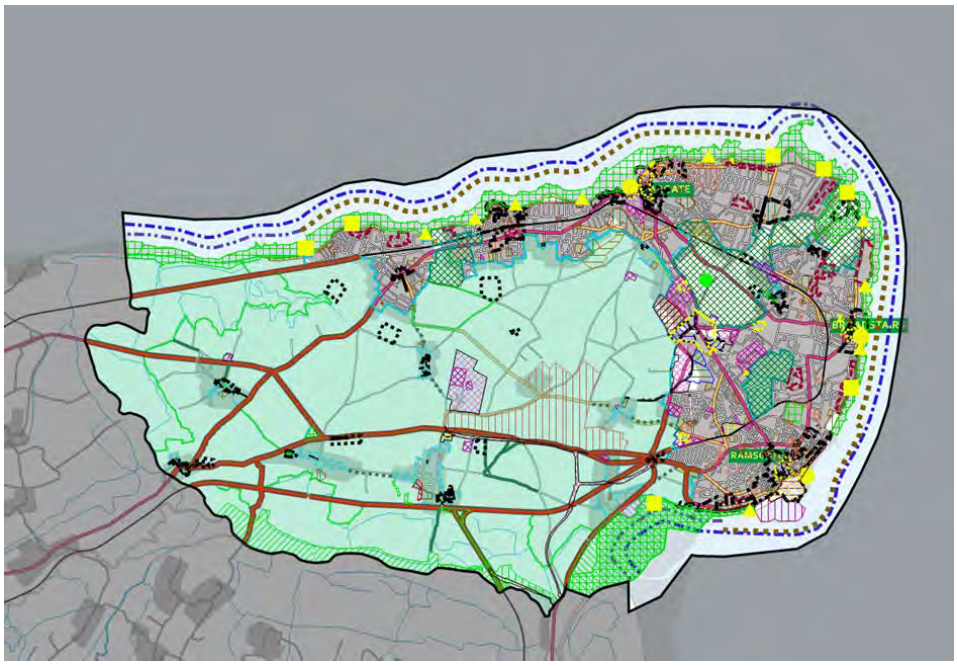


Figure 5.19 – A copy of the Thanet Proposals Map/ 2006 Adopted Local plan

5.7. Summary of assigned Environmental Zones

Table 5.4 summarises the Environmental Zone assigned to each viewpoint location, following the baseline survey and review of the Thanet District Council Development Plan and Proposals Map of the 2006 Adopted Local Plan. Further details of each viewpoint location are given in section 5.3.

Most of the viewpoint locations are considered to be classified as Environmental Zone E2. Viewpoint 1 is within the Kent International Airport designated area, and therefore has been assigned as Environmental Zone E3. Viewpoint 9 is within the urban and village confines of Acol, and has therefore also been assigned Environmental Zone E3.

The site itself is classified as an E3 zone, in accordance with the Thanet Development Plan, see section 5.6.

TABLE 5.4 : ENVIRONMENTAL ZONE ASSIGNED TO EACH VIEWPOINT

Viewpoint reference	Environmental Zone
VP01	E3
VP02	E2
VP03	E2
VP05	E2
VP06	E2
VP07	E2
VP09	E3
VP11	E2
VP12	E2
VP14	E2
VP15	E2
VP20	E2

6. Conclusion/ Recommendations

The site is located within an Environmental Zone E3, with the immediate surrounding areas being classified as Environmental Zone E2. It is recommended that the external lighting for the proposed development is designed in accordance with the obtrusive light limitations for an E3 zone.

Appendix A
Lighting Terminology

Lighting Terminology

For the purpose of this report, the definitions given below apply:

CIBSE: Chartered Institute of Building Services Engineers

Colour Rendering Index (CRI): A scale of the colour appearance of an object under a particular light source compared to its colour appearance under a reference light source. Expressed on a scale of 1 to 100 Ra, where 100 Ra represents the colour rendering of natural daylight i.e. perfect colour.

Illuminance: Illuminance is the quantity of light, or luminous flux, falling on a unit area of a surface. It is designated by the symbol E. The unit is the lux (lx). One lux equals one lumen per square metre (lm/m^2).

Light Pollution: The spillage of light into areas where it is not required.

Light Intrusion: Light that impacts on a surface outside of the area designed to be lit by a lighting installation.

Disability Glare: Glare which impairs the vision of objects but may not cause discomfort.

Discomfort Glare: Glare causing discomfort which may not impair the ability to see objects.

Photocell: A unit which senses light to control luminaires.

Curfew: The time after which stricter requirements (for the control of obtrusive light) will apply; often a condition of use of lighting applied by a government controlling authority, usually the local government (CIE, 2003).

Environmental Zones: Area where specific activities take place or are planned and where specific requirements for the restriction of obtrusive light are recommended. Zones are indicated by the zone rating (E1… E4) (CIE, 2003).

Obtrusive Light: Spill light which because of quantitative, directional or spectral attributes in a given context, gives rise to annoyance, discomfort, distraction or a reduction in the ability to see essential information (CIE, 2003).

Residential Property: Land upon which a dwelling exists (CIE, 2003).

Sky Glow: The brightening of the night sky caused by artificial lighting resulting from the reflection of radiation (visible and non-visible), scattered from the constituents of the atmosphere (gas molecules, aerosols and particulate matter), in the direction of observation. It comprises two separate components as follows:

(a) *Natural sky glow* - That part of the sky glow which is attributable to radiation from celestial sources and luminescent processes in the Earth's upper atmosphere.

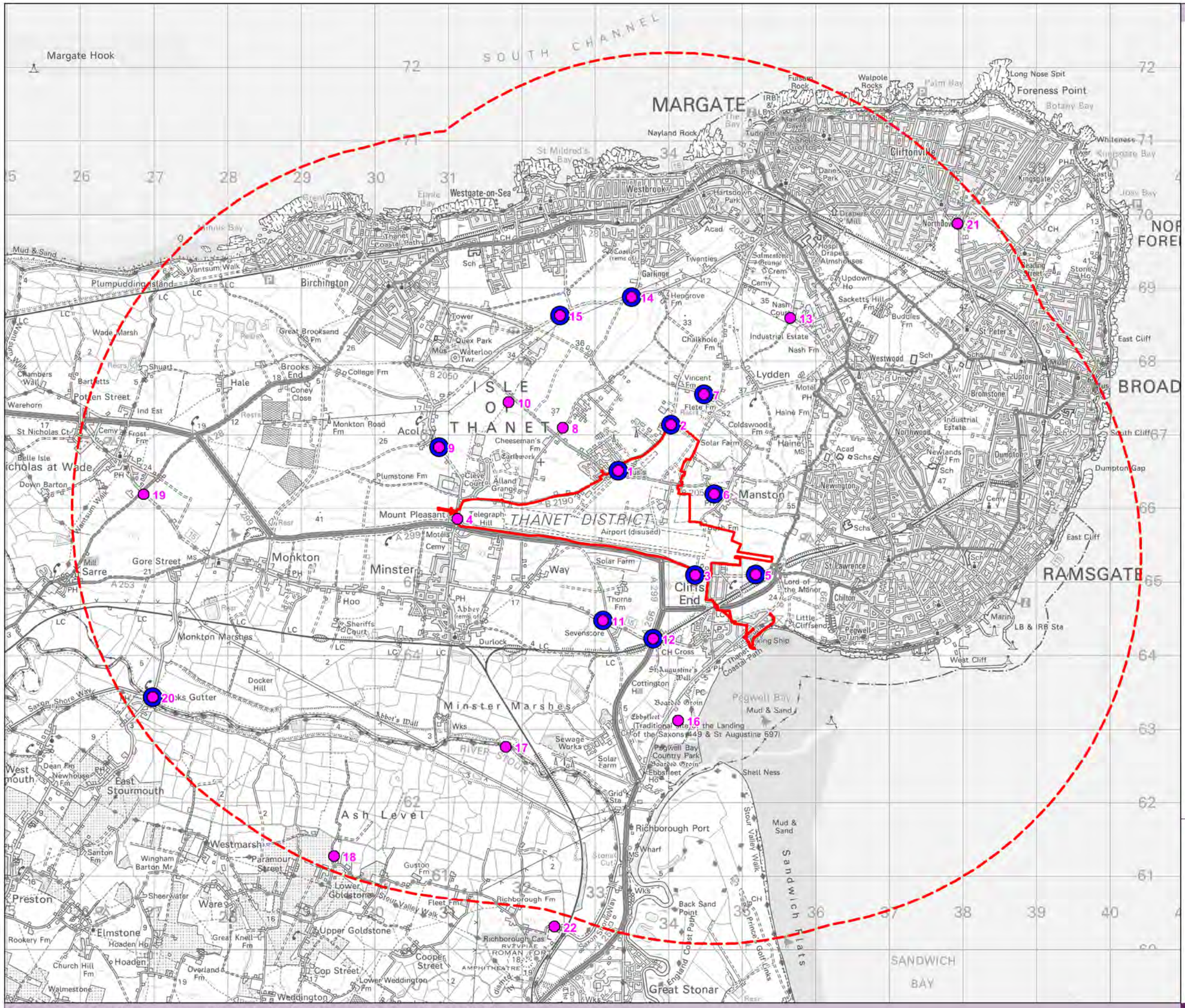
(b) *Man-made sky glow* - That part of the sky glow which is attributable to man-made sources of radiation (e.g. outdoor electric lighting), including radiation that is emitted directly upwards and radiation that is reflected from the surface of the Earth (CIE, 2003).

Spill Light (Stray Light): Light emitted by a lighting installation which falls outside the boundaries of the property for which the lighting installation is designed (CIE, 2003).

Upward Light Ratio: The maximum permitted percentage of luminaire flux for the total installation that goes directly into the sky.

Appendix B

Site Plan showing LVIA Viewpoint locations



Key

- Order Limits
- Study area
- Viewpoint location
- Viewpoint included in the lighting impact assessment

1. Manston Road close to RAF Manston Museum.
2. Manston Road, opposite bungalows.
3. PRoW, Canterbury Road West.
4. Minster Road.
5. Canterbury Road West.
6. B2050, western edge of Manston.
7. Vincent Road near Flete Farm.
8. Woodchurch Road, southern edge of Woodchurch.
9. Minster Road, Acol.
10. Pumping station south of Quex Park.
11. Viking Coastal Trail.
12. A256 Cottington Road Bridge.
13. Nash Court, Nash Road, Margate.
14. Junction of High Street & Shottendane Road, southern Garlinge.
15. PRoW, Shottendane Road.
16. Northern side of Pegwell Country Park.
17. South Saxon Way alongside River Stour.
18. Goldstone Drove near Lower Goldstone.
19. Eastern edge of St. Nicholas in Wade.
20. Plucks Gutter.
21. St. Michael's Avenue, Northdown.
22. Richborough Road, south of Richborough Castle.

0 km 3 km

Scale 1:50,000 @ A3

Manston Airport

amec foster wheeler

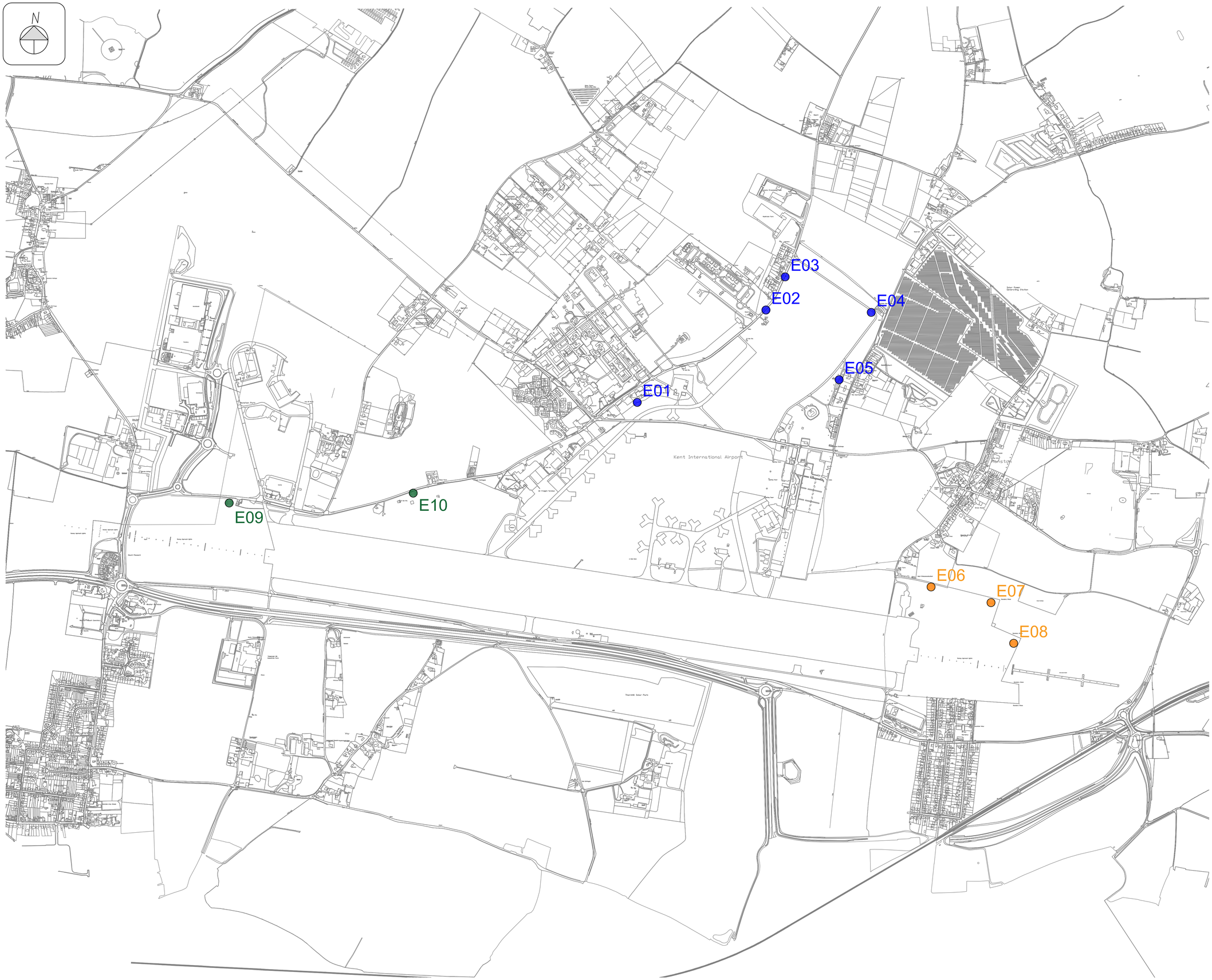
Viewpoint Locations

February 2018 38199-Lon376.wor holfs

Appendix C

Site Plan showing Ecological Survey Locations

A1 - Do not scale



LEGEND

- = TRANSECT 1 ECOLOGICAL RECEPTOR SURVEY LOCATION
- = TRANSECT 2 ECOLOGICAL RECEPTOR SURVEY LOCATION
- = TRANSECT 3 ECOLOGICAL RECEPTOR SURVEY LOCATION

NOTES

POSITIONS SHOWN ON LOCATION PLAN ARE INDICATIVE.

REFER TO BASELINE REPORT AND GPS LOCATIONS.

04138L

Rev	Details	Dm / Chkd	Date
P01	PRELIMINARY ISSUE	TB / BB	31/01/18

Engineering Consultants
SERVICES DESIGN SOLUTION Ltd
20 - 23 Mary Seacole Road, The Millfields
PLYMOUTH Devon PL1 3JY
Tel +44 (0)1752 255900 | www.sdsolution.co.uk

Client
AMEC FOSTER WHEELER / WOODS

Project
MANSTON AIRPORT
KENT

Drawing Title
LIGHTING IMPACT ASSESSMENT
BASELINE SURVEY LOCATION PLAN
FOR ECOLOGICAL RECEPTOR
SURVEY LOCATION

Scale at A1
NTS

Discipline
ELECTRICAL SERVICES

Job Number	Job Status	ISSUE
04138L	PRELIMINARY	P01

Drawing Number
04138L-SDS-XX-EX-SU-E-7080-0100

Engineering Consultants

SERVICES DESIGN SOLUTION LTD.
6 KEW COURT ▪ RYDON LANE ▪ PYNES HILL ▪ EXETER ▪ DEVON ▪ EX2 5AZ
TEL: 01392 444105 ▪ E-MAIL: CONTACTUS@SDSOLUTION.CO.UK ▪ WEB: WWW.SDSOLUTION.CO.UK
BUILDING SERVICES CONSULTING ENGINEERS