

City Airport Development Programme (CADP1)

Condition 41 : External Lighting



Table of contents

Chapter	Pages
Project Glossary of Abbreviations	3
1. Introduction	4
2. External lighting strategy site-wide	9
2.2. External Lighting Design Criteria	14
2.3. Obtrusive Lighting Mitigation	17
2.4. Physical Screening	18
2.5. Receptor sensitivity by lighting area	18
3. Lighting Approach	20
3.2. Western service yard (WSY)	20
3.3. Western Energy Centre (WEC)	23
3.4. Western terminal extension (WTE)	24
3.5. Hartmann Road/Eastern Entrance	24
3.6. Forecourt	26
3.7. Main Terminal Building (MTB) and East Terminal Extension (ETE)	29
3.8. Drop-off areas and bus stops	31
3.9. New east pier dockside façade	34
3.10. Car parking grade level (CP 2,3 and 4 (staff))	36
3.11. Rendezvous Point (RVP)	37
3.12. Decked Car Park (CP 1)	39
3.13. Eastern Energy Centre (EEC)	40
3.14. Taxi Feeder Park	42
3.15. Car hire and taxi Welfare building (CHTW)	43
3.16. Eastern Car Hire Car Parks CP5 and 6	44
3.17. Dockside heritage walk and footpaths	46
3.18. Refurbishment of Stands 21-24 and new Stands and Taxiway	47
3.19. External lighting control general principles	49
Appendices	50
Appendix A. Drawings	51
A.1. Lighting Layouts for Approval	51
A.2. Lighting Criteria and Isoline Drawings for Information	52
A.3. TPS Airfield Lighting Drawings	53
Appendix B. Overall Site Sensitive Receptors	54
B.1. Sensitive Receptor Survey 04-10-2016	54
B.2. Sensitive Receptor List	54
Appendix C. Lighting equipment	58
C.1. Luminaire schedule (whole schedule revised)	59
Appendix D. Controls Schedule	70
D.1. Control regimes	71
Appendix E. Glossary	73
E.1. External Lighting Technical Glossary	73

Tables

Table 1-1	External Lighting areas for Planning Approval	5
Table 1-2	External Lighting Drawings for Planning Information	6
Table 2-1	External lighting areas indicative lighting strategy overview	12
Table 2-2	BS EN 12464-2:2014 Table 5.2 Airports	14
Table 2-3	BS EN 12464-2:2014 Table 5.1 Requirements for areas and for cleaning at outdoor work places	14
Table 2-4	Institute of lighting Professionals ILP GN01 Table 2	16
Table 2-5	Physical screening elements that affect the external lighting	18
Table 3-1	WSY Details	22
Table 3-2	Western Energy Centre compliance	23
Table 3-3	Hartmann Road and Eastern Entrance Details	25
Table 3-4	Forecourt details	27
Table 3-5	MTB & ETE details	30
Table 3-6	Drop off areas and bus stops details	33
Table 3-7	New East Pier dockside façade details	35
Table 3-8	Car parking grade level details	37
Table 3-9	Rendezvous point details	38
Table 3-10	Decked Car park (CP1) details	39
Table 3-11	Eastern energy centre details	41
Table 3-12	Taxi feeder park details	42
Table 3-13	Car hire and Taxi welfare building details	43
Table 3-14	Car hire car park details	45
Table 3-15	Dockside heritage walk and footpaths details	46
Table 3-16	Airside Apron Lighting for New & Refurbished Stands details	47
Table A-1	Lighting Layout drawings relating to Condition 41	51
Table A-2	Lighting Criteria & Isoline drawings relating to Condition 41	52
Table A-3	TPS Drawings Related to Condition 41	53
Table B-1	Sensitive Receptor list	54

Figures

Figure 2-1	Lighting philosophy site-wide Column Heights	9
Figure 2-2	Extent of CADP1 delivered by Accelerated Phasing Plan	11
Figure 2-3	Overall site sensitive receptors layout	13
Figure 3-1	WSY luminaires (see luminaire schedule Appendix E for full details)	21
Figure 3-2	WSY visualisation	21
Figure 3-3	WEC luminaires (see luminaire schedule Appendix E for full details)	23
Figure 3-4	Hartman Rd luminaire (see luminaire schedule Appendix E for full details)	24
Figure 3-5	Forecourt luminaires (see luminaire schedule Appendix E for full details)	27
Figure 3-6	Visualisation of the Main Terminal Building & ETE Facade	29
Figure 3-7	MTB and ETE luminaires (see luminaire schedule Appendix E for full details)	30
Figure 3-8	Drop off area canopy lighting arrangement	32
Figure 3-9	Drop-off areas and bus stops luminaires (see luminaire Schedule Appendix E for details)	33
Figure 3-10	NEP Dockside Façade and Luminaires (see luminaire schedule Appendix E for full details)	34
Figure 3-11	Footpath and ramp retaining wall lighting	36
Figure 3-12	Grade car parking luminaires (see luminaire schedule Appendix E for full details)	36
Figure 3-13	RVP Typical Lighting Layout	38
Figure 3-14	Rendezvous point luminaires	38
Figure 3-15	Decked Car Park Luminaires	39
Figure 3-16	Local plan of RVP and EEC	41
Figure 3-17	Eastern energy centre luminaires (see luminaire Schedule Appendix E for details)	41
Figure 3-18	'Elephant's foot' protection taxi feeder park	42
Figure 3-19	Car Hire and Taxi Welfare building luminaires (see luminaire Schedule Appendix E for details)	43
Figure 3-20	CP5-6 luminaires (see luminaire Schedule Appendix E for details)	44
Figure 3-21	Dockside walk Balustrade Lighting	46

Project Glossary of Abbreviations

Project Glossary of Abbreviations	
Acronym	Meaning
CADP	City Airport Development Program
CCTV	Closed Circuit Television
CHTF	Car Hire and Taxi Welfare Building
CP (XX)	Car Park (number)
DLR	Docklands Light Railway
DZ	Drop -off Zone
EEC	Eastern Energy Centre
EPE	East Pier Extension
ETE	East Terminal Extension
ILP GN	Institute of Lighting Professionals General Note
KGV	King George V
LBN	London Borough of Newham
MTB	Main Terminal Building
DECKED CAR PARK	2 Storey Car Park
NEP	New East Pier
UES	Updated Environmental Statement
UKPNS	United Kingdom Power Networks
WEC	Western Energy Centre
WSY	Western Service Yard
WTE	West Terminal Extension

1. Introduction

- 1.1.1. The City Airport Development Programme 1 (CADP1) planning application (13/01228/FUL) was granted planning permission by the Secretaries of State for Communities and Local Government and Transport in July 2016 following an appeal and public inquiry which was held in March/April 2016.
- 1.1.2. On 5th January 2017, the London Borough of Newham (LBN) approved some minor non-material design changes to the appearance of the western and southern elevations of the Western Terminal Extension (WTE). A further non-material amendment (17/02865/NONMAT) to the Planning Permission was approved on 27 September 2017 for minor amendments to the terminal buildings and associated service yard, East Pier, Forecourt and Decked Car Park.
- 1.1.3. A Section 96a application for some minor changes to the Western Energy Centre (WEC) and Eastern Energy Centre (EEC) has been submitted to LBN under a separate cover.
- 1.1.4. All minor changes to the design referred to above have been incorporated into the details provided to satisfy this condition.
- 1.1.5. Condition 41 requires that:

No Phase of the Development shall commence until full details of any proposed external lighting (the external lighting scheme) for the relevant Phase have been submitted to and approved in writing by the Local Planning Authority. Each external lighting scheme shall in respect of the relevant Phase:

- *State the minimum luminance reasonably required to perform the relevant lighting task;*
- *Minimise glare, light spillage and pollution;*
- *Include landscaping/screening measures to screen illuminated areas in environmentally sensitive areas;*
- *Avoid dazzle or distraction to drivers on nearby highways;*
- *Include the location, type, number, mounting height and alignment of the luminaires;*
- *Include the beam angles and upward waste light ratio for each light;*
- *Include details of screening and other mitigation;*
- *Include an Isolux diagram showing the predicted illuminance levels at critical locations on the Airport Boundary of the Phase and where the Phase abuts residential properties or the public highway; and Set out where necessary, the percentage increase in luminance and the predicted illuminance in the vertical plane (in lux) at key points.*

The approved lighting scheme(s) shall be implemented prior to occupation of the relevant Phase of the Development and shall be permanently retained thereafter,

Reasons: To ensure that safety is not compromised with regard to the principles/practices of Secured by Design; to minimise adverse impacts of light pollution on the highway network; to minimise adverse impacts on the safeguarded area around London City Airport; to ensure that it does not cause a hazard to navigation of the Royal Albert Dock, and with regard to saved Policy EQ45 of the London Borough of Newham adopted Unitary Development Plan (adopted June 2001 and saved from 27 September 2007 by direction from the Secretary of State and not deleted on adoption of the Core Strategy on 26 January 2012), and Policies 7.3, 7.5, 7.6 of the London Plan (consolidated with alterations since

2011 and published March 2015) and Policies SP3 and SP4 of the Newham Core Strategy (adopted 26 January 2012).

- 1.1.6. The Airport submitted a Construction Phasing Plan to LBN pursuant to Condition 4 of the CADP1 permission in February 2017. It was proposed to build out CADP1 as a single uninterrupted period of construction over 5 years split into two distinct phases. Consistent with terminology used in the UES, the two phases were referred to as the 'Interim Works' and the 'Completed Works' – each delivering different parts of the CADP infrastructure. This Construction Phasing Plan was approved by LBN in March 2017 (ref. 17/00500/AOD) and the details pursuant to Condition 41 for the 'Interim Works' were also approved at the same time (ref. 17/00626/AOD).
- 1.1.7. Ahead of the commencement of construction of CADP1, the Airport's Delivery Partner have identified a number of programme efficiencies and improvements to the 5-year build which would reduce the duration of the construction programme by around 1 year and deliver the full CADP1 infrastructure in an accelerated single phase (Accelerated Construction Plan).
- 1.1.8. The new Accelerated Construction Plan has been submitted to London Borough of Newham pursuant to Condition 4 under separate cover. This submission seeks approval of the external lighting details pursuant to Condition 41 for all of the approved CADP1 infrastructure to be delivered by the new Accelerated Construction Plan as detailed in this report and the drawings included in appendix A: -

Table 1-1 External Lighting areas for Planning Approval

External Lighting Area	Report Section (text and image description) - see corresponding plans in appendix A
Western Service Yard (WSY)	Section 3.1.5
Western Energy Centre (WEC)	Section 3.1.11
Western Terminal Extension (WTE)	Section 3.1.16
Hartmann Road and Eastern Entrance	Section 3.1. 18
Forecourt (FCT)	Section 3.1.24
Main Terminal Building (MTB)	Section 3.1.33
Forecourt Drop off area	Section 3.1.42
Grade Car Parks (CP 2-4)	Section 3.1.51
Rendezvous Point (RVP)	Section 3.1.58
Car Park (Decked Car Park) CP1	Section 3.1.62
Eastern Energy Centre (EEC)	Section 3.1.67

Taxi Feeder Park	Section 3.1.67
Car Hire Taxi Welfare Building (CHTF)	Section 3.1.73
Car Hire Car Parks (CP 5-6)	Section 3.1.80
Dockside Heritage walk and Footpaths	Section 3.1.84
Reconfigured Stands 21-24 and new CADP1 stands and airfield	Section 3.1.88

Table 1-2 External Lighting Drawings for Planning Information

External Lighting Area	Report Section (text and image description) - see corresponding plans in appendix A
Western Service Yard (WSY)	Section 3.1.5
Western Energy Centre (WEC)	Section 3.1.11
Western Terminal Extension (WTE)	Section 3.1.16
Hartmann Road and Eastern Entrance	Section 3.1. 18

External Lighting Area	Report Section (text and image description) - see corresponding plans in appendix A
Forecourt (FCT)	Section 3.1.24
Forecourt Drop off area	Section 3.1.42
Grade Car Parks (CP 2-4)	Section 3.1.51
Rendezvous Point (RVP)	Section 3.1.58
Car Park (Decked Car Park) CP1	Section 3.1.62
Eastern Energy Centre (EEC)	Section 3.1.67
Taxi Feeder Park	Section 3.1.67
Car Hire Taxi Welfare Building (CHTF)	Section 3.1.73
Car Hire Car Parks (CP 5-6)	Section 3.1.80
Dockside Heritage walk and Footpaths	Section 3.1.84

External Lighting Area	Report Section (text and image description) - see corresponding plans in appendix A
Reconfigured Stands 21-24 and new CADP1 stands and airfield	Section 3.1.88

- 1.1.9. Atkins are responsible for design of lighting to landside locations and external lighting around buildings in the Works, whilst TPS are responsible for design of airside lighting. This document consolidates details of both landside and airside lighting for completeness.
- 1.1.10. A technical glossary of lighting technical terms is included in Appendix E.

2. External lighting strategy site-wide

2.1.1. The external lighting strategy is to provide a unified approach that includes the entire site. The external lighting strategy covers the following with respect to the external lighting works, some of which is already in place on the existing airport site. Where new lighting is proposed as part of the external lighting, this is clearly indicated in section 2.2 below:

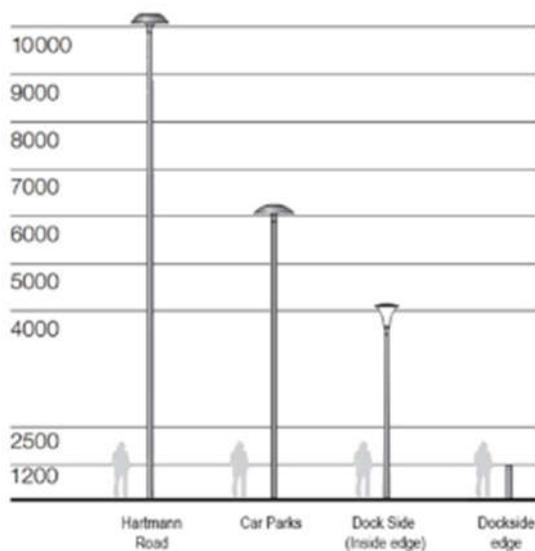
- Road lighting (Hartman Road and service roads);
- Grade Car Park (car hire, passenger and staff);
- Taxi feeder areas;
- Forecourt and drop off areas;
- Building façade lighting;
- Pedestrian footpaths and walkways;
- Decorative lighting to heritage dockside walk;
- Decked car park;
- Service yards;
- Emergency lighting final exit lighting and external muster point routes.
- Airside Apron Lighting

The external lighting strategy will exclude the Hotel in this submission as it sits outside of the approved CADP1 scope and is subject to a separate outline permission.

2.1.2. The overall lighting strategy will adopt common approaches to the following aspects of external lighting:

- Design and height of columns and the use of outreach arms;
- Luminaire types and design;
- Light source type colour appearance, colour rendering, and efficacy;
- Design luminance, illuminance and glare criteria and
- Curfews and lighting control techniques.

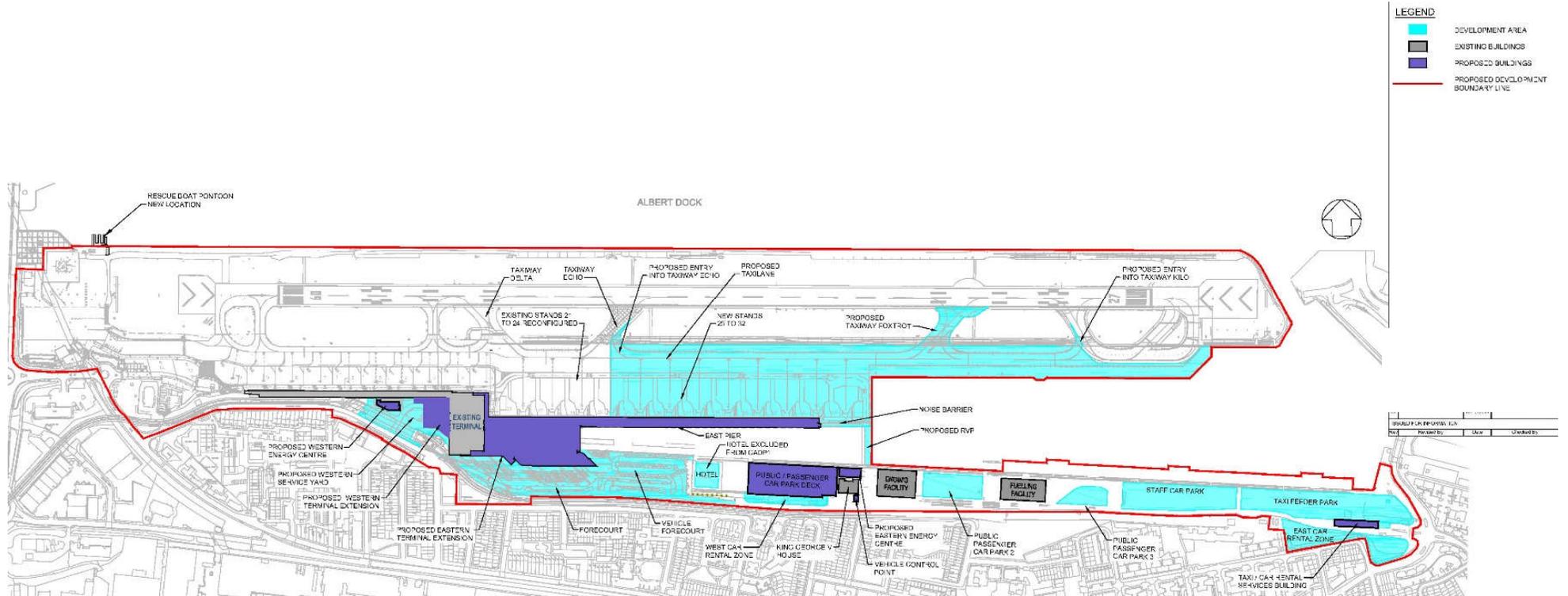
Figure 2-1 Lighting philosophy site-wide Column Heights



- 2.1.3. The following section identifies the areas, lighting criteria, type of lighting equipment and lighting control parameters for the CADP1 infrastructure.

- 2.1.4. To inform this lighting strategy for the external lighting a site survey was carried out to identify relevant 'visual receptors'. Details of the survey are included in appendix B.

Figure 2-2 Extent of CADP1 delivered by Accelerated Phasing Plan



2.1.5. Table 2-1 identifies the external lighting areas, as shown on the overall site drawing (Figure 2-2).

Table 2-1 External lighting areas indicative lighting strategy overview

Area	Intended Lighting Strategy
Western Service Yard (WSY)	6m column mounted full cut-off street lanterns illuminating roads car parking and vehicle turn-round areas. Tree up-lighting and local bollard lighting is also included in the landscaped areas and uncovered walkways.
Western Energy Centre (WEC)	Wall mounted full-cut-off luminaires above doors and walkway areas.
New and Reconfigured stands and Airfield	16m with outreach bracket, building mounted and 16m mast mounted luminaires illuminating new aircraft stands and associated apron areas
Hartmann Rd and Eastern entrance	10m column mounted full-cut off luminaires
Parallel Taxiway	No external lighting.
Main terminal building (MTB)	Selective façade lighting to the landside building, in canopy lighting and halo lighting to key entrance façade bezels.
Forecourt (FCT)	Low level bollard lighting incorporated into anti-terrorist bollards, in ground up-lighting to planter ends. Tree up-lighting and monumental light columns.
New east pier (NEP)	Selective façade lighting and halo lighting to east gable bezels
Pedestrian canopied walkway	Downlighting Luminaires incorporated within canopy design.
Drop off areas and bus stops	10m and 6m column lighting with integral canopy lighting for the passenger drop off areas.
Grade level Car Parks (CPs No)	6m column mounted full-cut off luminaires.
Dockside heritage walk	4m column mounted luminaires and integrated lighting incorporated into the dock edge balustrade.
Passenger Decked Car Park 1 (2 levels)	Ceiling mounted luminaires internally and 6m column mounted full-cut off luminaires on first floor external deck.
Eastern energy centre (EEC)	Wall mounted full cut-off luminaires lighting service yard and full cut-off luminaires mounted above entrance doors.
Taxi Feeder Park	6m column mounted full-cut off luminaires.
Car hire & Taxi Welfare building	Wall mounted full cut off luminaires above final exit doors and recessed downlighters within cantilevered canopy.
Car Hire Parking	6m column mounted full-cut off luminaires

2.1.6. Figure 2-3 below identifies the visual light sensitive receptors for the external lighting works in the context of the overall site. This and the details of each individual receptor can be found in Appendix B.

ATKINS

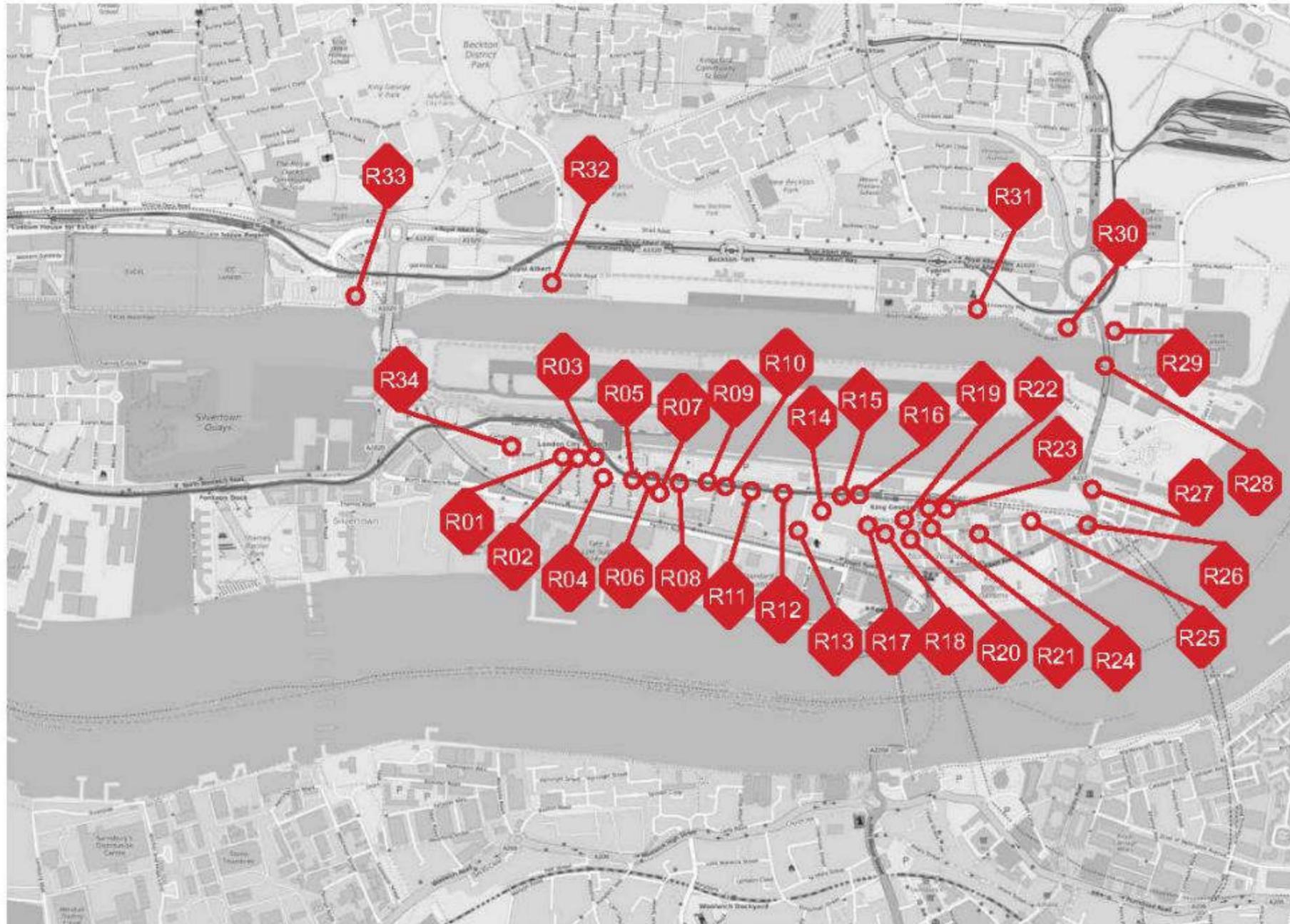


Figure 2-3 Overall site sensitive receptors layout

2.2. External Lighting Design Criteria

2.2.1. The external lighting will be designed in accordance with the following criteria: -

Table 2-2 BS EN 12464-2:2014 Table 5.2 Airports

Notes: the red outlined box identifies the additional aviation glare criteria which must be met.

Ref. no.	Type of area, task or activity	E_m	U_o	R_{GL}	R_a	Specific requirements
		lx	–	–	–	
General						1. Direct light in the direction of the control tower and landing aircraft shall be avoided. 2. Direct light emitted above horizontal from floodlights should be restricted to the minimum.
5.2.1	Hangar apron	20	0,10	55	20	
5.2.2	Terminal apron	20	0,25	50	20	
5.2.3	Loading areas	20	0,25	50	40	For reading labels: $E_m = 50$ lx
5.2.4	Fuel depot	50	0,25	50	40	
5.2.5	Aircraft maintenance stands	200	0,50	45	60	

See appendix A for technical glossary and definitions of units.

Table 2-3 BS EN 12464-2:2014 Table 5.1 Requirements for areas and for cleaning at outdoor work places

Ref. no.	Type of area, task or activity	E_m	U_o	R_{GL}	R_a	Specific requirements
		lx	–	–	–	
5.1.1	Walkways exclusively for pedestrians	5	0.25	50	20	
5.1.2	Traffic areas for slowly moving vehicles(max 10 km/h) eg bicycles trucks and excavators	10	0.4	50	20	
5.1.3	Regular vehicle traffic (max 40Km/h)	20	0.4	45	20	At shipyards and in dock, R_{GL} may be 50
5.1.4	Pedestrian passages, vehicle turning and unloading points	50	0.4	50	20	
5.1.5	Cleaning and servicing	50	0.25	50	20	All relevant surfaces.

2.2.2. Landside external illumination is required to be designed to Table 2-3 with the additional requirements of conforming with the criteria listed in Table 2-4 in respect of lighting impact to surrounding area.

2.2.3. Airfield apron lighting has been designed by TPS. Requirements for airside lighting are laid out as follows:

2.2.4. The standards governing Apron floodlighting at LCA are prescribed by the European Aviation Safety Agency (EASA) in their Certification Specifications for Aerodrome Design: CS-ADR-DSN, section 4 – Apron Lighting.

2.2.5. Clause CS ADR DSN.M.750 of this specification requires an arrangement of lighting such that an aircraft stand receives light from two or more directions to minimise shadows, with floodlights located so as to provide adequate illumination whilst minimising glare to aircraft pilots, aerodrome controllers and personnel on the ground. The minimum average illuminance on an aircraft stand must be 20 lux with a uniformity ratio (average to minimum) of not more than 4 to 1 horizontally and 20 lux at a height of 2m above apron level vertically. On other apron areas (such as apron roads and equipment areas) the average horizontal illuminance must be 50% of the average on the adjacent aircraft stands, with a uniformity ratio of not more than 4 to 1.

2.2.6. The EASA specification clause in full is:

2.2.7. CS ADR-DSN.M.750 Apron floodlighting

(a) The purpose of apron floodlighting is to facilitate safe operations on an apron, on a de-icing/anti-icing facility, and on a designated isolated aircraft parking position intended to be used in reduced visibility conditions and at night.

(b) Applicability: Apron floodlighting should be provided on an apron, as necessary on a de-icing/anti-icing facility, and on a designated isolated aircraft parking position intended to be used at night. Aprons primarily used for recreational flying need not be illuminated.

(c) Location: Apron floodlights should be located so as to provide adequate illumination on all apron service areas, with a minimum of glare to pilots on aircraft in flight and on the ground, aerodrome and apron controllers, and personnel on the apron. The arrangement and aiming of floodlights should be such that an aircraft stand receives light from two or more directions to minimise shadows.

(d) Characteristics:

(1) The spectral distribution of apron floodlights should be such that the colours used for aircraft marking connected with routine servicing, and for surface and obstacle marking, can be correctly identified.

(2) The average illuminance should be at least the following:

(i) Aircraft Stand:

(A) horizontal illuminance – 20 lux with a uniformity ratio (average to minimum) of not more than 4 to 1; and

(B) vertical illuminance – 20 lux at a height of 2m above the apron in relevant directions.

(ii) Other apron areas: horizontal illuminance – 50% of the average

illuminance on the aircraft stands with a uniformity ratio (average to minimum) of not more than 4 to 1.

Environmental Zoning

2.2.8. The UES produced by RPS in September 2015 has identified the environs around London City Airport as “E4 urban” (Refer to Table 2-4) and hence the areas that are required to meet the obtrusive lighting requirements of E4 for all areas identified in this report.

Table 2-4 Institute of lighting Professionals ILP GN01 Table 2

Obtrusive Light Limitations for Exterior Lighting Installations – General Observers						
Environmental Zone	Sky Glow ULR [Max %] (1)	Light Intrusion (into Windows) Ev [lux] (2)		Luminaire Intensity I [candelas] (3)		Building Luminance Pre-curfew (4) Average, L [cd/m ²]
		Pre-curfew	Post-curfew	Pre-curfew	Post-curfew	
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

(1) Upward Light Ratio – Some lighting schemes will require the deliberate and careful use of upward light, e.g. ground recessed luminaires, ground mounted floodlights, festive lighting, to which these limits cannot apply. However, care should always be taken to minimise any upward waste light by the proper application of suitably directional luminaires and light controlling attachments.

(2) Light Intrusion (into Windows) – These values are suggested maxima and need to take account of existing light intrusion at the point of measurement. In the case of road lighting on public highways where building facades are adjacent to the lit highway, these levels may not be obtainable. In such cases where a specific complaint has been received, the Highway Authority should endeavour to reduce the light intrusion into the window down to the post curfew value by fitting a shield, replacing the luminaire, or by varying the lighting level.

(3) Luminaire Intensity – This applies to each luminaire in the potentially obtrusive direction, outside of the area being lit. The figures given are for general guidance only and for some sports lighting applications with limited mounting heights, may be difficult to achieve.

(4) Building Luminance – This should be limited to avoid over lighting, and related to the general district brightness. In this reference building luminance is applicable to buildings directly illuminated as a night-time feature as against the illumination of a building caused by spill light from adjacent luminaires or luminaires fixed to the building but used to light an adjacent area.

2.3. Obtrusive Lighting Mitigation

Lighting equipment general specification

- 2.3.1. The nature of the design of the majority of the luminaires has been chosen specifically to reduce, if not eliminate obtrusive light to the sensitive receptors. The following specification aspects have been chosen to mitigate the obtrusive lighting aspects identified in Table 2-4 :-

Sky glow:-

- Wherever possible full cut-off luminaires with no upward light have been used;
- Waste light has been minimised by use of luminaires with correct photometric distribution; and
- Façade lighting and tree up-lights will be turned off after the last DLR train.

Light Intrusion:-

- Luminaires with minimal waste light have been utilised;
- Luminaires have been aimed to face away from receptors when they are close by;
- Asymmetric photometric distributions have been chosen to contain light within the red line boundary and
- Mounting heights have been chosen to be optimal height so as to provide the correct balance between the number of luminaires and the higher light output required for higher mounting heights.

Luminaire Intensity:-

- Luminaires have been chosen to have the optimum light output and asymmetric distributions with a balance point achieved between the number of luminaires and their light output and
- Luminaires will have low light intensities in the direction of receptors.

Façade Lighting:-

- Waste light will be reduced with shielding on luminaires;
- Close offset positioning will pick up texture of façade and matched to the materiality and
- Luminance levels will be chosen to suit actual ambient lighting environment with a luminance ratio between the facades and the background illuminance of no greater than 5:1.

2.4. Physical Screening

- 2.4.1. Physical screening is not the primary mitigation measure for the CADP external lighting. However, there are a number of existing and new elements that will offer a level of physical screening to external lighting. The screening will not be to all receptors and does not cover all the areas of external lighting. It should be noted that the compliance of the design to the quoted criteria does not rely on any physical screening element but they are beneficial for some of the receptors.

Table 2-5 Physical screening elements that affect the external lighting

Existing screening element	Receptors numbers benefiting from screening	Sites benefiting
DLR station	R1,2,3, 34	WEC WTE WSY
West Pier	R29-33	WEC WTE WSY
Main Terminal Building	R1-12 and R29-33 (for TBF and DOZ)	WEC WTE WSY
DLR Wall and Viaduct	R4-23 (excluding R18, R19 & R20)	CPs DCP
East Pier	R4-12	Apron Lighting
Noise Barrier.	R4-12	Apron Lighting
New screening element	Receptors numbers benefiting from screening	Sites benefiting
ETE	R1-12 and R29-33	Apron Lighting
NEP	R1-12, R14- R-16, R19	Apron Lighting
Extension to noise barrier	R1-12, R14- R-16, R19	Apron Lighting

Notes

1. Screening elements are only appropriate for ground and first floors of the all properties with second floors being offered some level of partial screening in certain cases.

2.5. Receptor sensitivity by lighting area

- 2.5.1. Each of the lighting areas can be aligned to a subset of the receptors identified on Figure 2-3. The applicable receptors for each lighting area are identified in Table 2-6.

Table 2-6 Receptor subsets applied to lighting areas

Lighting Area	Applicable receptors	Mitigation
Western Service Yard	R01 R02 R03 R34	Full cut off luminaires, no tilt, luminaires aimed away from receptors, curfew

Western Energy Centre	R01 R02 R03 R34	Full cut off luminaires, no tilt, luminaires aimed away from receptors, curfew
Hartmann Rd/Eastern Entrance	R01-R27, R34	Full cut off luminaires, no tilt, luminaires aimed away from receptors, glare shields if necessary. Curfew
Main terminal Building	R01-R10, R13, R17, R18, R20, R22,	Curfew
Forecourt	R01 R02 R03, R34	Curfew
Drop off areas and bus stops	R01-R08, R34	Full cut off luminaires, no tilt, luminaires aimed away from receptors, curfew
Airfield Apron Stand lighting	R05-R12, R13, R17, R18, R20, R22, R30-R34	Full cut off luminaires, only 15° tilt, luminaires aimed away from receptors. Curfew
Car park 1 Decked Car Park	R7-R12 R13, R17, R18, R20, R22, R34	Full cut off luminaires, no tilt, luminaires aimed away from receptors
Eastern Energy Centre	R13, R17, R18, R20, R22, R34	Full cut off luminaires, no tilt, luminaires aimed away from receptors
Rendezvous Point	R7-R12 R13, R17, R18, R20, R22, R34	Full cut off luminaires, no tilt, luminaires aimed away from receptors
Grade Car parks	R7-R12 R13, R17, R18, R20, R22, R34	Full cut off luminaires, no tilt, luminaires aimed away from receptors
Taxi Feeder Park	R21-R27, R17, R18, R20, R22, R34	Full cut off luminaires, no tilt, glare shields on nearest luminaires, luminaires aimed away from receptors
Car Hire and Taxi Welfare	R25-R27 R17, R18, R20, R22, R34	Full cut off luminaires, no tilt, luminaires aimed away from receptors
Car hire car parks	R21-R27 R17, R18, R20, R22, R34	Full cut off luminaires, no tilt, glare shields on nearest luminaires, luminaires aimed away from receptors. Curfew
Dockside Heritage Walk	R21-R27 R17, R18, R20, R22, R34	Full cut off luminaires, no tilt, luminaires aimed away from receptors. Curfew

3. Lighting Approach

- 3.1.1. Approval is sought for the lighting intent design parameters including general layout, illuminance levels, column heights, general luminaire types and positions.. The lighting layouts included are indicative of column position, single luminaire type/ photometric distribution and will be dependant on ground conditions final site configuration and subject to change. This refinement may require repositioning, re-aiming, change of optical distribution or minor increase of luminaire quantities indicated on the lighting layout drawings.

3.2. Western service yard (WSY)

- 3.2.1. The WSY consists of sub areas with individual external lighting treatments for each: -
- 3.2.2. Vehicle Access road, landscaped area, vehicle turn-round area, DLR car park spaces, pedestrian covered walkway, escape walkway from WTE and refuse compound.
- 3.2.3. The access road will be lit by two 6m column mounted street lanterns placed locally to the security gate. The columns are to provide additional lighting at the security readers/ intercom and for Automatic Number Plate Recognition (ANPR) for security reasons. The luminaires are far enough back from Hartman Rd to cause minimal lighting of Hartmann Rd and are out of drivers' field of view when proceeding down Hartmann Rd.
- 3.2.4. The landscaped area will be lit with low level bollard luminaires, in-ground linear up-lighter washing the ends of the raised planters and tree up-lights.
- 3.2.5. The vehicle turnaround area will be lit via 6m column mounted street lanterns mounted around the perimeter of the vehicle turning area extending in front of the WEC.

Figure 3-1 WSY luminaires (see luminaire schedule Appendix E for full details)



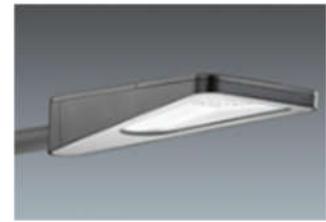
Type A1 – A3



Type A4



Type A5



Type B1-B7



Type F1



Type F2



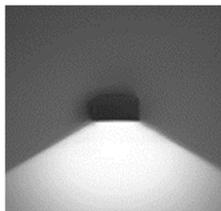
Type F4



Type F5



Type J3



Type N2



Type P2



Type P3

Figure 3-2 WSY visualisation



Table 3-1 WSY Details

WSY lighting Details.	
Condition 41 Requirements	Details
<i>State the minimum luminance reasonably required to perform the relevant lighting task</i>	See Tables 2-2 and 2-3 & drawing A400-ATK-E-30-XXX-XX-DR-GL-827-001 in Appendix A.
<i>Minimise glare, light spillage and pollution</i>	All street lamps and amenity luminaires are fully cut-off; it is recognised that there is some up-lighting to facades, planters and trees; as a percentage of the full development and general lighting on the site is expected to fall below the E4 environmental zone recommendations, up-light elements will incorporate shields and louvres to minimise unwanted overspill.
<i>Include landscaping/screening measures to screen illuminated areas in environmentally sensitive areas</i>	Screening is not used as a primary mitigation measure but the DLR station and viaduct is an existing screening element.
<i>Avoid dazzle or distraction to drivers on nearby highways;</i>	Not applicable to this design as the DLR station is a major screening element to the luminaires.
<i>Include the location, type, number, mounting height and alignment of the luminaires</i>	See Lighting layout drawing A400-ATK-E-30-XXX-XX-DR-GA-827-001 in Appendix A.
<i>Include the beam angles and upward waste light ratio for each light</i>	The nature of the design means that there is no upward light and we have an upward waste light ratio UWLR of 0. The exception to this is the tree Up-lighters within the landscaped area which have a 100% Upward light Output ratio
<i>Include details of screening and other mitigation</i>	None envisaged; see Table 2-5 for details of physical screening elements
<i>Include an Isolux diagram showing the predicted illuminance levels at critical locations on the Airport Boundary of the Phase and where the Phase abuts residential properties or the public highway; and Set out where necessary, the percentage increase in luminance and the predicted illuminance in the vertical plane (in lux) at key point:</i>	See drawing A400-ATK-E-30-XXX XX-DR-GL-827-002 in Appendix A. The 1 lux contour demonstrates that there is negligible obtrusive light directly outside of the design areas.

3.3. Western Energy Centre (WEC)

- 3.3.1. The WEC external lighting includes perimeter wall mounted luminaires above doors and maintenance lighting on the roof for plant access. The perimeter wall luminaires will provide local ingress and egress lighting and final exit emergency lighting.
- 3.3.2. The luminaires will be operated automatically by the overall lighting control system. With external ambient illuminance sensors operating within fixed time regime control.
- 3.3.3. All lighting on the roof will be mounted at low level no more than 1.5m above roof level and will utilise full cut-off luminaires with no upward light.
- 3.3.4. Local manual switching with photocell and time regime override will be used to minimise inadvertent use.

Figure 3-3 WEC luminaires (see luminaire schedule Appendix E for full details)



Type A1 – A3



Type A4



Type A5



Type N3

Table 3-2 Western Energy Centre compliance

WEC lighting Details.	
Condition 41 Requirements	Lighting Details
<i>State the minimum luminance reasonably required to perform the relevant lighting task</i>	See Tables 2-2 and 2-3 & drawing A400-ATK-E-30-XXX-XX-DR-GL-827-001 in Appendix A.
<i>Minimise glare, light spillage and pollution</i>	All luminaires are full-cut off and design complies with GN01 E4 criteria
<i>Include landscaping/screening measures to screen illuminated areas in environmentally sensitive areas</i>	Screening is not used as primary mitigation measure but the DLR station and viaduct is an existing screening element
<i>Avoid dazzle or distraction to drivers on nearby highways;</i>	Not applicable to this design
<i>Include the location, type, number, mounting height and alignment of the luminaires</i>	See Lighting layout drawing A400-ATK-E-30-XXX-XX-DR-GA-827-001 in Appendix A.
<i>Include the beam angles and upward waste light ratio for each light</i>	Photometry of luminaires contained within luminaire datasheets and luminaire schedule Appendix A.
<i>Include details of screening and other mitigation</i>	None envisaged see Table 2-5 for details of physical screening elements
<i>Include an Isolux diagram showing the predicted illuminance levels at critical locations on the Airport</i>	See drawing A400-ATK-E-30-XXX-XX-DR-GL-827-002 in Appendix A. The 1 lux contour demonstrates

<i>Boundary of the Phase and where the Phase abuts residential properties or the public highway; and Set out where necessary, the percentage increase in luminance and the predicted illuminance in the vertical plane (in lux) at key point:</i>	that there is negligible obtrusive light direct outside of the design areas.
---	--

3.4. Western terminal extension (WTE)

- 3.4.1. It is not proposed to light the WTE façade due to the complexity of the detailing of the approved façade cladding. The likely positions of the luminaires are not feasible and shadow pattern would be unattractive. A floodlit façade to WTE is not therefore considered appropriate. However, the lighting in the WSY is considered appropriate to illuminate the areas surrounding the WTE to an acceptable standard.

3.5. Hartmann Road/Eastern Entrance

- 3.5.1. The entire length of Hartmann road will be re-lit with 10m high full-cut off street lighting columns placed at 25m centres on predominantly the southern side of Hartmann Road and orientated away from the DLR and residential properties on adjacent roads (receptor numbers R01 - R27, R34). The DLR have been consulted on these proposals prior to formal submission (dated 12 January 2018) and raised no objections in principle.
- 3.5.2. The lighting has been designed to BS EN 5489-1 2013 and the road class has been assessed as ME4b / S2.
- 3.5.3. Pedestrian crossings have been lit to comply with ILP TR12.
- 3.5.4. Road junctions and other conflict areas have been evaluated and lit appropriately to BS5489.
- 3.5.5. The luminaires have been chosen to be a common design with the car parking and other external column mounted lighting to give a balanced approach.

Figure 3-4 Hartman Rd luminaire (see luminaire schedule Appendix E for full details)



Type B3

Table 3-3 Hartmann Road and Eastern Entrance Details

Hartman Road and Eastern Entrance Details.	
Condition 41 Requirements	Lighting Details
<i>State the minimum luminance reasonably required to perform the relevant lighting task</i>	See Tables 2-2 and 2-3 & drawings A400-ATK-E-40-XXX-XX-DR-GL-827-001 to -010 in Appendix A.
<i>Minimise glare, light spillage and pollution</i>	All luminaires are asymmetric distribution E4 environmental zone recommendations, up-light elements will incorporate shields and louvres to minimise unwanted overspill
<i>Include landscaping/screening measures to screen illuminated areas in environmentally sensitive areas</i>	Screening is not used as primary mitigation measure but the DLR station and viaduct is an existing screening element for local receptors.
<i>Avoid dazzle or distraction to drivers on nearby highways;</i>	Luminaires meet the glare rating required by BS 5489 and will have additional shielding if required to prevent glare to the DLR drivers and adjacent residential properties.
<i>Include the location, type, number, mounting height and alignment of the luminaires</i>	See Lighting layout drawings A400-ATK-E-40-XXX-XX-DR-GA-827-001 to -010 in Appendix A.
<i>Include the beam angles and upward waste light ratio for each light</i>	Photometry of luminaires contained within luminaire datasheets and luminaire schedule Appendix C, see also comments regarding item 2 above on minimising light pollution
<i>Include details of screening and other mitigation</i>	None envisaged see Table 2-5 for details of physical screening elements
<i>Include an Isolux diagram showing the predicted illuminance levels at critical locations on the Airport Boundary of the Phase and where the Phase abuts residential properties or the public highway; and Set out where necessary, the percentage increase in luminance and the predicted illuminance in the vertical plane (in lux) at key point:</i>	See drawings A400-ATK-E-40-XXX-XX-DR-GL-827-011 to -021 in Appendix A. The 1 lux contour demonstrates that there is negligible obtrusive light direct outside of the design areas.

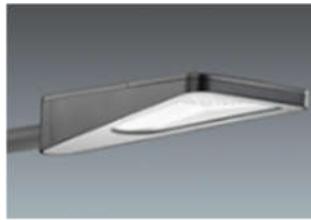
3.6. Forecourt

- 3.6.1. The forecourt consists of several functional and decorative lighting elements. The design has a philosophy of lighting normal pedestrian and vehicular areas to recognised illuminance standards whilst providing a lower level of security lighting to areas where the public are not supposed to go such as the fire vehicle access road.
- 3.6.2. The lighting also identifies a selection of landscape elements such as the trees and the ends of the raised planters.
- 3.6.3. The trees will be up-lit with a cool white light that identifies the trunk of the tree and the structure of the canopy. The up-lighting will be subject to a curfew enacted by the lighting control system timed to go off after the last DLR train.
- 3.6.4. Pedestrian walkways and hardstanding will be lit by a combination of 6m column luminaires following the overall site philosophy with bollard lighting incorporated within the anti-terrorist bollards.
- 3.6.5. The two main entrances to the landside building will have a line of monumental column lights that signpost the entrances to the building.
- 3.6.6. The entrance canopy will have recessed downlighters incorporated within the canopy
- 3.6.7. The taxi drop of entrance will have perimeter halo lighting concealed within an architectural detail that follows the door frames and provides a close off set wash of the sloping façade panels.
- 3.6.8. The LFB fire access road is provided with a level of security lighting to cover the minimum illuminance and uniformity required by Secured by Design recommendations. This minimum lighting level is referred to within PCC40.

Figure 3-5 Forecourt luminaires (see luminaire schedule Appendix E for full details)



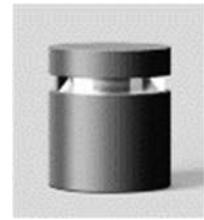
Type A1



Type B1, B2, B6, B7



Type F1



Type F2



Type F3



Type F4



Type F5



Type M1



Type P3



Type J3

Table 3-4 Forecourt details

Forecourt Details.	
Condition 41 Requirements	Details
<i>State the minimum luminance reasonably required to perform the relevant lighting task</i>	See Tables 2-2 and 2-3 & drawings A400-ATK-E-36-XXX-XX-DR-GL-827-001 to -003 in Appendix A.
<i>Minimise glare, light spillage and pollution</i>	It is recognised that there is some up-lighting to facades, planters and trees, as percentage of the full development and general lighting on the site is expected to fall below the E4 environmental zone recommendations, up-light elements will incorporate shields and louvres to minimise unwanted overspill.
<i>Include landscaping/screening measures to screen illuminated areas in environmentally sensitive areas</i>	Screening is not used as primary mitigation measure but the DLR station and viaduct is an existing screening element

<i>Avoid dazzle or distraction to drivers on nearby highways;</i>	Not applicable to this design
<i>Include the location, type, number, mounting height and alignment of the luminaires</i>	See Lighting layout drawings A400-ATK-E-36-XXX-DR-GA-827-001 to -003 in Appendix A.
<i>Include the beam angles and upward waste light ratio for each light</i>	Photometry of luminaires contained within luminaire datasheets and luminaire schedule Appendix C, see also comments regarding item 2 above on minimising light pollution
<i>Include details of screening and other mitigation</i>	None envisaged see Table 2-5 for details of physical screening elements
<i>Include an Isolux diagram showing the predicted illuminance levels at critical locations on the Airport Boundary of the Phase and where the Phase abuts residential properties or the public highway; and Set out where necessary, the percentage increase in luminance and the predicted illuminance in the vertical plane (in lux) at key point:</i>	See drawings A400-ATK-E-36-XXX-XX-DR-GL-827-004 to -006 in Appendix A. The 1 lux contour demonstrates that there is negligible obtrusive light direct outside of the design areas.

3.7. Main Terminal Building (MTB) and East Terminal Extension (ETE)

- 3.7.1. The MTB consists of several physical massing elements that have some varying light treatments most of the elements are unlit.
- 3.7.2. The landside building (gold clad) is façade lit with close offset linear floodlights both at ground level and from the canopy above the windows. The floodlighting wraps round the west and east facades of the gold clad element. Indicative visualisations are shown in Figure 3-6 below. The lighting levels will be constrained by the façade lighting design levels quoted in ILP GN 01. The distribution of the luminaires is an aesthetic consideration and will be decided upon via site trial during construction. Typical luminaires are shown to support the concept but will be determined by final design and installation details.
- 3.7.3. The canopies have recessed downlighters that provide additional threshold lighting to the drop off zone entrance. The window canopy has low power asymmetric downlighters to supplement the lighting to the LFB access road.
- 3.7.4. The taxi drop-off entrance at the western end of the building has a façade bezel which is lit with a halo wall washing effect from luminaires integrated within the door frame detail.
- 3.7.5. The angled solar shades are up-lit on a random pattern to provide a consistent approach with the NEP façade lighting.
- 3.7.6. The luminaires will be operated automatically by the overall lighting control system, with external ambient illuminance sensors operating within fixed time regime control.
- 3.7.7. All maintenance lighting on the roof will be mounted at low level no more than 1.5 m above roof level and will utilise full cut-off luminaires with no upward light.
- 3.7.8. Local manual switching with photocell and time regime override will be used to minimise inadvertent use of the maintenance lighting.

Figure 3-6 Visualisation of the Main Terminal Building & ETE Facade

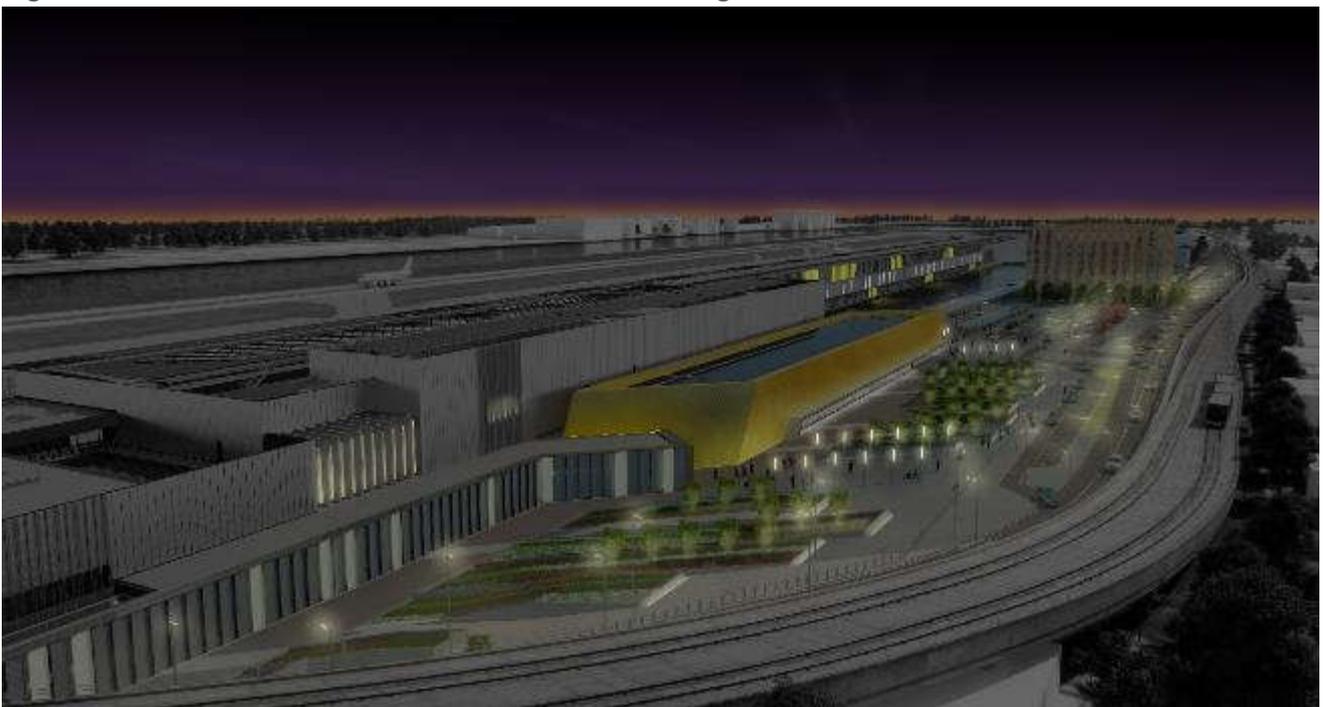


Figure 3-7 MTB and ETE luminaires (see luminaire schedule Appendix E for full details)



Type A4



Type J2



Type J3



Type P1



Type P3

Table 3-5 MTB & ETE details

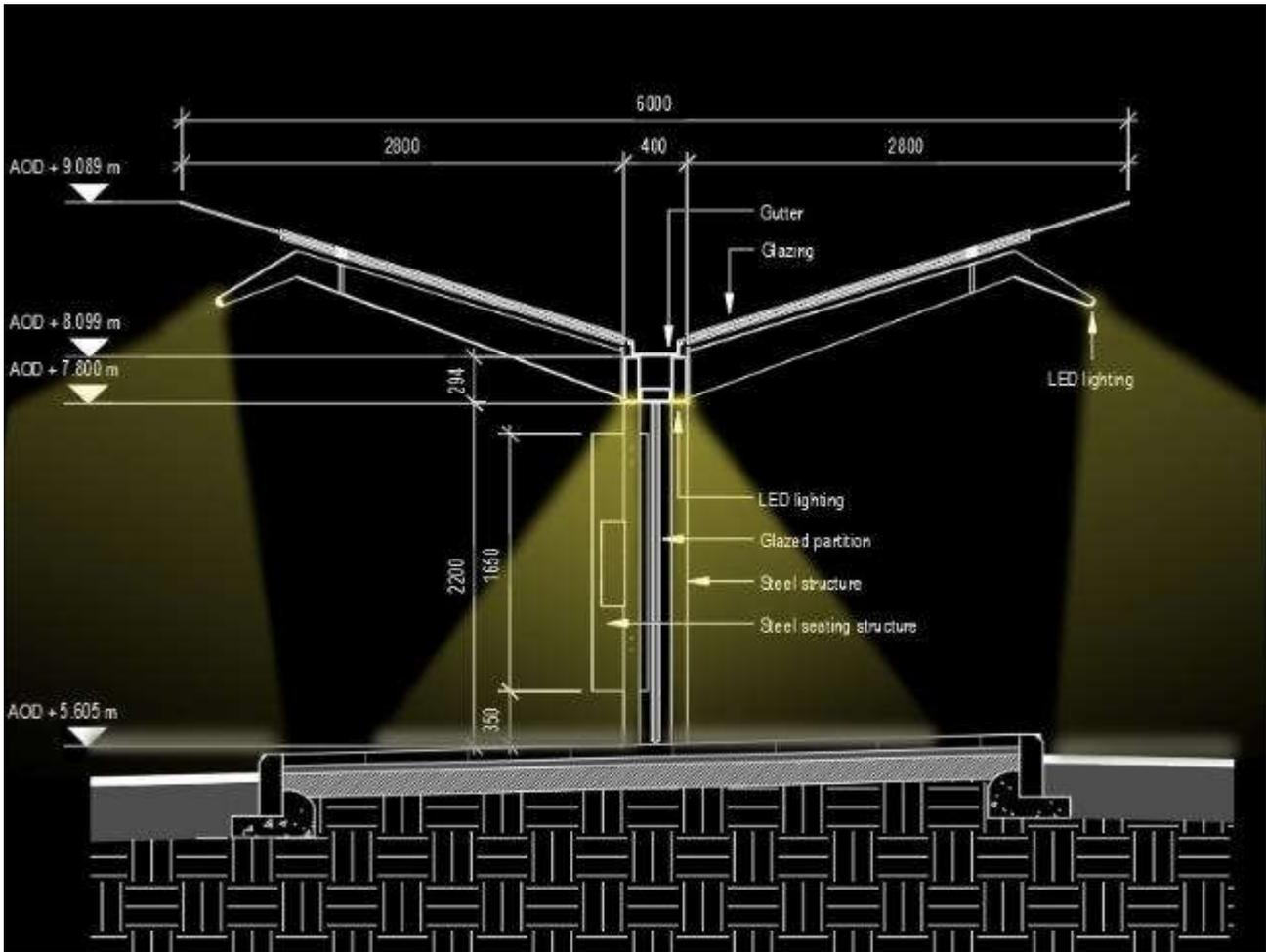
MTB & ETE Details	
Condition 41 Requirements	Details
<i>State the minimum luminance reasonably required to perform the relevant lighting task</i>	The lighting levels will be chosen on aesthetic basis but will not exceed the levels of illuminance. See visualisations.
<i>Minimise glare, light spillage and pollution</i>	It is recognised that there is some up-lighting to facades, planters and trees, as percentage of the full development and general lighting on the site is expected to fall below the E4 environmental zone recommendations, up-light elements will incorporate shields and louvres to minimise unwanted overspill
<i>Include landscaping/screening measures to screen illuminated areas in environmentally sensitive areas</i>	Screening is not used as primary mitigation measure but the DLR station and viaduct is an existing screening element
<i>Avoid dazzle or distraction to drivers on nearby highways;</i>	Not applicable to this design
<i>Include the location, type, number, mounting height and alignment of the luminaires</i>	See lighting visualisation in Figure 3-6.
<i>Include the beam angles and upward waste light ratio for each light</i>	Photometry of luminaires contained within luminaire datasheets and luminaire schedule Appendix C, see also comments regarding item 2 above on minimising light pollution
<i>Include details of screening and other mitigation</i>	None envisaged see Table 2-5 for details of physical screening elements

<p><i>Include an Isolux diagram showing the predicted illuminance levels at critical locations on the Airport Boundary of the Phase and where the Phase abuts residential properties or the public highway; and Set out where necessary, the percentage increase in luminance and the predicted illuminance in the vertical plane (in lux) at key point:</i></p>	<p>Not applicable to this design.</p>
--	---------------------------------------

3.8. Drop-off areas and bus stops

- 3.8.1. The drop-off zones and bus stops represent a high-risk area due to both pedestrians and vehicles occupying the same space whilst parking and loading/unloading.
- 3.8.2. The lighting has been design to BS 5489 for a conflict zone classification CE2 20 lux Em Uo 0.4.
- 3.8.3. The lighting consists of both over-road and pedestrian walkway luminaires incorporated into the canopy design.

Figure 3-8 Drop off area canopy lighting arrangement



3.8.4. The bus stops utilise the same lighting principle as the drop off zones but are supplemented with additional 6m lighting columns for the other open areas.

Figure 3-9 Drop-off areas and bus stops luminaires (see luminaire Schedule Appendix E for details)



Type B1-B7



Type P1

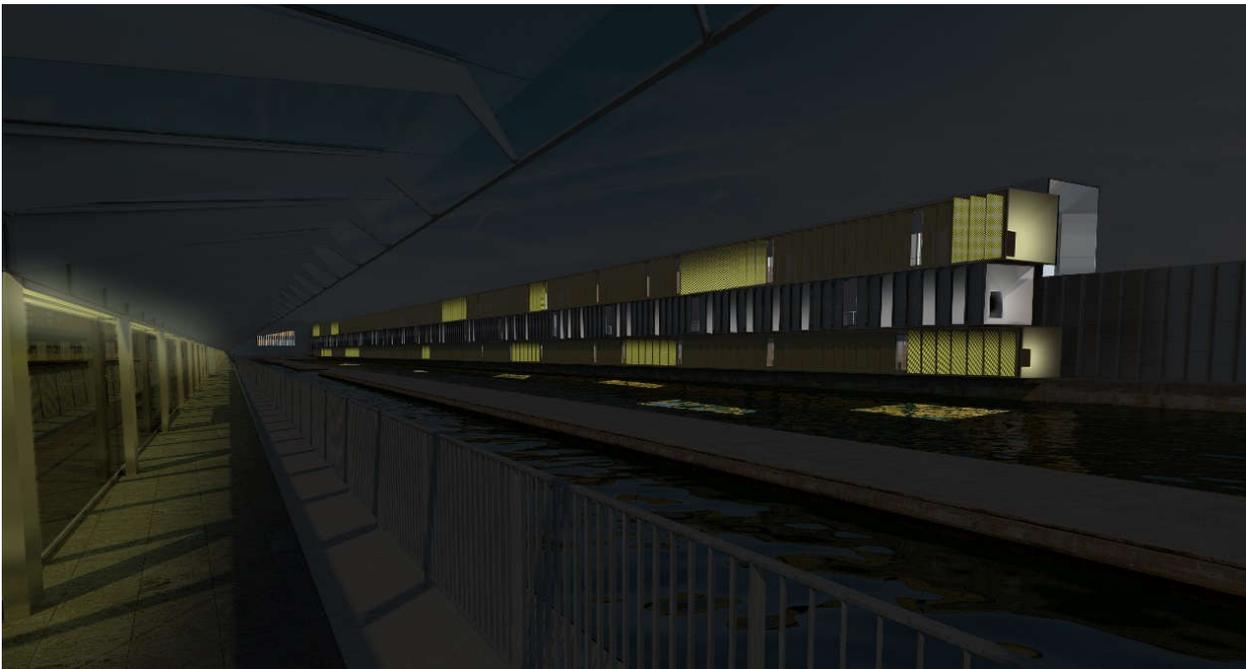
Table 3-6 Drop off areas and bus stops details

Drop off Areas Details.	
Condition	Response
<i>State the minimum luminance reasonably required to perform the relevant lighting task</i>	See Tables 2-2 and 2-3 & drawings A400-ATK-E-36-XXX-XX-DR-GL-827-002 and -003 in Appendix A.
<i>Minimise glare, light spillage and pollution</i>	All luminaires within this area are full cut-off luminaires.
<i>Include landscaping/screening measures to screen illuminated areas in environmentally sensitive areas</i>	Screening is not used as primary mitigation measure but the DLR station and viaduct is an existing screening element
<i>Avoid dazzle or distraction to drivers on nearby highways;</i>	Not applicable to this design
<i>Include the location, type, number, mounting height and alignment of the luminaires</i>	See Lighting layout drawings A400-ATK-E-36-XXX-XX-DR-GA-827-002 and -003 in Appendix A.
<i>Include the beam angles and upward waste light ratio for each light</i>	Photometry of luminaires contained within luminaire datasheets and luminaire schedule Appendix C, see also comments regarding item 2 above on minimising light pollution
<i>Include details of screening and other mitigation</i>	None envisaged see Table 2-5 for details of physical screening elements
<i>Include an Isolux diagram showing the predicted illuminance levels at critical locations on the Airport Boundary of the Phase and where the Phase abuts residential properties or the public highway; and Set out where necessary, the percentage increase in luminance and the predicted illuminance in the vertical plane (in lux) at key point:</i>	See drawings A400-ATK-E-36-XXX-XX-DR-GL-827-005 to -006 in Appendix A. The 1 lux contour demonstrates that there is negligible obtrusive light direct outside of the design areas.

3.9. New east pier dockside façade

- 3.9.1. The NEP has a coordinated approach with the MTB each of the floors having close off set façade lighting washing the external façade lighting following a different random pattern.
- 3.9.2. The eastern end of the NEP is highlighted by a halo lighting effect incorporated with the window edge detail wall washing the surrounding chamfered panelling.
- 3.9.3. The lighting control system will control both the colour and the intensity of the light onto the water and the exact scene change arrangements and timing are still subject to final agreement.

Figure 3-10 NEP Dockside Façade and Luminaires (see luminaire schedule Appendix E for full details)



These luminaires and their final location/design have not yet been chosen and will be developed later in the detailed design through an on-site mock up.

Table 3-7 New East Pier dockside façade details

New East Pier Dockside Façade Details	
Condition 41 Requirements	Details
<i>State the minimum luminance reasonably required to perform the relevant lighting task</i>	The lighting levels will be chosen on aesthetic basis but will not exceed the levels of illuminance. See visualisations.
<i>Minimise glare, light spillage and pollution</i>	It is recognised that there is some up-lighting to facades, planters and trees, as percentage of the full development and general lighting on the site is expected to fall below the E4 environmental zone recommendations, up-light elements will incorporate shields and louvres to minimise unwanted overspill
<i>Include landscaping/screening measures to screen illuminated areas in environmentally sensitive areas</i>	Screening is not used as primary mitigation measure but the DLR station and viaduct is an existing screening element
<i>Avoid dazzle or distraction to drivers on nearby highways;</i>	Not applicable to this design
<i>Include the location, type, number, mounting height and alignment of the luminaires</i>	See lighting visualisation in Figure 3-10.
<i>Include the beam angles and upward waste light ratio for each light</i>	Photometry of luminaires contained within luminaire datasheets and luminaire schedule Appendix C, see also comments regarding item 2 above on minimising light pollution
<i>Include details of screening and other mitigation</i>	None envisaged see Table 2-5 for details of physical screening elements
<i>Include an Isolux diagram showing the predicted illuminance levels at critical locations on the Airport Boundary of the Phase and where the Phase abuts residential properties or the public highway; and Set out where necessary, the percentage increase in luminance and the predicted illuminance in the vertical plane (in lux) at key point:</i>	Not applicable to this design

3.10. Car parking grade level (CP 2,3 and 4 (staff))

- 3.10.1. The grade level car parking is lit with 6m column mounted full cut-off luminaires with varying optical distributions to suit the layout of the car parks.
- 3.10.2. The luminaires are mounted on outreach arms either in double or single head arrangements.
- 3.10.3. The luminaires nearest the southern boundary residential properties are orientated away from the properties with a forward throw optic minimising any backward light.
- 3.10.4. Obtrusive lighting calculations have been taken on both horizontal and vertical planes and are identified in the lighting calculation layouts contained within Appendix D.
- 3.10.5. Additional glare shields maybe added if there are any specific requirements but the calculations indicate that both luminance and Illuminance.
- 3.10.6. Footpaths between the car parks will be illuminated primarily with spill light from the car parks with additional local lighting at step and ramps. The luminaires will be recessed mounted within the retaining walls and will be vandal resistant with a minimum IK rating of IK 10.

Figure 3-11 Footpath and ramp retaining wall lighting

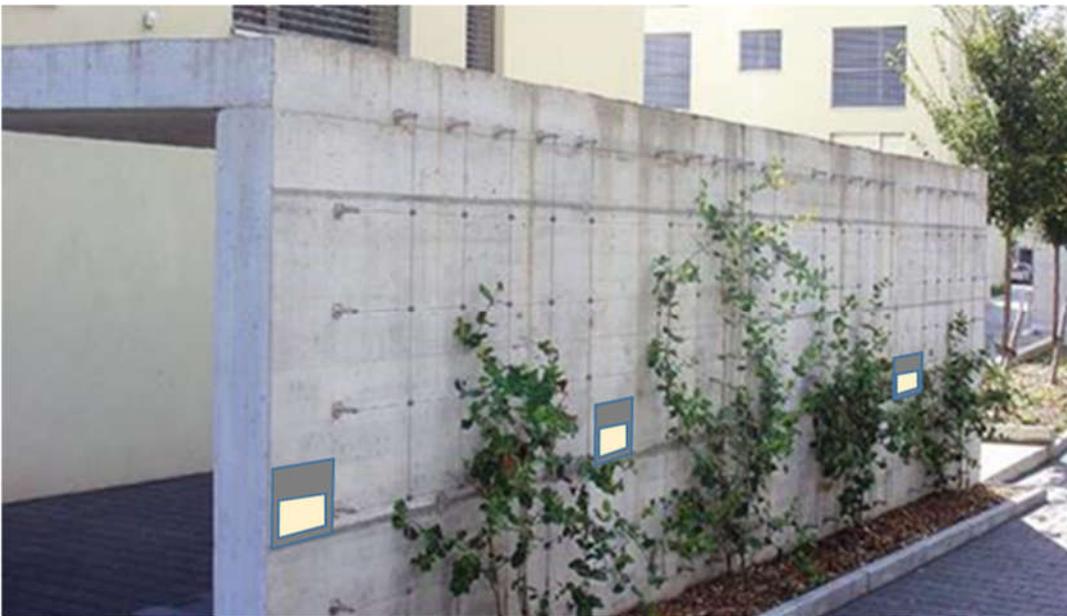


Figure 3-12 Grade car parking luminaires (see luminaire schedule Appendix E for full details)



Type B5 and B6

Table 3-8 Car parking grade level details

Car parking grade Level Details CP2-4	
Condition 41 Requirements	Details
<i>State the minimum luminance reasonably required to perform the relevant lighting task</i>	See Tables 2-2 and 2-3 & drawings A400-ATK-E-40-XXX-XX-DR-GL-827-001 to -010 in Appendix A.
<i>Minimise glare, light spillage and pollution</i>	It is recognised that there is some up-lighting to facades, planters and trees, as a percentage of the full development and general lighting on the site is expected to fall below the E4 environmental zone recommendations, up-light elements will incorporate shields and louvres to minimise unwanted overspill
<i>Include landscaping/screening measures to screen illuminated areas in environmentally sensitive areas</i>	Screening is not used as primary mitigation measure but the DLR station and viaduct is an existing screening element
<i>Avoid dazzle or distraction to drivers on nearby highways</i>	Not applicable to this design
<i>Include the location, type, number, mounting height and alignment of the luminaires</i>	See Lighting layout drawings A400-ATK-E-40-XXX-XX-DR-GA-827-001 to -010 in Appendix A.
<i>Include the beam angles and upward waste light ratio for each light</i>	Photometry of luminaires contained within luminaire datasheets and luminaire schedule in Appendix C, see also comments regarding item 2 above on minimising light pollution
<i>Include details of screening and other mitigation</i>	None envisaged see Table 2-5 for details of physical screening elements
<i>Include an Isolux diagram showing the predicted illuminance levels at critical locations on the Airport Boundary of the Phase and where the Phase abuts residential properties or the public highway; and Set out where necessary, the percentage increase in luminance and the predicted illuminance in the vertical plane (in lux) at key point:</i>	See drawings A400-ATK-E-40-XXX-XX-DR-GL-827-011 to -021 in Appendix A. The 1 lux contour demonstrates that there is negligible obtrusive light direct outside of the design areas.

3.11. Rendezvous Point (RVP)

- 3.11.1. The RVP is essentially a secured car park and is lit to car parking standards aligned with the other grade level car parks.
- 3.11.2. The luminaires are 6m column mounted luminaires with a single head placed at the perimeter of the compound and aimed inwards.
- 3.11.3. The rendezvous point will be lit to a security level normally and set to normal working levels when used for an emergency incident.

Figure 3-13 RVP Typical Lighting Layout

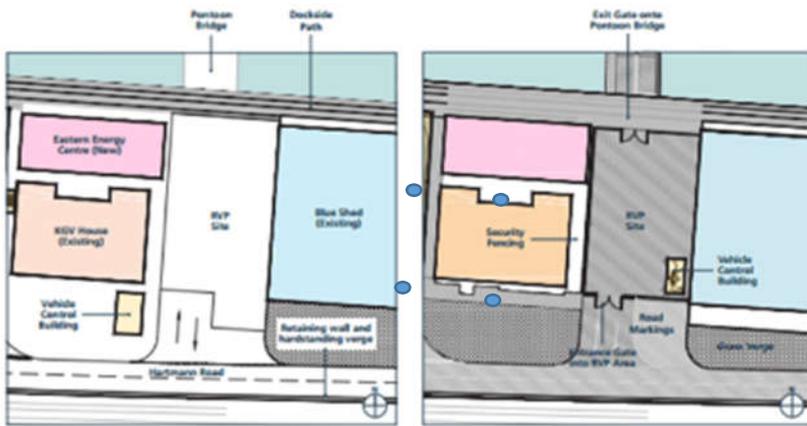


Figure 3-14 Rendezvous point luminaires



Types B1 and B2

Table 3-9 Rendezvous point details

Rendezvous Point Details	
Condition 41 Requirements	Details
<i>State the minimum luminance reasonably required to perform the relevant lighting task</i>	See Tables 2-2 and 2-3 & drawing A400-ATK-E-40-XXX-XX-DR-GL-827-001 to -010 in Appendix A.
<i>Minimise glare, light spillage and pollution</i>	It is recognised that there is some up-lighting to facades, planters and trees, as a percentage of the full development and general lighting on the site is expected to fall below the E4 environmental zone recommendations, up-light elements will incorporate shields and louvres to minimise unwanted overspill
<i>Include landscaping/screening measures to screen illuminated areas in environmentally sensitive areas</i>	Screening is not used as primary mitigation measure but the DLR station and viaduct is an existing screening element
<i>Avoid dazzle or distraction to drivers on nearby highways;</i>	Not applicable to this design.
<i>Include the location, type, number, mounting height and alignment of the luminaires</i>	See Lighting layout drawing A400-ATK-E-40-XXX-XX-DR-GA-827-001 to -010..

<i>Include the beam angles and upward waste light ratio for each light</i>	Photometry of luminaires contained within luminaire datasheets and luminaire schedule in Appendix C, see also comments regarding item 2 above on minimising light pollution
<i>Include details of screening and other mitigation</i>	None envisaged see table 2-5 for details of physical screening elements
<i>Include an Isolux diagram showing the predicted illuminance levels at critical locations on the Airport Boundary of the Phase and where the Phase abuts residential properties or the public highway; and Set out where necessary, the percentage increase in luminance and the predicted illuminance in the vertical plane (in lux) at key point:</i>	See drawing A400-ATK-E-40-XXX-XX-DR-GL-827-011 to -021. The 1 lux contour demonstrates that there is negligible obtrusive light direct outside of the design areas.

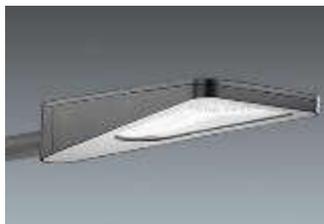
3.12. Decked Car Park (CP 1)

- 3.12.1. The CP 1 is lit with surface mounted low glare luminaires in the ground floor covered car park area.
- 3.12.2. The upper deck of the car park is lit with 6m column full- off luminaires with wide beam optics.
- 3.12.3. The Ground floor luminaires will be predominantly shielded by the 1st floor deck.
- 3.12.4. The luminaires on the southern edge of the first-floor deck may have glare shields added.

Figure 3-15 Decked Car Park Luminaires



Type K1



Type B4

Table 3-10 Decked Car park (CP1) details

Decked Car park (CP 1) Details.	
Condition 41 Requirements	Details
<i>State the minimum luminance reasonably required to perform the relevant lighting task</i>	See Tables 2-2 and 2-3 & drawings A400 ATK-E-32-L00-XX-DR-GL-827-001 to -003 and A400-ATK-E-32-L10-XX-DR-GL-827-001 to -003 in Appendix A.
<i>Minimise glare, light spillage and pollution</i>	It is recognised that there is some up-lighting to facades, planters and trees, as percentage of the full development and general lighting on the site is expected to fall below the E4 environmental zone recommendations, up-light elements will incorporate shields and louvres to minimise unwanted overspill

<i>Include landscaping/screening measures to screen illuminated areas in environmentally sensitive areas</i>	Screening is not used as primary mitigation measure but the DLR station and viaduct is an existing screening element
<i>Avoid dazzle or distraction to drivers on nearby highways;</i>	Not applicable to this design
<i>Include the location, type, number, mounting height and alignment of the luminaires</i>	See Lighting layout drawings A400 ATK-E-32-L00-XX-DR-GA-827-001 to -003 and A400-ATK-E-32-L10-XX-DR-GA-827-001 to 003 in Appendix A.
<i>Include the beam angles and upward waste light ratio for each light</i>	Photometry of luminaires contained within luminaire datasheets and luminaire schedule Appendix C, see also comments regarding item 2 above on minimising light pollution
<i>Include details of screening and other mitigation</i>	None envisaged (see table 2-5 for details of physical screening elements)
<i>Include an Isolux diagram showing the predicted illuminance levels at critical locations on the Airport Boundary of the Phase and where the Phase abuts residential properties or the public highway; and Set out where necessary, the percentage increase in luminance and the predicted illuminance in the vertical plane (in lux) at key point:</i>	See drawings A400 ATK-E-32-L00-XX-DR-GL-827-004 to -006 and A400-ATK-E-32-L10-XX-DR-GA-827-004 to 006 in Appendix A. The 1 lux contour demonstrates that there is negligible obtrusive light direct outside of the design areas.

3.13. Eastern Energy Centre (EEC)

- 3.13.1. The EEC follows the same external lighting philosophy as the WEC.
- 3.13.2. The EEC external lighting includes perimeter wall mounted luminaires above doors and maintenance lighting on the roof for plant access. The perimeter wall luminaires will provide local ingress and egress lighting and final exit emergency lighting.
- 3.13.3. The luminaires will be operated automatically by the overall lighting control system. With external ambient illuminance sensors operating within fixed time regime control.
- 3.13.4. All lighting on the roof will be mounted at low level no more than 1.5 m above roof level and will utilise full cut-off luminaires with no upward light.
- 3.13.5. Local manual switching with photocell and time regime override will be used to minimise inadvertent use.

Figure 3-16 Local plan of RVP and EEC

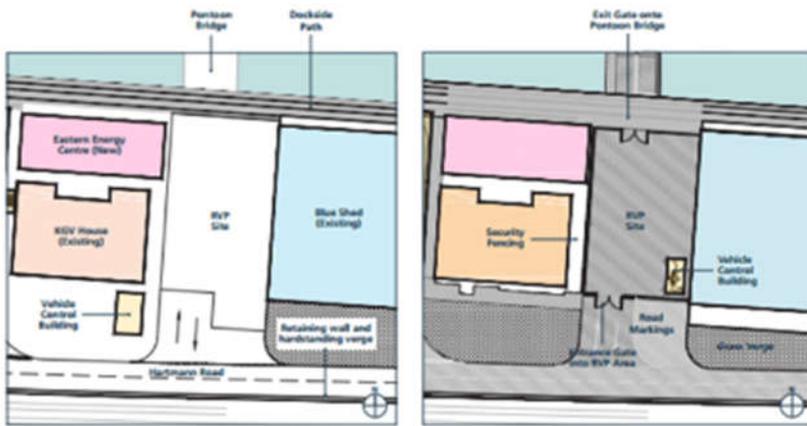


Figure 3-17 Eastern energy centre luminaires (see luminaire Schedule Appendix E for details)



Type A1 – A3

Type A4

Type A5

Type B1-B7

Table 3-11 Eastern energy centre details

Eastern Energy Centre (EEC) Details	
Condition 41 Requirements	Details
State the minimum luminance reasonably required to perform the relevant lighting task	See Tables 2-2 and 2-3 & drawing A400-ATK-E-40-XXX-XX-DR-GL-827-001 to -010 in Appendix A.
Minimise glare, light spillage and pollution	It is recognised that there is some up-lighting to facades, planters and trees, as a percentage of the full development and general lighting on the site is expected to fall below the E4 environmental zone recommendations, up-light elements will incorporate shields and louvres to minimise unwanted overspill
Include landscaping/screening measures to screen illuminated areas in environmentally sensitive areas	Screening is not used as primary mitigation measure but the DLR station and viaduct is an existing screening element
Avoid dazzle or distraction to drivers on nearby highways;	Not applicable to this design
Include the location, type, number, mounting height and alignment of the luminaires	See Lighting layout drawing A400-ATK-E-40-XXX-XX-DR-GA-827-001 to -010.

<i>Include the beam angles and upward waste light ratio for each light</i>	Photometry of luminaires contained within luminaire datasheets and luminaire schedule Appendix C, see also comments regarding item 2 above on minimising light pollution
<i>Include details of screening and other mitigation</i>	None envisaged see Table 2-5 for details of physical screening elements
<i>Include an Isolux diagram showing the predicted illuminance levels at critical locations on the Airport Boundary of the Phase and where the Phase abuts residential properties or the public highway; and Set out where necessary, the percentage increase in luminance and the predicted illuminance in the vertical plane (in lux) at key point:</i>	See drawing A400-ATK-E-40-XXX-XX-DR-GL-827-011 to -021. The 1 lux contour demonstrates that there is negligible obtrusive light direct outside of the design areas.

3.14. Taxi Feeder Park

- 3.14.1. The taxi feeder area and rest follows the same philosophy as the car park with 6m column mounted luminaires
- 3.14.2. The close spacing of the taxi queues will require that the bottom 1m of the column will form a concrete 'elephant's foot' to protect the column from vehicular impact.
- 3.14.3. The luminaires for the taxi rest area will have glare shields for the local flats (receptor 27) as these have a direct view of the rest area and have been found to have issues without a glare shield.

Figure 3-18 'Elephant's foot' protection taxi feeder park



Table 3-12 Taxi feeder park details

Taxi Feeder Park Details	
Condition 41 Requirements	Details
<i>State the minimum luminance reasonably required to perform the relevant lighting task</i>	See Tables 2-2 and 2-3 & drawings A400-ATK-E-40-XXX-XX-DR-GL-827-008 to -010 in Appendix A.
<i>Minimise glare, light spillage and pollution</i>	It is recognised that there is some up-lighting to facades, planters and trees, as percentage of the full development and general lighting on the site is expected to fall below the E4 environmental zone recommendations, up-light elements will incorporate shields and louvres to minimise unwanted overspill

<i>Include landscaping/screening measures to screen illuminated areas in environmentally sensitive areas</i>	Screening is not used as primary mitigation measure but the DLR station and viaduct is an existing screening element
<i>Avoid dazzle or distraction to drivers on nearby highways;</i>	Not applicable to this design
<i>Include the location, type, number, mounting height and alignment of the luminaires</i>	See Lighting layout drawings A400-ATK-E-40-XXX-XX-DR-GA-827-008 to -010 in Appendix A.
<i>Include the beam angles and upward waste light ratio for each light</i>	Photometry of luminaires contained within luminaire datasheets and luminaire schedule Appendix C, see also comments regarding item 2 above on minimising light pollution
<i>Include details of screening and other mitigation</i>	None envisaged see Table 2-5 for details of physical screening elements
<i>Include an Isolux diagram showing the predicted illuminance levels at critical locations on the Airport Boundary of the Phase and where the Phase abuts residential properties or the public highway; and Set out where necessary, the percentage increase in luminance and the predicted illuminance in the vertical plane (in lux) at key point:</i>	See drawings A400-ATK-E-40-XXX-XX-DR-GL-827-018 to -021 in Appendix A. The 1 lux contour demonstrates that there is negligible obtrusive light direct outside of the design areas.

3.15. Car hire and taxi Welfare building (CHTW)

- 3.15.1. The external lighting around CHTW will be in the form of lighting recessed in the cantilever canopy and wall mounted above final exit doors.
- 3.15.2. The luminaires are full cut off with no upward light

Figure 3-19 Car Hire and Taxi Welfare building luminaires (see luminaire Schedule Appendix E for details)



Type J1

Table 3-13 Car hire and Taxi welfare building details

Pre-condition 41 clauses applied to Car Hire and Taxi Welfare Building.	
Condition	Response
<i>State the minimum luminance reasonably required to perform the relevant lighting task</i>	See Tables 2-2 and 2-3 & drawing A400-ATK-E-40-XXX-XX-DR-GL-827-008 to -010 in Appendix A.
<i>Minimise glare, light spillage and pollution</i>	It is recognised that there is some up-lighting to facades, planters and trees, as percentage of the

	full development and general lighting on the site is expected to fall below the E4 environmental zone recommendations, up-light elements will incorporate shields and louvres to minimise unwanted overspill
<i>Include landscaping/screening measures to screen illuminated areas in environmentally sensitive areas</i>	Screening is not used as primary mitigation measure but the DLR station and viaduct is an existing screening element
<i>Avoid dazzle or distraction to drivers on nearby highways;</i>	Not applicable to this design
<i>Include the location, type, number, mounting height and alignment of the luminaires</i>	See Lighting layout drawing. A400 ATK-E-40-XXX-XX-DR-GA-827-008 to -010. Please note that this drawing is not provided as part of PCC41.
<i>Include the beam angles and upward waste light ratio for each light</i>	Photometry of luminaires contained within luminaire datasheets and luminaire schedule Appendix C, see also comments regarding item 2 above on minimising light pollution
<i>Include details of screening and other mitigation</i>	None envisaged see Table 2-5 for details of physical screening elements
<i>Include an Isolux diagram showing the predicted illuminance levels at critical locations on the Airport Boundary of the Phase and where the Phase abuts residential properties or the public highway; and Set out where necessary, the percentage increase in luminance and the predicted illuminance in the vertical plane (in lux) at key point:</i>	See drawing A400 ATK-E-40-XXX-XX-DR-GL-827-018 to -021. Please note that this drawing is not provided as part of PCC41. The 1 lux contour demonstrates that there is negligible obtrusive light direct outside of the design areas.

3.16. Eastern Car Hire Car Parks CP5 and 6

- 3.16.1. The eastern car park area is the closest of the car parking areas to the southern residential properties and will have the most stringent obtrusive lighting
- 3.16.2. The indicative luminaires chosen do not need glare shields but the final contractor-chosen luminaires may.
- 3.16.3. All luminaires have been located and aimed into the site to minimise any obtrusive light affecting the adjacent receptors.

Figure 3-20 CP5-6 luminaires (see luminaire Schedule Appendix E for details)



Type B5-6

Table 3-14 Car hire car park details

Car Hire Car Parks CP5 and 6 Details	
Condition 41 Requirements	Details
<i>State the minimum luminance reasonably required to perform the relevant lighting task</i>	See Tables 2-2 and 2-3 & drawing A400-ATK-E-40-XXX-DR-GL-827-001 to -010 in Appendix A.
<i>Minimise glare, light spillage and pollution</i>	It is recognised that there is some up-lighting to facades, planters and trees, as percentage of the full development and general lighting on the site is expected to fall below the E4 environmental zone recommendations, up-light elements will incorporate shields and louvres to minimise unwanted overspill
<i>Include landscaping/screening measures to screen illuminated areas in environmentally sensitive areas</i>	Screening is not used as primary mitigation measure but the DLR station and viaduct is an existing screening element
<i>Avoid dazzle or distraction to drivers on nearby highways;</i>	Not applicable to this design
<i>Include the location, type, number, mounting height and alignment of the luminaires</i>	See Lighting layout drawing A400-ATK-E-40-XXX-XX-DR-GA-827-001 to -010 in Appendix A.
<i>Include the beam angles and upward waste light ratio for each light</i>	Photometry of luminaires contained within luminaire datasheets and luminaire schedule Appendix C, see also comments regarding item 2 above on minimising light pollution
<i>Include details of screening and other mitigation</i>	None envisaged see Table 2-5 for details of physical screening elements
<i>Include an Isolux diagram showing the predicted illuminance levels at critical locations on the Airport Boundary of the Phase and where the Phase abuts residential properties or the public highway; and Set out where necessary, the percentage increase in luminance and the predicted illuminance in the vertical plane (in lux) at key point:</i>	See drawing A400-ATK-E-40-XXX-XX-DR-GL-827-011 to -021 in Appendix A. The 1 lux contour demonstrates that there is negligible obtrusive light direct outside of the design areas.

3.17. Dockside heritage walk and footpaths

- 3.17.1. The dockside heritage walk will be lit by a combination of 4m column luminaires mounted along the southern (car park) side supplemented with luminaires integrated into the dockside balustrade.
- 3.17.2. The lighting within the balustrade will be incorporated in a double pillar detail to allow the mounting of a wide asymmetric distribution wall luminaire giving optimal performance with minimal spill light into the dock waters.

Figure 3-21 Dockside walk Balustrade Lighting

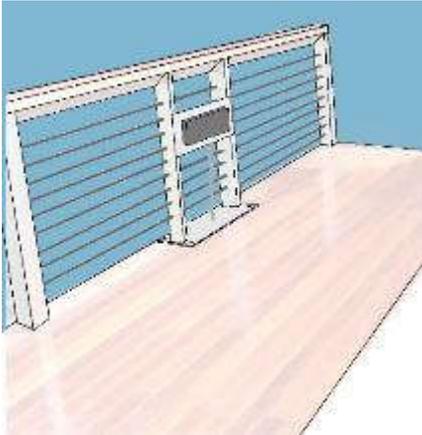


Table 3-15 Dockside heritage walk and footpaths details

Dockside Heritage Walk and Footpath Details	
Condition 41 Requirements	Details
<i>State the minimum luminance reasonably required to perform the relevant lighting task</i>	See Tables 2-2 and 2-3 & drawings A400-ATK-E-40-XXX-XX-DR-GL-827-001 to -010 in Appendix A.
<i>Minimise glare, light spillage and pollution</i>	It is recognised that there is some up-lighting to facades, planters and trees, as percentage of the full development and general lighting on the site is expected to fall below the E4 environmental zone recommendations, up-light elements will incorporate shields and louvres to minimise unwanted overspill
<i>Include landscaping/screening measures to screen illuminated areas in environmentally sensitive areas</i>	Screening is not used as primary mitigation measure but the DLR station and viaduct is an existing screening element
<i>Avoid dazzle or distraction to drivers on nearby highways;</i>	Not applicable to this design
<i>Include the location, type, number, mounting height and alignment of the luminaires</i>	See Lighting layout drawing A400-ATK-E-40-XXX-XX-DR-GA-827-001 to 010 in Appendix A.
<i>Include the beam angles and upward waste light ratio for each light</i>	Photometry of luminaires contained within luminaire datasheets and luminaire schedule Appendix C,

	see also comments regarding item 2 above on minimising light pollution
<i>Include details of screening and other mitigation</i>	None envisaged see table 2-5 for details of physical screening elements
<i>Include an Isolux diagram showing the predicted illuminance levels at critical locations on the Airport Boundary of the Phase and where the Phase abuts residential properties or the public highway; and Set out where necessary, the percentage increase in luminance and the predicted illuminance in the vertical plane (in lux) at key point:</i>	See drawing A400-ATK-E-40-XXX-XX-DR-GL-827-011 to -021 in Appendix A. The 1 lux contour demonstrates that there is negligible obtrusive light direct outside of the design areas.

3.18. Refurbishment of Stands 21-24 and new Stands and Taxiway

- 3.18.1. Apron floodlighting will be provided to facilitate safe operations on the aircraft stands and associated equipment areas and roadways. The floodlights will typically be mounted at a height of 16m on the new NEP building and floodlighting masts.
- 3.18.2. Apron floodlighting will be using carefully oriented luminaires to provide adequate illumination on all apron service areas, and back of stand road but with a minimum of glare to pilots on aircraft in flight and on the ground, aerodrome controllers, and personnel on the apron. The arrangement and aiming of floodlights will be such that each aircraft stand receives light from two or more directions so as to minimise shadows. This is a similar arrangement to the existing apron floodlighting at LCA.

Table 3-16 Airside Apron Lighting for New & Refurbished Stands details

Airside Apron Lighting for New and Refurbished Stands Details	
Condition	Response
<i>State the minimum luminance reasonably required to perform the relevant lighting task</i>	Section 2.2.6 gives full details of regulatory luminance levels.
<i>Minimise glare, light spillage and pollution</i>	<p>The EASA standard requires the use of lighting that will minimise glare. Light spillage is controlled through the design process with the apron floodlighting system designed to ensure that all fittings are directed onto the apron, such that the EASA requirements are met with minimal extraneous light spillage.</p> <p>The fittings designed for use on CADP new and reconfigured stands are fitted with high asymmetric optics and internally angled lenses to provide exceptional control of obtrusive light, glare and upward light and match current fittings used at the Airport Western Stands. The luminaires are positioned at a height of 16m above apron level mounted on the roof of the new NEP building and on high masts on Stand 32. All are set at 15° angles to the horizontal, aligned in a northerly direction, to achieve EASA minimum average illuminance requirements on stands and back of stand road. The key receptors are therefore to the north of the ADE (the obtrusive direction for our luminaires) and distances and luminaire angles from these receptors are shown on drawing A400-TPS-E-00-L00-DR-GA-161-006 in Appendix E and are reproduced in the table below:</p>

	Receptor Reference	Distance to closest apron luminaire (m)	Angle to the horizontal (°)
	R29	973	0.9
	R30	783	1.2
	R31	505	1.8
	R32	480	1.9
	R33	905	1.0
	<p>In conclusion, at these receptor distances and incidence angles, the fittings specified will therefore meet the requirements of ILP GN01 Table 2 for environmental zone E4 and glare and light spillage requirements of BS EN 12464-2:2014 Light and lighting — Lighting of work places; Outdoor workplaces, Table 5.1. Refer to drawing no. A400-TPS-E-00-L00-DR-GA-161-006 for detailed information of glare levels in relation to the both standards at the sensitive receptor points to the north of the airfield.</p>		
<i>Include landscaping/screening measures to screen illuminated areas in environmentally sensitive areas</i>	Not required for Apron floodlighting, as this is not in an environmentally sensitive area.		
<i>Avoid dazzle or distraction to drivers on nearby highways;</i>	The closest public highway to the new and refurbished aircraft stands is Newland Street, which is 135m to the south of the closest apron floodlight luminaire. Furthermore, all luminaires are angled slightly northwards towards the aircraft stands and away from Newland Street. There is no dazzle or perceivable light spill from apron lighting at this distance, with Lux levels being below 0.2 lux at the southern KGV dock edge, which is some 75m north of Newland Street.		
<i>Include the location, type, number, mounting height and alignment of the luminaires</i>	This information is included on Apron Lighting drawing A400-TPS-E-00-L00-DR-GA-161-005 in Appendix E. This drawing is prepared from the apron lighting design for the complete scheme including all reconfigured and new stands produced as part of stage 3 design. This design is based on the preferred LED manufacturer currently installed at the airport. The design will be reviewed prior to final procurement and installation to take account of manufacturing changes to luminaires and advances in technology. Any such advances are expected to further reduce the incidence of spill light away from the apron,		
<i>Include the beam angles and upward waste light ratio for each light</i>	Luminaire beam angles are specified in drawing A400-TPS-E-00-L00-DR-GA-161-005 in Appendix E. The upward waste light ratio of the apron luminaires is 2.5% which is below the 15% required by ILP GN01 table 2 for environmental zone E4.		
<i>Include details of screening and other mitigation</i>	The illuminated area of the apron is screened from sensitive receptors to the south by the airport passenger terminal buildings and the noise barrier. Whilst these building elements are provided for operational and other environmental reasons they also provide a screening benefit to these sensitive receptors in relation to light. On Stands 31 and 32 there will be a provision of noise barrier that will provide additional screening to light spillage. With the noise barrier at a height of 8m and the luminaires at a height of 16m there is a viewport of 8m above the screening which reduces the light spillage. Refer to the drawing A400-TPS-E-00-L00-DR-GA-161-006 in Appendix E for details. As the floodlighting provides		

	<p>forward asymmetric lighting, therefore mostly atmospheric light (reflected by dust or raindrops) will be seen at these receptor sites.</p>
<p><i>Include an Isolux diagram showing the predicted illuminance levels at critical locations on the Airport Boundary of the Phase and where the Phase abuts residential properties or the public highway; and Set out where necessary, the percentage increase in luminance and the predicted illuminance in the vertical plane (in lux) at key point:</i></p>	<p>Drawing A400 -TPS-E-00-L00-DR-GA-161-005 in Appendix E gives design illuminance levels on the stands and back of stand road.</p> <p>Drawing A400 -TPS-E-00-L00-DR-GA-161-006 in Appendix E gives horizontal illuminance levels in the airfield and surrounding areas in form of isolines and summary of the vertical illuminances at the sensitive receptor points to the north.</p> <p>Horizontal illuminance reduces to 1 lux or below at a distance of 121m within the north-side Airport Boundary and 91m within the south-side Airport Boundary. It also reduces to 0.2 Lux or below at the edge of the docks. The optical performance and design of the apron floodlight system is such that vertical illuminance is also very low at the boundary and reduces to below 0.3 Lux at 1.5 m height at the sensitive receptor points at the northern edge of Albert Dock and meets GN01 E4 criteria. (Refer to drawing A400 -TPS-E-00-L00-DR-GA-161-006 for detailed information)</p>

3.19. External lighting control general principles

- 3.19.1. All external lighting will be controlled by a central lighting control system which will switch and dim the luminaires by automatic regimes or by local or central manual intervention on occasion.
- 3.19.2. The lighting control regimes are currently in design development and are outlined as scheme design philosophy in the lighting control schedule LTG-SCH-LCA-02 in Appendix D. A curfew beyond airport opening hours will reduce the lighting levels to a reduced output security regime as appropriate to the lighting usage, in line with the requirements of the UES.
- 3.19.3. The lighting curfew strategy will be developed further in line with the overall airport security philosophy.

Appendices



Appendix A. Drawings

A.1. Lighting Layouts for Approval

Table A-1 Lighting Layout drawings relating to Condition 41

Drawing No	Title	Revision
A400-ATK-E-40-XXX-01-DR-GA-827-001	DOCKSIDE LIGHTING LAYOUT SHEET 1	03
A400-ATK-E-40-XXX-02-DR-GA-827-002	DOCKSIDE LIGHTING LAYOUT SHEET 2	03
A400-ATK-E-40-XXX-03-DR-GA-827-003	DOCKSIDE LIGHTING LAYOUT SHEET 3	03
A400-ATK-E-40-XXX-04-DR-GA-827-004	DOCKSIDE LIGHTING LAYOUT SHEET 4	03
A400-ATK-E-40-XXX-05-DR-GA-827-005	DOCKSIDE LIGHTING LAYOUT SHEET 5	03
A400-ATK-E-40-XXX-06-DR-GA-827-006	DOCKSIDE LIGHTING LAYOUT SHEET 6	03
A400-ATK-E-40-XXX-07-DR-GA-827-007	DOCKSIDE LIGHTING LAYOUT SHEET 7	03
A400-ATK-E-40-XXX-08-DR-GA-827-008	DOCKSIDE LIGHTING LAYOUT SHEET 8	03
A400-ATK-E-40-XXX-09-DR-GA-827-009	DOCKSIDE LIGHTING LAYOUT SHEET 9	03
A400-ATK-E-40-XXX-10-DR-GA-827-010	DOCKSIDE LIGHTING LAYOUT SHEET 10	03
A400-ATK-E-32-L00-01-DR-GA-827-001	DECKED CAR PARK GRADE LEVEL LIGHTING LAYOUT SHEET 1	02
A400-ATK-E-32-L00-02-DR-GA-827-002	DECKED CAR PARK GRADE LEVEL LIGHTING LAYOUT SHEET 2	02
A400-ATK-E-32-L00-03-DR-GA-827-003	DECKED CAR PARK GRADE LEVEL LIGHTING LAYOUT SHEET 3	02
A400-ATK-E-32-L10-01-DR-GA-827-001	DECKED CAR PARK LEVEL 10 LIGHTING LAYOUT SHEET 1	02
A400-ATK-E-32-L10-02-DR-GA-827-002	DECKED CAR PARK LEVEL 10 LIGHTING LAYOUT SHEET 2	02
A400-ATK-E-32-L10-03-DR-GA-827-003	DECKED CAR PARK LEVEL 10 LIGHTING LAYOUT SHEET 3	02
A400-ATK-E-36-XXX-01-DR-GA-827-001	FORECOURT LIGHTING LAYOUT SHEET 1	01
A400-ATK-E-36-XXX-02-DR-GA-827-002	FORECOURT LIGHTING LAYOUT SHEET 2	01
A400-ATK-E-36-XXX-03-DR-GA-827-003	FORECOURT LIGHTING LAYOUT SHEET 3	01
A400-ATK-E-30-XXX-XX-DR-GA-827-001	WESTERN SERVICE YARD LIGHTING LAYOUT SHEET 1	02

DO NOT SCALE

SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION

In addition to the hazards/risks normally associated with the types of work detailed on this drawing, note the following:

CONSTRUCTION

Not Applicable to this design

MAINTENANCE/CLEANING

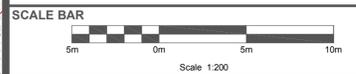
Not Applicable to this design

DECOMMISSIONING/DEMOLITION

Not Applicable to this design

It is assumed that all works will be carried out by a competent contractor working, where appropriate, to an approved method statement

- Lighting locations subject to design / installation details and are subject to change slightly.



Rev.	Date	Description	By	Chkd	App'd
03	28/02/18	STAGE 3 ISSUE	KL	DM	JD
02	01/12/17	Fit for information	KL	DM	MdS
01	27/10/17	Amended for final issue to client	KL	DM	MdS

FOR PLANNING APPROVAL **S2**

ATKINS
Euston Tower
286 Euston Road
London
NW1 3AT

Copyright © Atkins Limited (2013)
Tel: +44 (0) 1207 121 2000
www.atkinsglobal.com



Project Title
**LONDON CITY AIRPORT
DEVELOPMENT PROGRAMME (CADP)
DOCKSIDE**

Drawing Title
**DOCKSIDE
LIGHTING LAYOUT
SHEET 1**

Scale	Designed	Drawn	Checked	Authorised
1:200	KL	KL	DM	JD
Original Size	Date	Date	Date	Date
A1	22.12.17	03.01.17	04.01.18	28.02.18

Drawing Number
A400-ATK-E-40-XXX-01-DR-GA-827-001-03-S2

100
0 10
Millimetres

**NOT PART OF CADP1 -
SUBJECT TO SEPARATE
CADP2 OUTLINE
CONSENT**

HOTEL

HOTEL SERVICE YARD

HOTEL COACH LAYBY

HARTMANN ROAD

HARTMAN

NEWLAND STREET

FOR CONTINUATION OF DRAWING REFER TO DRAWING NO. A400-ATK-E-40-XXX-02-DR-GA-827-002

100
10
0
Millimetres

DO NOT SCALE

SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION

In addition to the hazards/risks normally associated with the types of work detailed on this drawing, note the following:

CONSTRUCTION

Not Applicable to this design

MAINTENANCE/CLEANING

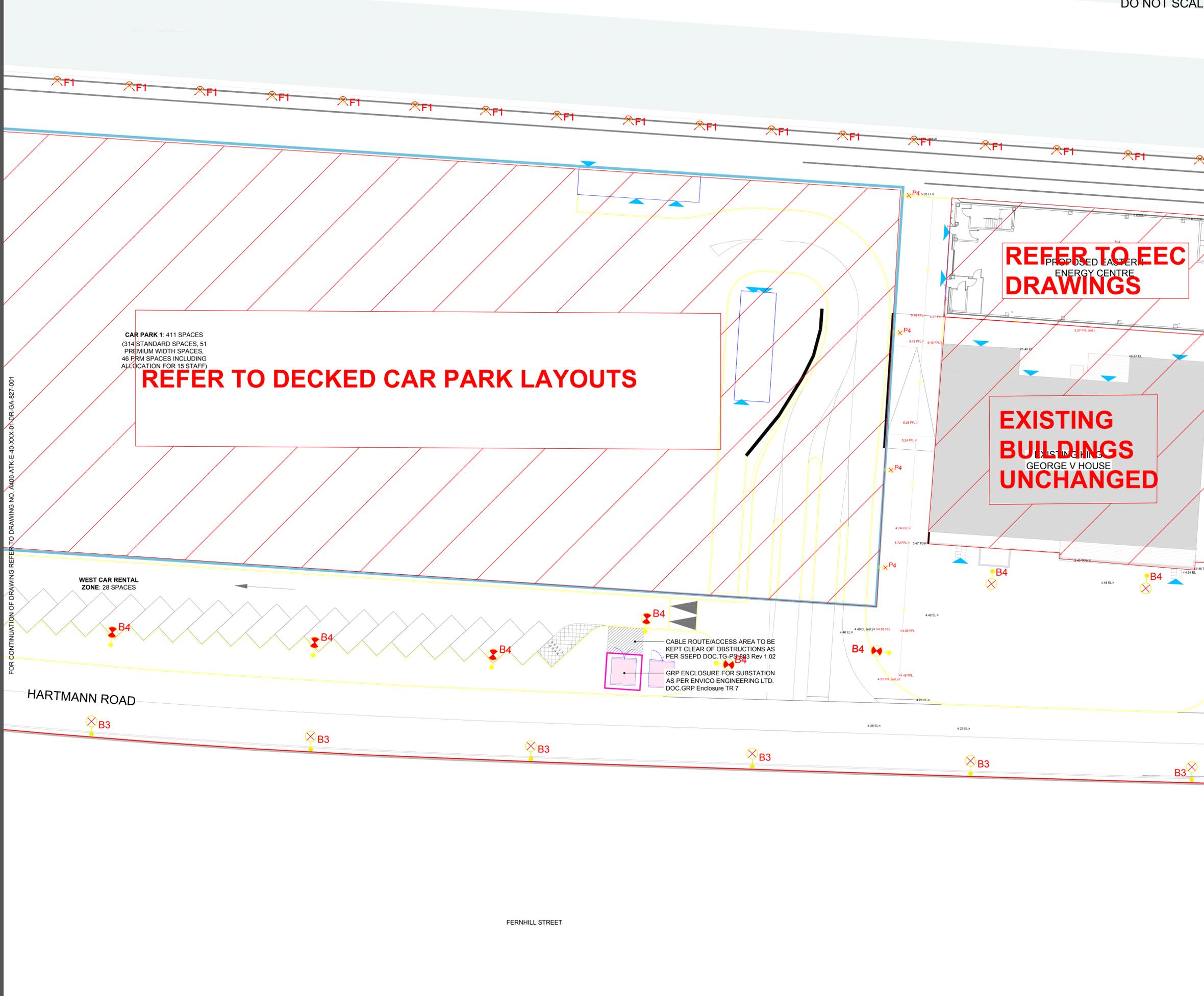
Not Applicable to this design

DECOMMISSIONING/DEMOLITION

Not Applicable to this design

It is assumed that all works will be carried out by a competent contractor working, where appropriate, to an approved method statement

- Lighting locations subject to design / installation details and are subject to change slightly.



CAR PARK 1: 411 SPACES
(314 STANDARD SPACES, 51 PREMIUM WIDTH SPACES, 46 PRM SPACES INCLUDING ALLOCATION FOR 15 STAFF)

REFER TO DECKED CAR PARK LAYOUTS

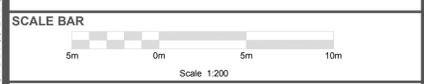
REFER TO EEC DRAWINGS

EXISTING BUILDINGS UNCHANGED

WEST CAR RENTAL ZONE: 28 SPACES

CABLE ROUTE/ACCESS AREA TO BE KEPT CLEAR OF OBSTRUCTIONS AS PER SSEPD DOC.TG-PS-883 Rev 1.02

GRP ENCLOSURE FOR SUBSTATION AS PER ENVICO ENGINEERING LTD. DOC.GRP Enclosure TR 7



Rev.	Date	Description	By	Chkd	App'd
03	28/02/18	STAGE 3 ISSUE	KL	DM	JD
02	01/12/17	Fit for information	KL	DM	MdS
01	27/10/17	Amended for final issue to client	KL	DM	MdS

FOR PLANNING APPROVAL **S2**

ATKINS

Euston Tower
286 Euston Road
London
NW1 3AT

Tel: +44 (0) 1207 121 2000
www.atkinsglobal.com

Copyright © Atkins Limited (2013)



Project Title
LONDON CITY AIRPORT DEVELOPMENT PROGRAMME (CADP) DOCKSIDE

Drawing Title
DOCKSIDE LIGHTING LAYOUT SHEET 2

Scale	Designed	Drawn	Checked	Authorised
1:200	KL	KL	DM	JD
Original Size	Date	Date	Date	Date
A1	22.12.17	03.01.17	04.01.18	28.02.18

Drawing Number
A400-ATK-E-40-XXX-02-DR-GA-827-002-03-S2

FOR CONTINUATION OF DRAWING REFER TO DRAWING NO. A400-ATK-E-40-XXX-01-DR-GA-827-001

FOR CONTINUATION OF DRAWING REFER TO DRAWING NO. A400-ATK-E-40-XXX-03-DR-GA-827-003