

HCC Property Services

Electrical Engineering Services

Information for Planning – External Lighting Strategy

E05323 Park Lane Infant School – Improvement Works

August 2024

Issue no. Planning



Document:	Electrical Engineering Services – External Lighting – Information for Planning
HCC Property Services Reference:	E05323
Author:	Name: Brian Bland Position: Principal Electrical Engineer
Date:	August 2024
Document Checked and Approved:	Name: Andy Howard Position: Delivery Manager Engineering Services

Revision History			
Issue number	Description	Author(s)	Date
1	Initial issue	BGB	August 2024

1 Executive Summary

The following information outlines the strategy at Planning stage for the proposed external lighting at Park Lane Infant School, Tilehurst, Reading. An appropriate lighting strategy for the site has been developed and assessment made of effects on the surrounding environment and neighbouring properties.

The lighting scheme in this report is to be viewed as a lighting design strategy rather than a detailed design solution. It is recommended that the lighting strategy outlined in this report is adopted including criteria, luminaries, switching methods, luminaire source type etc. and developed into a more detailed design when undertaking the full external lighting design of the site.

An adequate and safe level of lighting will be provided for site tasks, school and community activities, amenity and security, whilst maintaining a minimal impact on the site surroundings, environment and neighbouring properties.

This lighting strategy considers building-mounted external lighting for the 2-storey KS1 modular building and both the new and the extended school car park lighting.

These proposals have been prepared with due note of the recommendations made within ILP Guidance Note 01: 2021 – Guidance notes for the reduction of obtrusive light.

2 Introduction

2.1 Scope of External Lighting Report

This report outlines the external lighting strategy for the KS1 modular building (relocated from the Alfred Sutton school site) and considers the potential effects of the new building together with the proposed upgraded car park lighting scheme and the impact upon the surrounding areas. The report accompanies the planning application for the proposed 2-storey building and associated site improvements.

2.2 Site Location & Description

The Infant school site is located at:
55 School Road
Tilehurst
Reading
Berkshire
RG31 5AS

For the purpose of this report it has been assumed that the site falls into Lighting Class Environmental Zone E3 – Suburban (Surroundings) with the Lighting Environment classified as ‘Medium brightness’.

2.3 Objectives

The general objective of this report is to provide details of the proposed external lighting and assess the likely impact of the lighting scheme for the proposed new development and car park lighting upgrade on the surrounding area and environment.

Specific objectives of the proposed lighting scheme when fully designed include:

- To limit light pollution and sky glow
- To limit obtrusive light, spill light / trespass light and glare to neighbouring land and properties
- To provide an external lighting strategy and level of illuminance that addresses site security and complies with the police initiative ‘Secured by Design’ approach
- To provide a safe and adequate level of illuminance for the proposed new building exterior area, consisting of entrances/ exits, access routes for cars and lorries, pedestrian and cycle paths, loading bays and lay down areas, and the remodelled and extended car park area. Only areas directly associated with the proposed improvements to the site are considered within the scope of the report.
- To provide a safe level of illuminance for movement of vehicles, goods and persons

3 Assessment methodology

An appropriate initial lighting scheme for the site has been assessed using Relux and/or Dialux standard industry software.

From these initial calculations, lighting plots illustrating the illuminance levels throughout the site and at the boundary have been produced so that the external lighting scheme’s impact can be assessed. Refer to accompanying lighting information for details.

4 The Proposed Lighting Scheme

The lighting scheme detailed in this report should be viewed as a lighting design strategy rather than a detailed design solution.

4.1 Recommended lighting level values

Lighting levels have been designed in accordance with SLL Code for Lighting and ILP Guidance Note 01-2021 – Guidance note for the reduction of obtrusive light.

Using guidance from the SLL Lighting Code, the following design criteria have been used:

- Pedestrian pathways / Walkways is 5-10 Lux with uniformity of 0.25
- Traffic areas for slowly moving vehicles (max 10 km/h e.g. bicycles) is 10 Lux with uniformity of 0.40
- School car park is 10 Lux Maintained Average (horizontal) with uniformity of 0.25

4.2 Strategy for Minimising Obtrusive Light & Visual Impact of lighting Scheme

Careful consideration has been given to reducing obtrusive light during the night and the visual impact of the lighting scheme during the day, whilst maintaining an adequate level of illuminance for its application on the site. Particular attention has been paid to minimising the presence of the scheme and any intrusion, glare or sky glow produced by the scheme.

The proposed columns have been chosen to be as inconspicuous as possible. The luminaire, arm bracket and column shall generally be either black, titanium or grey colour finish to be confirmed at the design stage. All the luminaires will have 0% upward light ratio, and all necessary measures to reduce the visibility of the light source.

Car park planted columns will be 5m height. Building wall mounted luminaires will be mounted at a height not exceeding 2.6m above FFL.

Wherever possible luminaires are to be orientated towards the site, away from the land outside the site to make them less intrusive. Luminaires have been selected to have good light control and cut off angles to reduce light spillage. All the luminaires are directed at the ground to minimize glare.

Building mounted luminaires have been proposed to illuminate the main entrance and pathway to the front of the KS1 modular building, which have a flat glass to reduce visibility of the light source and have 0% upward light component.

LED bollard luminaires of the type which maximises downward light and minimises upward light are proposed for the footpath area within the school boundary and which is adjacent to the existing extended car park.

Consideration has been given to reducing the extent of illuminance falling on the building façade to reduce the visual impact of the building from a distance, whilst maintaining safe light levels for pedestrian circulation during the hours of darkness, and for security.

4.3 Strategy for Luminaire Types

The site shall be lit using LED luminaries throughout. These will comprise planted column mounted type within the car park area and bollard luminaires for the footpath area. Building mounted LED luminaires will be utilised around the new building for the pathway, amenity and security purposes.

LED luminaires utilised throughout will provide good colour rendering to improve visibility and provide a safer environment in line with a 'secured by design' approach. Using this type of luminaire will provide an energy efficient solution and Building Regulations Part L and BREEAM compliance. These luminaries, or equal and approved, have been selected as being designed to be anti-light pollution and low glare with good levels of efficiency for the chosen luminaire types and low upward light ratio.

All the luminaries are IP65 rated (min.) and impact resistant (IK10 rated). For specific details, refer to supplementary information that accompanies this report.

4.4 Lighting Strategy and Luminaire Controls

Lighting controls will be utilised to ensure that the impact on surrounding areas is minimised.

All external lighting will be controlled via a contactor arrangement with combined daylight sensitive photo electric cell and 24/7 digital programmable time switch control. A separate clearly labelled manual override facility will be located internally in a suitable location to be agreed.

The manual override facility (for use only if a school late evening function is planned) will comprise a multi-selectable time lag electronic switch (1 to 3 hours duration) to ensure lighting will not remain on after the selected time delay has elapsed.

The programmable time switch control and photocell system will be configured such that external lighting will be programmed to turn on/off as and when they are required to suit school activities, kitchen delivery times and working times of the school staff. External lighting will turn off at a pre-

determined time (typically 18.30hrs with 22:00hrs latest) but with the time to be agreed with school.

The photocell will be used as a primary control on all amenity and car park lighting so that no luminaries will be left on during daylight hours.

All external lighting will have a source nominal colour temperature of 4000°K to ensure colour definition is kept for the CCTV system (where installed).

4.5 Lighting for Car park

The new school car park area will be lit by column mounted, dark sky compliant luminaries, utilising a 32W LED source as ASD Lighting their Highway Diamond Elite Flood ref. HWD/B4KLED16625-FO mounted on 5m height planted columns.

The extended existing car park area will be lit by a column mounted, dark sky compliant luminaire, utilising a 37W LED source as ASD Lighting their Highway Diamond Elite Flood ref. HWD/B4LED1670-FO mounted on a 5m height planted column.

These luminaries have controlled directional light with zero upward light output to reduce light pollution, light spill and discomfort glare. The lighting columns will be positioned to keep light spill beyond the site boundary to a minimum.

4.6 Lighting for footpath

The footpath adjacent to the existing car park area will be lit by planted LED bollard luminaires, utilising a 20W LED source as ASD Lighting their Litehouse Bollard ref. LHR/B1AF4LED50J, root mounted, nominally 1m in height.

4.6 Building mounted luminaires

The pathway and entrance in front of the KS1 modular building will be lit with wall mounted luminaires to provide emergency lighting and security outside of the building.

Proposed luminaires are as Kingfisher Lighting their Semita Urban ref. SEMUFL08D or SEMUFL08D/EM3 where an emergency light function is required.

The luminaires have a zero upward light component. They will be fixed to the building façade in the nominal positions shown on the drawing accompanying this report. Mounting height for all wall mounted luminaires will be 2.6m to the top edge of the luminaire above finished ground level.

5 Assessment of the impact of the overall lighting scheme

Drawing E05323-HCC-XX-DR-E-8101, and the accompanying calculations and manufacturer's data sheet extracts, shows the proposed lighting scheme for the site, with the illuminance levels shown throughout the evaluation site and at the boundaries. The calculation model was prepared using industry standard software, Dialux. It shows that adequate levels of lighting have been achieved on the site with minimal effect on the surrounding area, as required by the various standards.

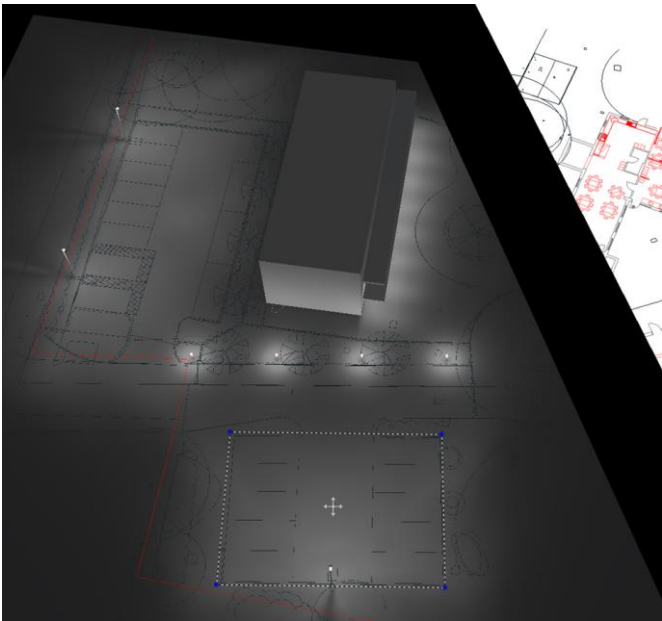
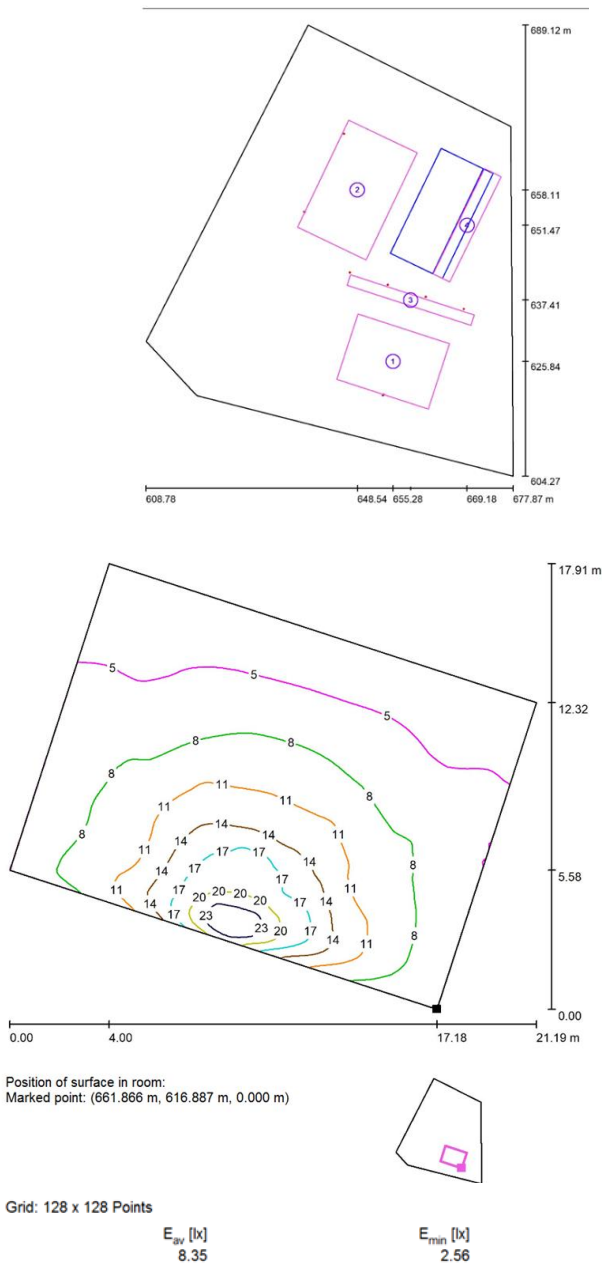
6 Conclusions

By adopting the lighting strategy including criteria, luminaries, control and switching methods etc. outlined in this report it can be concluded that:

- Lighting levels at the site boundary will be as regulated by the current standards.
- Lighting as proposed would not cause excessive glare to neighbouring domestic properties from this site.
- The majority of the luminaries will not be directly visible to neighbouring domestic properties.
- The effect on the night sky should be minimal inside the site and zero outside the site.
- The lighting scheme will be energy efficient utilising luminaires with high efficiency LED light sources, combined with efficient lighting controls.
- An adequate and safe level of lighting can be provided for site tasks, amenity and security, whilst maintaining a minimal impact on the site surroundings, environment and neighbouring properties.

Lighting Calculations

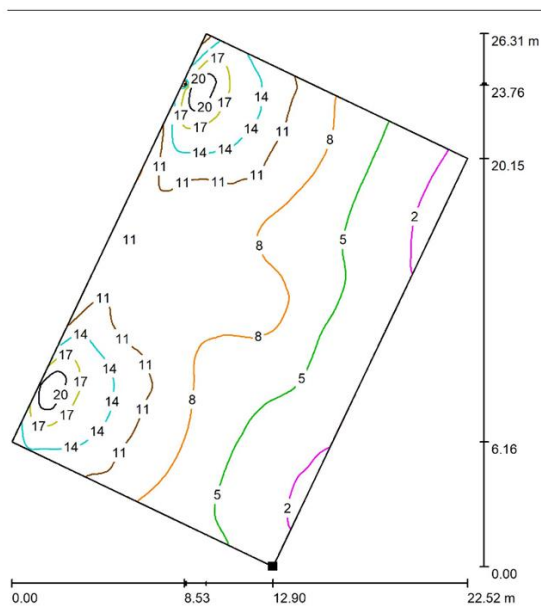
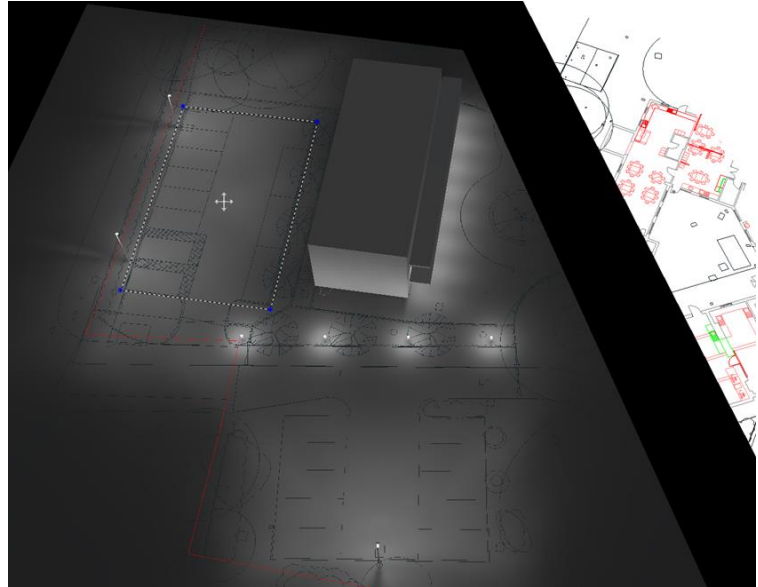
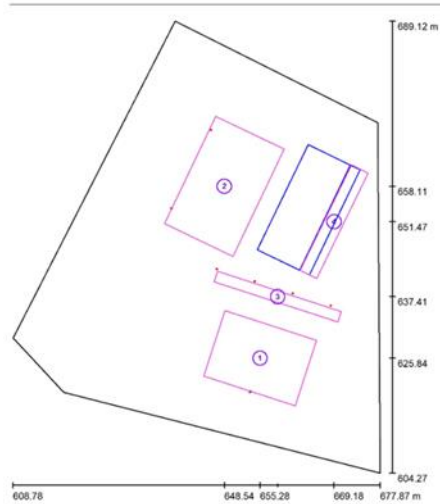
Existing Car Park Area (Calc Area 1)



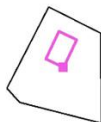
E05323 Park Lane Infant School – Improvement Works

Electrical Services – External Lighting - Information for Planning

Proposed Car Park Area (Calc Area 2)



Position of surface in room:
Marked point: (650.186 m, 644.959 m, 0.000 m)



Grid: 128 x 128 Points

E_{av} [lx]
8.39

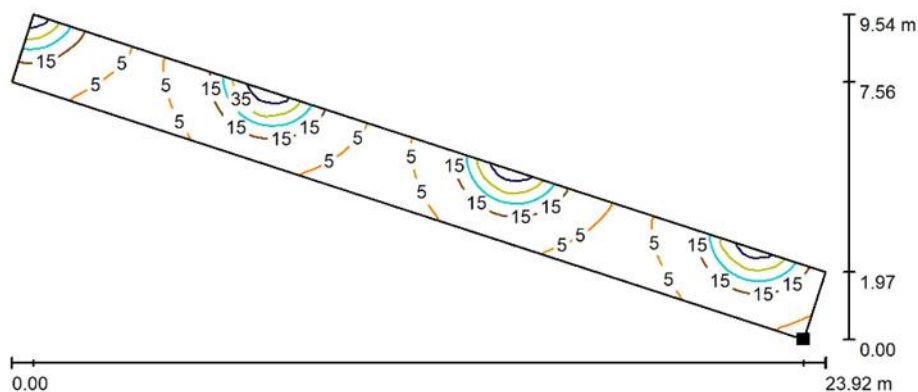
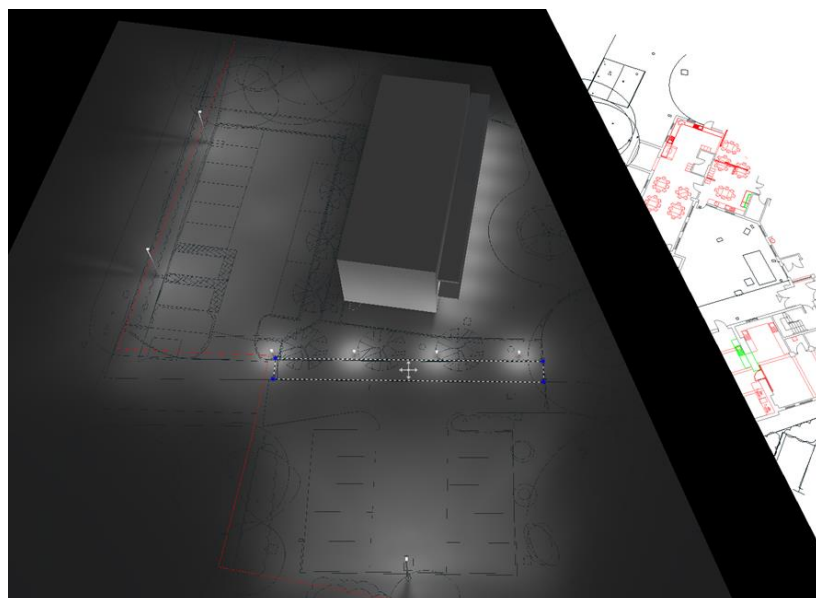
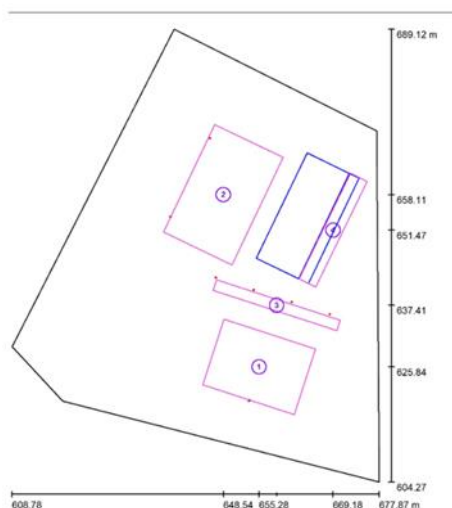
E_{min} [lx]
1.31

E_{max} [lx]
22

$u0$
0.156

E_{min} / E_{max}
0.059

Footpath Area (Calc Area 3)



Position of surface in room:
Marked point: (669.890 m, 632.638 m, 0.000 m)



Grid: 128 x 128 Points

E_{av} [lx]
12

E_{min} [lx]
2.94

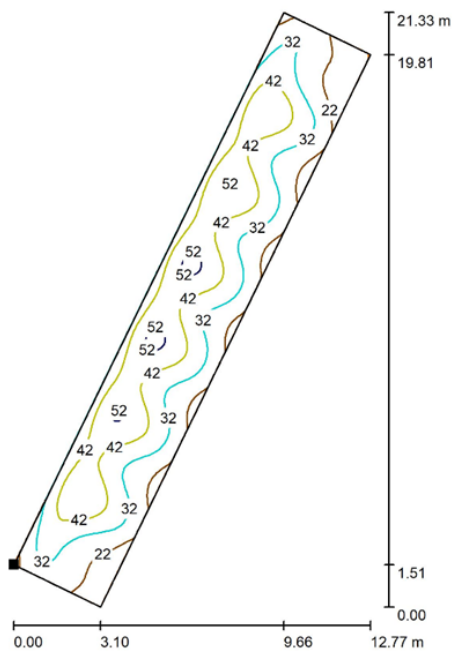
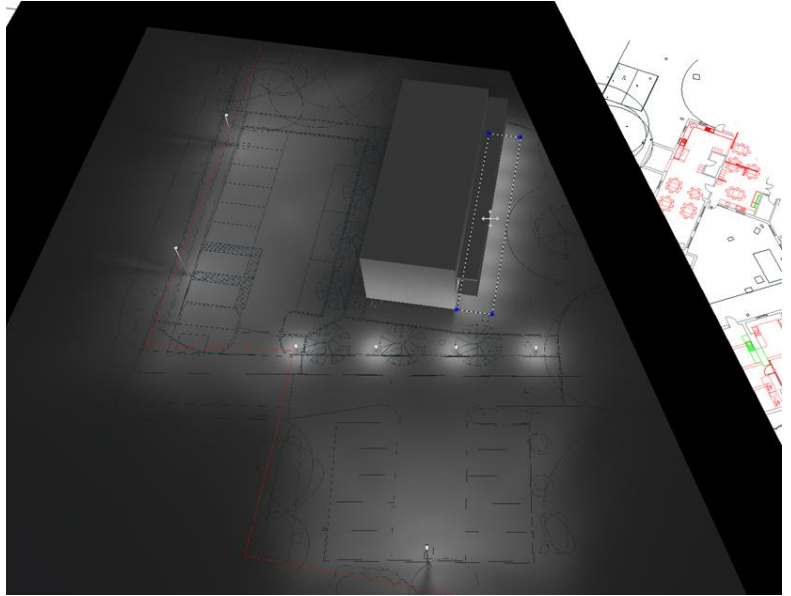
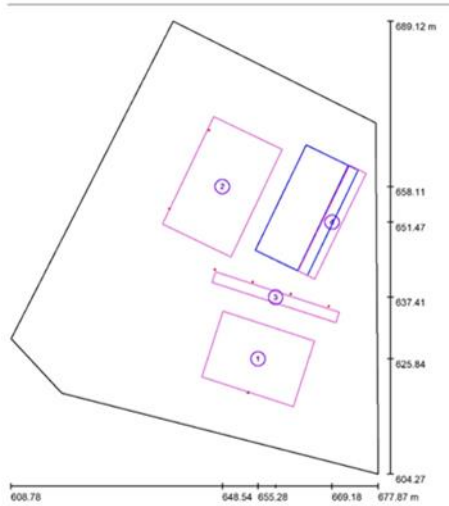
E_{max} [lx]
49

$u0$
0.245

E_{min} / E_{max}
0.060

Electrical Services – External Lighting - Information for Planning

Pathway & Entrance to KS1 Modular Building (Calc Area 4)



Position of surface in room:
Marked point: (662.798 m, 642.319 m, 0.000 m)



Grid: 128 x 32 Points

E_{av} [lx]
36

$$E_{\min} \text{ [lx]}$$

12

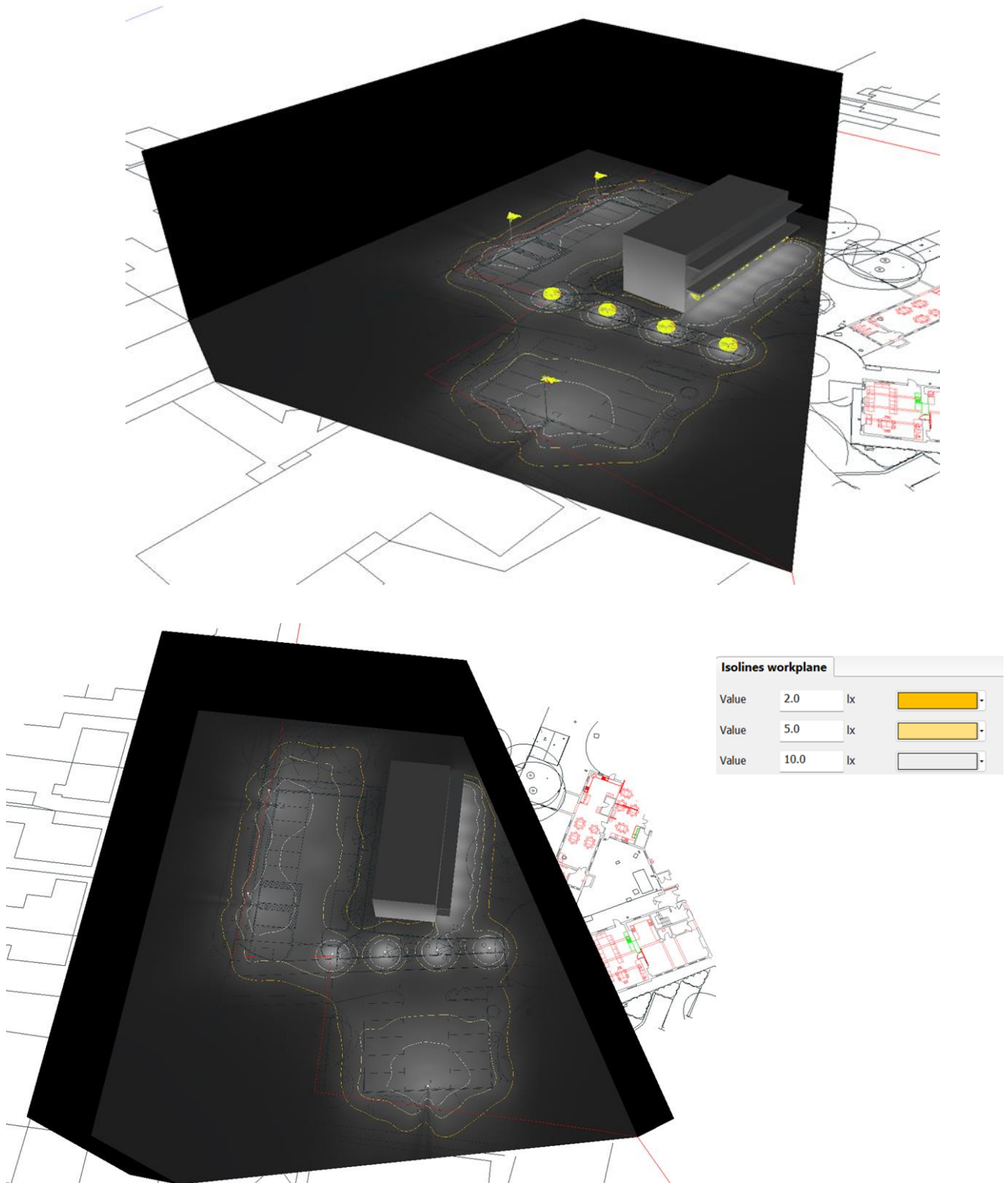
$E_{\max}$ [lx]
54

u0
0.333

$$E_{\min} / E_{\max}$$

0.219

Site Evaluation Area / Computer Visualisations



Luminaire Specification / Information - (Building mounted)

SEMITA Urban (Kingfisher Lighting)

Part Number: SEMUFL08D & SEMUFL08D/EM3

Code	Power	Luminaire Lumens	Drive Current	Inrush Current A pk	Optic	CCT(K)	IP	IK	Weight kg	Driver Included	Driver Type
SEMUFL08D	6.0	812	205	5.0		4000	IP66	IK10	2.4	Yes	Basic DALI

Specification Text

The SEMITA Urban shall be manufactured from high pressure die-cast aluminium and powder coated with a RAL 7016 Anthracite Grey marine grade finish. It shall have a power output ranging between 6 - 11W, with an efficacy of 127 - 146 lm/W. The luminaire shall deliver 744 - 1,611 luminaire lumens. The SEMITA Urban has a range of different optics to suit narrow, medium and wide paths, with a fully programmable DALI driver. Available in 2700K and 4000K, the luminaire shall be IK10 and IP66 rated with 3 hour integral emergency back-up and self-test options available.

For DarkSky Specifications, the luminaire shall produce a CCT of 2700K.



Specification

Weight: 2.4 kg
Material: Die-cast Aluminium
Paint Finish: RAL7016 Anthracite Grey
Embodied Carbon: 44 kg CO₂e

Product Description

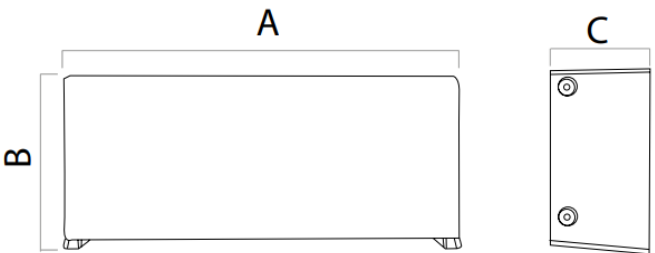
Designed and engineered in the UK, SEMITA Urban is a slimline wallpack, available with street, path or flood optics in addition to comfort options.

Key Features

- 6.0W - 11.0W
- 744 - 1,611 Luminaire Lumens
- Efficacy up to 146.0 lm/W
- 2700K, 4000K, CRI>70
- IP66, IK10
- Lifetime > 100,000hr, L80
- Toolless Entry
- 3 Hour Integral Emergency
- DarkSky Approved

Body Type	A	B	C
Standard	337	148	82

All measurements in mm



Luminaire Specification / Information (Existing Car Park - Planted 5m column mounted)

HWD/B4LED1670-F0



Code Specification

ASD Lighting Mini Highway Diamond™ Elite, Black, Clear, IP66/IK10, 4000K. 116mm Height, 233mm Width, 476mm Length, Body: Die-cast aluminium (powder coated), Diffuser: Vandal resistant clear polycarbonate. Applications not limited to: Airport, Car Park, Commercial & Amenity, Education, Healthcare, Hospitality, Industrial & Warehousing, Rail & Transport, Social Housing, Sports Venue, Urban & Street Lighting. CE, UKCA, BS EN 60598, ENEC, Class I, Class II (on request).

Technical Information

Colour	Black
Diffuser	Clear
CCT	4000 K
System Power	37.3 W
Delivered Lumens	4371.4 lm
Efficacy	117.2 lm/W
Weight	4.97 KG
Design Life	100k hours to L90

Dimensions

Height	116mm
Length	476mm
Width	233mm

Beam spread diagram showing light distribution with a central beam and side spill.

H

W

L

Page 15 of 17

August 2024 Issue no. Planning

Luminaire Specification / Information (New Car Park - Planted 5m column mounted)

HWD/B4K16625-F0

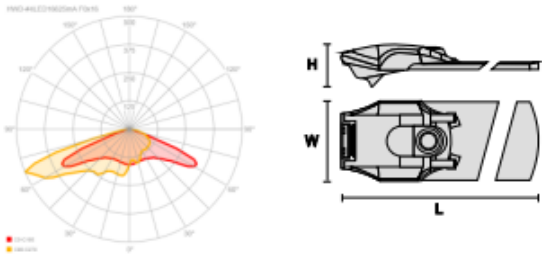


Code Specification

ASD Lighting Mini Highway Diamond™ Elite, Black, Clear, F0 Optic, 4000K, 625mA, IP66/IK10. 116mm Height, 233mm Width, 476mm Length, Body: Die-cast aluminium (powder coated), Diffuser: Vandal resistant clear polycarbonate.

Applications not limited to: Airport, Car Park, Commercial & Amenity, Education, Healthcare, Hospitality, Industrial & Warehousing, Rail & Transport, Social Housing, Sports Venue, Urban & Street Lighting.

CE, UKCA, BS EN 60598, ENEC, Class I, Class II (on request).

Technical Information	Dimensions
Colour	Black
Diffuser	Clear
CCT	4000 K
System Power	32 W
Delivered Lumens	3504 lm
Efficacy	106 lm/W
Weight	4.97 KG
Design Life	100k hours to L90
	

Luminaire Specification / Information (Footpath - Planted 1m height)

LHR/B1AF4LED50J



Code Specification

ASD Lighting Litehouse Bollard Root Mounted, Aluminium Body, Fresnel Diffuser, Black, Fresnel, Inline Fuse, IP65/IK10, 4000K. 260mm Diameter 1, 153mm Diameter 2, 1015mm Height 1, 400mm Height 2, Diffuser: Vandal resistant UV stabilised polycarbonate fresnel lens & optical louvre with top reflector, Body: Extruded aluminium column powder coated in black, Optional Ground Trim / Kick Plate.

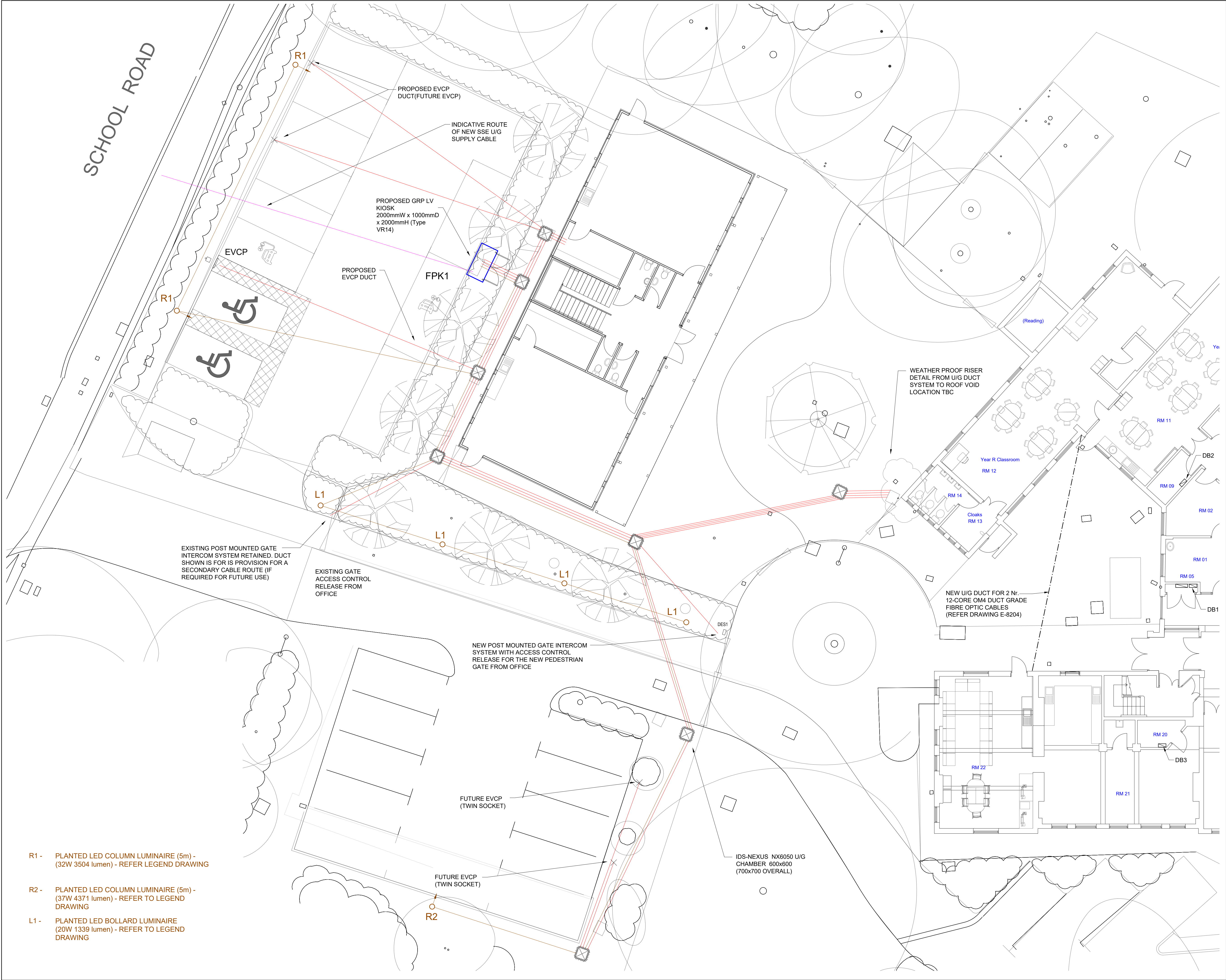
Applications not limited to: Car Park, Commercial & Amenity, Education, Healthcare, Hospitality, Industrial & Warehousing, Social Housing, Sports Venue.

Technical Information

Colour	Black
Diffuser	Fresnel
CCT	4000 K
System Power	20 W
Delivered Lumens	1339 lm
Efficacy	66 lm/W
Weight	6 KG
Design Life	60,000 hours to L70

Dimensions

Diameter (1)	260mm
Diameter (2)	153mm
Height (1)	1015mm

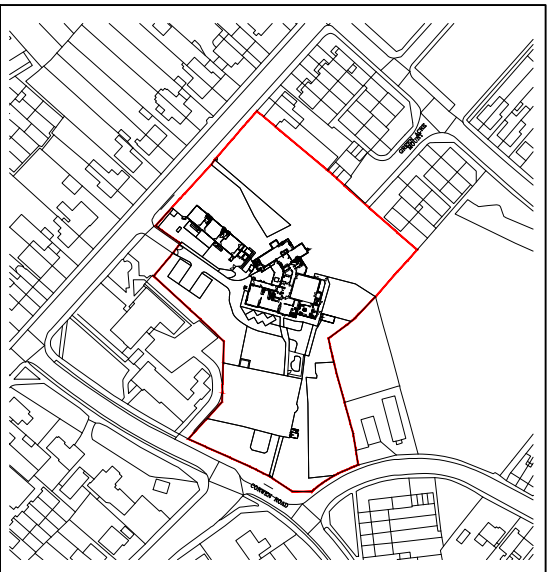


- General Notes**
- THIS DRAWING SHALL BE READ IN CONJUNCTION WITH ALL OTHER TENDER & CONTRACT DOCUMENTATION ISSUED FOR THIS PROJECT.
 - DO NOT SCALE THIS DRAWING. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS STATED OTHERWISE & SHALL BE CHECKED & VERIFIED ON SITE BEFORE CONSTRUCTION. FOR WALL SETTINGS OUT DIMENSIONS REFER TO ARCHITECTS DRAWINGS.
 - THE INSTALLATION SHALL BE CARRIED OUT IN STRICT ACCORDANCE WITH THE PROJECT TENDER DRAWINGS, PARTICULAR REQUIREMENTS & STANDARD SPECIFICATIONS & THE CURRENT EDITION OF THE WIRING REGULATIONS (BS7671).
 - FINAL POSITION OF ALL EQUIPMENT SHALL BE AGREED ON SITE WITH THE ENGINEER PRIOR TO INSTALLATION.
 - THE CONTRACTOR SHALL CO-ORDINATE THE WORKS WITH ALL OTHER TRADES PRIOR TO COMMENCEMENT.
 - WHERE ANY OF THE EXISTING INSTALLATION DETAILED TO BE RE-USED IS FOUND TO BE OF A DUBIOUS STANDARD, CLARIFYING INSTRUCTIONS SHALL BE SOUGHT FROM THE PROJECT ENGINEER.
 - THE CONTRACTOR SHALL LIAISE & CO-ORDINATE WITH ALL SPECIALIST CONTRACTORS EMPLOYED FOR THE WORKS.
 - ISOLATE, REMOVE & PROTECT ANY SERVICES TO ALLOW DEMOLITION WORKS TO TAKE PLACE IN ACCORDANCE WITH THE SCOPE OF WORKS.
 - ALL ITEMS OF EQUIPMENT TO BE REMOVED & NOT RE-USED, SHALL BE OFFERED TO THE CLIENT'S REPRESENTATIVE & IF NOT REQUIRED, CONFIRMATION FOR THEIR DISPOSAL SHALL BE OBTAINED FROM THE PROJECT ENGINEER.
 - THE CONTRACTOR SHALL ENSURE THE ACOUSTIC INTEGRITY & FIRE RATING OF WALLS & PARTITIONS, IS MAINTAINED WHERE SERVICES ARE REQUIRED TO PASS THROUGH.

NOTE: IF THIS TEXT IS NOT RED PLEASE PRINT / REQUEST A COLOUR COPY OF THIS DRAWING

- DRAWING NOTES:**
- UNDERGROUND DUCT SYSTEM SHOWN UTILISED FOR: FIRE, INTRUDER ALARM, DATA CABLE / FIBRE LINKS TO MODULAR BUILDING, GATE ACCESS / INTERCOM, EVCP & EXTERNAL LIGHTING INCLUDING LINK TO OFFICE (RM01) FOR LIGHTING CONTROL OVERRIDE TIMER UNIT.

LOCATION PLAN (NTS)



CONTRACT

Rev	Description	Date	By
T1	ISSUED FOR TENDER	18.03.24	BGB
C1	ISSUED FOR CONTRACT	17.06.24	BGB
C2	TEXT/DATA UPDATE FOR LUMINAIRES REF. R1 & R2	18.07.24	BGB

HCC Universal Services,
Three Ministers House,
76 High Street, Winchester SO23 8UL
tel: (01962) 847801



PROJECT NAME
PARK LANE PRIMARY SCHOOL
TILEHURST, READING
(REFURBISHMENT & ALTERATIONS)

SHEET NAME
ELECTRICAL ENGINEERING SERVICES
EXTERNAL SERVICES LAYOUT (INFANTS)

SCALE
1:100 @ A1

DRAWN CAD
CHKD BGB
APRV

DRAWING No.
project code - originator - volume - level - type - role - number version
E05323-HCC-XX-DR-E-8101 C2

SUITABILITY
code description