



DESIGN ENGINEER SUSTAIN

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Port Street

Manchester

External Lighting Assessment

QA

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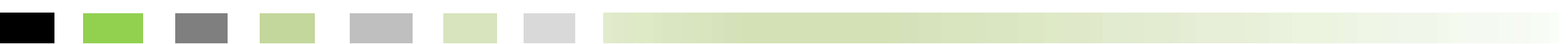
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Section 1 - Introduction

Futureserv have been appointed by Select Property to produce an External Lighting Assessment to support the external lighting planning conditions for the construction of a residential development in Manchester.

This report outlines the principles that have been utilised when developing the detailed external lighting design for the development to ensure that the effects of lighting are controlled in line with best practice and to minimise light pollution.

A lighting simulation has been developed using industry standard software to model the proposed external lighting provision across the site and determine estimated lighting levels both on the site and also spill lighting levels adjacent to the site boundaries with the results indicated on the lux plot drawing included within the report.

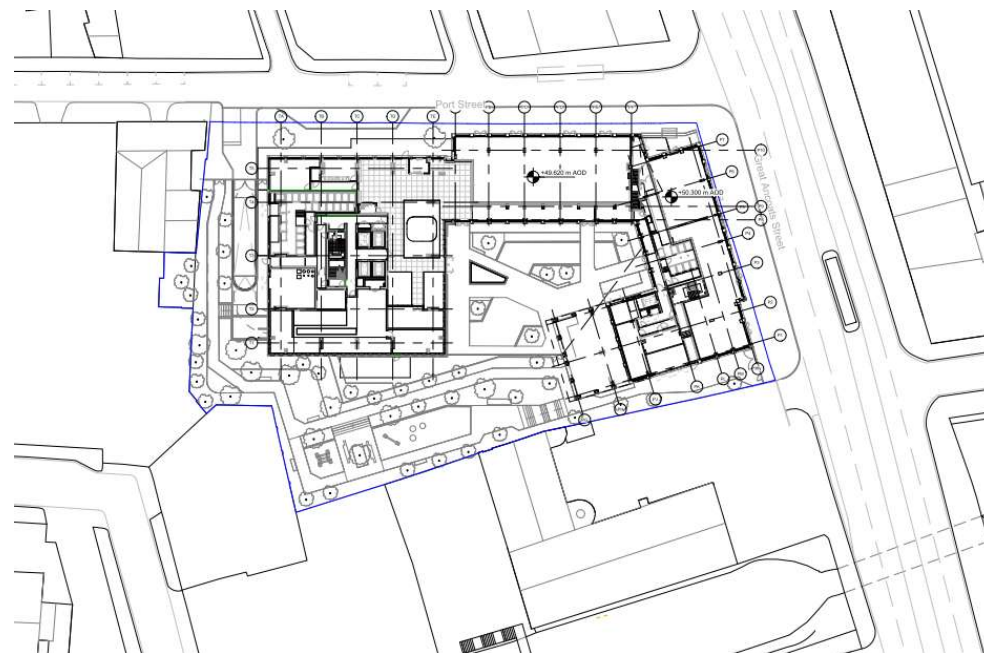
The overall lighting philosophy for the development is to achieve appropriate levels of artificial lighting to ensure a safe environment for residents, visitors and staff whilst also minimising light spill, obtrusive light and light pollution.

The detailed design of the external lighting has been developed to achieve a visually attractive and interesting environment, complimenting the sites natural and architectural features.

The use of high-efficiency LED luminaires with automatic control systems has been employed to minimise energy consumption and also ensure that lighting levels are maintained by selection of luminaires with a long lifespans.

Section 2 – Site Constraints and Requirements

The development plot located on Great Ancoats and Port Street is adjacent to an existing residential development. Vehicular & pedestrian access will be provided via the services entrance with pedestrian access to the courtyard via several routes.



The main objectives for providing external lighting to the development include:

- Provide safe access for pedestrians, cyclists and vehicles.
- Ensure appropriate illumination for operation of CCTV and security.
- Provide appropriate illumination of the carparking entrance areas.
- Highlight building entry points.
- Illumination of the service area to facilitate deliveries.
- Provide subtle illumination of natural & Architectural features.
- Control and minimise obtrusive and spill lighting.

The designed external lighting will help promote residents, staff and visitors feeling of safety & security whilst assisting with direction finding around the buildings and landscaped amenity areas.

Section 3 – Design Criteria

The external lighting solutions to all areas has been designed in accordance with the following key design standards and follow industry best practice.

- SLL Code for lighting
- CIBSE LG6 - Lighting Guide 06 : The Exterior Environment.
- GN01 – Guidance Note For The Reduction of Obtrusive Lighting.
- BS5489 – Road lighting
- BS12464 – Lighting of workplaces (where applicable).

The external lighting design will also take into account any recommendations of the Ecological Appraisal and measures required to protect bats and other wildlife and in particular when adjacent to the sensitive woodland areas.

Design Lighting Levels

A summary of target lighting levels is included below following the design criteria standards. During the project detailed design stage, the use of industry standard modelling and simulation software (Relux or Dialux) will be utilised to confirm resulting lux levels and spill light surrounding the site prior to commencement.

	<i>Target Ave Illuminance</i>	<i>Uniformity</i>
▪ Footpaths	10 lux	0.25
▪ Vehicle Access	10 lux	0.25

Consideration has been given to the presence of the elderly and disabled residents with the above required lux levels exceeded to provide additional illuminance.

All ramps for use by wheelchair users achieve adequate illumination with lighting controls in use to ensure the constant operation of the fittings within darkness hours.

Section 4 – Light Pollution & Control of Obtrusive Light.

Selection of all exterior luminaires and light sources has been made to minimise both light spill to the surrounding areas and also control of upward light as defined by ILP for Category E3 areas.

This will be achieved where possible by the use of lower output luminaires appropriately spaced to avoid excessive upward reflected light/glare. Careful selection of luminaire optics will ensure light distribution is directed to the ground and where necessary the use of optic shields to minimise direct glare to surrounding areas.

Lighting levels will be in accordance with the stated design standards and best practice ensuring that areas are not unnecessarily over-illuminated.

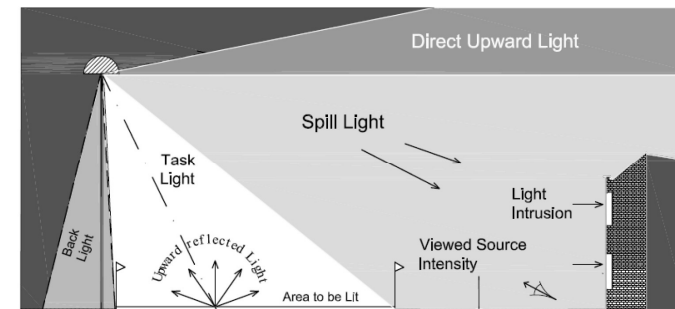


Fig 1 – Sources of intrusive Light

Section 5 – Lighting Components

The use of colour matched, high efficiency LED light sources will be employed across key external areas to help achieve a high quality, energy efficient visually interesting environment.

The external lighting scheme will comprise of the following main elements.

Pedestrian Walkways, Paths and Podium

Led Bollards will be used to illuminate pedestrian walkways and paths. The bollard lighting shall be directed onto the walkways thereby limiting glare and obtrusive light.

Vehicle Entrance to Service Area and Basement Car Park

High quality lighting columns with a maximum height of 4mtrs will be used to efficiently illuminate the parking entrance areas with fittings selected to minimise upward light spill and obtrusive light to the surrounding residences.

Building Entrances

The use of architectural LED wall mounted luminaires will be used to clearly highlight building entrances and will also provide emergency lighting to facilitate safe egress during power outages.

Section 6 – Lighting Controls

Control of the external lighting systems will be automatic by means of electronic programable timeclocks and photocells which will ensure that artificial lighting remains operational only when necessary, during the hours of darkness.

The external lighting elements will be configured into individually controlled 'zones' to allow independent control of each area (e.g. roadway, footpaths, parking zones, courtyard etc). This will allow areas which are not intended to be in use during the night period to be either switched off thereby saving energy and further reducing obtrusive light.

Consideration of the implementation of automatically dimming selected lighting outside of curfew hours will also be evaluated to further reduce obtrusive light.

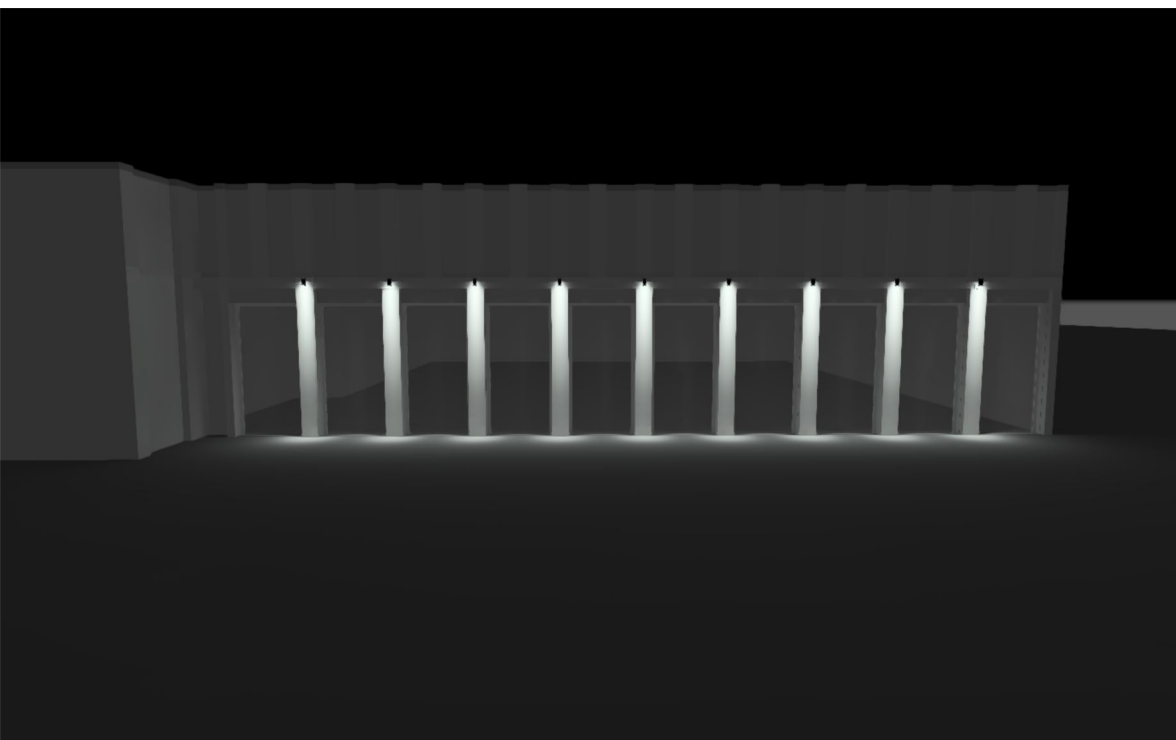
Section 7 – Conclusions

A well designed, energy efficient external lighting scheme will help provide and maintain safe access for residents, staff and visitors to the development during the evenings and during night time hours.

Careful selection, control and positioning of luminaires will ensure that the effects of obtrusive spill light is minimised to both the development and to neighbouring areas.

Our initial lighting simulation lux plot drawing demonstrates that safe and appropriate lighting levels can be achieved across the site whilst minimising spill light adjacent to the site boundary. It can be seen that spill light reduces to >1lux close to the site boundary and well before it reaches any neighbouring properties or sensitive areas.

Section 8 – External Lighting Lux Plot



Port Street Manchester

Preface

Notes on planning:

The energy consumption quantities do not take into account light scenes and their dimming levels.

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WE-EF - VLS410 [E] IP66:LED-3/9W/3K (3x LED-3/9W/830 - 3000K) 7

Site 1

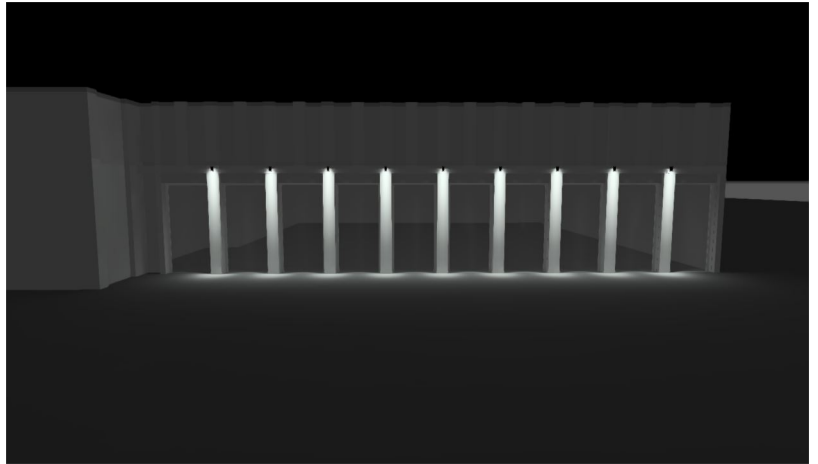
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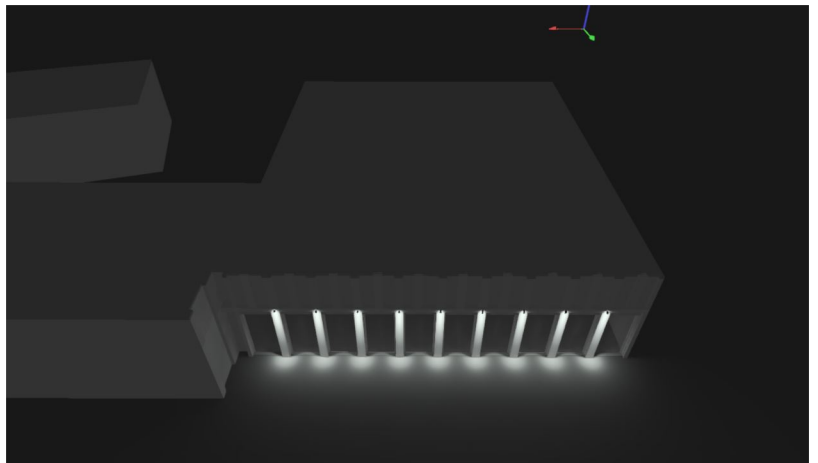
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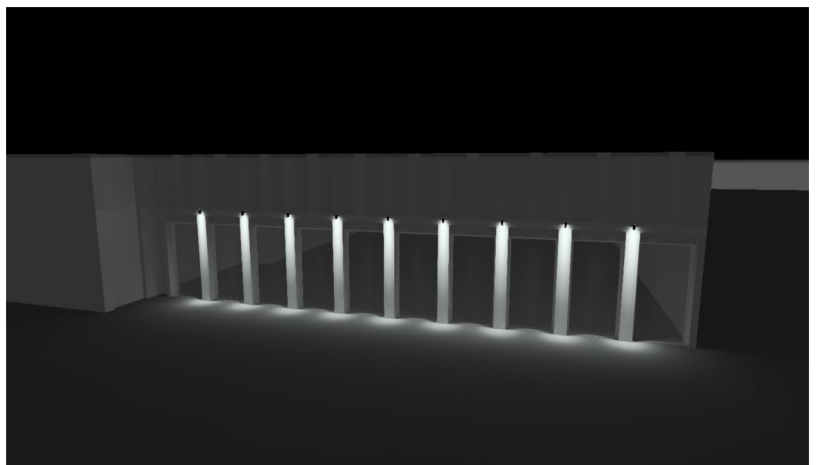
Site 1 (4)



Site 1 (5)

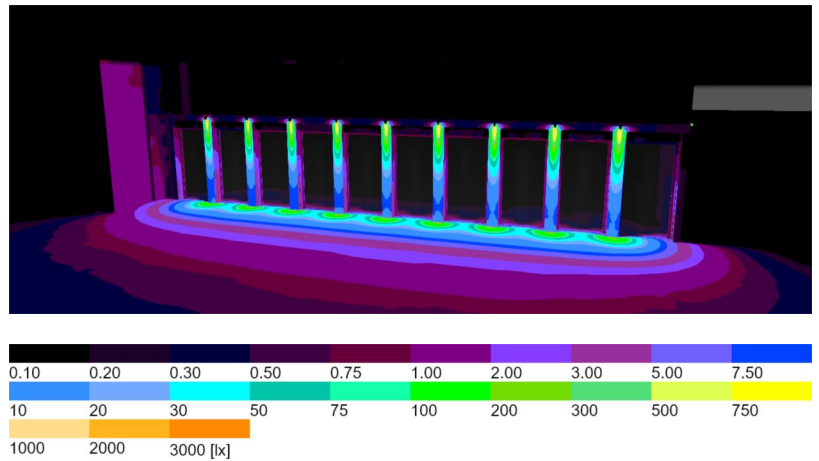


Site 1 (3)

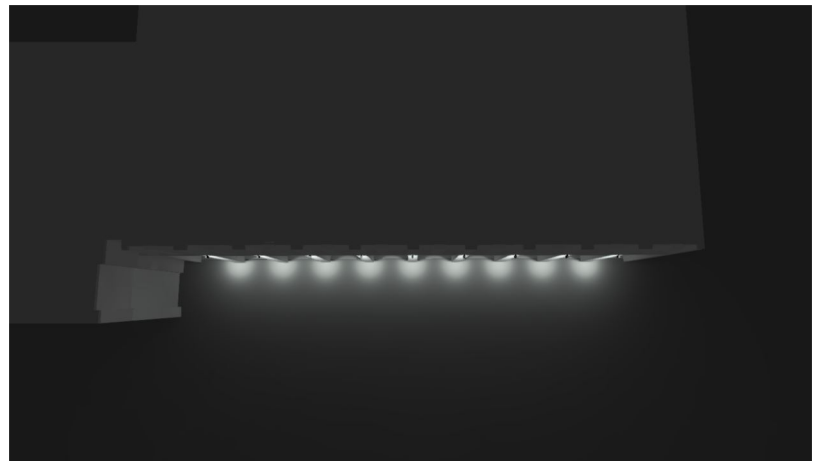


Images

Site 1 (2)



Site 1 (6)

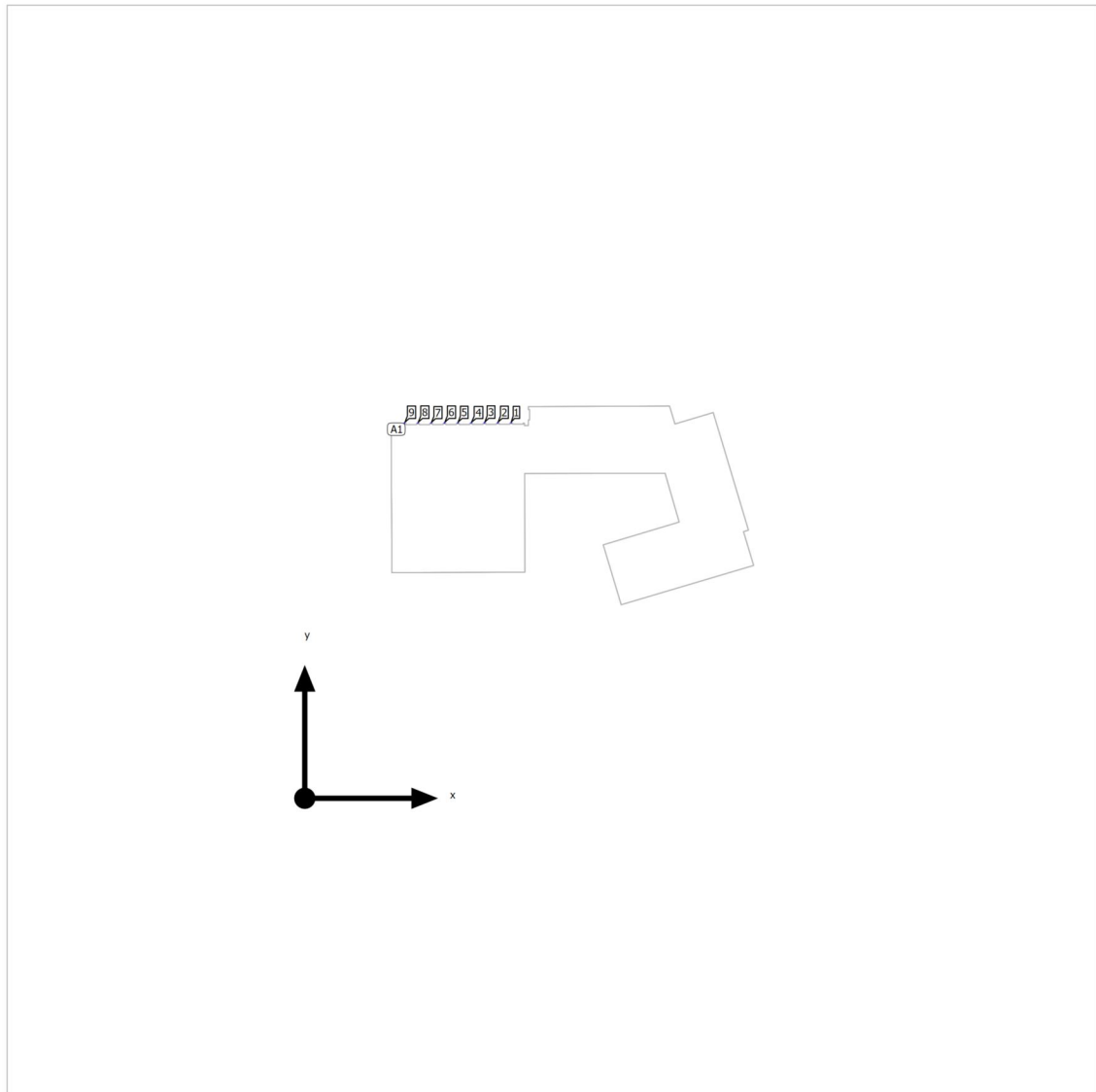


Luminaire list

Φ_{total} 8748 lm		P_{total} 99.0 W		Luminous efficacy 88.4 lm/W		
pcs.	Manufacturer	Article No.	Article name	P	Φ	Luminous efficacy
9	WE-EF	131-0200	VLS410 [E] IP66:LED-3/9W/3K	11.0 W	972 lm	88.4 lm/W

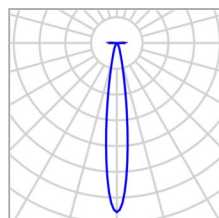
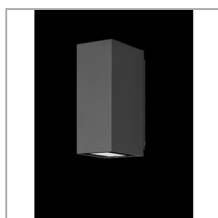
Site 1

Luminaire layout plan



Site 1

Luminaire layout plan



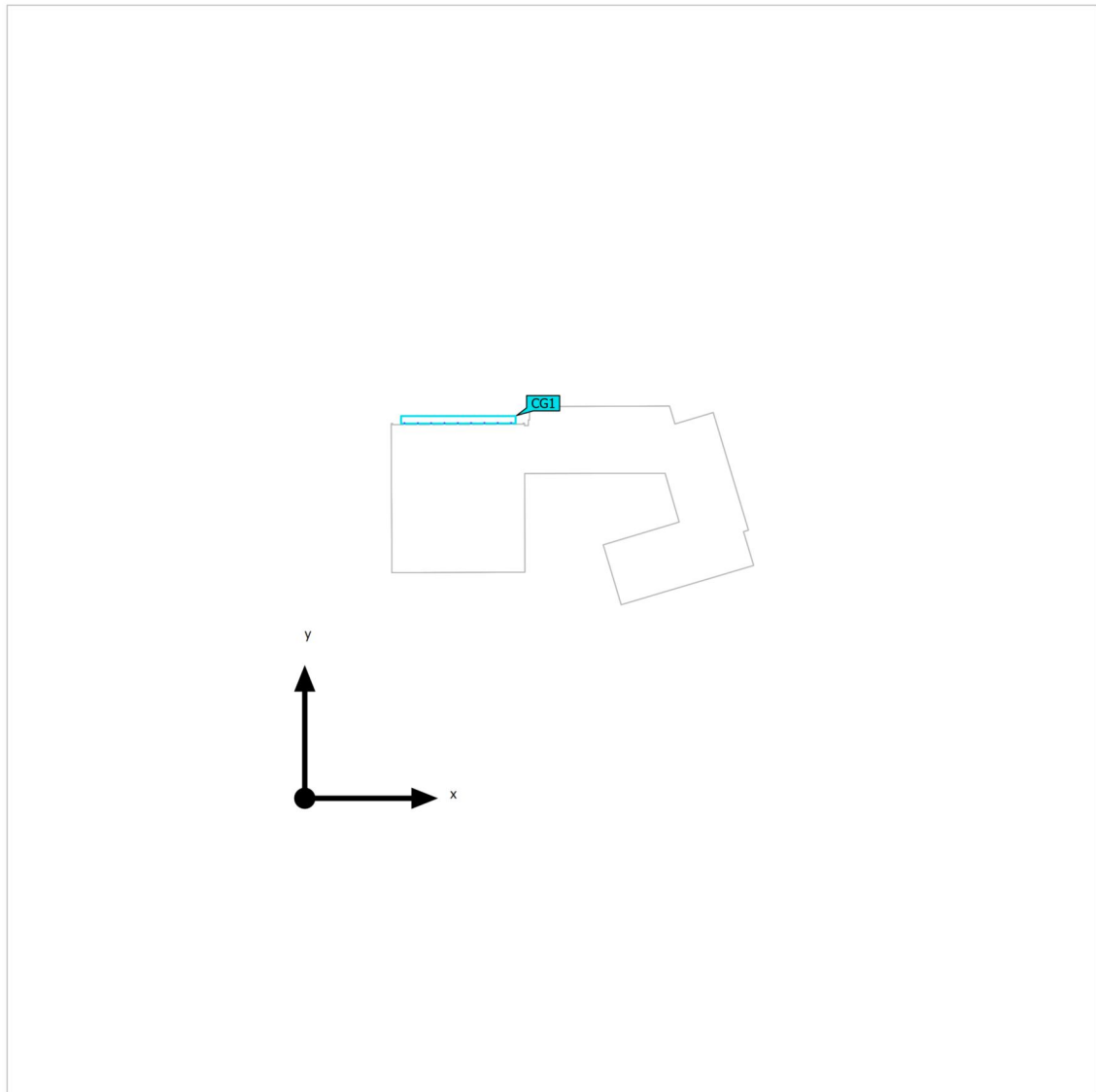
Manufacturer	WE-EF	P	11.0 W
Article No.	131-0200	$\Phi_{\text{Luminaire}}$	972 lm
Article name	VLS410 [E] IP66:LED-3/9W/3K		
Fitting	3x LED-3/9W/830 - 3000K		

9 x WE-EF VLS410 [E] IP66:LED-3/9W/3K

Type	Line arrangement	X	Y	Mounting height	Luminaire
1st luminaire (X/Y/Z)	46.480 m / 84.473 m / 5.537 m	46.480 m	84.473 m	5.537 m	1
X-direction	9 pcs., Centre - centre, 3.001 m	43.480 m	84.466 m	5.537 m	2
		40.479 m	84.460 m	5.537 m	3
Arrangement	A1	37.478 m	84.454 m	5.537 m	4
		34.478 m	84.447 m	5.537 m	5
		31.477 m	84.441 m	5.537 m	6
		28.476 m	84.434 m	5.537 m	7
		25.476 m	84.428 m	5.537 m	8
		22.475 m	84.421 m	5.537 m	9

Site 1 (Light scene 1)

Calculation objects



Site 1 (Light scene 1)

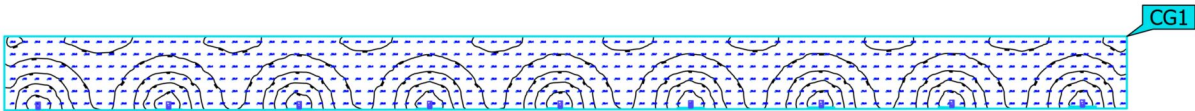
Calculation objects

Calculation surfaces

Properties	$\bar{E}$	$E_{\min}$	$E_{\max}$	$U_o (g_1)$	g_2	Index
Calculation surface 1 Perpendicular illuminance Height: 0.000 m	74.3 lx	19.1 lx	230 lx	0.26	0.083	CG1

Utilisation profile: DIALux presetting (5.1.4 Standard (outdoor transportation area))

Site 1 (Light scene 1)
Calculation surface 1



Properties	$\bar{E}$	E_{min}	E_{max}	$U_o (g_1)$	g_2	Index
Calculation surface 1 Perpendicular illuminance Height: 0.000 m	74.3 lx	19.1 lx	230 lx	0.26	0.083	CG1

Utilisation profile: DIALux presetting (5.1.4 Standard (outdoor transportation area))

Installation : Port Street External Downlight

Project number : 2299
Customer : RNM
Processed by : Dale Farrimond
Date : 13.06.2025

Project description:

Project description:

Calculation based on standard reflectance Values- Ceiling 0.7, Walls 0.5 and Floor 0.2.
For external calculation reflectance will be based on environment.

Calculations are based on empty rooms. In real world conditions with furniture/machinery present inside the room/area may result in lower lux levels than stated within this document.

If the design area dimensions, floor to ceiling or mounting heights have been issued from a third party and we are unable to verify drawings/plans or dimensions cannot accept responsibility for the accuracy of the information issued.

PLEASE NOTE: IT IS THE RESONSIBILITY OF THE CONTRACTOR/INSTALLER TO CHECK ALL ROOM/EXTERIOR AREA DIMENSIONS ON-SITE PRIOR TO INSTALLATION. IF IN DOUBT, ASK.

Lighting calculations are designed to CIBSE guidelines where applicable and/or client requirements, all stated lux values are for overall averages across the room reference plane.

If dimmable luminaires have been specified, then it is the responsibility of the contractor to establish the dimming protocol needed and how this is to be used.

Emergency lighting design conforms to BS5266/EN1838 where applicable, if included as part of this design document.

Please note that 'high risk areas' and 'points of emphasis' such as locations of fire fighting equipment also require emergency lighting, these locations are to be confirmed by contractor.

Please note that the emergency lighting calculation are produced using the emergency lighting calculation facility within this program, this ensures that the results are as near to real life simulation as possible.

The following values are based on precise calculations performed on calibrated lamps and luminaires, and their configurations, whereby gradual, unavoidable deviations can occur in practice. All guarantee claims are excluded for the specified data.

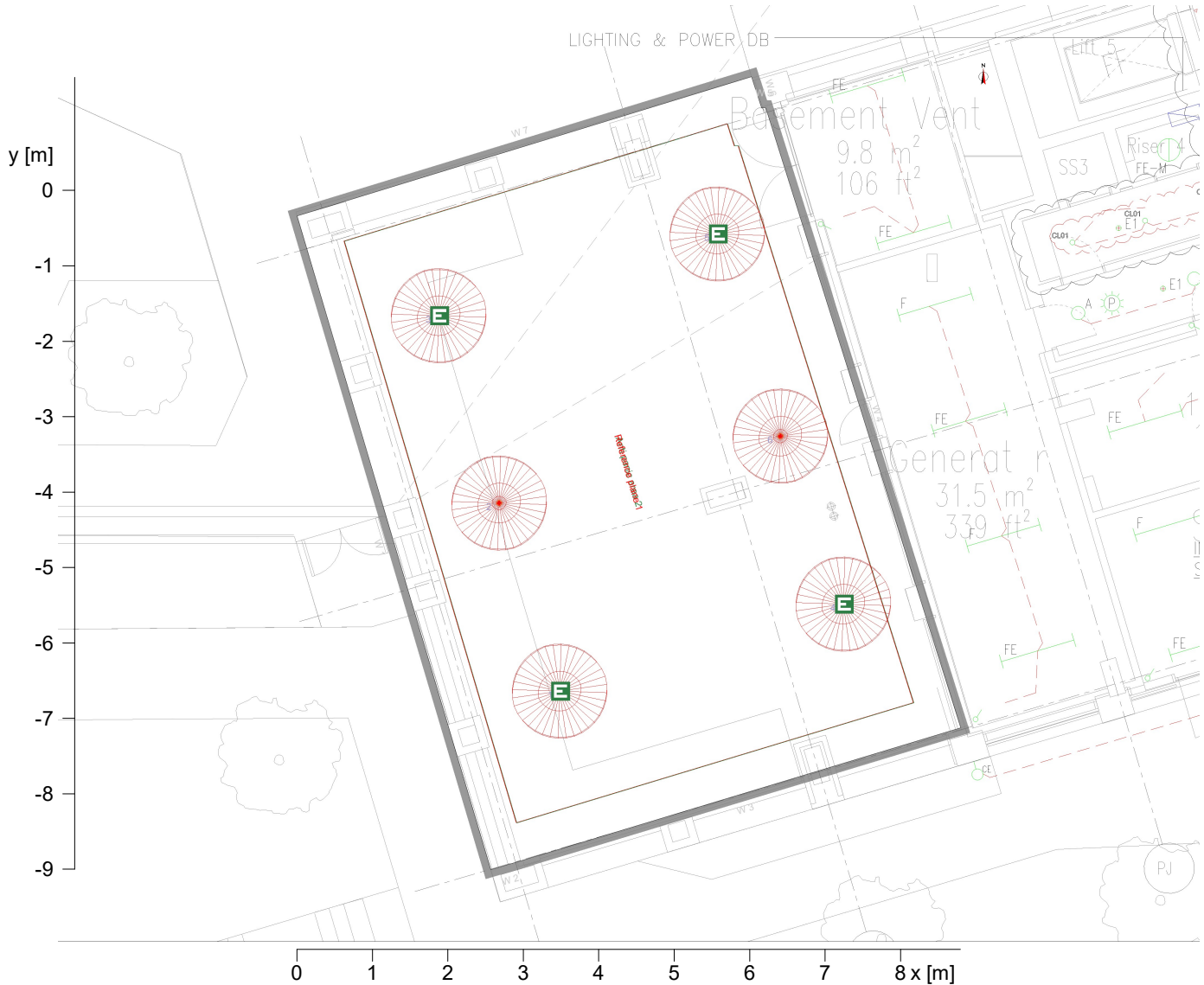
This exclusion of liability applies irrespective of the legal grounds for both damages and consequential damages suffered by users and third parties.

Object :
Installation : Port Street External Downlight
Project number : 2299
Date : 13.06.2025

1 Room 1

1.1 Description, Room 1

1.1.1 Floor plan



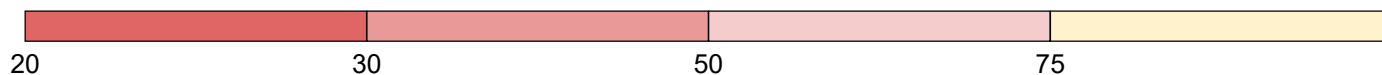
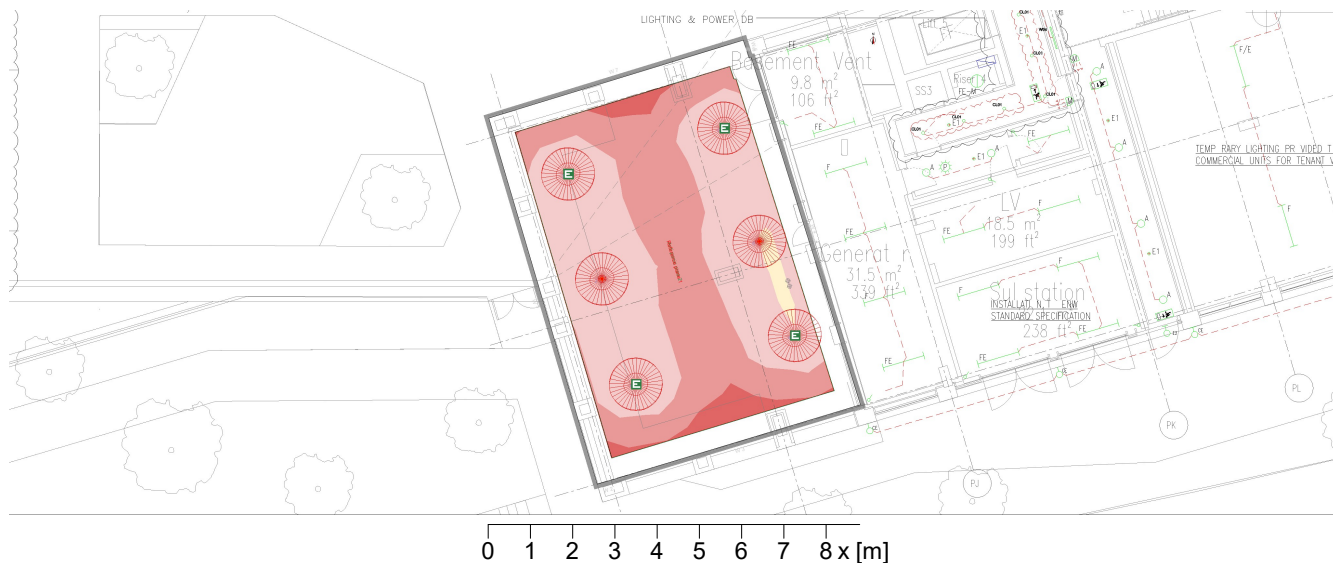
Wall	x	y	Length	Reflectance
1	45.02 m	7.11 m	9.03 m	50.0 %
2	45.42 m	7.23 m	0.41 m	50.0 %
3	51.25 m	8.99 m	6.09 m	50.0 %
4	48.67 m	17.20 m	8.60 m	50.0 %
5	48.61 m	17.20 m	0.06 m	50.0 %
6	48.48 m	17.61 m	0.43 m	50.0 %
7	42.46 m	15.77 m	6.30 m	50.0 %
Floor				20.0 %
Ceiling				70.0 %
Room height		4.50 m		
Height of ref. plane		0.00 m		

Object :
Installation : Port Street External Downlight
Project number : 2299
Date : 13.06.2025

1 Room 1

1.2 Summary, Room 1

1.2.1 Result overview, Reference plane 1



Illuminance [lx]

General

Calculation algorithm used	Average indirect fraction
Height of evaluation surface	0.00 m
Height of luminaire plane	4.50 m
Maintenance factor	0.80
Total luminous flux	4206 lm
Total power	57 W
Total power per area (58.11 m²)	0.98 W/m² (1.80 W/m²/100lx)

Illuminance

Average illuminance	$\bar{E}_m$	54.4 lx
Minimum illuminance	E_{min}	23.6 lx
Maximum illuminance	E_{max}	77.8 lx
Uniformity U_o	$E_{min}/\bar{E}_m$	1:2.3 (0.43)
Diversity U_d	E_{min}/E_{max}	1:3.29 (0.3)

Type No. \Make

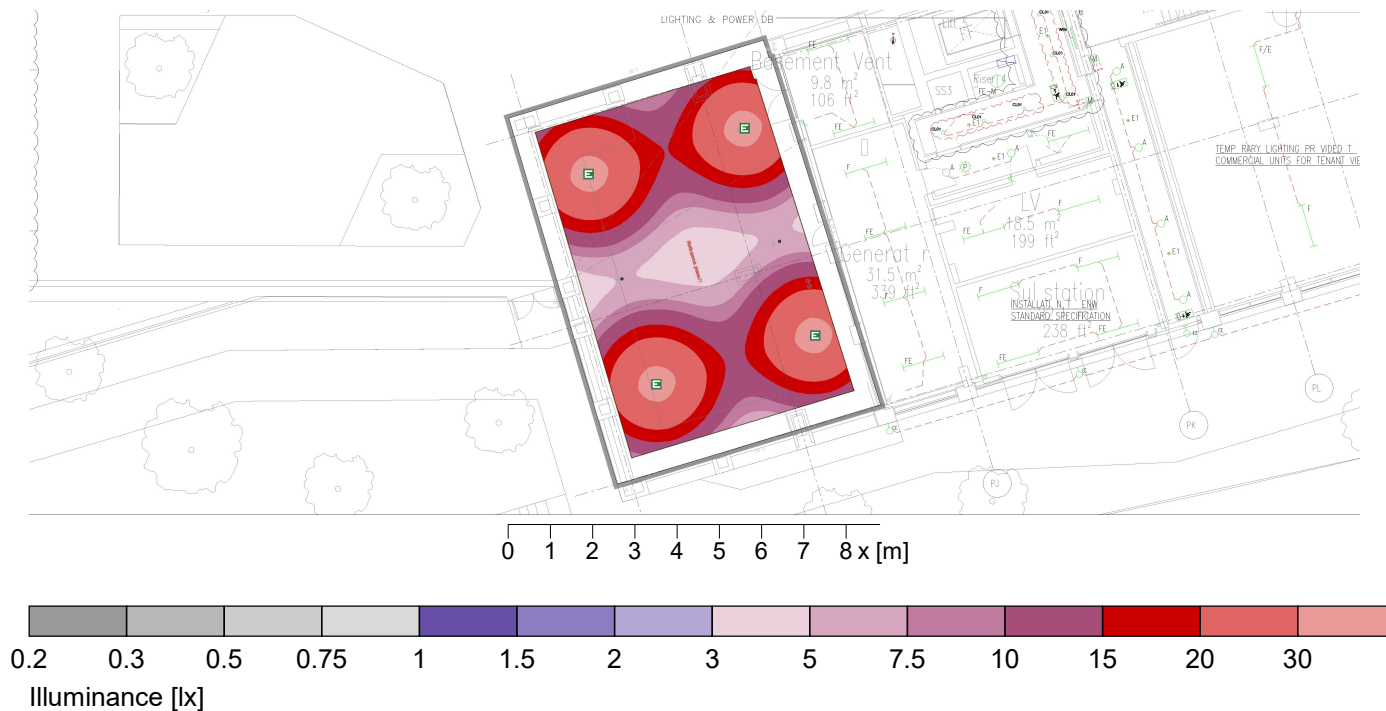
3 6E x 	PLS	
	Order No.	: S2299-DL176-700-830-WSB
	Luminaire name	: S2299-DL176-700-830-WSB
	Equipment	: 1 x Tridonic SLA LED 9.5 W / 701 lm
	Emergency	: 360 lm (51.4 %)

Object :
Installation : Port Street External Downlight
Project number : 2299
Date : 13.06.2025

1 Room 1

1.3 Summary, Room 1

1.3.1.1 Result overview (emergency lighting)

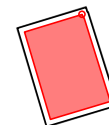


General

Calculation algorithm used : Direct component
Maintenance factor : 0.8
Height (phot centre) : 4.50 m
Maximum I : 810 cd <= 3500 cd

Anti panic area:

No.	Surface Emin [lx]	Emax [lx]	Ud
Anti panic area 2			
Calculation field: 8.08m x 5.5m (9 x 6 pts), Height = 0.00m			
1	3.69 lx	32.41 lx	1: 8.78
	>= 0.5 lx		>= 1 : 40



Type No. \Make

3 4E x **PLS**
Order No. : S2299-DL176-700-830-WSB -- Emergency Lighting --
Luminaire name : S2299-DL176-700-830-WSB
Equipment : 1 x Tridonic SLA LED 9.5 W / 701 lm
Emergency : 360 lm (51.4 %)

