Engineering services enable architecture.
Sean Mulcahy

Mechanical Engineering
Lighting Design
Sustainable Design
Electrical Engineering

Copenhagen
London
Sydney
Canberra
Hong Kong
New York

4th Floor, 3 Soho Square
London W1D 3HD, United Kingdom
CRN 08 63 62 80
t: +44 / 20 7734 1255
e: info@steensenvarming.com

LIGHTING DESIGN

STEENSEN VARMING

British Museum
South-West Energy Centre Building
Lighting Assessment

4th Floor, 3 Soho Square
London W1D 3HD, United Kingdom
CRN 08 63 62 80
t: +44 / 20 7734 1255
e: info@steensenvarming.com

STEENSEN VARMING

Document Revision and Status

Date	Rev	Issue	Notes	Checked	Approved
04.09.23	00	Planning		EU	TT
29.09.23	01	Planning		EU	TT
13.10.23	02	Planning		EU	TT
19.10.23	03	Planning		EU	TT

London September 01, 2023

Simone Bonavia
Lighting Designer

simone.bonavia@steensenvarming.com

4th Floor, 3 Soho Square
London W1D 3HD, United Kingdom
CRN 08 63 62 80
t: +44 / 20 7734 1255
e: info@steensenvarming.com

Table of Contents

4th Floor, 3 Soho Square
London W1D 3HD, United Kingdom
CRN 08 63 62 80
t: +44 / 20 7734 1255
e: info@steensenvarming.com

1.0 Design Statement for South-West Energy Centre External Lighting

Location Context

The proposed development includes

- Demolition of existing Energy Centre to internal West Road.
- Removal of temporary buildings to the south of the existing energy centre on the internal West Road and to the north and east of the White Wing facing Montague Street.
- Erection of new energy centre incorporating maintenance support accommodation to internal West Road, new substation off Montague Street, all together with associated internal and external works, service runs, erection of plant, landscaping, and temporary works associated with construction.

The plan below shows the location of the proposed SWEC building in green:

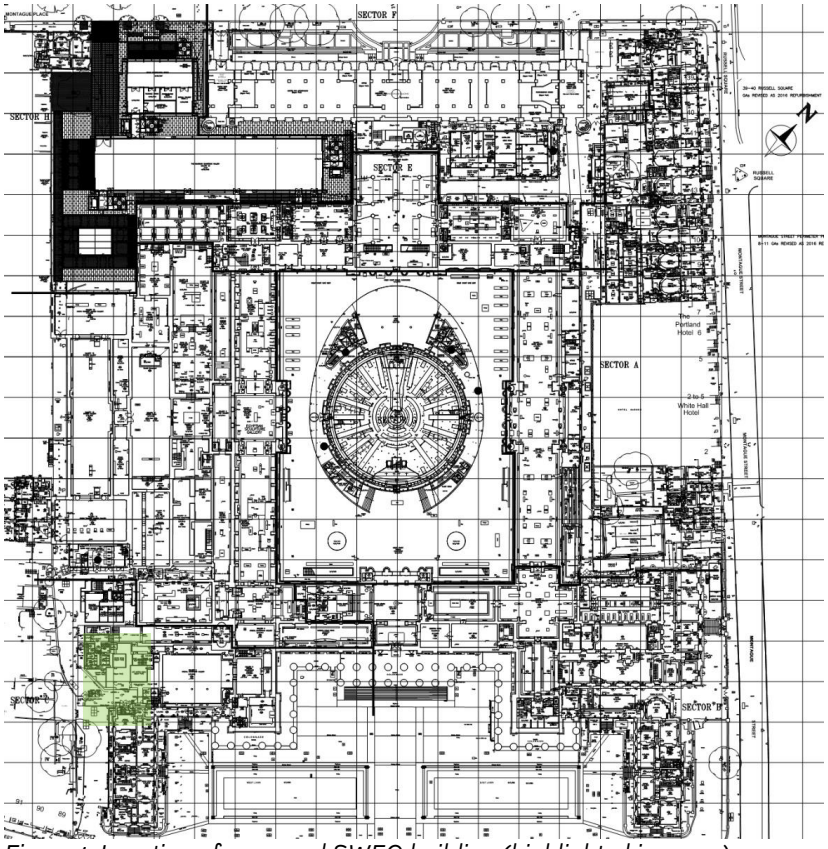


Figure 1: Location of proposed SWEC building (highlighted in green)

4th Floor, 3 Soho Square
London W1D 3HD, United Kingdom
CRN 08 63 62 80
t: +44 / 20 7734 1255
e: info@steensenvarming.com

The proposed SWEC building is a five-storey building plus external rooftop plant area. The building will house building services plant and support accommodation including office space and changing facilities.

The proposed building effectively forms an infill block between the Duveen Gallery and New Wing.

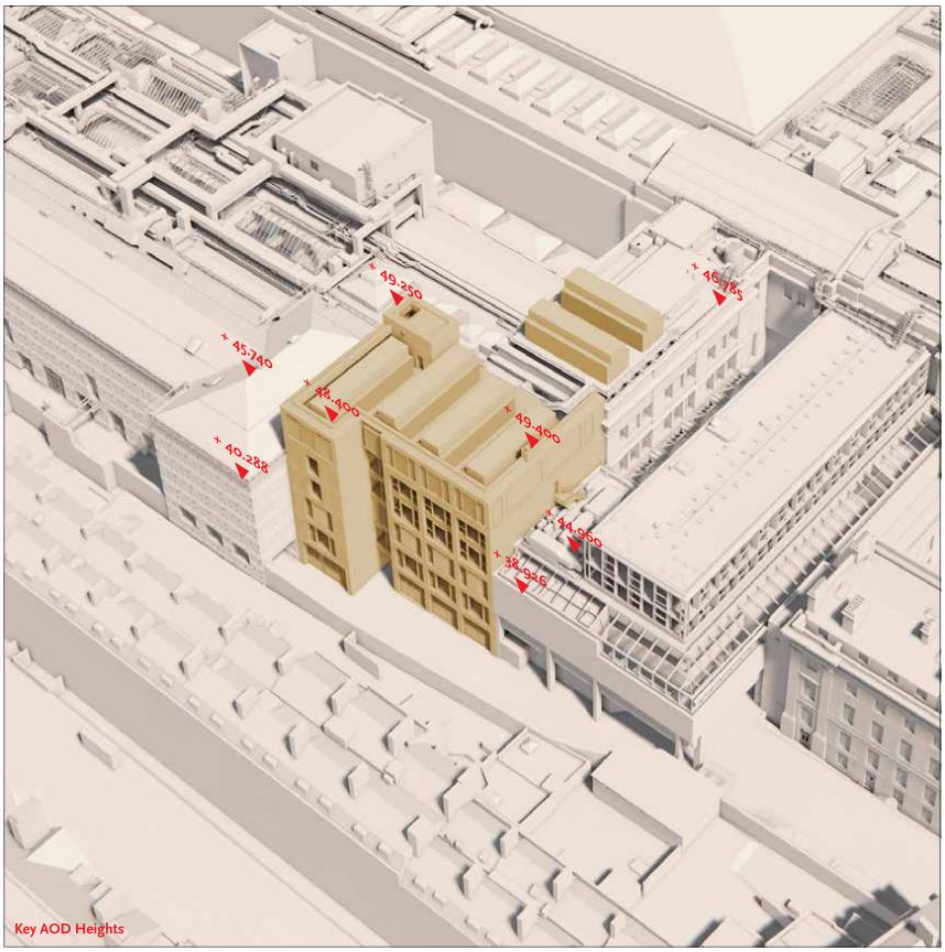


Figure 2 – Proposed SWEC massing in context of surrounding buildings (Image from Wright and Wright Stage 3 Report, 2023)

The night-time environment of the site location and the impact of the proposed development on the surrounding buildings have been key considerations throughout the design process including the exterior lighting design for the project and in line with Camden Local Plan policy A1, measures have been taken to manage the potential impact of exterior artificial lighting, as described in this document.

4th Floor, 3 Soho Square
London W1D 3HD, United Kingdom
CRN 08 63 62 80
t: +44 / 20 7734 1255
e: info@steensenvarming.com

Design Objectives – Exterior Lighting for SWEC building.

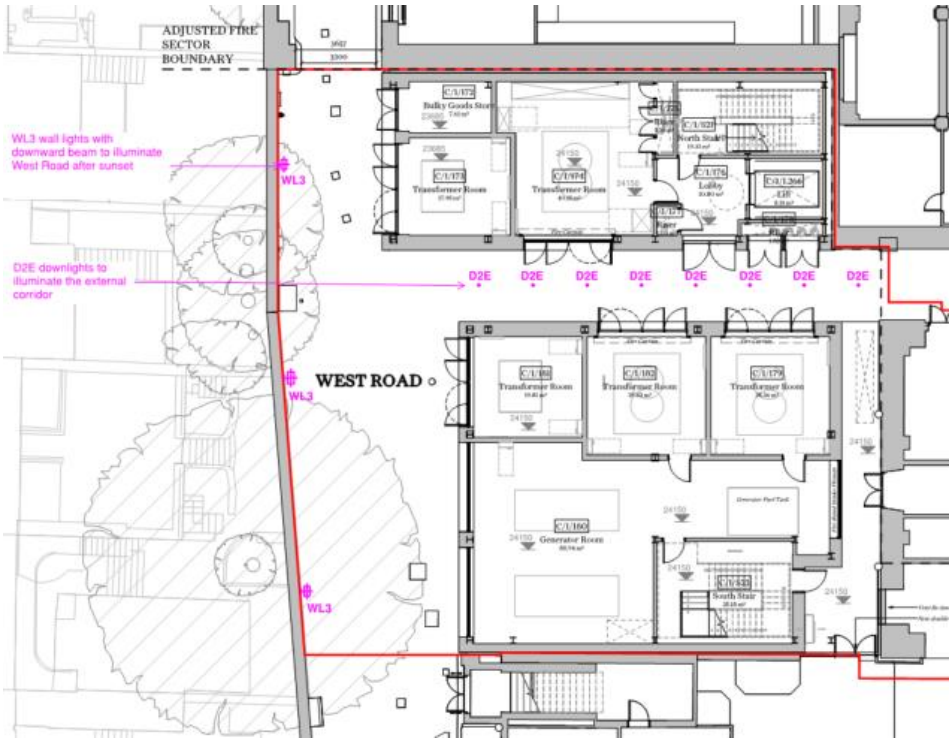
The proposed SWEC building will house building services plant and additional support accommodation. The exterior lighting requirement is therefore to provide illumination for both general staff and functional access for maintenance and service work. To this end, the exterior lighting is proposed to include:

- Wall mounted luminaires on the western façade to facilitate access to transformer rooms and generator plant.
- Surface mounted downlights in the external corridor which separates the northern and southern parts of the SWEC building at ground floor level, and outside the (covered) entrance to the South Stair at the rear of the building.
- Wall lights (with minimal upward beam to reduce spill light to the sky) to facilitate access to the mechanical plant at roof level.

4th Floor, 3 Soho Square
London W1D 3HD, United Kingdom
CRN 08 63 62 80
t: +44 / 20 7734 1255
e: info@steensenvarming.com

2.0 Proposed Luminaire Positions and Hours of Operation

At ground level, wall-mounted luminaires (WL3), with only downward beam, are proposed to illuminate West Road in front of the SWEC building. Luminaires are proposed to be mounted at the top of ground floor level as shown in the elevation below. Covered corridors are illuminated by can type downlights (D2E).



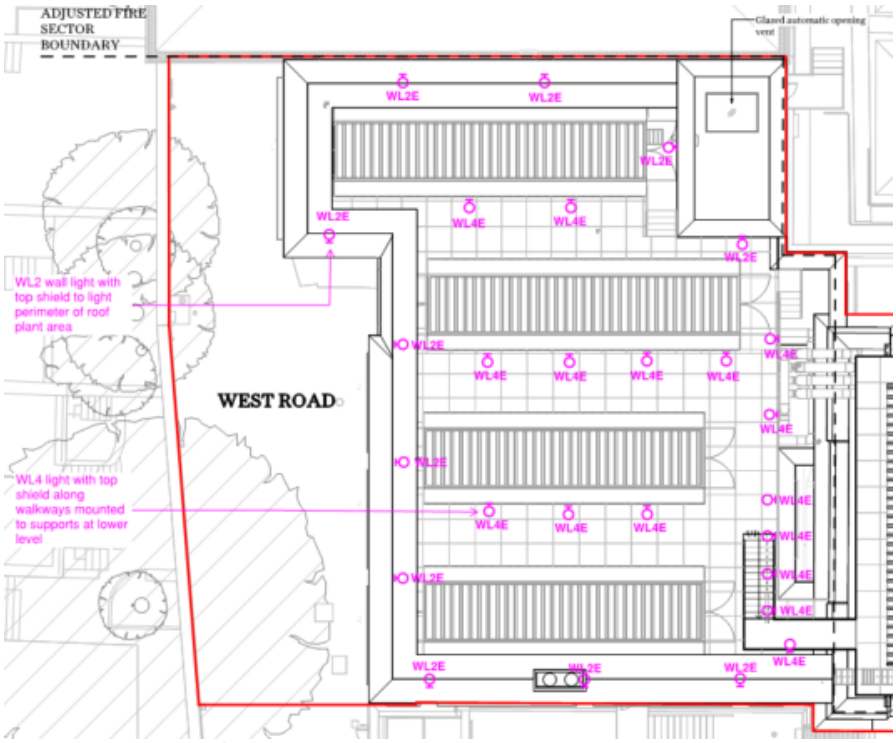
SWEC Building ground floor plan

All WL3 luminaires are to be controlled via an astronomical time clock and/or a daylight sensor to switch on at sunset and automatically switching off at 23.00

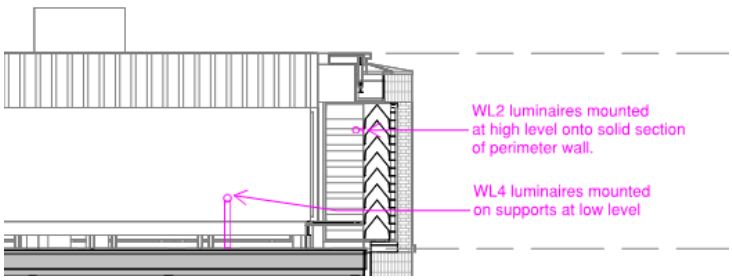
4th Floor, 3 Soho Square
London W1D 3HD, United Kingdom
CRN 08 63 62 80
t: +44 / 20 7734 1255
e: info@steensenvarming.com

The roof level accommodates plant and is shielded by full-height parapet walls. Luminaires with top shields are proposed to be wall mounted at high level (WL2E) on the inside of perimeter walls of the plant area or mounted onto low level supports (WL4E) along paths between mechanical equipment, to provide safety lighting. The perimeter luminaires are shielded from view by the wall coping detail as shown on the section below.

All WL2 and WL4 type luminaires are to be switched on by PIR. Therefore, the lighting in the roof will only be on when access is required, or maintenance is taking place.



SWEC Building roof plan



Section showing mounting locations of type WL2 and WL4 luminaires.

4th Floor, 3 Soho Square
London W1D 3HD, United Kingdom
CRN 08 63 62 80
t: +44 / 20 7734 1255
e: info@steensenvarming.com

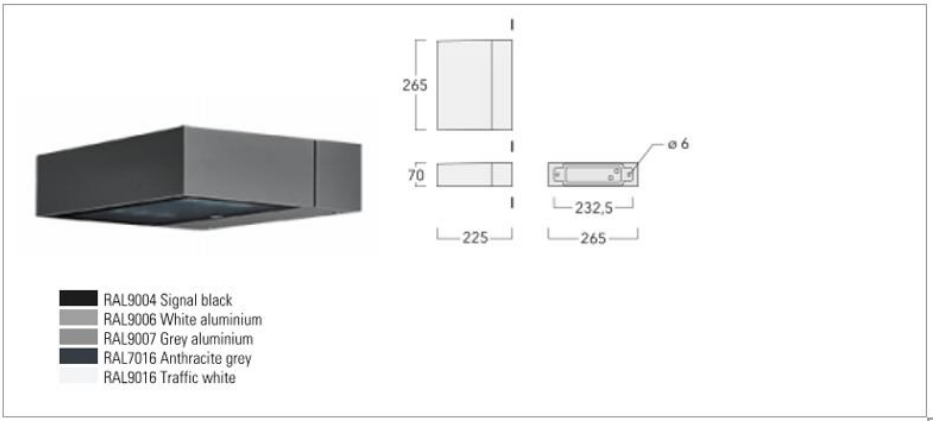
3.0 Proposed Luminaires

The following section details the specification of the proposed luminaires.

WL3

Description	Wall-mounted luminaire IP66 IK08
Model	PLS420 LED
Catalogue No.	131-9565
Manufacturer	WE-EF
Supplier	Fagerhult
Light Source	LED, 21W, 3000K TBC, CRI 80, 1500 lm, asymmetric side throw beam
Finish	Grey TBC with architect and client
Dimensions	265mm (l) x 225mm (w) x 70mm (h)
Control	Integrated driver / on-off
Accessories	Fixing accessories as required Light shield LS180 (TBC)
Location	West Road Montague Place Entrance

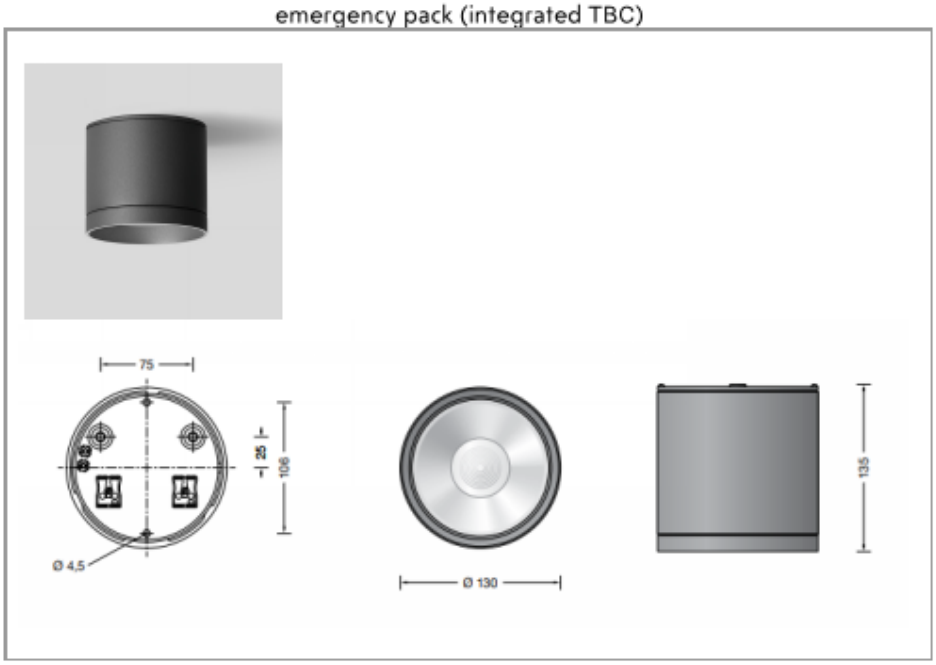
Notes



4th Floor, 3 Soho Square
London W1D 3HD, United Kingdom
CRN 08 63 62 80
t: +44 / 20 7734 1255
e: info@steensenvarming.com

S2E

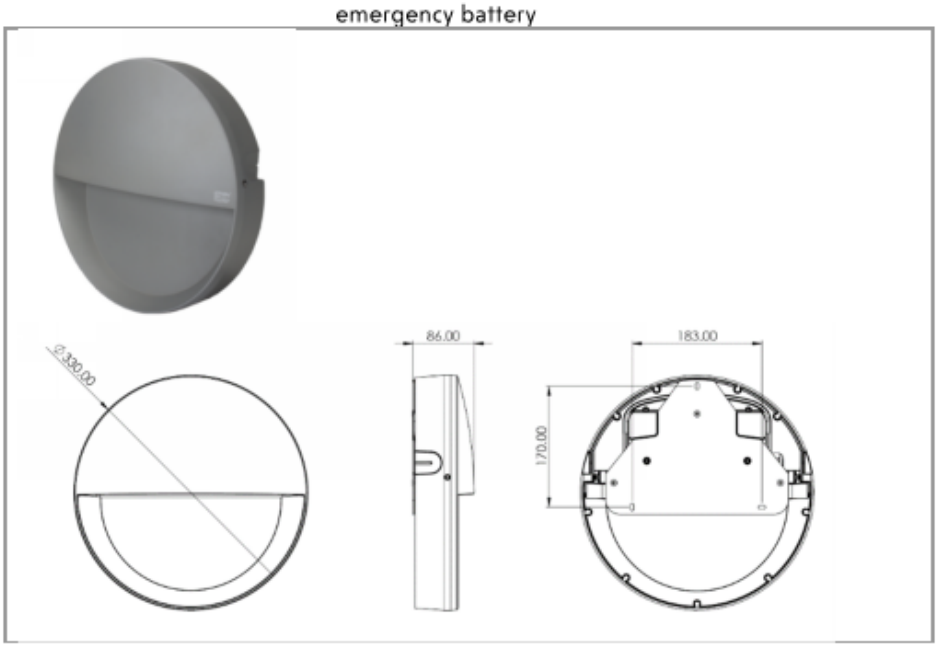
Description	Surface-mounted downlight IP65
Model	24 527
Catalogue No.	24 527 K3
Manufacturer	Bega
Supplier	Optelma
Light Source	LED, 19.3W, 3000 K, 2036lm, 105.5 lm/W, CRI 80, 90deg beam
Finish	Graphite - TBC by architect
Dimensions	130mm (dia) x 135mm (h)
Control	DALI driver (integrated TBC)
Accessories	
Location	Office floor
Notes	S2E denotes fitting to be provided with 3hr DALI emergency pack (integrated TBC)



4th Floor, 3 Soho Square
London W1D 3HD, United Kingdom
CRN 08 63 62 80
t: +44 / 20 7734 1255
e: info@steensenvarming.com

WL2E

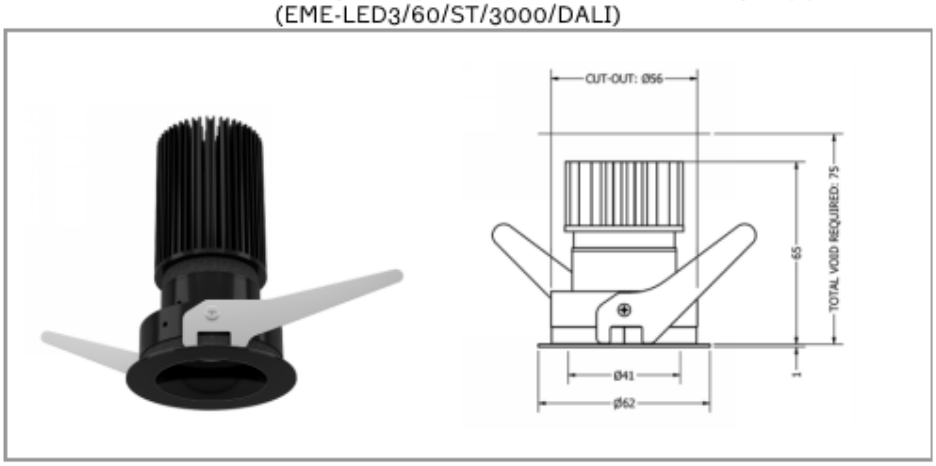
Description	Wall-mounted luminaire IP65
Model	CITY WP 18W 3000K DALI
Catalogue No.	CWP180WWGDD3
Manufacturer	Tamlite
Supplier	Tamlite
Light Source	LED, 18W, 3000K, 1800 lm, 100 lm/W, CRI 80, dark sky optics
Finish	Grey TBC by architect
Dimensions	330mm (dia) x 86mm (w)
Control	Integral DALI driver
Accessories	
Location	Roof level exterior plant area
Notes	Fitting is to be supplied with integral 3hr DALI emergency battery



4th Floor, 3 Soho Square
London W1D 3HD, United Kingdom
CRN 08 63 62 80
t: +44 / 20 7734 1255
e: info@steensenvarming.com

D2E

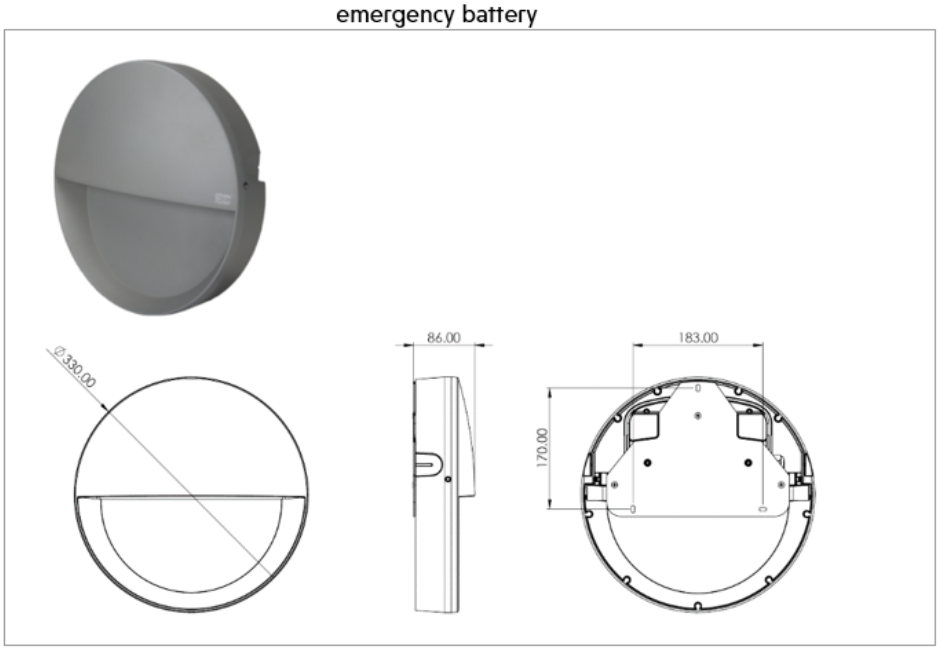
Description	Recessed downlight IP65
Model	Eyeconic Mini Trim Fixed
Catalogue No.	EY-MTF-B1/B1-STD9-30-90-30-700
Manufacturer	Phos
Supplier	Phos
Light Source	LED, 9W, 3000 K, 564lm, 54lm/W, CRI 91, 30deg beam
Finish	Anodised black (bezel), anodised black (inner baffle) - TBC by architect
Dimensions	62mm (dia) x 65mm (h); cut-out required 56mm (dia)
Control	Remote DALI driver
Accessories	Recessed Honeycomb Recessed Softening Insert - TBC
Location	Lift entrance
Notes	Fitting to be provided with 3hr DALI emergency pack (EME-LED3/60/ST/3000/DALI)



4th Floor, 3 Soho Square
London W1D 3HD, United Kingdom
CRN 08 63 62 80
t: +44 / 20 7734 1255
e: info@steensenvarming.com

WL4E

Description	Wall-mounted luminaire IP65
Model	CITY WP 8W 3000K DALI
Catalogue No.	CWP80WWGD3
Manufacturer	Tamlite
Supplier	Tamlite
Light Source	LED, 8W, 3000K, 800 lm, 100 lm/W, CRI 80, dark sky optics
Finish	Grey TBC by architect
Dimensions	330mm (dia) x 86mm (w)
Control	Integral DALI driver
Accessories	
Location	Roof level exterior plant area
Notes	Fitting is to be supplied with integral 3hr DALI emergency battery



4th Floor, 3 Soho Square
London W1D 3HD, United Kingdom
CRN 08 63 62 80
t: +44 / 20 7734 1255
e: info@steensenvarming.com

Below are luminaire lumens per circuit watt and the quantity of each fitting type:

WL3:	70 lm per circuit watt / Quantity: 3 no.
S2E:	105.5 lm per circuit watt / Quantity: 10 no.
WL2E:	100 lm per circuit watt / Quantity: 11 no.
WL4E:	100lm per circuit watt/ Quantity: 17 no.
D2E:	54 lm per circuit watt / Quantity: 1 no.

The average luminous efficacy is 98 lm per circuit watt in compliance with BREEAM Ene 03 External lighting criteria which require the average initial luminous efficacy of the external light fittings within the construction zone to be not less than 60 luminaire lumens per circuit watt.

The control system will allow dimming to the required levels.

4th Floor, 3 Soho Square
London W1D 3HD, United Kingdom
CRN 08 63 62 80
t: +44 / 20 7734 1255
e: info@steensenvarming.com

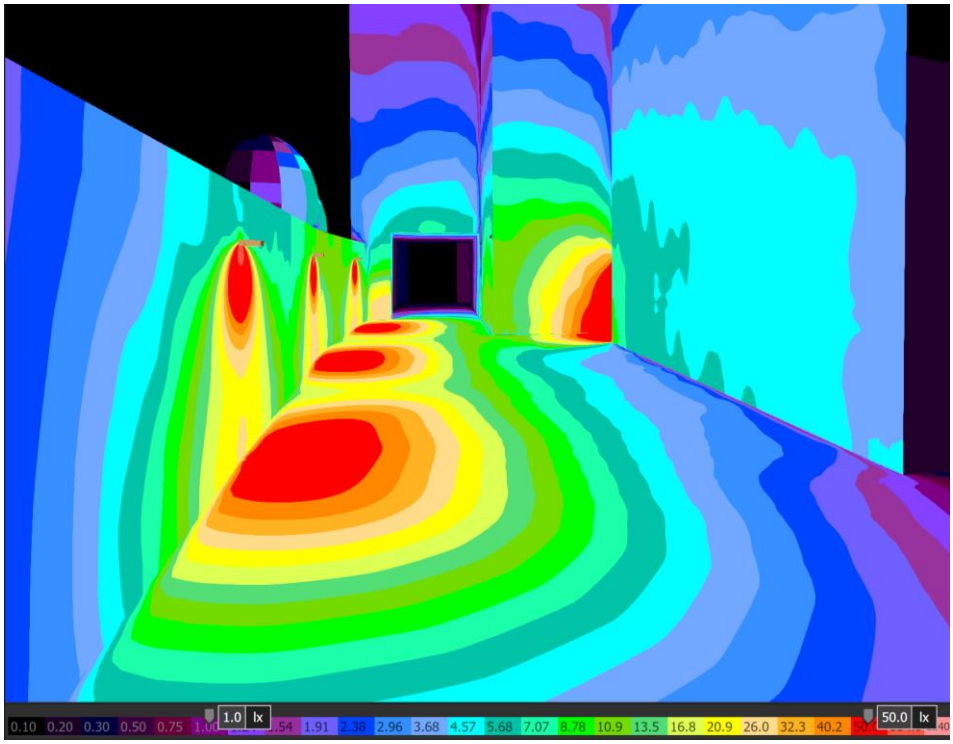
4.0 Light Level and Reduction of Night-time Light Pollution

Light modelling showing the Ground Floor Level of the SWEC building as viewed from West Road.

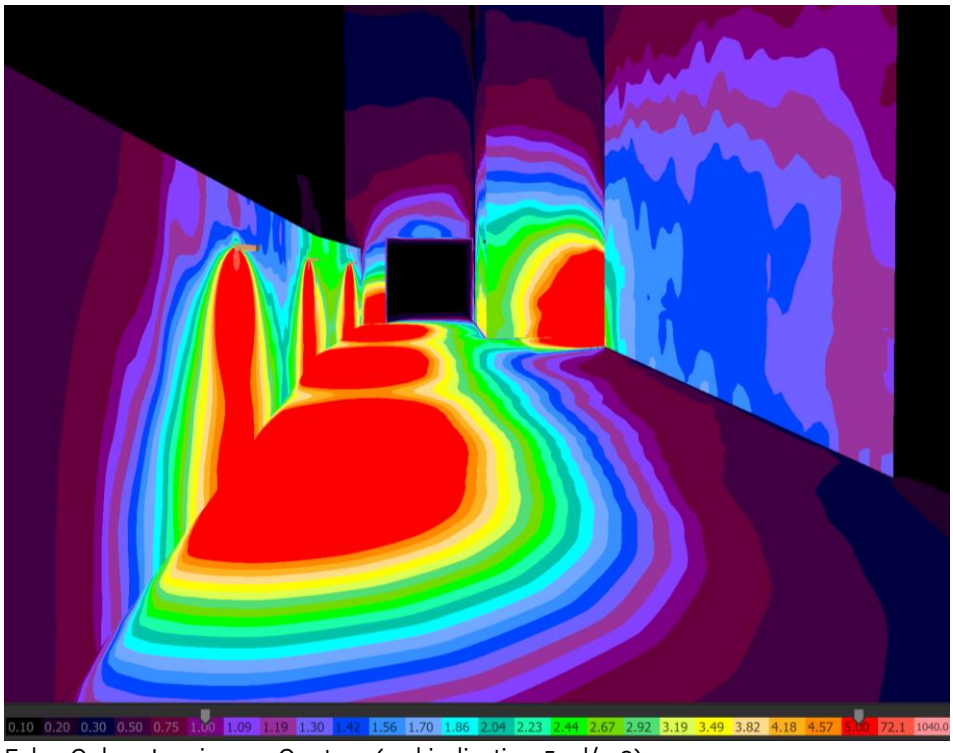
Light render

4th Floor, 3 Soho Square
London W1D 3HD, United Kingdom
CRN 08 63 62 80
t: +44 / 20 7734 1255
e: info@steensenvarming.com

STEENSEN VARMING



False Colour Illuminance Contour (red indicating 50 lux)



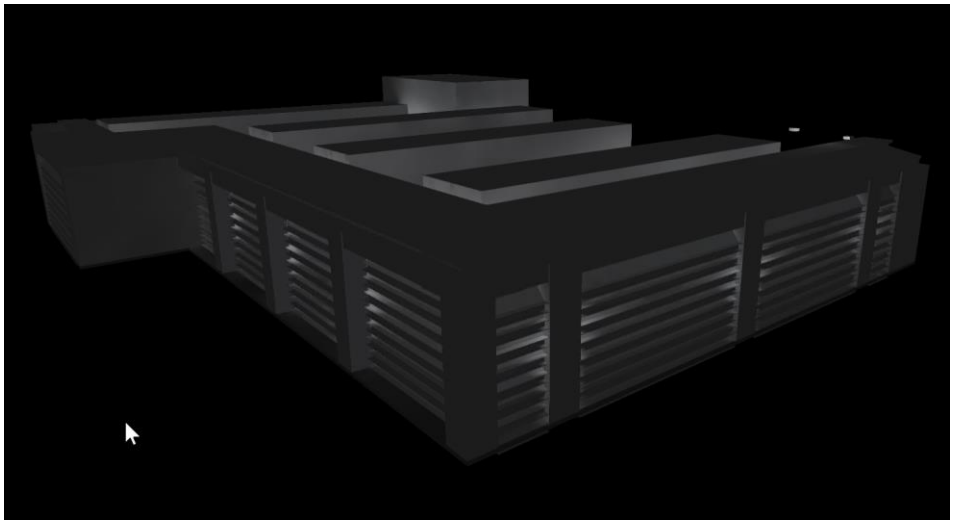
False Colour Luminance Contour (red indicating 5 cd/m2)

4th Floor, 3 Soho Square
London W1D 3HD, United Kingdom
CRN 08 63 62 80
t: +44 / 20 7734 1255
e: info@steensenvarming.com

From the calculation, the average light level on West Road in front of the building is 20 lux. Light is directed from the boundary wall towards the British Museum site and no light nuisance is expected to accommodation on Bloomsbury street neighbouring buildings. Trees along the boundary wall limit potential ingress from reflected light, although it is noted that luminance levels in the area directly above the boundary wall are less than 0.25cd/m^2 .

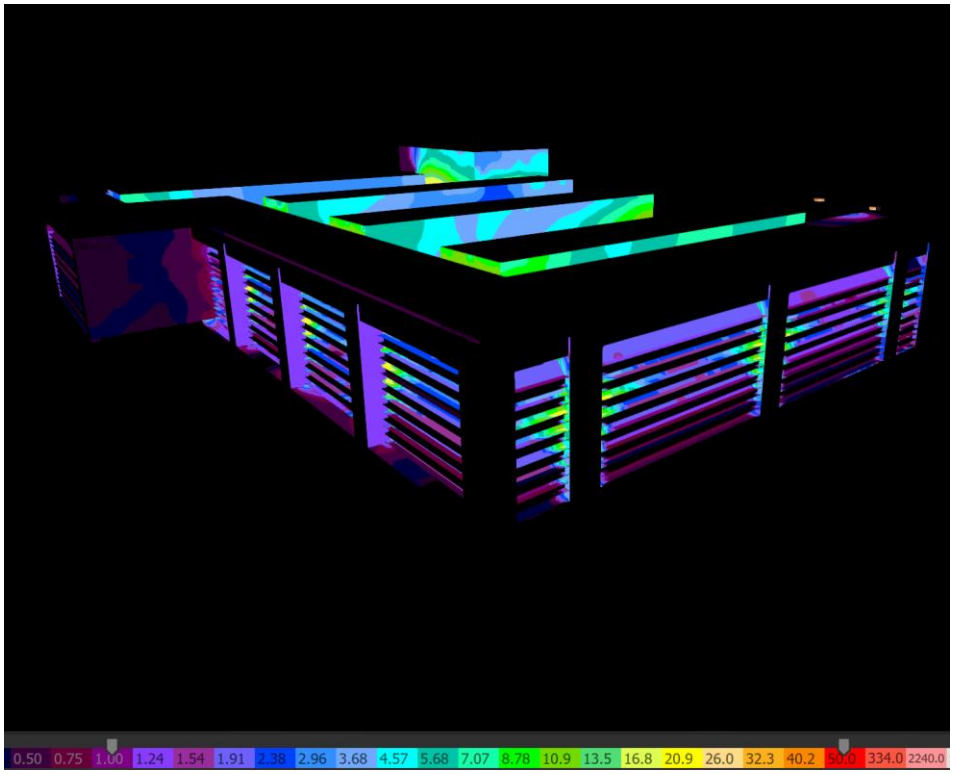
Access to the plant area will typically be during the day and, if required at night, will be during the pre-curfew period. Lighting to the external plant area will be switched on by PIR when the roof is in use for maintenance only. In this instance when the plant area is in use, the light levels viewed from neighbouring buildings are as shown in the false contour below.

Light modelling showing an exterior view of the roof plant

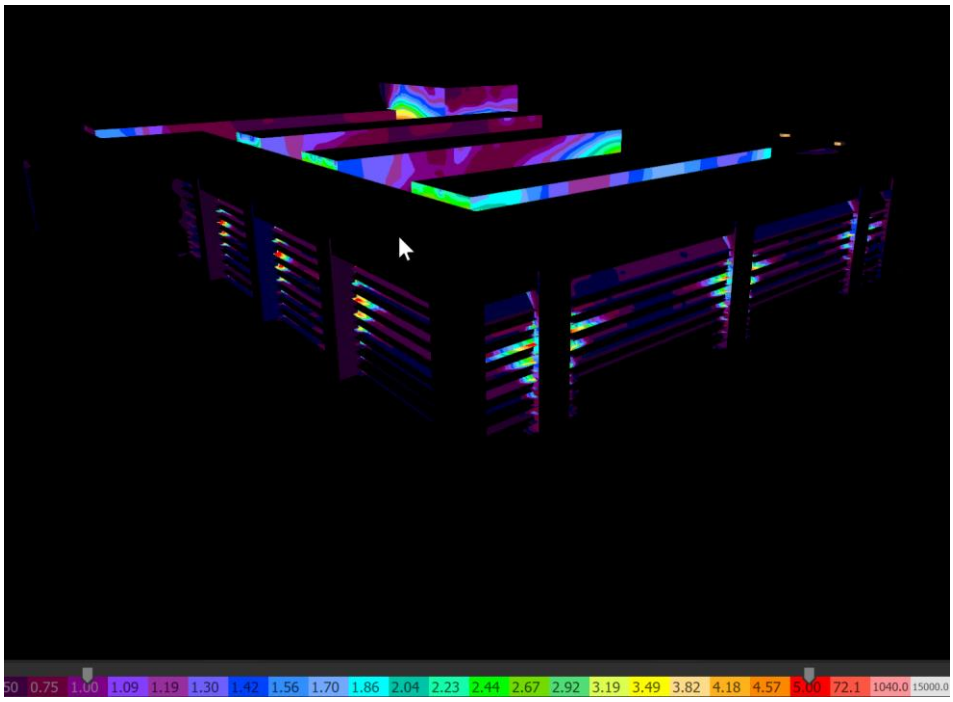


Light render showing an exterior view of the roof plant

4th Floor, 3 Soho Square
London W1D 3HD, United Kingdom
CRN 08 63 62 80
t: +44 / 20 7734 1255
e: info@steensenvarming.com

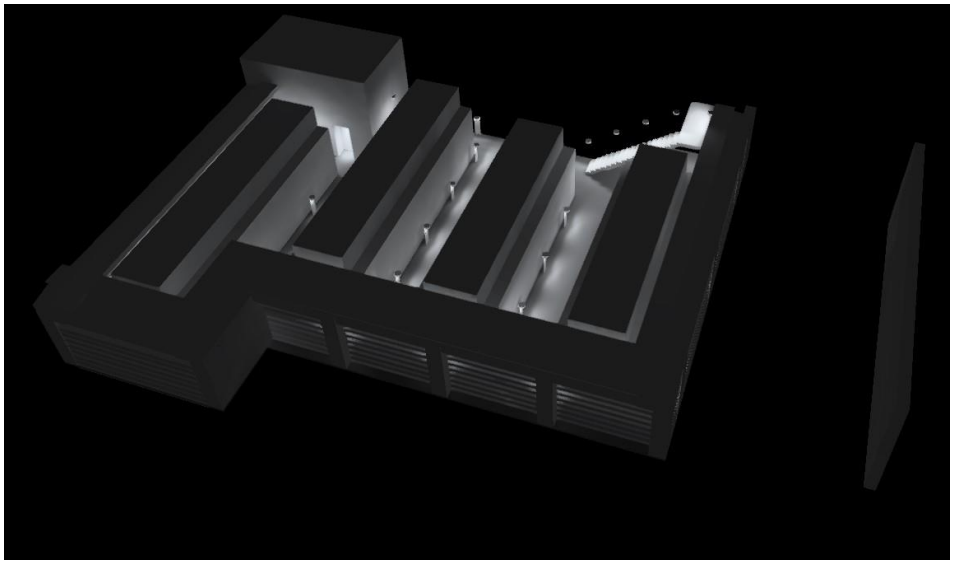


False Colour Illuminance Contour (red indicating 50 lux)

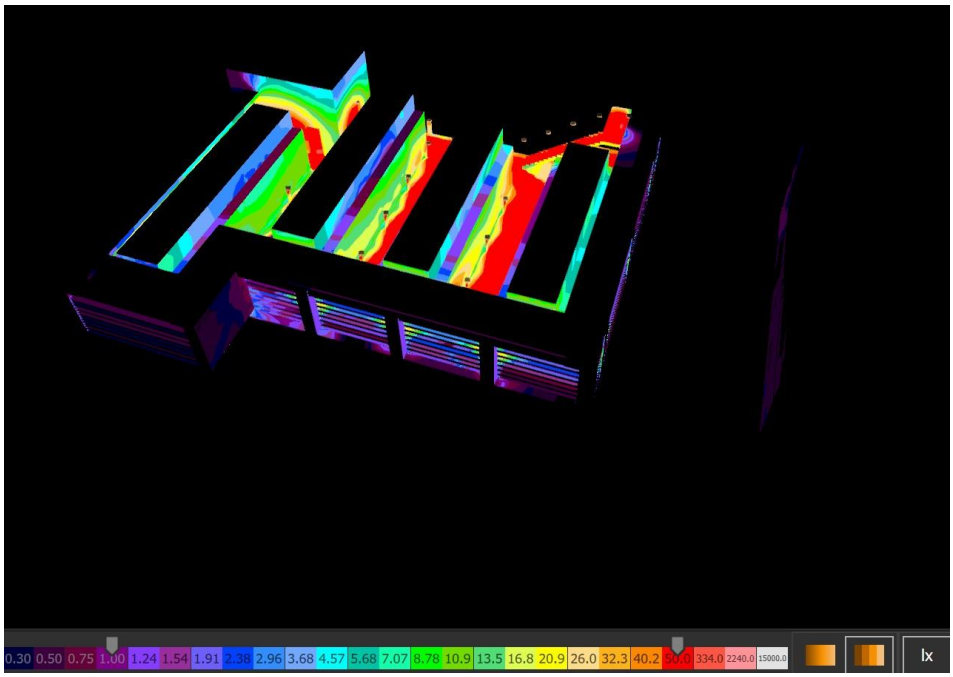


False Colour Luminance Contour (red indicating 5 cd/m^2)

4th Floor, 3 Soho Square
London W1D 3HD, United Kingdom
CRN 08 63 62 80
t: +44 / 20 7734 1255
e: info@steensenvarming.com



Light render showing birds' eye view of the roof plant and adjacent façade.



False Colour Illuminance Contour (red indicating 50 lux)

Most of the light from the plant area is restricted because of the high perimeter walls and louvers enclosing the plant area. The elevation of the roof plant area is higher than the immediate neighbouring buildings. The calculation shows that spill from the façade louvers is minimal and the light level due to lighting from the plant area on the closest façade i.e. the North Façade of the New Wing is less than 1 lux and 0.1 cd/$m^{2.}$

4th Floor, 3 Soho Square
London W1D 3HD, United Kingdom
CRN 08 63 62 80
t: +44 / 20 7734 1255
e: info@steensenvarming.com

All external fittings within the construction zone as shown in this document meet the lighting requirements as given in Table 2 (and its accompanying notes) of the ILP Guidance notes for the reduction of obtrusive light, 2011.

(1) Upward Light Ratio – No upward beam is utilised as care has been taken to minimise any upward waste light by the proper application of suitably directional luminaires and light-controlling attachments. All luminaires are to illuminate with downward beam and equipped with top shield where possible to reduce skyglow.

(2) Light Intrusion (into windows) - All light fittings are installed with lenses/diffusers that focus the light beam onto the task area and with a shield to prevent spill light; fittings are also carefully positioned to prevent direct light into windows.

(3) Luminaire Intensity - All light fittings use energy-efficient LEDs with focused beam or shield suitable for their applications to reduce light spill outside of the lit area.

(4) Building Luminance – Exterior lighting is lit for safety and functional purposes only to avoid overlighting. East Road Building façade luminance is kept at a minimum and does not exceed the same brightness level as the surrounding environment.

The external lighting design also incorporates the requirements of ILP Guidance note GN08: 2018 Bats and artificial lighting in the UK as per Writtle Forest's Preliminary Ecological Appraisal (December 2022), namely:

- Using LED luminaires to minimise UV light emission.
- Adopting a warm white spectrum
- Using luminaires which feature a peak wavelength higher than 550 nm (2700K-3000K)

In summary, the proposed exterior lighting scheme for the SWEC Building is designed to allow access during darker hours, ensuring that the building can be accessed safely and without discomfort. In line with Policy A1 of the Camden Local Plan, the scheme is also designed to be as unobtrusive as possible to the neighbouring buildings as well as to minimise its environmental impact and contribution to skyglow.