ST. GILES
LIGHTING CALCULATION SUPPLEMENT

BUROHAPPOLD ENGINEERING

Rev 00

25th November 2019

LIGHTING CALCULATION SUPPLEMENT

The following documentation provides an overview of the design criteria the external lighting scheme for the development.

A design target of 15lux at floor level had been set as a bench mark for which the external illumination levels would achieve. The design target is in access of the recommendations of the BS EN 12464-2:2014, which indicates requirements to provide 5lux maintained illuminance.

However the proposed lighting includes for dimming and levels can be reduced to 5lux if required, the purpose of higher illumination levels is to allows a level of flexibility with lighting levels and also provide increased levels for safety of high density people traffic during events with a general overall illumination of 22.7lux achieved at normal output without dimming.

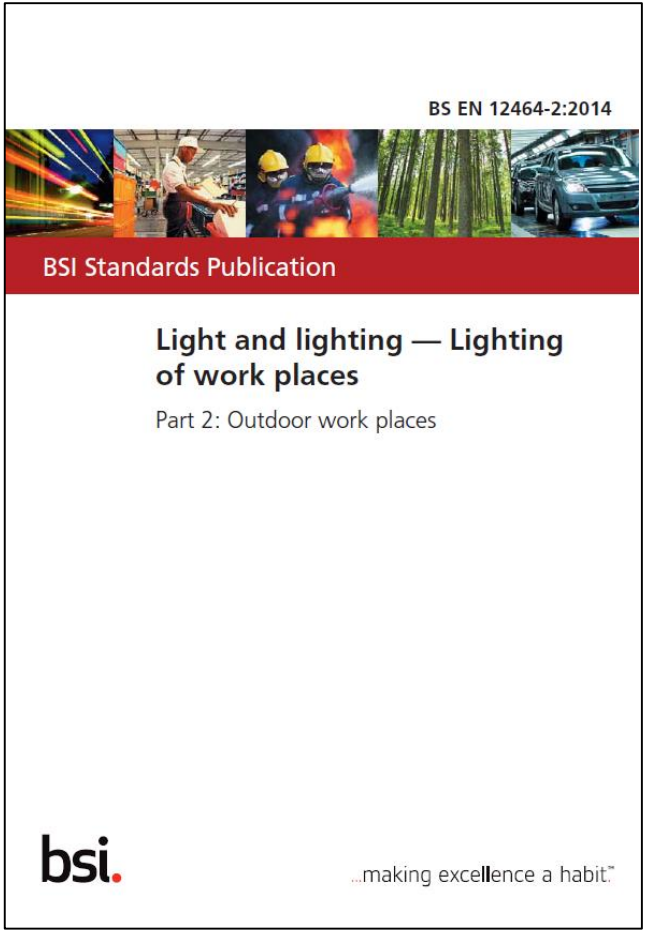
LIGHTING CALCULATION SUPPLEMENT

The below table extracted from the BS EN 12464-2:2014 Ref No 5.1.1 denotes the illumination requirements for the external walkways within the development.

5.4 Lighting requirements for areas, tasks and activities

Table 5.1 — General requirements for areas and for cleaning at outdoor work places

Ref. no.	Type of area, task or activity	$\overline{E}_m$ lx	U_o –	R_{GL} –	R_a –	Specific requirements
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), e.g. bicycles, trucks and excavators	10	0,40	50	20	
5.1.3	Regular vehicle traffic (max. 40 km/h)	20	0,40	45	20	At shipyards and in docks, R_{GL} may be 50
5.1.4	Pedestrian passages, vehicle turning, loading and unloading points	50	0,40	50	20	
5.1.5	Cleaning and servicing	50	0,25	50	20	All relevant surfaces



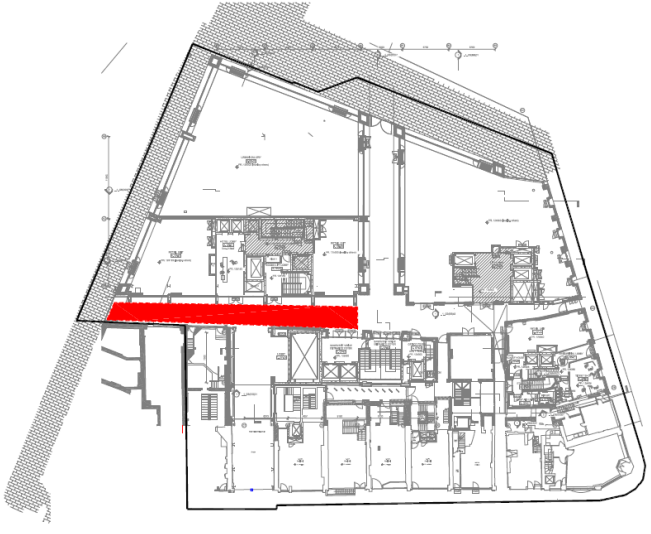
LIGHTING CALCULATION SUPPLEMENT

The following provide details of the illumination levels achieved from the proposed lighting scheme for the function lighting catering for circulation and safe use of the exterior spaces within the development.

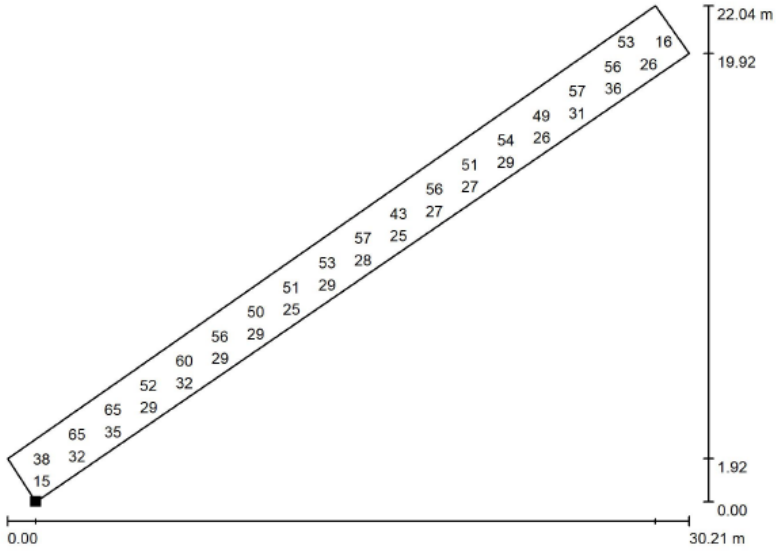
All illuminations levels noted are those obtained at floor level.

LIGHTING CALCULATION SUPPLEMENT

Area 1.



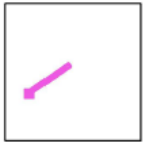
Denmark Place RGBW / Calculation Surface 1 / Value Chart (E, Perpendicular)



Values in Lux, Scale 1 : 216

Not all calculated values could be displayed.

Position of surface in external scene:
Marked point:
(4.786 m, -8.129 m, 0.100 m)

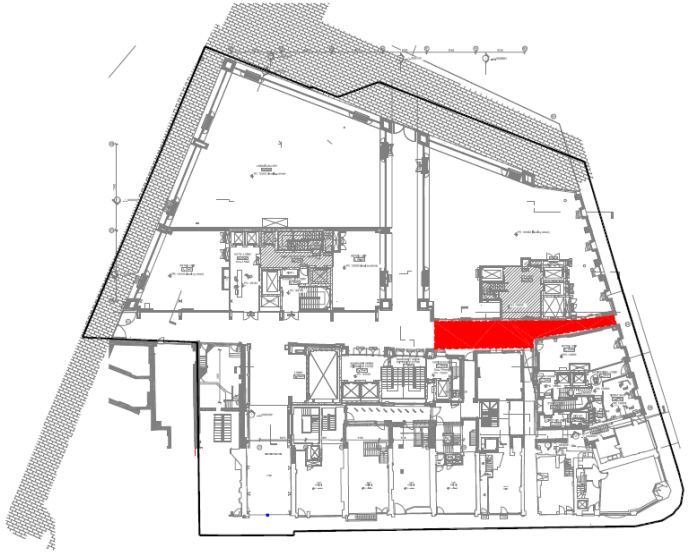


Grid: 128 x 64 Points

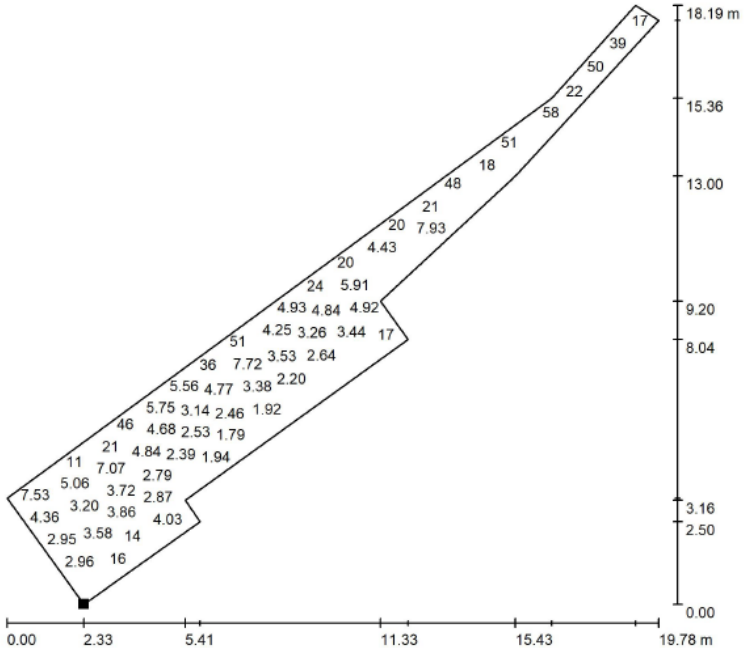
E_{av} [lx]	E_{min} [lx]	E_{max} [lx]	u0	E_{min} / E_{max}
48	8.49	108	0.175	0.078

LIGHTING CALCULATION SUPPLEMENT

Area 2.



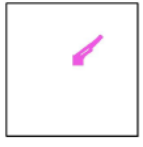
Denmark Place RGBW / Calculation Surface 2 / Value Chart (E, Perpendicular)



Values in Lux, Scale 1 : 143

Not all calculated values could be displayed.

Position of surface in external scene:
Marked point:
(40.500 m, 14.800 m, 0.100 m)

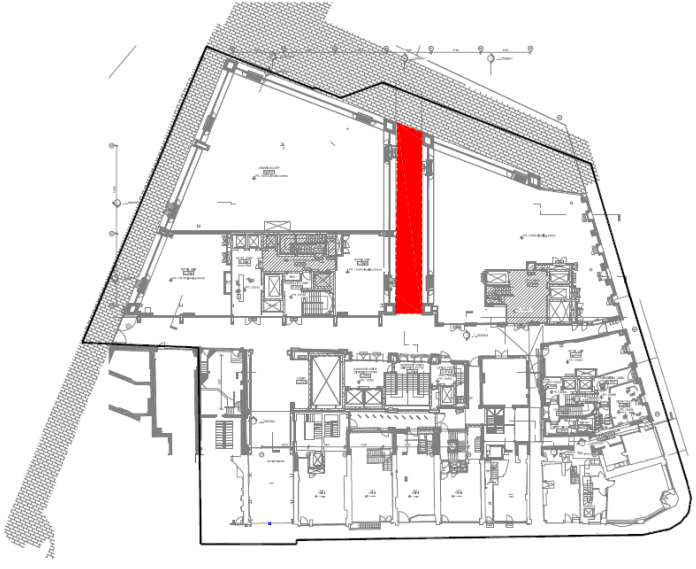


Grid: 128 x 64 Points

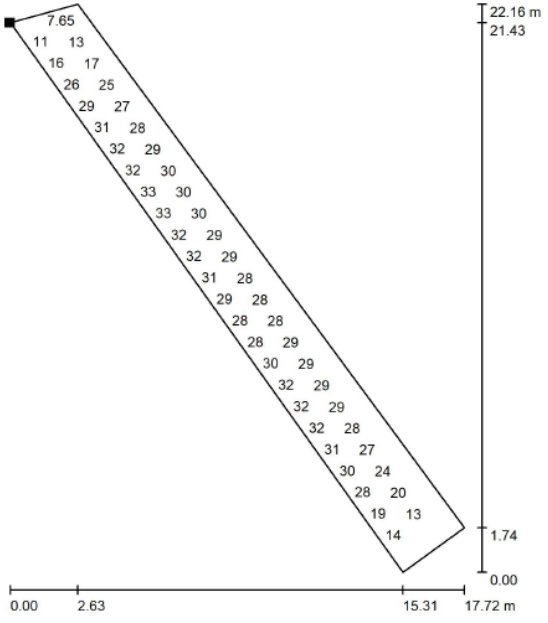
E_{av} [lx]	E_{min} [lx]	E_{max} [lx]	u0	E_{min} / E_{max}
13	1.62	147	0.121	0.011

LIGHTING CALCULATION SUPPLEMENT

Area 3.



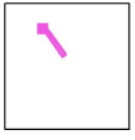
Denmark Place RGBW / Calculation Surface 3 / Value Chart (E, Perpendicular)



Values in Lux, Scale 1 : 174

Not all calculated values could be displayed.

Position of surface in external scene:
Marked point:
(16.874 m, 37.113 m, 0.100 m)

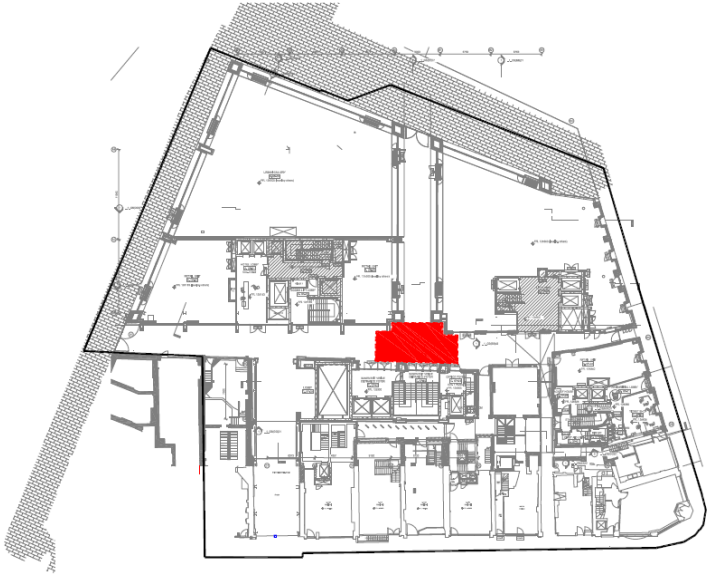


Grid: 128 x 32 Points

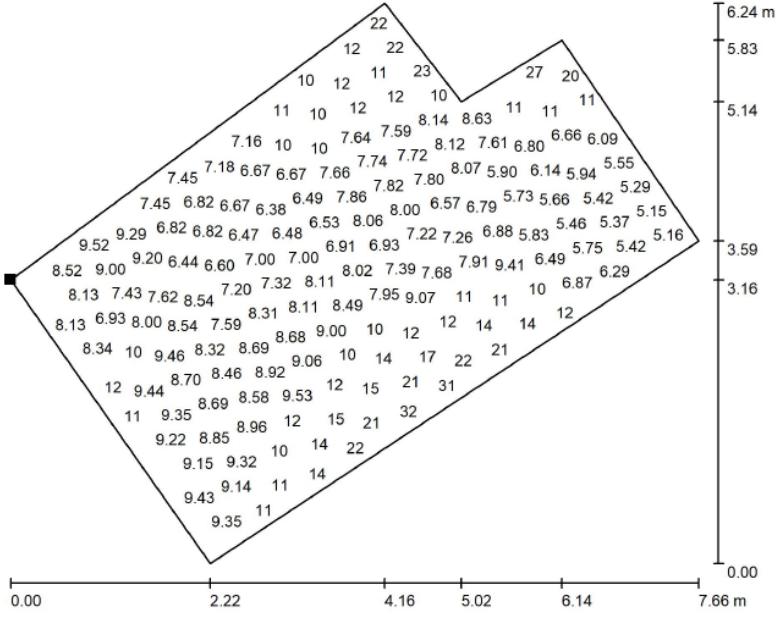
E_{av} [lx]	E_{min} [lx]	E_{max} [lx]	u0	E_{min} / E_{max}
26	5.84	36	0.221	0.161

LIGHTING CALCULATION SUPPLEMENT

Area 4.



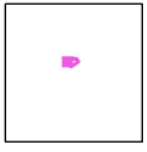
Denmark Place RGBW / Calculation Surface 4 / Value Chart (E, Perpendicular)



Values in Lux, Scale 1 : 55

Not all calculated values could be displayed.

Position of surface in external scene:
Marked point:
(31.828 m, 14.978 m, 0.100 m)

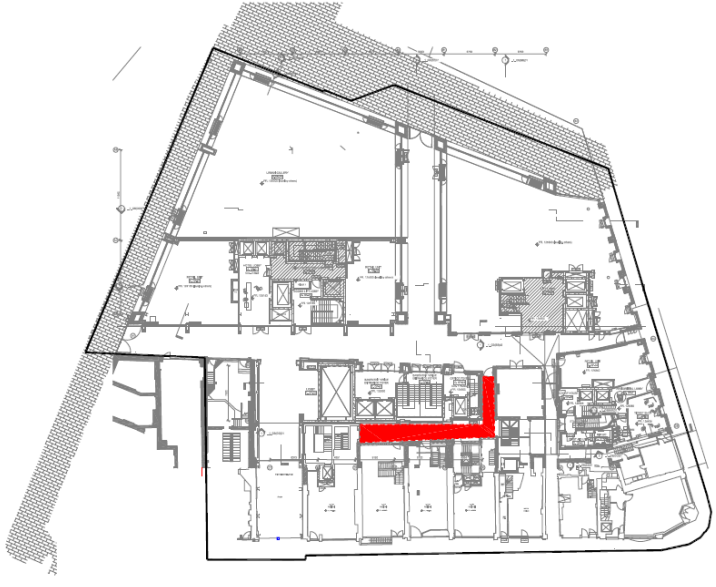


Grid: 64 x 64 Points

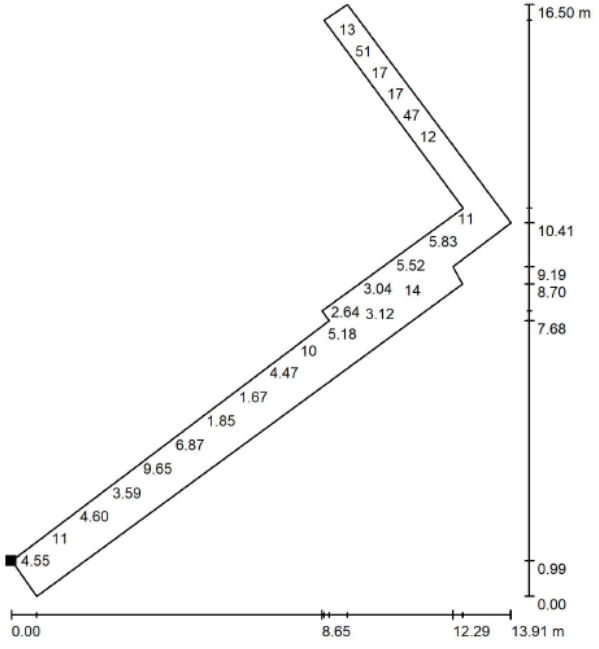
E_{av} [lx]	E_{min} [lx]	E_{max} [lx]	u0	E_{min} / E_{max}
9.83	5.07	71	0.516	0.071

LIGHTING CALCULATION SUPPLEMENT

Area 5.



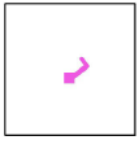
Denmark Place RGBW / Calculation Surface 5 / Value Chart (E, Perpendicular)



Values in Lux, Scale 1 : 130

Not all calculated values could be displayed.

Position of surface in external scene:
Marked point:
(35.407 m, 1.000 m, 0.100 m)



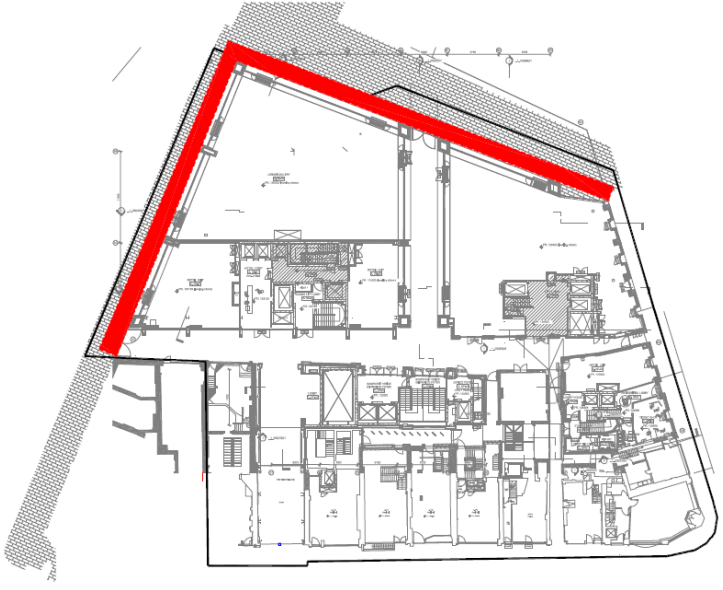
Grid: 128 x 128 Points

E_{av} [lx]	E_{min} [lx]	E_{max} [lx]	u0	E_{min} / E_{max}
16	1.45	164	0.089	0.009

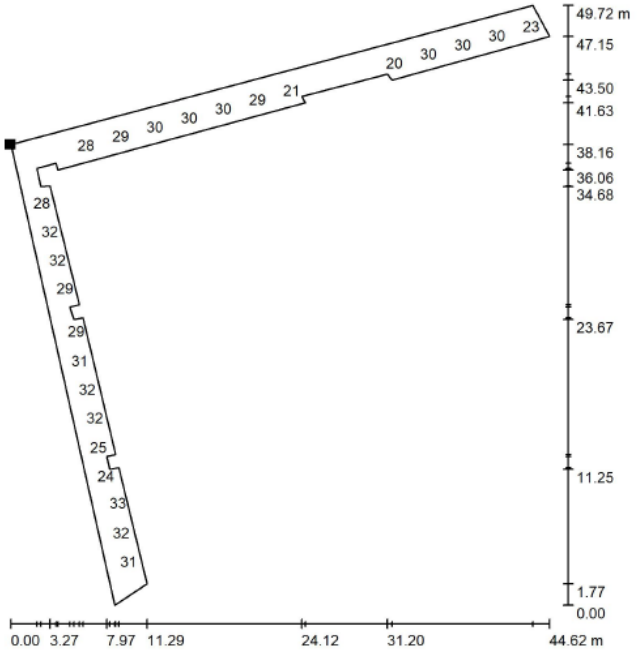
LIGHTING CALCULATION SUPPLEMENT

Area 6.

Please note the results for the external building perimeter do not include for the supplementary contributions from the street lighting which will provide an overall increase to the levels noted.



Denmark Place RGBW / Calculation Surface 6 / Value Chart (E, Perpendicular)



Values in Lux, Scale 1 : 389

Not all calculated values could be displayed.

Position of surface in external scene:
Marked point:
(-9.408 m, 32.680 m, 0.100 m)

Grid: 128 x 32 Points

E_{av} [lx]	E_{min} [lx]	E_{max} [lx]	u0	E_{min} / E_{max}
20	2.38	34	0.118	0.071

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