WOOTTON HALL PARK SCHOOL  
NORTHAMPTON NN4 OJQ  

OUTLINE EXTERNAL LIGHTING REPORT  
AND CCTV/ACCESS  

ELECTRICAL ENGINEERING SERVICES  

32920-E-  

<table>
<thead>
<tr>
<th>Revision</th>
<th>Date</th>
<th>Description</th>
<th>Made</th>
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<td>-</td>
<td>20.04.2016</td>
<td>For Comment</td>
<td>DCB</td>
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<td>06.05.2016</td>
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<td>For Comment</td>
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1. External Car Park and Entrance Services introduction

The construction of a new temporary building accommodation is being provided, as the new permanent Wootton Hall Park school building is due for completion in September 2019. Existing playing fields to the north of this building will be used for temporary accommodation building for the first three years of school intake during the construction period. Wootton Park Hall is a newly established all through-school for pupils aged 4 - 19 years.

As part of the temporary building new external lighting shall be provided to the staff and parent car park, drop-off area outside main building and external building entrances/exits. The performance objective is to provide adequate illumination for safe access for building users to satisfy the local authority/planning requirements. The lighting scheme will address local ecology issues and in keeping with the aesthetic demands of the site.

The area contains local residential properties and the scheme needs to address this issue in respect to light spill and light pollution. The car parks and access roads will generally be illuminated by low level bollards and bulkhead luminaires which adopt LED and flat dichroic glass to maximise control of unwanted upward light spill and light spill to adjoining areas. Low level bollards have been introduced to achieve the desired low lighting levels to ramps and walkways. Luminaires shall be mounted over each entrance/exit doorway with emergency modules as required.

The building lighting scheme reflects areas for use by small children and people with disabilities. Where road crossing is located flashing beacons will be provide to alert any car or cycle users.

2. Lighting Design levels

The CIBSE lighting guides give the following levels for external areas.

<table>
<thead>
<tr>
<th>Area</th>
<th>Illuminance (Lux)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Car Parks</td>
<td></td>
</tr>
<tr>
<td>Low Risk</td>
<td>20</td>
</tr>
<tr>
<td>High Risk</td>
<td>50</td>
</tr>
<tr>
<td>Footpaths</td>
<td>5-10</td>
</tr>
<tr>
<td>Cycle racks</td>
<td>5-10</td>
</tr>
<tr>
<td>Pathways</td>
<td>10-20</td>
</tr>
<tr>
<td>Area Lighting</td>
<td>5-20</td>
</tr>
</tbody>
</table>

Any scheme may have to be approved by the Local Area Council Lighting Department. The above values may increase or decrease subject to their comments and any specification requirements, however these are standard industry levels.
3. **Design Standards and Relevant documents (check dates)**

- BS EN 13201_2:2013 Road lighting – Part 2: Performance requirements
- BS EN 13201_3:2013 Road lighting – Part 3: Calculation of performance

*CIE Guide lines for minimizing Urban Sky Glow*

- 92 Guide for floodlighting
- 115 Recommendations for the lighting of roads for motor and pedestrian traffic
- 126 Guidelines for minimizing Sky glow
- 129 Guide for lighting exterior work areas
- 136 Guide to the lighting of urban areas
- 150 Guide on the limitations of the effect of obtrusive light from outdoor lighting installations
4. Light Pollution

External Lighting is designed to reduce **sky glow**, the brightening of the night sky above our towns, cities and countryside, **Glare** the uncomfortable brightness of a light source when viewed against a dark background, and **Light Trespass**, the spilling of light beyond the boundary of the property or area being lit, are all forms of obtrusive light which may cause nuisance to others, waste money and electricity. Design uses the do not over light as image below.

Street lighting is a BS requirement but should not be specified in a way which is detrimental to night environment.

Modern street optics will deliver without compromise to the rest of visual impression.
5. Proposed Design

Factors have been taken into consideration when designing the External Lighting scheme for this project some of which are listed below and briefly explained.

**Upward Sky Glow and/or Light Pollution**

The location of the school has been taken into consideration when designing the external lighting scheme and it can be seen from Table 1 of the ILE sky glow Guidance note (see below) that the School is situated in an E2 zone area of low district brightness i.e. an urban location. This then leads onto table 2 of the document which advises on to amount of upward light permissible as part of the base external lighting design.

Table 1 Description of the environmental zones according to the CIE Zoning System

<table>
<thead>
<tr>
<th>Zone rating</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>E1</td>
<td>Areas with intrinsically dark landscapes: National Parks, Areas of outstanding natural beauty (where roads usually are unlit);</td>
</tr>
<tr>
<td>E2</td>
<td>Areas of 'low district brightness’: generally outer urban and rural residential areas (where roads are lit to residential road standard)</td>
</tr>
<tr>
<td>E3</td>
<td>Areas of 'middle district brightness’: generally urban residential areas (where roads are lit to traffic route standard)</td>
</tr>
<tr>
<td>E4</td>
<td>Areas of 'high district brightness’: generally urban areas having mixed residential and commercial land use with high night-time activity.</td>
</tr>
</tbody>
</table>

Table 2. Recommendations for the limitation of sky-glow

<table>
<thead>
<tr>
<th>Zone rating</th>
<th>ULORinst (%)</th>
<th>Astronomical activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>E1</td>
<td>0</td>
<td>observatories of (inter)national standing</td>
</tr>
<tr>
<td>E2</td>
<td>0 – 5</td>
<td><strong>postgraduate and academic studies</strong></td>
</tr>
<tr>
<td>E3</td>
<td>0 - 15</td>
<td>undergraduate studies, amateur observations</td>
</tr>
<tr>
<td>E4</td>
<td>0 - 25</td>
<td>casual sky viewing</td>
</tr>
</tbody>
</table>

As evident from the above tables that the permissible level of upward lighting for the base external lighting scheme is between 0 and 5%. The light fittings selected for the base lighting scheme are in accordance with this as there ULOR percentage is 0%.
6. **Proposed Lighting controls**

Basically lighting control systems will be adopted aimed at satisfying each area’s specific needs:

a) **Adjustable timer zones** – these are areas where timer and photocell control is considered desirable but not driven by ecology, rather visual impact – hence lighting would go off between agreed times during daylight and night-time hours.

b) **Adjustable timer and PIR movement sensor zones** – these are areas where ecology considerations require lighting to be turned off early (7pm) but the zone could be ‘switched on’ by movement sensor for a pre-set period of up to an hour via strategically located movement (PIR) sensors. Luminaires can be fitted with light reduction sensors to say 15% where lack of movement is detected then revert to full brightness when required.

c) **Switched Area** – Lighting generally ‘switched off’ but can be turned on occasionally as required

Generally, scheme will incorporate lighting controls to provide an energy efficiency and avoid luminaire operating when not required.
7. **External Lighting Design data.**

**Comment.**

The construction of a new temporary building School accommodation is being proposed, consisting of three main areas as follows,

1) Main school, Senior Car Park and Bike Storage.
2) Interlinking Pathway between Main Car Park and school.
3) Staff and Parent Parking spaces away from main building.

Each area is being design individually taking into account activities likely to occur. The choice of luminaires is being restricted to three types:-

A) Bulkhead type luminaire with visor.
B) Low level bollard
C) Low level column with mounted pole luminaire with adjustable options. This allows the luminaire mounting angle to be adjusted, if required, to give greater light area coverage.

Please refer to attached Luminaire data sheets for review.

Design development has included further Lighting Plots to suit the above area, including consideration of ecology and residential area.
1) A. Main Building and Senior Staff Parking, plot.

Main Building Senior Staff Car Park / Luminaires (layout plan)

Luminaire Parts List

<table>
<thead>
<tr>
<th>No.</th>
<th>Pieces</th>
<th>Designation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>6</td>
<td>Thorlux STF174/10 Starfood LED SMART</td>
</tr>
<tr>
<td>2</td>
<td>14</td>
<td>Thorn 96 210 424 EYE HA 750 LED HF MW5 CORR OP L ANT L04 [STD]</td>
</tr>
<tr>
<td>3</td>
<td>28</td>
<td>Thorn 96 262 145 D-LED BOLLARD 1900 30L50 840 CL1 [STD]</td>
</tr>
</tbody>
</table>
1) B. Main Building and Senior Staff Parking, 3D Rendering.
1) C. Main Building and Senior Staff Parking, Greyscale.
1) D. Main Building and Senior Staff Parking, Isolines.

Wootton Park Hall External Lighting

Main Building Senior Staff Car Park / Ground Element 1 / Surface 1 / Isolines (E)

Values in Lux, Scale 1 : 750

Position of surface in external scene:
Marked point:
(74.524 m, 10.300 m, 0.000 m)

Grid: 128 x 128 Points

$E_{av} [lx] \quad E_{min} [lx] \quad E_{max} [lx] \quad \mu_0 \quad E_{min} / E_{max}$

3.94  0.00  51  0.000  0.000
1) E. Main Building and Senior Staff Parking, Isolines Drawing.
1) F. Senior Staff Parking, Isolines.

Main Building Senior Staff Car Park / Main Parking Area / Isolines (E, Perpendicular)

Position of surface in external scene:
Marked point:
(70.181 m, 11.157 m, 0.250 m)

Values in Lux, Scale 1 : 400

Grid: 128 x 128 Points

<table>
<thead>
<tr>
<th>$E_{\text{av}}$ [lx]</th>
<th>$E_{\text{min}}$ [lx]</th>
<th>$E_{\text{max}}$ [lx]</th>
<th>$u_0$</th>
<th>$E_{\text{min}} / E_{\text{max}}$</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.20</td>
<td>0.07</td>
<td>56</td>
<td>0.007</td>
<td>0.001</td>
</tr>
</tbody>
</table>
1) G. Senior Staff Parking, Greyscale.
2) A. Cycle Rack Area, Isolines.
2) B. Cycle Rack Area, Greyscale.
3) A. Staff and Parent Parking Spaces, Plot.

Woolton Park Hall External Lighting

Mace Group
100 Moorgate
London
EC2M 8B

Operator: David Beaumont
Telephone: e-Mail

Main Car Park / Luminaires (layout plan)

Scale 1: 814

Luminaire Parts List

<table>
<thead>
<tr>
<th>No.</th>
<th>Pieces</th>
<th>Designation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>11</td>
<td>Thorlux STF17410 Starfood LED SMART</td>
</tr>
<tr>
<td>2</td>
<td>13</td>
<td>Thorn 96 262 145 D-CO LED BOLLARD 1000 30L 50 840 CL1 [STD]</td>
</tr>
</tbody>
</table>
3) B. Staff and Parent Parking Spaces, 3D Render
3) C. Staff and Parent Parking Spaces, Greyscale.
3) D. Staff and Parent Parking Spaces, Isolines.

Main Car Park / Ground Element 1 / Surface 1 / Isolines (E)

Position of surface in external scene:
Marked point:
(-100.655 m, 145.000 m, 0.000 m)

Values in Lux, Scale 1 : 814

Grid: 128 x 128 Points

\[\begin{array}{cccccc}
\text{E}_{\text{av}} & \text{E}_{\text{min}} & \text{E}_{\text{max}} & \mu_0 & \frac{E_{\text{min}}}{E_{\text{max}}} \\
5.43 & 0.14 & 39 & 0.025 & 0.004
\end{array}\]
3) D. Staff and Parent Parking Spaces, Isolines Drawing.
4) A. Pathway to Main Building, Plot

Pathway Luminaires / Luminaires (layout plan)

Luminaire Parts List

<table>
<thead>
<tr>
<th>No.</th>
<th>Pieces</th>
<th>Designation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>12</td>
<td>Thorn 96 252 145 D-CO LED BOLLARD 1000 30L50 840 CL1 [STD]</td>
</tr>
</tbody>
</table>
4) B. Pathway to Main Building, Greyscale

Wootton Park Hall External Lighting

Mace Group
155 Moorgate
London
EC2M 1B

Operator: David Beaumont
Telephone: Fax: e-Mail

Pathway Luminaires / Ground Element 1 / Surface 1 / Greyscale (E)

Position of surface in external scene:
Marked point:
(-1.917 m, 111.108 m, 0.000 m)

Grid: 128 x 128 Points

\[
\begin{align*}
E_{av} \, [lx] & \quad E_{min} \, [lx] & \quad E_{max} \, [lx] & \quad \mu 0 & \quad E_{min} / E_{max} \\
1.29 & \quad 0.01 & \quad 37 & \quad 0.006 & \quad 0.000
\end{align*}
\]

Scale 1 : 426
4) C Pathway to Main Building, Isolines

Position of surface in external scene:
Marked point:
(-1.917 m, 111.108 m, 0.000 m)

Grid: 128 x 128 Points

<table>
<thead>
<tr>
<th>$E_{2v}$ [lx]</th>
<th>$E_{\text{min}}$ [lx]</th>
<th>$E_{\text{max}}$ [lx]</th>
<th>$\mu_0$</th>
<th>$E_{\text{min}} / E_{\text{max}}$</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.29</td>
<td>0.01</td>
<td>37</td>
<td>0.006</td>
<td>0.000</td>
</tr>
</tbody>
</table>
4) D Pathway to Main Building, 3D Rendering
4) E Pathway to Main Building, Isolines Drawing
8. Luminaire Type A

Used over doorway entrances/exits, can be combined with emergency lighting module.

Luminaire classification according to CIE: 69
CIE flux code: 26 52 77 69 100


Dimensions: Ø340 x 156mm
Total power: 32 W
Weight: 3.9 kg

Due to missing symmetry properties, no UGR table can be displayed for this luminaire.
9. Luminaire Type B

Low level bollard for use on ramps and entrances.

Thorn 06 262 145 D-CO LED BOLLARD 1000 30L50 840 CL1 [STD] / Luminaire Data Sheet

Luminous emittance 1:

Luminaire classification according to CIE: 85
CIE flux code: 18 48 77 85 100


Dimensions: Ø150 x 1000 mm
Total power: 14 W
Weight: 5.46 kg
10. Luminaire Type C

Low level lighting column for car parks and areas.
11. **CCTV and Access proposals and locations**

**Comment.**

The construction of a new temporary building School accommodation is being proposed, consisting of three main areas as follows,

1. Main school, Senior Car Park and Bike Storage.
2. Interlinking Pathway between Main Car Park and school.
3. Staff and Parent Parking spaces away from main building.

An outline scheme incorporating coverage of various school areas as detailed on attached plots.

The CCTV, Access control can interlink to any internal intruder alarm to provide coverage to the internal and external spaces.

All systems would be complaint with all require standards and installed by specialists.

CCTV will consist of video monitoring, monitors and cameras at various locations to specification. It is not envisages that internal cameras are required. All external systems will be weather protected.

Access control will consist card/fobs and readers with alarm monitoring. Readers will record entry/exit of personal. System can be controlled to operate open system policy during specific school times and/or at weekend via a master control.
Isolines

- 5.0 lx
- 10.0 lx
- 20.0 lx
- 30.0 lx
Wootton Park Hall External Lighting

1. Thorlux STF17410 Starflood LED SMART
2. Thorn 96 262 145 D-60 LED BOLLARD 1000 30L50 840 CL1 [STD]

Isolines
- 5.0 lx
- 10.0 lx
- 20.0 lx
- 30.0 lx