Calculations have been performed according to CIBSE standards and good design practice.

Some differences between measured values and calculated results may occur due to calculation methods, testing procedures, component performance, field conditions and assumptions used to generate the calculations such as room details.

These differences may typically be +/- 10%.

Prepared by: Craig Smith
Peer Review: Iain Nelson
Checked by: Lee Tait
Authorised by: Craig Smith

Date: 15.10.2013
Operator: Craig Smith
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Redwell Infant and Junior School - External Lighting Scheme / Luminaire parts list

22 Pieces  
HAVELLSSYLVANIA 0049433 ONGROUND 3-900 GRY 35W G12 MGR  
Article No.: 0049433  
Luminous flux (Luminaire): 1104 lm  
Luminous flux (Lamps): 3700 lm  
Luminaire Wattage: 47.0 W  
Luminaire classification according to CIE: 50  
CIE flux code: 11 35 66 50 30  
Fitting: 1 x CMI-T 35W/WDL (Correction Factor 1.000).  

5 Pieces  
HavellsSylvania 2038670 + 2028034 LED 150-TE  
II 1 x 18W Axial faceted + Clear IP Glass  
Article No.: 2038670 + 2028034  
Luminous flux (Luminaire): 860 lm  
Luminous flux (Lamps): 1200 lm  
Luminaire Wattage: 19.0 W  
Luminaire classification according to CIE: 100  
CIE flux code: 74 99 100 100 71  
Fitting: 1 x 18W TC-TEL (Correction Factor 1.000).  

11 Pieces  
HavellsSylvania 4064161 STERLING ASYMMETRIC  
Article No.: 4064161  
Luminous flux (Luminaire): 637 lm  
Luminous flux (Lamps): 1800 lm  
Luminaire Wattage: 27.0 W  
Luminaire classification according to CIE: 91  
CIE flux code: 17 44 79 92 35  
Fitting: 1 x 26W TC-TEL (Correction Factor 1.000).
HAVELLSSYLVANIA 0049433 ONGROUND 3-900 GRY 35W G12 MGR / Luminaire Data Sheet

Luminous emittance 1:

Luminaire classification according to CIE: 50
CIE flux code: 11 35 66 50 30

26W, 35W and 60W onground luminaire
Choose from: Compact Fluorescent Lamps integrated, High Intensity Discharge lamps or Compact Fluorescent Lamps
Suitable for LED retrofit lamps
Comes in a soft squared tube shape
Available in 2 heights: 600mm or 900mm
Fully integrated gear (where applicable)
Generates a surround in 4 segments light beam
Die-cast Aluminium body with segmented opal top
High protection class: IP55
Heavy-duty housing: IK08
RAL 9007
Ground mounting accessories available
HavellsSylvania 4064161 STERLING ASYMMETRIC / Luminaire Data Sheet

Luminous emittance 1:

Luminaire classification according to CIE: 91
CIE flux code: 17 44 79 92 35

Sterling wall mounted asymmetric 26W TC-TEL compact fluorescent bulkhead with clear polycarbonate diffuser. Pressure die cast aluminium housing, anti-corrosion pre-treated prior to stoved powder coating.
(White:RAL9016, Black:RAL9005, Silver:RAL9006) Stainless steel retaining screws.

Due to missing symmetry properties, no UGR table can be displayed for this luminaire.
HavellsSylvania 2038670 + 2028034 LED 150-TE II 1 x 18W Axial faceted + Clear IP Glass / Luminaire Data Sheet

Luminous emittance 1:

Luminaire classification according to CIE: 100
CIE flux code: 74 99 100 100 71

LED 150-TE II
Recessed downlight for use with TC-TEL horizontally mounted compact fluorescent lamps (not included). All metal construction with die cast zinc bezel polyester powder coated white. Axial faceted pure aluminised, iridescence-free reflector, offering high LOR and excellent glare control. High frequency ballast. IP20 rating can be increased up to IP54 below the ceiling with accessories.

Due to missing symmetry properties, no UGR table can be displayed for this luminaire.
Exterior Scene 1 / Planning data

Maintenance factor: 0.80, ULR (Upward Light Ratio): 25.0%  Scale 1:1002

Luminaire Parts List

<table>
<thead>
<tr>
<th>No.</th>
<th>Pieces</th>
<th>Designation (Correction Factor)</th>
<th>( \Phi ) (Luminaire) [lm]</th>
<th>( \Phi ) (Lamps) [lm]</th>
<th>P [W]</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>22</td>
<td>HAVELLSSYLVANIA 0049433 ONSGROUND 3-900 GRY 35W G12 MGR (1.000)</td>
<td>1104</td>
<td>3700</td>
<td>47.0</td>
</tr>
<tr>
<td>2</td>
<td>5</td>
<td>HavellsSylvania 2038670 + 2028034 LED 150-TE II 1 x 18W Axial faceted + Clear IP Glass (1.000)</td>
<td>860</td>
<td>1200</td>
<td>19.0</td>
</tr>
<tr>
<td>3</td>
<td>11</td>
<td>HavellsSylvania 4064161 STERLING ASYMMETRIC (1.000)</td>
<td>637</td>
<td>1800</td>
<td>27.0</td>
</tr>
</tbody>
</table>

Total: 35593  Total: 107200  1426.0
**Exterior Scene 1 / Entrance Canopy / Isolines (E, Perpendicular)**

Position of surface in external scene:
Marked point:
(61.600 m, 68.577 m, 0.000 m)

Grid: 64 x 32 Points

<table>
<thead>
<tr>
<th>$E_{av}$ [lx]</th>
<th>$E_{min}$ [lx]</th>
<th>$E_{max}$ [lx]</th>
<th>$u_0$</th>
<th>$E_{min} / E_{max}$</th>
</tr>
</thead>
<tbody>
<tr>
<td>62</td>
<td>17</td>
<td>109</td>
<td>0.282</td>
<td>0.161</td>
</tr>
</tbody>
</table>
Exterior Scene 1 / Walkway / Isolines (E, Perpendicular)

Position of surface in external scene:
Marked point:
(54.735 m, 67.659 m, 0.000 m)

Grid: 128 x 128 Points

<table>
<thead>
<tr>
<th>$E_{av}$ [lx]</th>
<th>$E_{min}$ [lx]</th>
<th>$E_{max}$ [lx]</th>
<th>$u0$</th>
<th>$E_{min} / E_{max}$</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>1.62</td>
<td>40</td>
<td>0.159</td>
<td>0.040</td>
</tr>
</tbody>
</table>
Exterior Scene 1 / Rear Access Pathway / Isolines (E, Perpendicular)

Position of surface in external scene:
Marked point:
(76.545 m, 23.555 m, 0.901 m)

Grid: 128 x 16 Points

<table>
<thead>
<tr>
<th>$E_{av}$ [lx]</th>
<th>$E_{min}$ [lx]</th>
<th>$E_{max}$ [lx]</th>
<th>$u_0$</th>
<th>$E_{min} / E_{max}$</th>
</tr>
</thead>
<tbody>
<tr>
<td>29</td>
<td>6.97</td>
<td>44</td>
<td>0.239</td>
<td>0.157</td>
</tr>
</tbody>
</table>

Values in Lux, Scale 1 : 120
Exterior Scene 1 / Rear Walkway / Isolines (E, Perpendicular)

Position of surface in external scene:
Marked point:
(71.215 m, 18.931 m, 0.000 m)

Grid: 128 x 128 Points

<table>
<thead>
<tr>
<th></th>
<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></td>
<td>12</td>
<td>3.84</td>
<td>32</td>
<td>0.327</td>
<td>0.120</td>
</tr>
</tbody>
</table>
Exterior Scene 1 / Side Walkway / Isolines (E, Perpendicular)

Position of surface in external scene:
Marked point:
(103.514 m, 84.228 m, 0.750 m)

Grid: 128 x 64 Points

\[
\begin{array}{cccccc}
E_{av} \text{ [lx]} & E_{\min} \text{ [lx]} & E_{\max} \text{ [lx]} & u_0 & E_{\min} / E_{\max} \\
9.80 & 1.17 & 228 & 0.119 & 0.005 \\
\end{array}
\]
Exterior Scene 1 / Side Canopy / Isolines (E, Perpendicular)

Position of surface in external scene:
Marked point:
(98.084 m, 77.488 m, 0.000 m)

Grid: 16 x 16 Points

<table>
<thead>
<tr>
<th>$E_{av}$ [lx]</th>
<th>$E_{min}$ [lx]</th>
<th>$E_{max}$ [lx]</th>
<th>$u_0$</th>
<th>$E_{min} / E_{max}$</th>
</tr>
</thead>
<tbody>
<tr>
<td>99</td>
<td>70</td>
<td>126</td>
<td>0.704</td>
<td>0.557</td>
</tr>
</tbody>
</table>
Exterior Scene 1 / Small "Courtyard" / Isolines (E, Perpendicular)

Position of surface in external scene:
Marked point:
(96.808 m, 57.640 m, 0.000 m)

Values in Lux, Scale 1 : 83

<table>
<thead>
<tr>
<th>$E_{av}$ [lx]</th>
<th>$E_{min}$ [lx]</th>
<th>$E_{max}$ [lx]</th>
<th>$u_0$</th>
<th>$E_{min} / E_{max}$</th>
</tr>
</thead>
<tbody>
<tr>
<td>23</td>
<td>3.44</td>
<td>46</td>
<td>0.147</td>
<td>0.075</td>
</tr>
</tbody>
</table>
NOTES

1. This drawing is to be read in conjunction with all the relevant contract documentation.

2. All dimensions are in mm unless otherwise stated.

3. Changes to the original project are to be prepared by the Contractor.

4. All external lighting shall be controlled from multi-channel digital 24 hour 7 day timer, prioritising any switch over natural light in an emergency situation.

   These shall be configured as follows:

   - Timeswitch turns lights on in the morning at 7am, lights are turned off by the photocell, in the afternoon the lights will be switched on by the photocell and switched off at 9pm by the timeswitch.

5. All luminaires selected from the Havells Sylvania Fixtures UK Ltd external range. As follows:

   - EX1 - LED Onground Bollard. 35W. Aluminum or dark grey finish.
   - EX2 - LED 150-TE IP65 Under Canopy Recessed. 1x18W TC-TEL. Aluminum or dark grey finish.
   - EX3 - Sterling Bulkhead + Hood Wall Mount. 1x32W TC-TEL. Aluminum or dark grey finish.

6. 'LP' denotes existing column mounted lamp positions which are to be retained and re-supplied from the new LV Distribution and external lighting control equipment.

7. This drawing details external lighting only, for emergency lighting bulkheads over final escape routes refer to the general lighting and emergency lighting drawings.

8. Contractor to provide small power supply to external illuminated signage, exact location subject to detailed design.

See note 6
Redwell Junior School

Existing pavement. Hedge to be trimmed back to suit new opening.

NOTES

1. This drawing is to be read in conjunction with all the relevant contract documents.
2. All dimensions are in mm unless otherwise stated.
3. Drawings marked Preliminary are for guidance/approval only.
4. All external lighting shall be controlled on multi-channel digital in load 24/7 timer, programmed with key switch override to suit external Photocell unit.
   These shall be configured as follows:
   - Timeswitch turns lights on in the morning at 7am, lights are turned off by the photocell, in the afternoon the lights will be switched on by the photocell and switched off at 9pm by the timeswitch.
5. All luminaires selected from the Havells Sylvania Fixtures UK Ltd external range. As follows:
   - EX1 - LED Onground Bollard.
     35W. Aluminum or dark grey finish.
   - EX2 - LED 150-TE IP65 Under Canopy Recessed.
     1x18W TC-TEL. Aluminum or dark grey finish.
   - EX3 - Sterling Bulkhead + Hood Wall Mount.
     1x32W TC-TEL. Aluminum or dark grey finish.
800mm AFFL subject to detailed design.
6. ‘LP’ denotes existing column mounted lamp positions which are to be retained and re-supplied from the new LV distribution and external lighting control equipment.
7. All luminaires selected from the Havells Sylvania Fixtures UK Ltd external range. As follows:
   - EX1 - LED Onground Bollard.
     35W. Aluminum or dark grey finish.
   - EX2 - LED 150-TE IP65 Under Canopy Recessed.
     1x18W TC-TEL. Aluminum or dark grey finish.
   - EX3 - Sterling Bulkhead + Hood Wall Mount.
     1x32W TC-TEL. Aluminum or dark grey finish.
800mm AFFL subject to detailed design.
6. ‘LP’ denotes existing column mounted lamp positions which are to be retained and re-supplied from the new LV distribution and external lighting control equipment.
7. This drawing details external lighting only, for emergency lighting bulkheads over final escape routes refer to the general lighting and emergency lighting drawings.

Planning
Redwell Infants And Junior School, Wellingborough
Extensions And Alterations

Electrical Building Services
Proposed External Lighting
Layout - Area 02

13-0165 XDRA001
13-0165 XSPE001

DA

1:100 0A1
1:200 0A3

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NOTES
1. This drawing is to be read in conjunction with all the relevant contract documentation.
2. All dimensions are in mm unless otherwise stated.
3. Drawings marked Preliminary are for guidance/approval only.
4. All external lighting shall be controlled via multi-channel digital 24 hour 7 day timer/programmer with key switch override test bracket to an external photocell unit.
5. All luminaires selected from the Havells Sylvania Fixtures UK Ltd external range. As follows:
   - EX1 - LED Onground Bollard. 35W. Aluminum or dark grey finish.
   - EX2 - LED 150-TE IP65 Under Canopy Recessed. 1x18W TC-TEL. Aluminum or dark grey finish.
   - EX3 - Sterling Bulkhead + Hood Wall Mount. 1x32W TC-TEL. Aluminum or dark grey finish.
   - 2000mm AFFL subject to detailed design.
6. 'LP' denotes existing column mounted lamp positions which are to be retained and re-supplied from the new LV Distribution and external lighting control equipment.
7. This drawing details external lighting only, for emergency lighting back-up over final escape routes refer to the general lighting and emergency lighting drawings.