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MEC
Development Technical Consultants

| | |
|---|---|
| **Doc. Ref.** | 27141_02_LSPEC_01 |
| **Sheet** | 1 of 28 |
| **Engineer** | Nathan Allen |
| **Date** | 18.05.2022 |
| **Revision** | - |

# DESIGN CALCULATIONS FRONT SHEET

| | |
|---|---|
| **SCHEME** | Land South of West Street & West of Loose Lane, Sompting Phase 1 |
| **CLIENT** | Persimmon Homes |
| **ASPECTS OF SCHEME TO BE DESIGNED** | Street lighting for Section 38 |
| **CODES OF PRACTICE, DESIGN SPECIFICATIONS & BRITISH STANDARDS** | BS 5489-1:2020 & BS EN 13201-2:2003 |
| **NOTES** | • Main Road Lighting to class P4 (Eav 5lux-7.5lux Emin 1 lux)<br>• Cul-de-sacs and minor roads lighting class P5 (Eav 3lux – 4.5lux Emin 0.6lux)<br>• Utilise Philips Luma Gen2 Micro lantern, column height 6m (0 degree tilt, 0.3m outreach)<br>• Street lighting layout shown on latest engineering drawing ref. 27141_02_100_01 s38 street lighting layout<br>Use Lighting Reality design software |

# INDEX


| Pages | Calculations | Checked by | Date |
|---|---|---|---|
| 2-14 | Lighting Reality design calculations | DMH | 17.05.2022 |
| 15-20 | Road Calculation – 9.5m road width (P4) (for information only) | DMH | 17.05.2022 |
| 21-26 | Road Calculation – 6.0m road width (P5) (for information only) | DMH | 17.05.2022 |
| 27-28 | Designer risk assessment | DMH | 17.05.2022 |

| | |
|---|---|
| **DATE:** | **17 May 2022** |
| **DESIGNER:** | **Nathan Allen** |
| **PROJECT No:** | **27141** |
| **PROJECT NAME:** | **West Sompting Phase 1** |

MEC Development Technical Consultants

SCHEME DESIGNED IN ACCORDANCE WITH BS5489-1:2020 & BS EN 13201-2:2015

West Sompting Phase 1

S38 Street Lighting Layout

P4- Eav 5lux - 7.5lux Emin 1lux for Main Spine Road

P5 Eav 3lux - 4.5lux Emin 0.6lux for Side Roads

# Outdoor Lighting Report

# Layout Report

## General Data

Dimensions in Metres Angles in Degrees

## Calculation Grids

| ID | Grid Name | X | Y | X' Length | Y' Length | X' Spacing | Y' Spacing |
|---|---|---|---|---|---|---|---|
| 1 | Grid 1 | 516231.38 | 104732.73 | 337.68 | 222.39 | 1.50 | 1.50 |
| 2 | Grid 2 | 516231.72 | 104954.24 | 348.56 | 235.19 | 1.50 | 1.50 |
| 3 | Grid 3 | 516381.24 | 104961.89 | 43.51 | 36.04 | 1.50 | 1.50 |
| 4 | Grid 4 | 516360.91 | 104869.07 | 55.45 | 40.53 | 1.50 | 1.50 |
| 5 | Grid 5 | 516338.36 | 104799.20 | 63.01 | 35.97 | 1.50 | 1.50 |
| 6 | Grid 6 | 516361.93 | 104879.74 | 23.41 | 5.00 | 1.46 | 1.25 |
| 7 | Grid 7 | 516341.16 | 104802.09 | 33.16 | 5.00 | 1.44 | 1.25 |
| 8 | Grid 8 | 516318.97 | 104973.87 | 66.05 | 5.00 | 1.47 | 1.25 |
| 9 | Grid 9 | 516453.24 | 104896.12 | 26.02 | 5.00 | 1.04 | 0.20 |

## Luminaires



### Luminaire A Data

| | |
|---|---|
| Supplier | Philips |
| Type | BGP702 DW10 |
| Lamp(s) | LED-HB 5.2S 740 |
| Lamp Flux (klm) | 2.40 |
| File Name | Luma Gen2 Micro_BGP702_DW10_2400_10LED_5.2S_CLO_L90_740.ies |
| Maintenance Factor | 0.83 |
| Imax70,80,90(cd/klm) | 438.8, 62.1, 0.0 |
| No. in Project | 25 |



### Luminaire B Data

| | |
|---|---|
| Supplier | Philips |
| Type | BGP702 DM50 |
| Lamp(s) | LED-HB 5.2S 740 |
| Lamp Flux (klm) | 1.80 |
| File Name | Luma Gen2 Micro_BGP702_DM50_1800_10LED_5.2S_CLO_L90_740.ies |
| Maintenance Factor | 0.83 |
| Imax70,80,90(cd/klm) | 921.3, 65.9, 0.0 |
| No. in Project | 6 |

## Layout

| ID | Type | X | Y | Height | Angle | Tilt | Cant | Out-reach | Target X | Target Y | Target Z |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | A | 516372.41 | 105104.16 | 6.00 | 13.00 | 0.00 | 0.00 | 0.30 | | | |
| 2 | A | 516380.85 | 105135.24 | 6.00 | 181.00 | 0.00 | 0.00 | 0.30 | | | |
| 3 | A | 516395.62 | 105089.57 | 6.00 | 256.00 | 0.00 | 0.00 | 0.30 | | | |
| 4 | A | 516421.00 | 105078.01 | 6.00 | 86.00 | 0.00 | 0.00 | 0.30 | | | |
| 5 | A | 516444.22 | 105056.18 | 6.00 | 349.00 | 0.00 | 0.00 | 0.30 | | | |
| 6 | A | 516452.04 | 105076.47 | 6.00 | 224.00 | 0.00 | 0.00 | 0.30 | | | |
| 7 | A | 516439.40 | 105036.59 | 6.00 | 347.00 | 0.00 | 0.00 | 0.30 | | | |
| 8 | A | 516434.83 | 105019.13 | 6.00 | 344.00 | 0.00 | 0.00 | 0.30 | | | |
| 9 | A | 516443.92 | 104979.32 | 6.00 | 202.00 | 0.00 | 0.00 | 0.30 | | | |
| 10 | B | 516389.56 | 104979.91 | 6.00 | 1.00 | 0.00 | 0.00 | 0.30 | | | |
| 11 | A | 516449.03 | 104957.13 | 6.00 | 174.00 | 0.00 | 0.00 | 0.30 | | | |
| 12 | A | 516428.21 | 104998.07 | 6.00 | 350.00 | 0.00 | 0.00 | 0.30 | | | |

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## Layout Continued

| ID | Type | X | Y | Height | Angle | Tilt | Cant | Out-reach | Target X | Target Y | Target Z |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 13 | B | 516415.38 | 104983.58 | 6.00 | 273.00 | 0.00 | 0.00 | 0.30 | | | |
| 14 | B | 516371.95 | 104890.88 | 6.00 | 350.00 | 0.00 | 0.00 | 0.30 | | | |
| 15 | B | 516404.14 | 104886.30 | 6.00 | 255.00 | 0.00 | 0.00 | 0.30 | | | |
| 16 | B | 516352.64 | 104820.59 | 6.00 | 337.00 | 0.00 | 0.00 | 0.30 | | | |
| 17 | B | 516376.10 | 104810.27 | 6.00 | 77.00 | 0.00 | 0.00 | 0.30 | | | |
| 18 | A | 516441.23 | 104933.70 | 6.00 | 168.00 | 0.00 | 0.00 | 0.30 | | | |
| 19 | A | 516438.69 | 104911.36 | 6.00 | 174.00 | 0.00 | 0.00 | 0.30 | | | |
| 20 | A | 516427.22 | 104869.61 | 6.00 | 167.00 | 0.00 | 0.00 | 0.30 | | | |
| 21 | A | 516422.75 | 104850.08 | 6.00 | 166.00 | 0.00 | 0.00 | 0.30 | | | |
| 22 | A | 516411.09 | 104831.33 | 6.00 | 349.00 | 0.00 | 0.00 | 0.30 | | | |
| 23 | A | 516405.96 | 104814.69 | 6.00 | 305.00 | 0.00 | 0.00 | 0.30 | | | |
| 24 | A | 516431.29 | 104812.82 | 6.00 | 259.00 | 0.00 | 0.00 | 0.30 | | | |
| 25 | A | 516457.62 | 104810.03 | 6.00 | 259.00 | 2.00 | 0.00 | 0.30 | | | |
| 26 | A | 516474.48 | 104794.46 | 6.00 | 195.00 | 2.00 | 0.00 | 0.30 | | | |
| 27 | A | 516462.29 | 104768.83 | 6.00 | 354.00 | 0.00 | 0.00 | 0.30 | | | |
| 28 | A | 516457.64 | 104744.00 | 6.00 | 347.00 | 0.00 | 0.00 | 0.30 | | | |
| 29 | A | 516485.70 | 104748.72 | 6.00 | 264.00 | 0.00 | 0.00 | 0.30 | | | |
| 30 | A | 516432.83 | 104889.10 | 6.00 | 161.00 | 0.00 | 0.00 | 0.30 | | | |
| 33 | A | 516509.13 | 104751.14 | 6.00 | 288.00 | 0.00 | 0.00 | 0.30 | | | |

DATE: 17 May 2022 DESIGNER: Nathan Allen

PROJECT No: 27141 PROJECT NAME: West Sompting Phase 1

# Horizontal Illuminance (lux)

Grid 1




## Results

| | |
|---|---|
| Eav | 5.21 |
| Emin | 1.27 |
| Emax | 11.01 |
| Emin/Emax | 0.12 |
| Emin/Eav | 0.24 |
| | |

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DATE: 17 May 2022 DESIGNER: Nathan Allen

PROJECT No: 27141 PROJECT NAME: West Sompting Phase 1

# Horizontal Illuminance (lux)

Grid 1




## Results

| | |
|---|---|
| Eav | 5.21 |
| Emin | 1.27 |
| Emax | 11.01 |
| Emin/Emax | 0.12 |
| Emin/Eav | 0.24 |
| | |

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DATE: 17 May 2022 DESIGNER: Nathan Allen

PROJECT No: 27141 PROJECT NAME: West Sompting Phase 1

# Horizontal Illuminance (lux)

Grid 2




## Results

| | |
|---|---|
| Eav | 5.21 |
| Emin | 1.35 |
| Emax | 10.95 |
| Emin/Emax | 0.12 |
| Emin/Eav | 0.26 |
| | |

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DATE: 17 May 2022 DESIGNER: Nathan Allen

PROJECT No: 27141 PROJECT NAME: West Sompting Phase 1

# Horizontal Illuminance (lux)

Grid 2




## Results

| | |
|---|---|
| Eav | 5.21 |
| Emin | 1.35 |
| Emax | 10.95 |
| Emin/Emax | 0.12 |
| Emin/Eav | 0.26 |
| | |

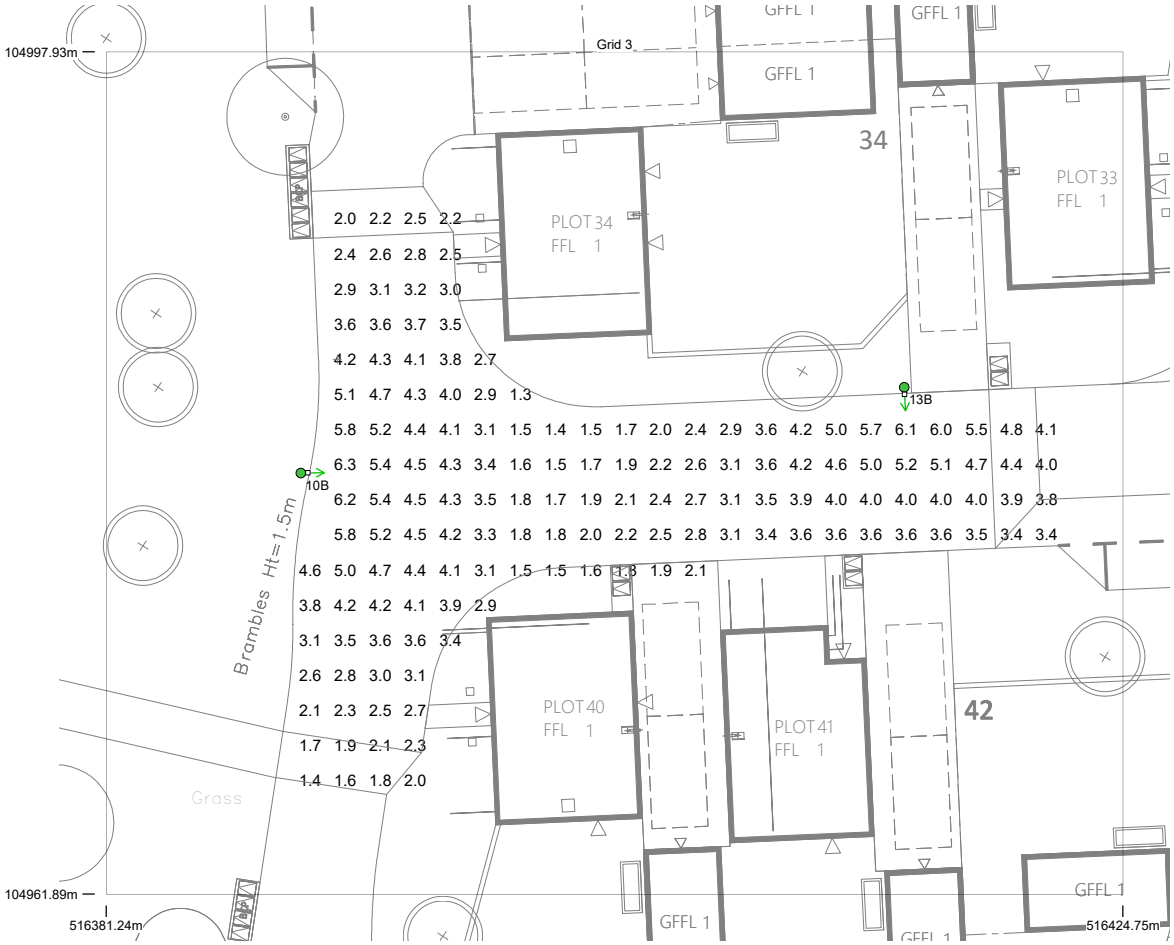
8514277661

DATE: 17 May 2022 DESIGNER: Nathan Allen

PROJECT No: 27141 PROJECT NAME: West Sompting Phase 1

# Horizontal Illuminance (lux)

Grid 3




## Results

| | |
|---|---|
| Eav | 3.37 |
| Emin | 1.34 |
| Emax | 6.26 |
| Emin/Emax | 0.21 |
| Emin/Eav | 0.40 |
| | |

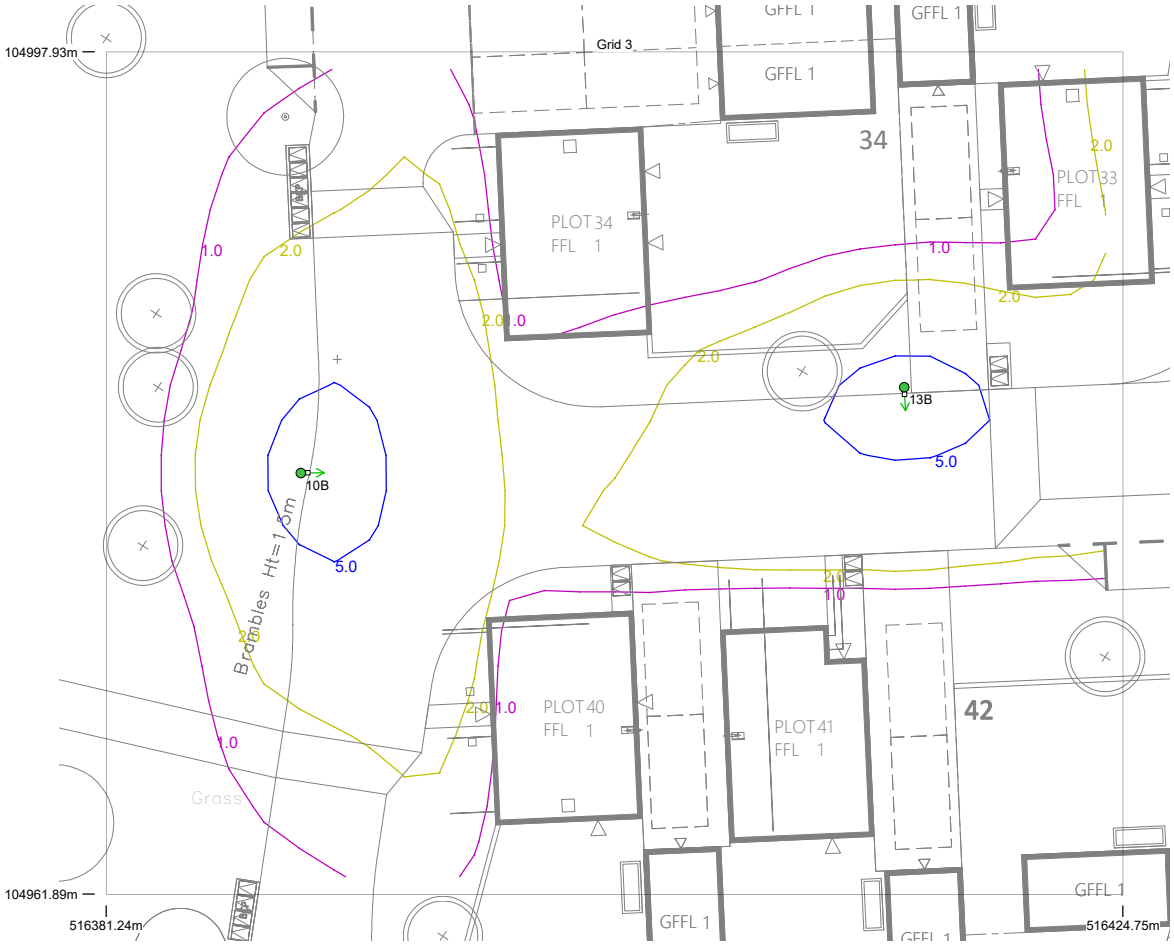
8514277661

DATE: 17 May 2022 DESIGNER: Nathan Allen

PROJECT No: 27141 PROJECT NAME: West Sompting Phase 1

# Horizontal Illuminance (lux)

Grid 3




## Results

| | |
|---|---|
| Eav | 3.37 |
| Emin | 1.34 |
| Emax | 6.26 |
| Emin/Emax | 0.21 |
| Emin/Eav | 0.40 |
| | |

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DATE: 17 May 2022 DESIGNER: Nathan Allen

PROJECT No: 27141 PROJECT NAME: West Sompting Phase 1

# Horizontal Illuminance (lux)

Grid 4




## Results

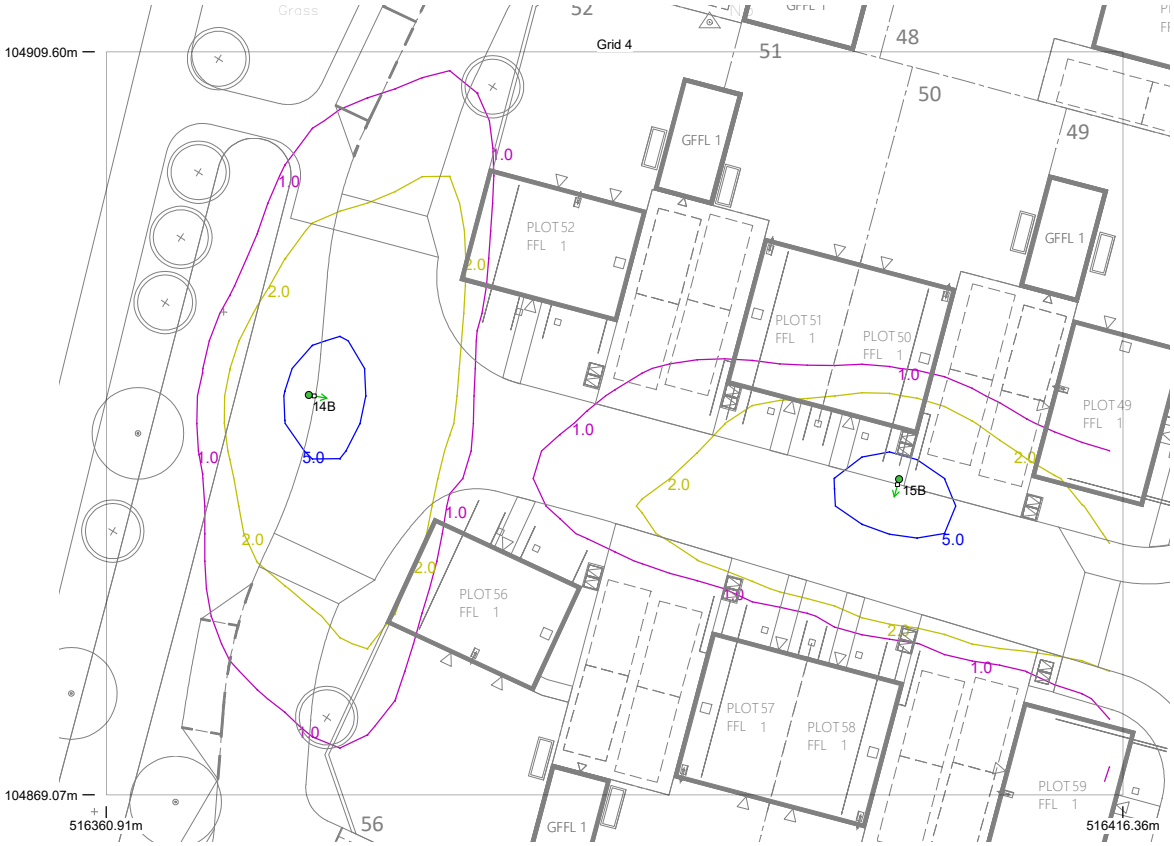
| | |
|---|---|
| Eav | 3.08 |
| Emin | 0.71 |
| Emax | 6.09 |
| Emin/Emax | 0.12 |
| Emin/Eav | 0.23 |
| | |

DATE: 17 May 2022 DESIGNER: Nathan Allen

PROJECT No: 27141 PROJECT NAME: West Sompting Phase 1

# Horizontal Illuminance (lux)

Grid 4




## Results

| | |
|---|---|
| Eav | 3.08 |
| Emin | 0.71 |
| Emax | 6.09 |
| Emin/Emax | 0.12 |
| Emin/Eav | 0.23 |
| | |

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DATE: 17 May 2022 DESIGNER: Nathan Allen

PROJECT No: 27141 PROJECT NAME: West Sompting Phase 1

# Horizontal Illuminance (lux)

Grid 5




## Results

| | |
|---|---|
| Eav | 3.28 |
| Emin | 1.21 |
| Emax | 6.33 |
| Emin/Emax | 0.19 |
| Emin/Eav | 0.37 |
| | |

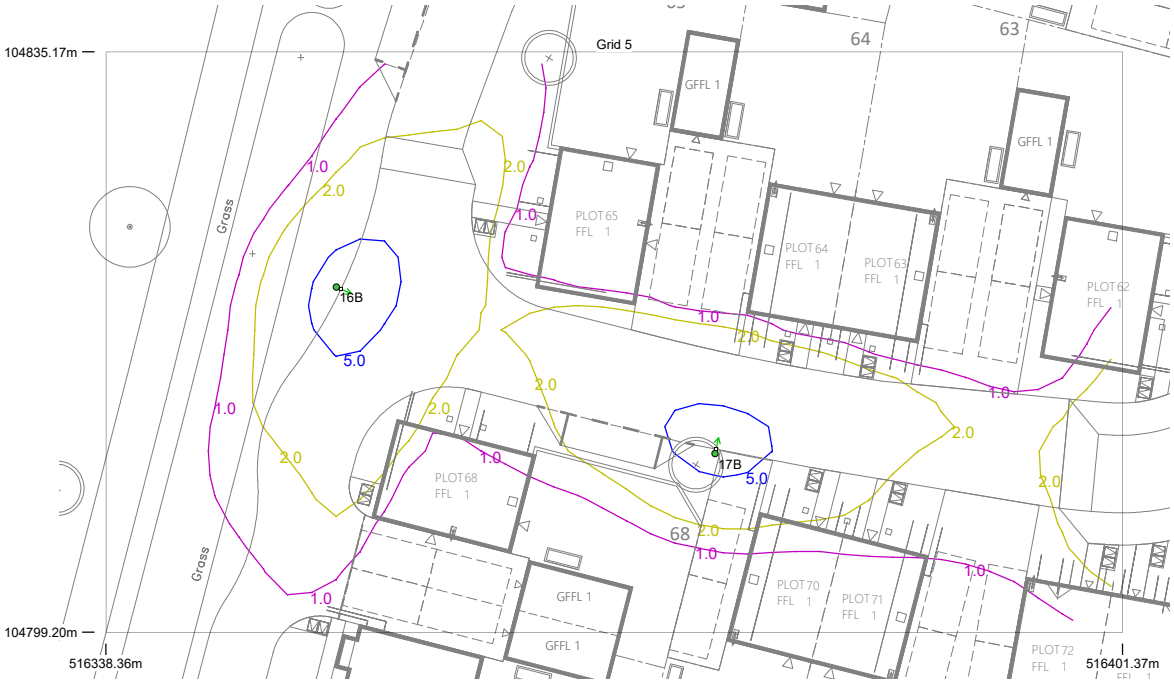
8514277661

DATE: 17 May 2022 DESIGNER: Nathan Allen

PROJECT No: 27141 PROJECT NAME: West Sompting Phase 1

# Horizontal Illuminance (lux)

Grid 5




## Results

| | |
|---|---|
| Eav | 3.28 |
| Emin | 1.21 |
| Emax | 6.33 |
| Emin/Emax | 0.19 |
| Emin/Eav | 0.37 |
| | |

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| | |
|---|---|
| **DATE:** | **17 May 2022** |
| **DESIGNER:** | **Nathan Allen** |
| **PROJECT No:** | **27141** |
| **PROJECT NAME:** | **West Sompting Phase 1** |

MEC
Development Technical Consultants

SCHEME DESIGNED IN ACCORDANCE WITH BS5489-1:2020 & BS EN 13201-2:2015

West Sompting Phase 1

S38 Street Lighting Road Calc - 9.5m -2m footpath left & right

P4- Eav 5.0lux - 7.5lux Emin 1.0lux

Max spacing - 24.50m
Min Spacing - 17.00m

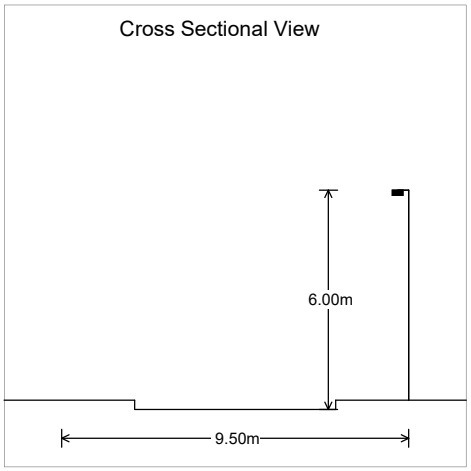
# Roadway Lighting Report

DATE: 17 May 2022 DESIGNER: Nathan Allen

PROJECT No: 27141 PROJECT NAME: West Sompting Phase 1

# Roadway Report Summary

## Layout




### Road Data

| | |
|---|---|
| Calculation Grid | BS5489:1 2020 |
| Width (m) | 9.50 |
| No. of Lanes | 2 |
| Road Surface | R2 |
| Q0 | 0.07 |
| Left Footpath(m) | 2.00 |
| Right Footpath(m) | 2.00 |

## Main Lighting



### Column Data

| | |
|---|---|
| Configuration | Single Sided Right |
| Spacing (m) | 24.50 |
| Height (m) | 6.00 |
| Tilt (deg) | 0.00 |
| Setback (m) | 2.00 |
| Outreach (m) | 0.30 |
| Overhang (m) | -1.70 |

### Luminaire Data

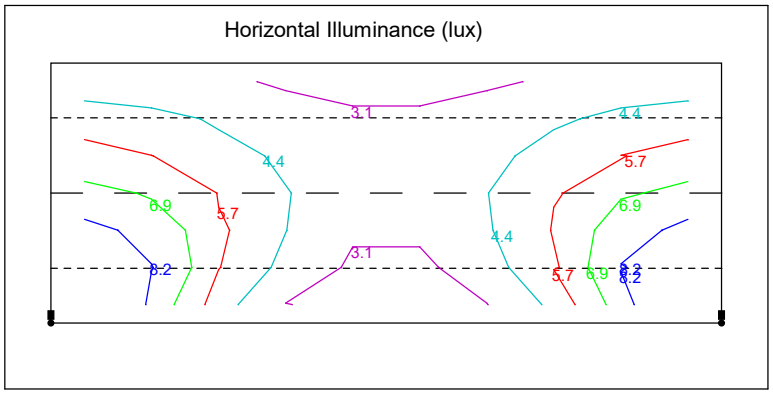
| | |
|---|---|
| Supplier | Philips |
| Type | BGP702 DW10 |
| Lamp(s) | LED-HB 5.2S 740 |
| Lamp Flux (klm) | 2.40 |
| File Name | Luma Gen2 Micro_BGP702_DW10_2400_10LED_5.2S_CLO_L90_740.ies |
| Maintenance Factor | 0.83 |
| Lum. Int. Class | G4 |

## Results

### Main

Complies with P4

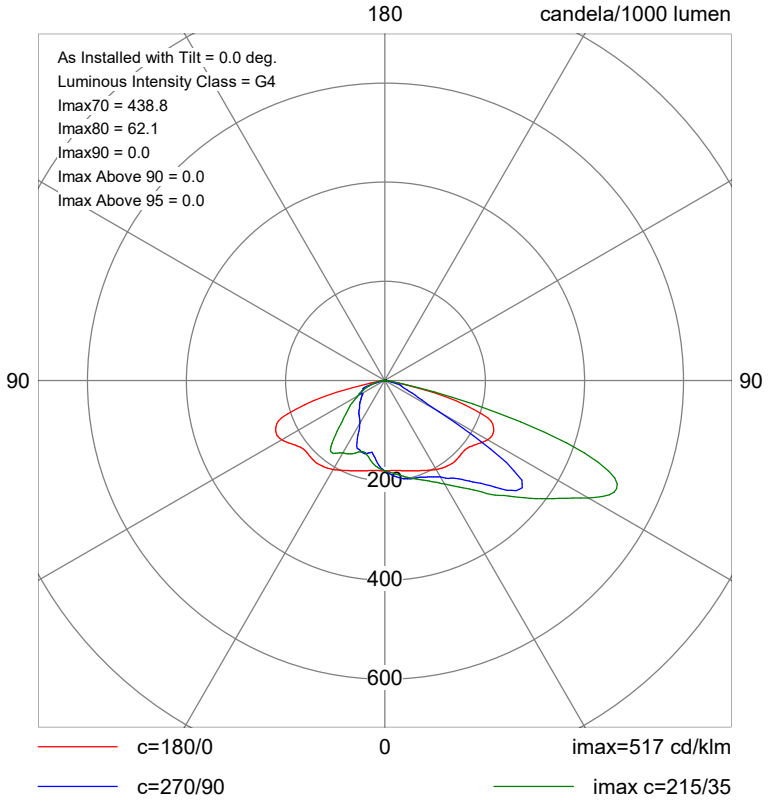
| | |
|---|---|
| Eav | 5.08 |
| Emin | 2.45 |
| Emax | 10.16 |
| Emin/Emax | 0.24 |
| Emin/Eav | 0.48 |




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# Polar Diagram

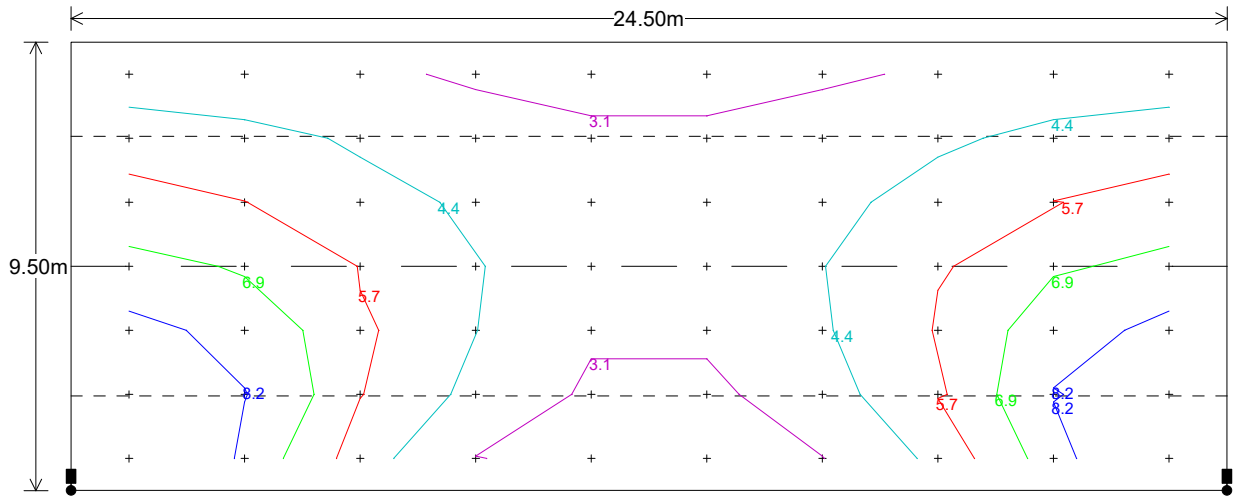
## Main Luminaire BGP702 DW10



DATE: 17 May 2022 DESIGNER: Nathan Allen

PROJECT No: 27141 PROJECT NAME: West Sompting Phase 1

# Horizontal Illuminance (lux)




## Main Results

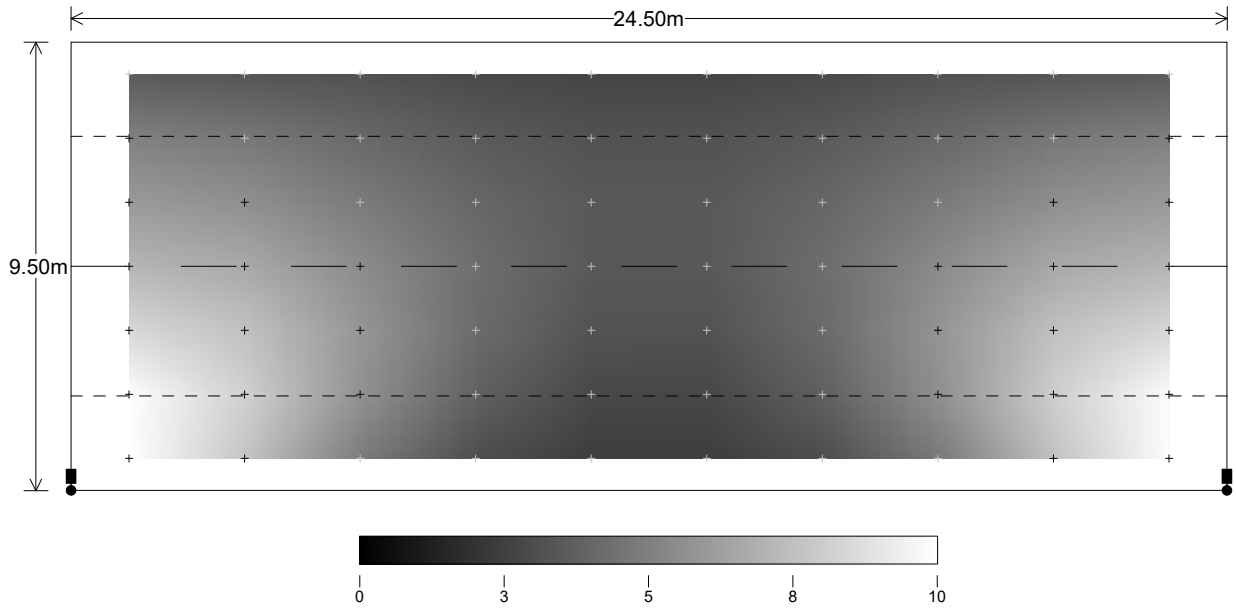
| | |
|---|---|
| Eav | 5.08 |
| Emin | 2.45 |
| Emax | 10.16 |
| Emin/Emax | 0.24 |
| Emin/Eav | 0.48 |

8514277661

DATE: 17 May 2022 DESIGNER: Nathan Allen

PROJECT No: 27141 PROJECT NAME: West Sompting Phase 1

# Horizontal Illuminance (lux)

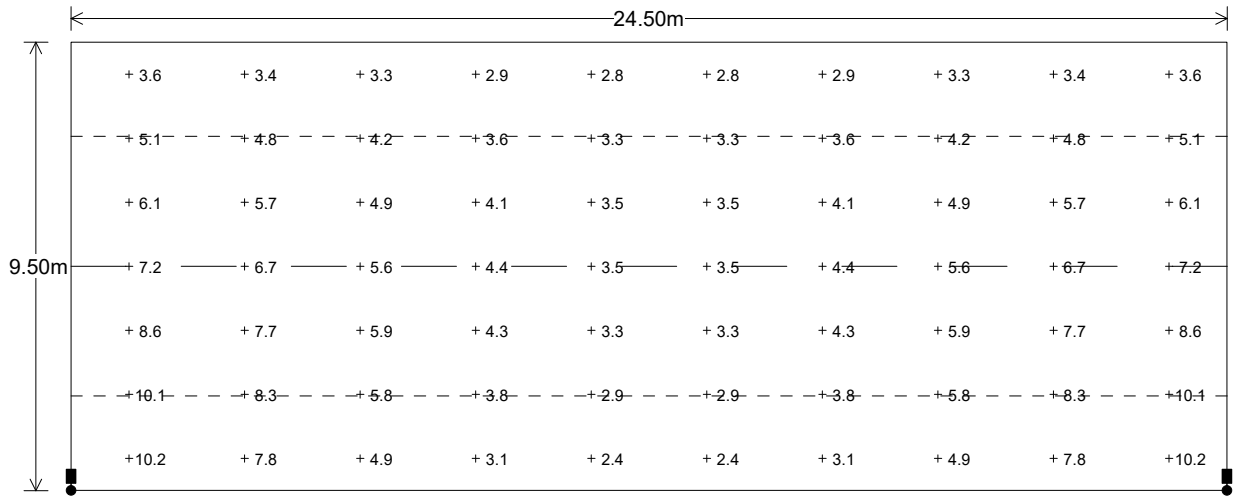



8514277661

DATE: 17 May 2022 DESIGNER: Nathan Allen

PROJECT No: 27141 PROJECT NAME: West Sompting Phase 1

# Horizontal Illuminance (lux)




8514277661

**DATE:** 17 May 2022

**DESIGNER:** Nathan Allen

**PROJECT No:** 27141

**PROJECT NAME:** West Sompting Phase 1

SCHEME DESIGNED IN ACCORDANCE WITH BS5489-1:2020 & BS EN 13201-2:2015

West Sompting Phase 1

S38 Street Lighting Road Calc - 6m -0m footpath left & right

P5- Eav 3.0lux - 4.5lux Emin 0.6lux

Max spacing - 36.50m
Min Spacing - 24.50m

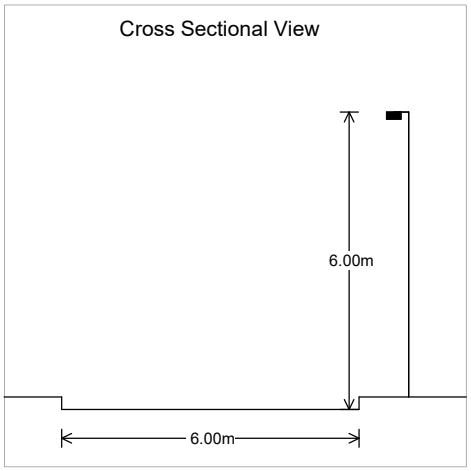
# Roadway Lighting Report

DATE: 17 May 2022 DESIGNER: Nathan Allen

PROJECT No: 27141 PROJECT NAME: West Sompting Phase 1

# Roadway Report Summary

## Layout




### Road Data

| | |
|---|---|
| Calculation Grid | BS5489:1 2020 |
| Width (m) | 6.00 |
| No. of Lanes | 2 |
| Road Surface | R2 |
| Q0 | 0.07 |
| Left Footpath(m) | 0.00 |
| Right Footpath(m) | 0.00 |

## Main Lighting



### Column Data

| | |
|---|---|
| Configuration | Single Sided Right |
| Spacing (m) | 36.50 |
| Height (m) | 6.00 |
| Tilt (deg) | 0.00 |
| Setback (m) | 1.00 |
| Outreach (m) | 0.30 |
| Overhang (m) | -0.70 |

### Luminaire Data

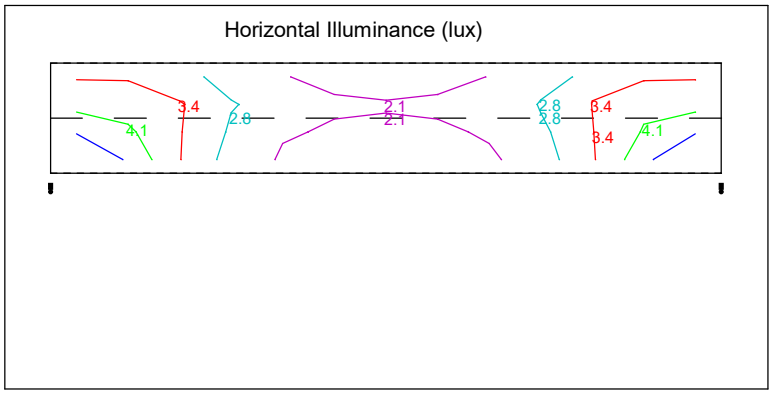
| | |
|---|---|
| Supplier | Philips |
| Type | BGP702 DM50 |
| Lamp(s) | LED-HB 5.2S 740 |
| Lamp Flux (klm) | 1.80 |
| File Name | Luma Gen2 Micro_BGP702_DM50_1800_10LED_5.2S_CLO_L90_740.ies |
| Maintenance Factor | 0.83 |
| Lum. Int. Class | G3 |

## Results

### Main

Complies with P5

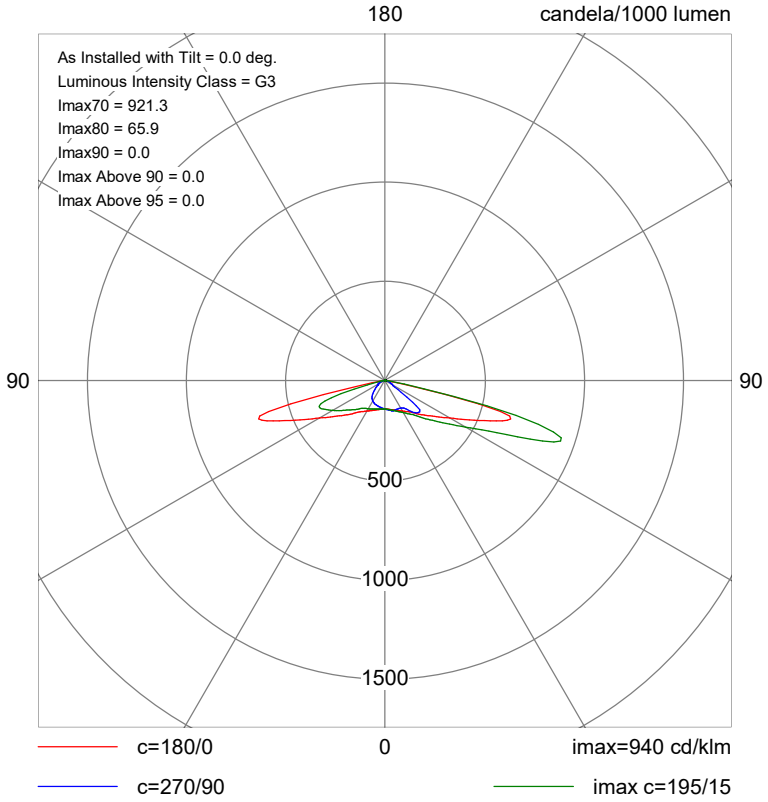
| | |
|---|---|
| Eav | 3.00 |
| Emin | 1.77 |
| Emax | 5.77 |
| Emin/Emax | 0.31 |
| Emin/Eav | 0.59 |




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# Polar Diagram

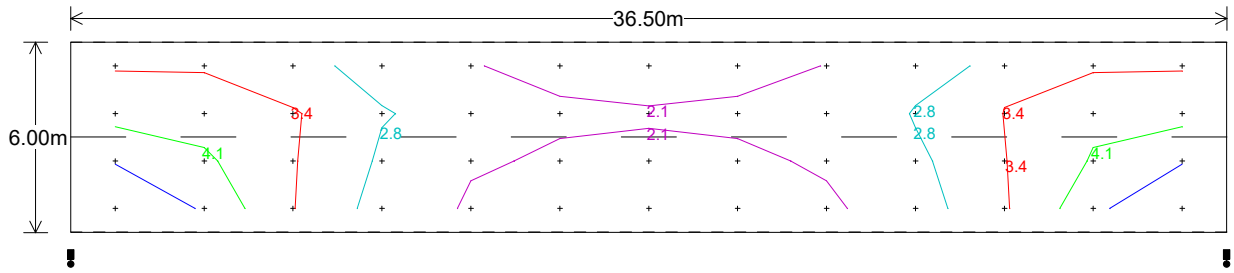
## Main Luminaire BGP702 DM50



DATE: 17 May 2022 DESIGNER: Nathan Allen

PROJECT No: 27141 PROJECT NAME: West Sompting Phase 1

# Horizontal Illuminance (lux)




## Main Results

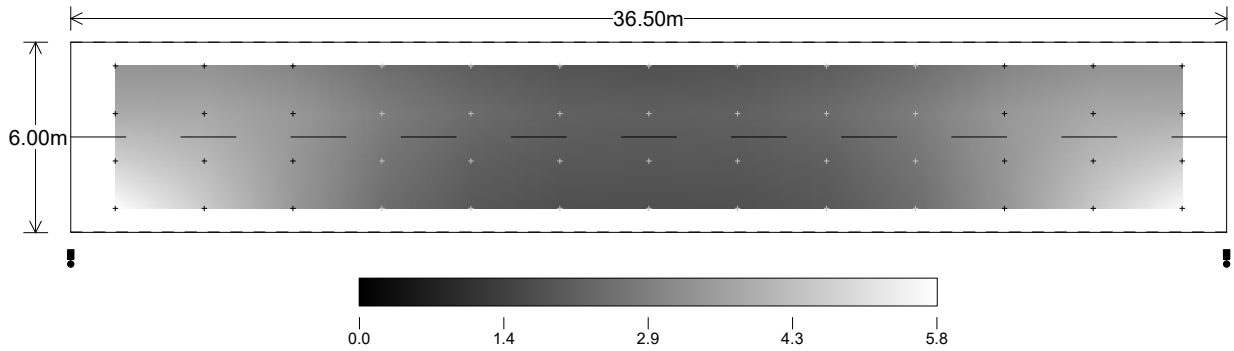
| | |
|---|---|
| Eav | 3.00 |
| Emin | 1.77 |
| Emax | 5.77 |
| Emin/Emax | 0.31 |
| Emin/Eav | 0.59 |

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DATE: 17 May 2022 DESIGNER: Nathan Allen

PROJECT No: 27141 PROJECT NAME: West Sompting Phase 1

# Horizontal Illuminance (lux)

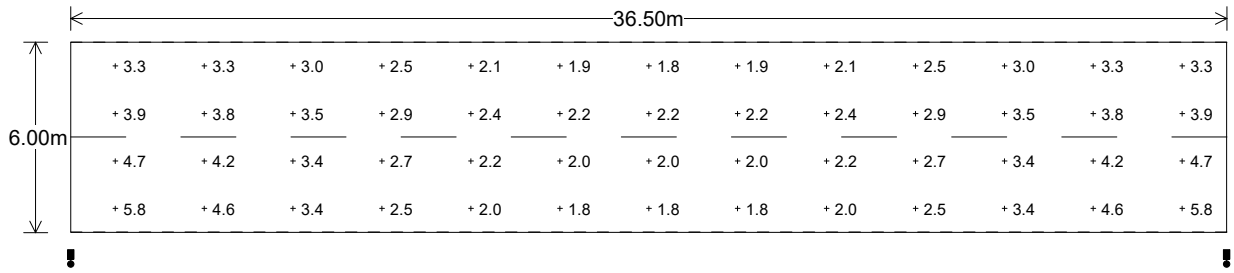



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DATE: 17 May 2022 DESIGNER: Nathan Allen

PROJECT No: 27141 PROJECT NAME: West Sompting Phase 1

# Horizontal Illuminance (lux)




8514277661

| STREET LIGHTING DESIGN RISK ASSESSMENT | | | | | |
|---|---|---|---|---|---|
| **Project** | Land south of West Street & West of Loose Lane, Sompting Phase 1 | | | | |
| **Ref.** | 27141 | **Client** | Persimmon Homes | | |
| **Engineer** | N. Allen | **Date** | 18.05.2022 | | |

| Ref. No | Activity/ Element | Potential Hazards | Those at Risk | Risk Rating LOW/ MED/ HIGH | Possible Control Options (Contractors) |
|---|---|---|---|---|---|
| 1.1 | Installation and removal of street lighting | Erection and removal of lighting columns and signs | Contractor Visitors Public | MED | Safety zone to be maintained between column erection and other site users/pedestrians. Comply with Well-maintained Highways Code of Practice and all requirements for manual handling of columns, refer to The Manual Handling Operations Regulations 1992. Reflective jackets and safety equipment to be worn at all times. Traffic management to be carried out in accordance with Chapter 8. When removing existing apparatus carry out appropriate safety checks to ensure supply is disconnected. Existing street lighting to be maintained in accordance with appropriate BS EN 13201:2015 (BS 5489) Code of practice or as specified by engineer, during construction process. Maintained minimum 0.5m safety zone from overhead lines at all times. The use of impact tools must be limited. For the installation of raise/lower columns, the contractor should consider the use of a carrying cradle. |
| 1.2 | Excavation for the Installation and removal of street lighting | Buried services may exist that have not been identified on the record and survey information resulting in risk of potential electrocution, damage to cables, damage to ducting system and damage to gas mains/water mains. | Site operatives and persons permitted within site. Public | MED | Collate service records from ALL major utility companies with equipment within the vicinity before starting work. All holes to be excavated by hand digging to minimise risks. CT scan to locate buried obstructions. Safety zone to be maintained between other site users / pedestrians. Comply with HSG47 – Avoiding danger from underground services and all requirements for manual handling of equipment (Manual Handling Techniques). Reflective jackets and safety equipment to be worn at all times. Traffic management to be carried out in accordance with Chapter 8. When removing existing apparatus carry out appropriate safety checks to ensure supply is disconnected. The use of impact tools must be limited or appropriate road closure/diversions set up. |
| 1.3 | Electrical Installation/ Testing | Electrocution | Contractor | MED | All electrical work to be carried out in accordance with the latest BS 7671:2018 18th Edition, The electricity at work regulations, Health and safety at work Act and CDM. Reflective jackets and safety equipment to be worn at all times. Traffic management to be carried out in accordance with Chapter 8. Existing street lighting to be maintained in accordance with appropriate BS EN 13201:2015 (BS 5489) Code of practice or as specified by engineer, during construction process. When removing existing apparatus carry |

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| | | | | | out appropriate safety checks to ensure supply is disconnected. |
| 1.4 | COSHH | Dust, Fumes, Vapour, Gas, Skin contact with liquids | Contractor Visitors Public | MED | Design and operate processes and activities to minimise emission, release and spread of substances hazardous to health. Take into account all relevant routes of exposure – inhalation, skin absorption and ingestion – when developing control measures. Control exposure by measures that are proportionate to the health risk. Inform and train all employees on the hazards and risks from substances with which they work and the use of control measures developed to minimise the risks. |
| 1.5 | Working at heights | People falling and objects falling | Contractor Visitors Public | MED | Avoid working at heights where it's reasonably practicable to do so. Minimise the distance and consequences of a fall, by using the right type of equipment where the risk cannot be eliminated. Keep loose materials and stacking or storing materials well back from edges. Contractor to comply with work place regulations and also the personal protective equipment at work regulations 1992 |
| 1.6 | Lifting operations near live carriageway | Objects falling | Contractor Visitors Public | MED | Contractor to provide method statements and detailed risk assessment to cover this operation. |
| 1.7 | Working in the vicinity of LV or HV overhead power lines | Coming into contact with live power lines | Contractor Visitors Public | HIGH | Operative to be G39 trained and have knowledge of identification of overhead line voltage cables. Work in accordance with the ILP document GP10 – safety during the installation and removal of lighting columns and similar street furniture in the proximity of overhead lines. |
| 1.8 | Removal of DNO fuse carriers | Electrocution | Contractor | MED | Only electricians holding a G39 certificate allowed to perform this task |