



Northern Arc Avenue Scheme

Design considerations

Document Details

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1. Client Brief & Proposed Works

Street lighting design is required for the newly proposed Section 38, North Arc Avenue, Central section as highlighted in Fig 1&2.

This proposed road section has link to both B2036 road (Cuckfield road) and A273 road. The surrounding area to this section mostly consists of provision for the future developments. All existing adjoining roads to this scheme are not currently lit and the proposed lighting will require a completely new lighting system.

Fig1: Highlighted in red is the approximate location of North Arc Avenue:

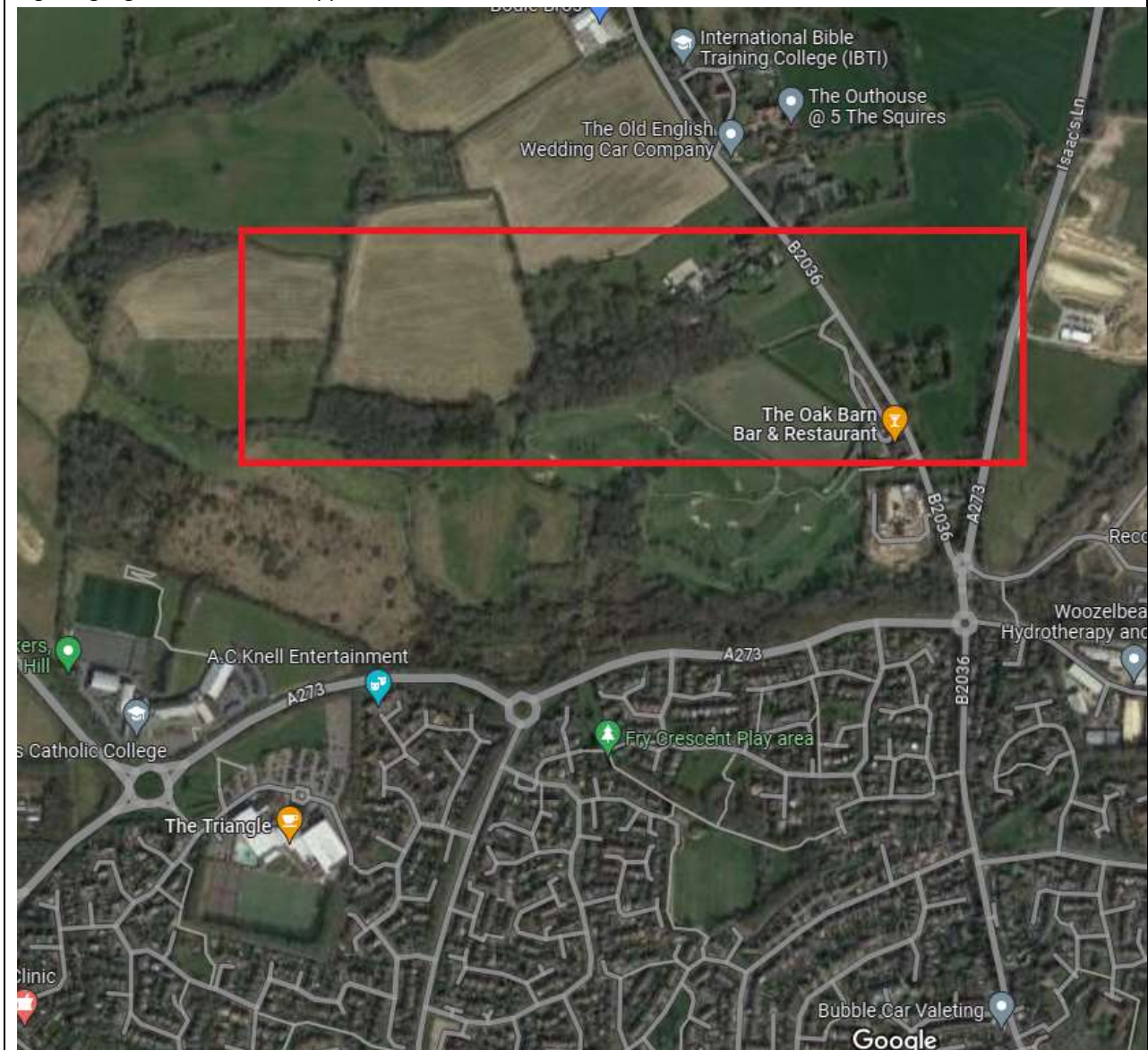
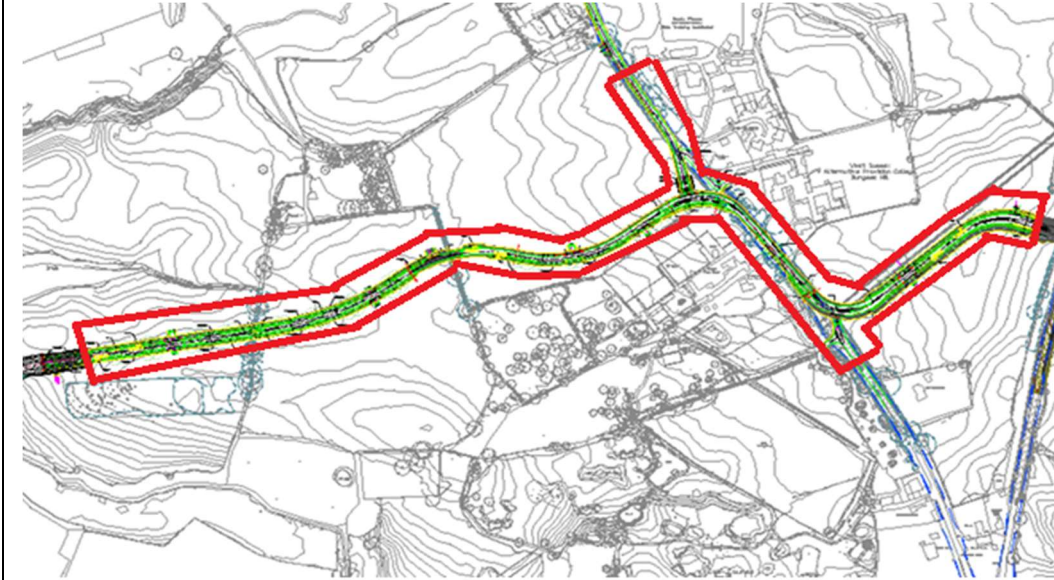


Fig2: Overview of proposed S38 Lighting design area (Ref Doc: 60610807-ACM-CS-XX-M2-HW-0001)



2. Environmental Impact Assessment

The proposed lighting scheme will ensure that the neighbouring areas do not have light spillage onto their property as that would be deemed to be unacceptable in line with the current guidelines.

It is proposed that the lighting impact can be minimised by using accepted methods of lighting control, essentially limiting illuminance and controlling light spill. It is proposed that the external lighting shall be installed on 8m columns along the main traffic route and 6m columns for the adjoining roads. Generally lighting shall be selected to provide safety and security without polluting the boundary site residents.

The chosen lighting equipment for this area follows the lighting specifications from West Sussex Council. All luminaires need to have dimmable electronic ballasts and electronic drivers. The electronic drivers and LED lamps running together produce a very efficient street lighting system which reduces overall energy usage and environmental impact on natural resources. Individual Telensa CMS telecells fit into a 7-pin NEMA socket that is built into lantern. The light source specified for this lighting scheme is LED, this is a low lumen output high efficiency light source.

Note that the currently proposed road lighting design also accounts for the Bat Survey Report and aims to strike a reasonable balance between mitigating road safety risks with potential impacts on sensitive light receptors in this area. Considering presence of the badger/bat tunnels, we considered rear louvers type lamp model wherever possible to minimize lighting intrusions.

Desktop assessments on the proposed street lighting installation indicate that overall surrounding light pollution levels will not be significantly influenced by the proposed street lighting. It is proposed that the lighting impact can be reduced using accepted methods of lighting control, essentially limiting illuminance and controlling light spill. These accepted methods have all been adopted within the proposed lighting design to keep the overall impact of the lighting to a minimum.

In summary our proposed street lighting installation will not have any significant negative impact on the immediate environment with respect to lighting pollution or energy usage and that all sensible steps have been taken within the design stage of this lighting scheme to keep the impact to the environment to a minimum.

3. Lighting Class Assessment

It has been assessed that the lighting levels shall be as per the latest British Standard BS 5489 and BS EN 13201-2:2003 recommendations. The Traffic Route section (as depicted in fig2) with footpath is required to meet the **M class** lighting standards. The two small junctions (highlighted as per Fig 3&4) are required to meet the **C class** lighting standards. These junctions are not major conflict areas and the C class lighting should be limited to the area of the hazard and should not extend out to the stopping site distance. The determination of lighting classes is based on providing greater flexibility to leverage the functionality of existing dynamic lighting CMS system while reducing risk and impact of obtrusive light, which makes things much easier for the local authority moving forwards.

To carry out the assessment of the lighting class the following factors have been taken into consideration.

Lighting Class Parameters

The following factors have been considered in the class selection process:

- Speed Limit – 30/20 mph
- Traffic Flow - Busy
- Ambient luminance/environmental zone – E3 (Based on the future expansion)

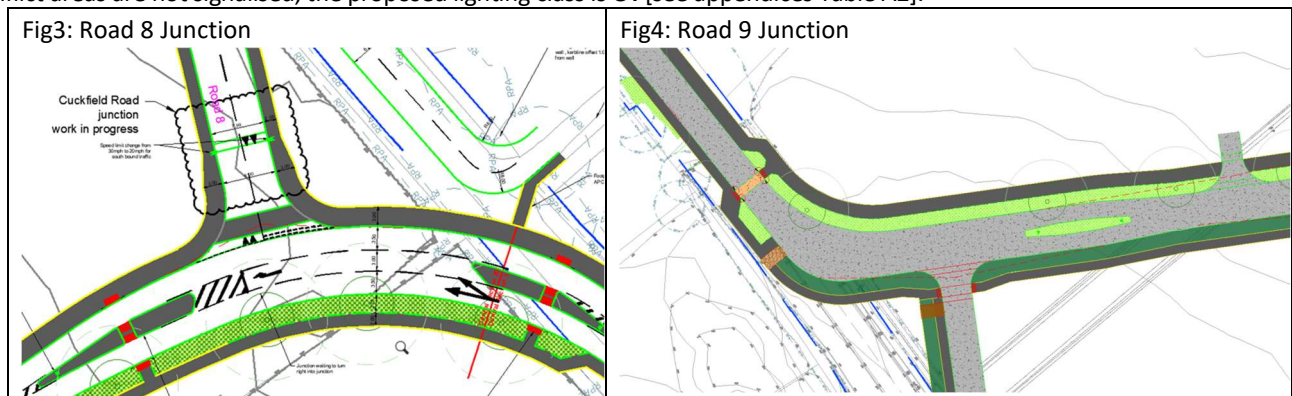
Lighting Class Risk Assessment

The following aspects have affected the lighting class selection.

- Traffic Composition - mixed with separate footpaths.
- Environmental considerations – Presence of Bat& Badgers in the area.
- Crime Rate

The above has been made on the assumption that the proposed street lighting installation will be a 'Busy Traffic Flow' area, where traffic usage is of a level equivalent to a subsidiary road and solely associated with the adjacent properties and future developments. The 'Crime Rate' for this street is currently unknown so it has been selected as a 'Low to Moderate' area. Based on the assessment of the lighting class in accordance with BS 5489 and Table A1 (Appendices) required the lighting class required for the subsidiary road sections is **M4** class.

For areas of the considered conflict sections, required the lighting class to be raised unless it is signalised. As these minor conflict areas are not signalised, the proposed lighting class is **C4** [see appendices Table A2].



Appendices

Table A1 – M Class selection Table

BS5489 table A.3 - Lighting classes for traffic routes ($v \leq 40\text{mph}$)

Traffic Flow	Lighting Class		
	Dual carriageway		Single carriageway
	Junction density: high	Junction density: low	
High to very high	M3	M4	M3
Low to moderate	M4	M5	M4
Very low	M5	M6	M5
Table A3 Lighting Class:			M4

A.3.1.3 Risk Assessment

Traffic Composition - mixed with footpaths.

Future Expansions

Risk of crime – Moderate.

Environmental considerations – Bat/Badger in the area.

Recommended lighting class: M4

Table A2 – Lighting Classes of Comparable Level

The below table replicates that of BS5489-1_2013 table A.1, demonstrating comparable lighting classes. Highlighted is the comparable class used in the lighting calculation.

C0	C1	C2	C3	C4	C5			
	M1	M2	M3	M4	M5	M6		
			P1	P2	P3	P4	P5	P6



Northern Arc Avenue
LIGHTING SPECIFICATION FOR HIGHWAY WORKS

Nov 2024

DOCUMENT CONTROL

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APPENDIX 13/1: INFORMATION TO BE PROVIDED WHEN SPECIFYING LIGHTING COLUMNS AND BRACKET

1.1. GENERAL

- 1.1.1 Proposed designs should be produced in accordance with West Sussex County Council street lighting design specification. This specification document contains the equipment quantities only and details required by the specification for highways works.
- 1.1.2 The location of the proposed lighting columns is shown on the contract drawings.
- 1.1.3 Further to clause 1301 (1) of the Specification for Highway Works, the Contractor shall provide full supporting evidence to demonstrate that the lighting columns and/or bracket arms supplied by their chosen manufacturer meet the specifications set out in Table A/13/1/1 of this Appendix, that the manufacture of the column or bracket arm is in accordance with the National Highway Sector Scheme number 6 (NHSS) and that the manufacturer is registered to NHSS 6.

1.2. Design of Lighting Column Foundations

- 1.2.1. The Contractor shall design and validate the foundation details for the planted and flange plate lighting columns detailed on the Contract drawings. The design calculations and supporting information shall be submitted to the Overseeing Organisation not less than a minimum of 4 weeks prior to the start of fabrication.
- 1.2.2. Earth backfill will not be permitted.
- 1.2.3. The Contractor shall establish the soil types on site and submit, to the Overseeing Organisation for its acceptance, lighting column foundation details appropriate to the conditions found.

1.3. Data Sheets

- 1.3.1 The Contractor shall within 4 weeks prior to the start of fabrication / placement of any orders for materials, supply to the Overseeing Organisation for its approval triplicate copies of completed Appendix 13\2 data sheets for each type of lighting column and foundation combination and an associated Category 0 technical approval (CAT 0) certificate in accordance with the requirements of BD 94/17: Design of Minor Structures and BD 2/12: Technical Approval of Highway Structures (refer also Appendix 1/4).
- 1.3.2 The final identification numbering specification, application method, format and numbering schedule that is to be used for referencing the lighting columns / illuminated traffic signs is to be agreed with the Overseeing Organisation prior to ordering and the agreed referencing should be included on the As Built drawings and support documentation.

1.4. Handling, Transport and Erection

- 1.4.1 Manufacturer's recommendations shall be adhered to regarding method of off- loading, storing, and assembling the columns and brackets and for securing the brackets to the columns.

1.5. Lighting Column / Luminaire Positions

- 1.5.1 The Contractor shall install lighting columns / luminaires positioned as per the Contract drawings.
- 1.5.2 Details of the road lighting column characteristic referenced as Table A/13/1/1.
- 1.5.3 Details of the luminaire utilised as part of the design process referenced within Table A/14/1/2.
- 1.5.4 If the Contractor specifies an alternative design solution, they will be required to produce a lighting and electrical design for approval. All design calculations and supporting information shall be submitted to the Overseeing Organisation not less than 4 weeks prior to the placement of any orders for road lighting materials.
- 1.5.5 Where practical all lighting columns shall be installed such that the location of the door is facing away from oncoming traffic. Where lighting columns are located within in the central reserve all doors to face the same direction towards the carriageway to allow ease of maintenance.
- 1.5.6 Prior to installation an assessment shall be undertaken to determine if additional hard standing and handrail support is required to support ease of maintenance.
- 1.5.7 The Contractor shall be aware that, if deemed necessary, the marking and setting out of Columns shall be done as a joint site exercise with the Overseeing Organisation prior to works commencing on site. The Contractor shall notify the Overseeing Organisation in writing at least 10 working days prior to its intention to set out the lighting columns, such that appropriate staff can be made available to undertake this exercise.
 - (i) The following values shall be established by the Contractor for the actual equipment being offered.
 - a The lanterns weights and windage areas, and centres of application of the forces from the centroid of the column shaft.
 - b Size, length, and angle of lantern fixing.
 - c Size requirements for the base compartment(s) to accommodate all the necessary control gear and/or distribution equipment.

TABLE A/13/1/1: Lighting Column and Bracket Information

Number of Columns	Nominal Column Height	Bracket Details				Column/ Bracket Material	Terrain Category	Max Altitude (M)	Topo - Graphical Factor (f)	10 Minute mean Wind Velocity V ref	Rationalised Wind Factor: Rwf N/m2	Ratio nal Wind Loadi ng Regio n	Foundation Type
		Type	Proj ectio n	Arm Angle	Lantern Angle								
72	8m	Post top	NA	NA	0°	Galvanised Steel Tubular	III	132	1	22	147	Light	Planted
11	6m	Post top	NA	NA	0°	Galvanised Steel Tubular	III	132	1	22	147	Light	Planted

STANDARD DETAILS FOR 8m "POST TOP" TUBULAR STEEL PLANTED COLUMNS
AS PER WSCC STREET LIGHTING SPECIFICATION (DOC REF: WSCC-SD1-1400-032)

Design Standards	BS EN 40.3.1, BS EN 40.3.3, PD6547-2022
Design Life	50 years
10 min mean wind velocity	22m/s
Terrain Category (inland)	II - 8m
Max altitude (inland)	132m
Terrain category (coastal)	I - 8m
Max altitude (coastal)	100m

STANDARD DETAILS FOR 6m "POST TOP" TUBULAR STEEL PLANTED COLUMNS
AS PER WSCC STREET LIGHTING SPECIFICATION (DOC REF: WSCC-SD1-1400-031)

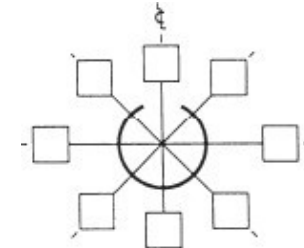
Design Standards	BS EN 40.3.1, BS EN 40.3.3, PD6547-2022
Design Life	50 years
10 min mean wind velocity	22m/s
Terrain Category (inland) III	- 5m, 6m
Max altitude (inland)	132m
Terrain category (coastal) II	- 5m, 6m
Max altitude (coastal)	100m

Notes

1. The Contractor is to submit Lighting Column and Bracket Data sheets as detailed in Appendix 13/2 and Appendix 13/3 for the lighting columns / post they intend to use to the Overseeing Organisation for its acceptance within a minimum of 4 weeks prior to the start of fabrication prior to placement of any orders for materials.
2. Calculations for the structural design of the lighting column / post based on the applicable lighting column design parameters include in Table A/13/1/1 and in compliance with EN 40, BD 94 / 17 and BD2 / 12 shall be submitted by the Contractor at the time of offer. Third party Cat 0 design verification (as applicable in accordance with BD2 / 12 for each type of lighting column / post including foundations shall be submitted by the Contractor to the Overseeing Organisation for its acceptance within one month of the commencement of the works and prior to placement of any orders for materials.
3. Where a lighting column is to be installed in an exposed location, for example a coastal location, a site subject to local wind funnelling or a site 250 m above sea level, specialist advice should be sought in determining the terrain category to be used in the calculation of the exposure coefficient $C_e(z)$
4. Flange plate and lower column section protection shall be to EN40 compliance.
5. Refer to Table A/14/2/1 for details of the luminaires utilised as part of the design process.
6. The ground section of rooted road lighting columns and posts, to be compliant with the requirements of BS EN 40-6:2002

APPENDIX 13/2 (SPECIFICATION FOR HIGHWAY WORKS)

TABLE A/13/2/1: Lighting Column and Column Bracket Information

NAME OF MANUFACTURER:			Column Reference No. Revision No. Date								
NAME OF CONTRACT: ***											
Part A General											
Column nominal height	(m)		Acceptable positions of bracket arms relative to door position Door Opening 								
Column material											
Material design strength	(N/mm2)										
No. of door openings											
Door opening size - Height	(mm)										
	Width (mm)										
Cross-section of base compartment	Height (mm)	Width (mm)	Depth (mm)								
			Manufacturer's drawing ref. no.								
Corrosion protection (steel columns only) – basic system type											
Reference Wind Velocity Vref,0 as defined in BS EN 40-3-1			m/s								
Details of signs and attachments allowed for in the design Area (mm2), Eccentricity (mm), Height											
- additional sacrificial steel thickness, above that needed in design, from the bottom of the column to at least 250 mm above the anticipated ground level			(mm)								
Part B Foundation Data											
Planted base	Planting depth (m)										
Diameter of concrete surround (if any)	Standard Soil Type Factor G <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 33%;">630</td> <td style="width: 33%;">390</td> <td style="width: 33%;">230</td> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> </table>					630	390	230			
	630	390	230								
Flange Plate	Bolt hole centers (mm)	Bolt hole diameter (mm)	Design load/bolt (N)								
Relevant forces and moments at ground level											
Line of action of max. moment relating to door opening											

NOTE: For flange plates with slotted holes a diagram shall be included with this Data Sheet.

PART C ACCEPTABLE LUMINAIRES

Post Top Column		LUMINAIRE: MAXIMUM CHARACTERISTICS					
		Terrain Categories as defined in BS EN 40-3-1					
		I II III IV					
		Luminaire Max Wt (kg) Maximum Windage Area (m2) for Terrain Categories as defined in BS EN 40-3-1					
Luminaire Connection							
Diameter	Length						

Single Arm Bracket Column	Luminaire Lever Arm (mm)	
	Due to wt. of luminaire	Due to windage on luminaire

Bracket Projection (m)	Ref No.	Drawing No.	Material		Luminaire Fixing Angle	Luminaire Connection		Luminaire Maximum Wt (kg)	Maximum Windage Area (m2) for Terrain Categories as defined in BS EN 40-3-1			
			Grade	Design Strength (N/mm2)		Diameter (mm)	Length (mm)					

Double Arm Bracket Column	Luminaire Lever Arm (mm)	
	Due to wt. of luminaire	Due to windage on luminaire

Bracket Projection (m)	Ref No.	Drawing No.	Material		Luminaire Fixing Angle	Luminaire Connection		Luminaire Maximum Wt (kg)	Maximum Windage Area (m2) for Terrain Categories as defined in BS EN 40-3-1			
			Grade	Design Strength (N/mm2)		Diameter (mm)	Length (mm)					

APPENDIX 14/1: SITE RECORDS

1.1 GENERAL

- 1.1.1 This specification document contains the numbered appendices required by the Specification for Highways Works and is to be read in conjunction with the Contract drawings listed in Appendix Awaiting completion by other disciplines.
- 1.1.2 As built drawings shall be produced by the Contractor for all private cabling and associated electrical equipment including termination types, cable joints, fusing arrangements, and supply types in accordance with Clause 1402 and this Appendix.
- 1.1.3 The Overseeing Organisation shall provide the Contractor with Contract drawings in .DXF or .DWG format. The Contractor shall complete site record drawings and return them to the Overseeing Organisation in AutoCAD .DXF format (latest version). All site records shall be supplied as part of the Handover Documentation / Health and Safety file.
- 1.1.4 Where applicable, the drawings shall include:
- Proposed private network cable records which shall be determined from kerb lines or fence lines, utilising a suitable GPS coordinate logging device.
 - Schematic distribution layout drawings indicating the distribution arrangement of each proposed private cable network.
 - proposed private network cable offsets / depths taken at 10m intervals where cables maintain a steady line, and at 5m intervals where the line of the cable varies utilising a suitable GPS coordinate logging device; and a schedule of abandoned cables (recorded as detailed item iii unless agreed otherwise with the Overseeing Organisation plus details of any existing foundations retained / Cut back below the finished ground level following the removal of flange plate columns, if agreed with the Overseeing Organisation that they can remain in situ.
 - Locations of lighting columns, lit traffic signs, illuminated bollards, duct chambers, joints Protective device types and rating, including for MCBs PSSC value and MCB.
- 1.1.5 The contractor shall provide full supporting evidence to demonstrate that the lighting columns and/or bracket arms supplied by their chosen manufacturer meets the specification set out in Table A/13/1/1 of the 1300 Series Work Information that the manufacture of the column or bracket arm is in accordance with the National Highway Sector Scheme number 6 (NHSS) and that the manufacturer is registered to NHSS 6.
- 1.1.6 The Contractor shall also supply electrical test and inspection certificates in accordance with BS 7671 cross-referenced to the apparatus identified on the as-built drawings utilising the NICEIC approved test sheet template unless agreed otherwise with the Overseeing Organisation.

- 1.1.7 The Contractor shall supply Operations and Maintenance manuals to support the site records / installed equipment.
- 1.1.8 The Contractor shall verify the lighting point schedules issued as part of the design, which will include attribute details for the proposed installation and amend according to reflect the 'as built' environment to enable the Overseeing Organisation to accurately input the revised asset data into their inventory system.
- 1.1.9 CMS control system for the purpose of the proposed road lighting shall be in accordance with the 'West Sussex County Council Street lighting specification. As specified by WSCC, individual Telensa CMS telecells fit into a 7-pin Nema socket that is built into each standard. the 7-pin Nema socket can accommodate a standard Nema-type photocell, which could be fitted temporarily, allowing installation of the telecells & base station at a later date (preaccrual); any conventional photocells fitted temporarily should be set to switch on at 35 lux & to switch off at 18 lux.

APPENDIX 14/2: LOCATION OF LIGHTING UNITS AND FEEDER PILLARS

1.1. GENERAL

- 1.1.1 All information relating to the existing installations possessed by the Overseeing Organisation regarding the position of existing underground cabling, feeder pillars and lighting unit positions will be made available to the Contractor without any guarantee as to its accuracy.
- 1.1.2 The position and description of all proposed road lighting units, lit traffic signage, bollards and associated equipment is detailed on the Contract drawings.
- 1.1.3 The insertion of the proposed lighting, detailing cable size and electrical supply points, into the proposed lighting network is shown on the Contract drawings.
- 1.1.4 The locations of all proposed equipment shall allow safe and easy access for future maintenance. An appropriate hard standing area shall be allowed for in front of each feeder pillar to facilitate future ease of maintenance.
- 1.1.5 Electricity supplies to proposed equipment detailed on the drawings shall not be connected prior to the Contractor confirming compliance with BS 7671. Where electricity is supplied by the Electric Company, only competent persons qualified to "Electrician" status with a current G39 certificate may remove the fuse.
- 1.1.6 The minimum lighting requirements for this scheme are detailed in Table A/14/2/1 on the following page.
- 1.1.7 If alternative luminaires are proposed by the Contractor, the following information shall be issued to the Overseeing Organisation at least 4 weeks before placement of procurement orders to demonstrate compliance with the requirements of Table A/14/2/1 the following information shall be returned based on the equipment proposed therein:
- (i) Longitudinal and Vertical (where applicable) lighting design calculations and explanatory notes demonstrating compliance with Table A/14/2/1
 - (ii) The information issued shall include luminaire type / catalogue no., lamp type / design lumen output, and identify the calculated lighting levels.
 - (iii) Manufacturer product data sheets, detailing complete equipment specification.
 - (iv) Were applicable, private network cable calculations verifying the electrical distribution system / private network cable arrangements.

TABLE A/14/2/1: Lighting Level Requirements to be completed following completion of options review

Reference	Location	Luminaire	Luminaire Maintenance Factor	Road Surface Category	Nominal Road Width	Typical Luminaire Overhang
A	Refer to Contract drawings	Urbis Axia 3.1, 5295 integrated lenses rear louver, 16 Oslon square giant, 870mA, 5.72 klm neutral white led – NW 740 (4000k)	0.94	Q0 = 0.07	Refer to Contract drawings	Refer to Contract drawings
B	Refer to Contract drawings	Urbis Axia 3.1, 5384 integrated lenses rear louver, 16 Oslon square giant, 870mA, 5.50klm neutral white led – NW 740 (4000k)	0.87	Q0 = 0.07	Refer to Contract drawings	Refer to Contract drawings
C	Refer to Contract drawings	Urbis Axia 3.2, 5293 integrated lenses rear louver, 24 Oslon square giant, 900ma, 8.65 klm neutral white led – NW 740 (4000k)	0.94	Q0 = 0.07	Refer to Contract drawings	Refer to Contract drawings

Notes

7. The detailed design calculations undertaken as part of the design selection process utilised the photometric data for the AXA 3.1 ranges as indicated above mounted with a 0° tilt.
8. Proposed Urbis Schreder AXA 3.1- luminaires have a weight of 3.6 kg and Aerodynamic resistance (CxS) as 0.032.
9. Proposed Urbis Schreder AXA 3.2- luminaires have a weight of 3.6 kg and Aerodynamic resistance (CxS) as 0.030.
10. The luminaire consists of a die cast LM6 aluminium housing ((EN AC-44100) (AL.Si12)) which is sealed to IP66 with a closed cell gasket and M5 stainless steel fastener that also allows access to the gear cover for electrical termination.
11. If the Contractor wishes to submit an equivalent alternative luminaire for the road lighting, then supporting data as described in Appendix 14 / 2 shall be submitted. The Contractor shall insert in Table A/14/4/1, details of all the luminaires proposed for use.

APPENDIX 14/4: ELECTRICAL EQUIPMENT FOR ROAD LIGHTING

1.1. ROAD LIGHTING LUMINAIRES AND LAMPS

- 1.1.1. All luminaires shall be as detailed on the contract drawings and shall be as indicated in Table A/14/2/1 or similar approved following submission / approval of an alternative luminaire as outlined in APPENDIX 14/2: Location of Lighting units, Lit Signs, Bollards, and Feeder Pillars.
- 1.1.2. All electrical equipment details are to be in accordance with WSCC street lighting specification and relevant British and European standards.
- 1.1.3. Where required, power supplies to the feeder pillars and road lighting units will be provided by the Regional Electric Company under an order issued by the contractor.
- 1.1.4. All electrical wiring that could be subjected to heat shall be protected by heat insulated sleeving.
- 1.1.5. All proposed luminaires shall be compatible with the columns and outreach brackets proposed to be installed.
- 1.1.6. All exposed metal casings of luminaire control gear shall be directly earthed to a common earth point if applicable, where reliance on the earthing of security clips shall not be deemed acceptable.
- 1.1.7. Luminaires shall be approved by the Overseeing Organisation and shall comply in all respects with the latest editions of British Standard BS 4533 and BS EN 60598. The lighting design shall utilise full cut-off luminaires with a minimum G4 classification. Glare control will comply with the requirements of BS EN 13201.
- 1.1.8. The degree of protection shall be not less than IP66 for luminaire optic and control gear compartments. The integrity specified must be capable of being maintained for the rated life of the luminaire.
- 1.1.9. The luminaire itself plus control gear / driver and other electrical / electronic equipment must be CE marked to confirm compliance with the fundamental health and safety requirements set out in the EMC, LV, and RoHS Directives. Manufacturer's must include their Declaration of Conformity for each product type as well as the supporting technical file containing the measurements to ensure compliance.
- 1.1.10. The Contractor shall ensure that the luminaire manufacturer operates a Quality Assurance system certified to ISO 9001, or equivalent, by a UKAS accredited, or equivalent body.
- 1.1.11. The luminaire must be tested against the unmetered equipment circuit watts criteria set out in BSCP520 and have been issued with an Unmetered Supplies User Group (UMSUG) Charge Code.
- 1.1.12. The luminaire weight (including all internal / external components and windage area) is to be confirmed as part of the detailed design submission and must be compatible with the proposed lighting column for the geographical location.
- 1.1.13. Luminaires shall be fitted with adequate surge protection in accordance with latest industry standards and regulations.
- 1.1.14. The Contractor shall insert in Table A/14/4/1, details of all the luminaires they propose to use.

1.2. SURGE PROTECTION

- 1.2.1. Surge protection devices shall be incorporated into road lighting and lit signage cut outs to protect electronic equipment against transient voltages and shall be compliant with BS EN 61643-11 / IEC61643-11
- 1.2.2. Surge protection devices shall be afforded Class 2 protection with a nominal operating voltage (L-N) of 230v (50Hz), with a maximum load current of 16A. L-N voltage protection (withstand) Up shall have a 1.5kV (maximum) with a short circuit capability (mains) Isccr of 6kA unless agreed otherwise with the Overseeing Organisation

1.3. INTERNAL WIRING

- 1.3.1. All wiring and installation of components within lighting columns and lit sign units shall be in accordance with the Contract drawings allowing termination with 3 core flexible cable (3183Y) according to the rating of the luminaire and column height.
- 1.3.2. The wiring shall be PVC or XLPE insulated and sheathed tri-rated multiple cores with PVC insulation.

1.4. EARTHING

- 1.4.1. All earthing for lighting columns shall be carried out in accordance with the Contract drawings, this specification, BS7671 18th Edition (IEE Regulations) and BS7430 :2011+A1:2015 Code of Practice for Protective Earthing of Electrical Installations.
- 1.4.2. The main earth terminal block to which the terminals of all equipment shall be separately bonded shall be connected to the incoming supply earth by the main earthing conductor.
- 1.4.3. A sound mechanical and electrical connection must be made between the earth continuity conductor and each item of exposed metal.
- 1.4.4. The earth continuity conductor shall be connected to all earthing terminals (provided for all metals parts of each lighting unit) using eye type terminal end. All such connections and joints shall be crimped, with the appropriate size terminal, and used with the correct size earth continuity conductor which is bent double inside the crimp with the bend extending through the crimp. They shall be mechanically sound electrically continuous and protected where necessary against corrosion. Additional external earth continuity conductors shall not be jointed but bonded to the column earth stud.
- 1.4.5. All earth connection shall be made between two plain brass washers and bare earth conductor shall be sleeved with green and yellow PVC sheathing.
- 1.4.6. Earth points shall be installed at the end of all circuits and feeder pillar positions as indicated on the Contact drawings and installed in accordance with manufacturer's instructions. Following installation earth points shall be inspected and tested to verify the requirements of BS7671 and BS7430 :2011+A1:2015 Code of Practice for Protective Earthing of Electrical Installations.
- 1.4.7. Where the CROSS-SECTIONAL AREA of the incoming phase conductor is greater than 25 sq mm, the Engineer shall be consulted regarding the size of the main earthing and bonding.
- 1.4.8. The earth continuity conductor points of origin inside illuminated signs and bollards, lighting

columns etc. shall be the incoming supply fused cut out as detailed in the drawings.

1.5. UNDERGROUND AND DUCTED CABLE

- 1.5.1. The route for cables shall be as described on the Contract Drawings.
- 1.5.2. All outgoing circuits from any supply point shall be labelled and identified at source, intermediary and remote end using an appropriate tag, secured to the armoured cable with tie-wraps.
- 1.5.3. All underground cables shall be copper XLPE/SWA/MDPE 600/1000-volt grade
- 1.5.4. Network cables shall be of the types and sizes described on the schematic cable layout drawings.
- 1.5.5. When required the optional CPC conductor insulation shall be coloured green/yellow.
- 1.5.6. For single and three phase cables, the neutral conductor insulation shall be coloured blue.
- 1.5.7. For single phase cables, the phase conductor insulation shall be coloured brown.
- 1.5.8. For three phase cables, the phase conductors' insulation shall be coloured brown, black and grey.
- 1.5.9. Cables crossing draw pits shall be adequately supported, with a maximum of 450mm between supports.
- 1.5.10. Cabling shall not be backfilled until inspected and approved by the Overseeing Organisation. Cabling shall be kept as straight as possible and follow the routes described on the Drawings.

1.6. CABLE JOINTS

- 1.6.1. Cable joints shall not be permitted unless required for sub-feed cable reduction at feeder pillar positions or to ensure the continuity of existing circuits outside the scheme extents fed from feeder pillars affected by the works following approval by the Overseeing Organisation.

1.7. ARMoured CABLE TERMINATION'S

- 1.7.1. Armoured cable terminations shall be carried out in accordance with the manufacturer's recommendations the Contract drawings and this specification using suitable cable glands comprising of a 2-part gland with a separate locking ring and shall be manufactured in brass to BS2874.
- 1.7.2. Cables shall be individually terminated and secured at feeder pillars, cut-outs, and other electrical apparatus by means of a brass gland and lock nut to BS6121 and thereafter suitably shrouded.
- 1.7.3. All metal gland parts shall be brass, bright dipped and the gland shall consist of gland body with an armour clamping cone and locking ring, armour nut, brass skid washer.

-
- 1.7.4. The gland shall be of such a design that during assembly no torque will be induced in the cable sheath or armour. Also, over tightening of the seals when clamping armour wires shall be prevented.
 - 1.7.5. Each gland shall be locked onto equipment gland plates with suitable brass locknuts. Also, at every gland a polychloroprene shroud shall be fitted over the gland for additional protection.

Appendix 14/31: Safety and Labour Requirements

1.1. EMERGENCY ELECTRICAL SITE ATTENDANCE

- 1.1.1. The Contractor shall provide an emergency electrical site attendance service consisting of plant, materials, and operatives for making safe electrical equipment in the event of emergency situations occurring within the site limits and/or works area.
- 1.1.2. Attendance by a qualified electrician is required within two hours of telephone notification. The service shall be provided both during normal working hours and outside working hours for the duration of the Contract, regardless of whether the Contractor has personnel on or off site.
- 1.1.3. The Contractor shall provide a dedicated telephone number for this purpose, which shall be continuously available.
- 1.1.4. This emergency service is deemed to include making the site safe and general clearance of lighting and electrical related debris. The vehicle and staff attending site shall have adequate equipment, plant, and expertise to isolate and make electrical supplies safe, effect repairs and restore service, until such time as permanent repairs may be completed.
- 1.1.5. The Contractor shall ensure that personnel have access to a location map of both existing and new feeder pillars taken over, to enable prompt isolation of electrical supplies to be made.
- 1.1.6. Should it be necessary to remove or dismantle lighting column(s), the Contractor shall ensure that a suitable crane vehicle is available within a further two hours.
- 1.1.7. Details of this Emergency service shall be submitted and approved by the Engineer prior to the commencement of the Contract.

1.2. PROCEDURES FOR ISOLATING POWER SUPPLIES

- 1.2.1. The safe, effective isolation and re-energising of supplies shall be the responsibility of the Contractor.
- 1.2.2. Failure to re-energise circuits at the end of each working day will result in the use Emergency Electrical Site Attendance service at no additional cost to the Engineer.
- 1.2.3. In order to control access to feeder pillars, the Contractor shall fit padlocking facilities to all feeder pillars (both existing and new) upon the commencement of the Contract- see Appendix 14/4 section 3 for further details.
- 1.2.4. The Engineer's representative will issue standard padlocks for each feeder pillar, which shall be fitted by the contractor. Three standard keys will also be issued to the Contractor, which shall be returned to the Engineer at the end of the contract. The contractor shall ensure that all personnel involved with the provision of Emergency Electrical Site Attendance have access to the standard padlock keys, for prompt isolation of supplies in an emergency.
- 1.2.5. When electrical work is to be carried out on a feeder pillar, the Contractor shall obtain a 'working' padlock from the Engineer's representative. This shall be used on the feeder pillar while work is being carried out, in place of the standard padlock. Only the Engineer's representative and the person working on the feeder pillar will have keys to the working padlock.

- 1.2.6. Upon completion of the electrical work, the Contractor shall refit the standard padlock and return the working padlock to the Engineer's representative promptly afterwards.
- 1.2.7. While work is in progress, the Contractor shall also display a suitable sign at the feeder pillar, indicating 'Work in Progress' and the name of the person carrying out the work.
- 1.2.8. It is the Contractor's responsibility to identify and prove all electricity supply sources prior to isolation and work commencing.

Appendix 14/32: Inspection and Testing

1.1. ELECTRICAL SITE SUPERVISION

- 1.1.1. The Contractor shall allocate an electrically qualified supervisor to the main Contractor's staff.
- 1.1.2. This Supervisor shall be responsible for the electrical works, be familiar with road lighting and electrical installations in general and have knowledge of current electrical standards and regulations, including the ILP Code of Practice for Electrical Safety in Public Lighting operations and the current IET Wiring Regulations.
- 1.1.3. The contractor's supervisor shall attend the regular progress meetings, held by the Engineer's representative normally at two-weekly intervals.



Northern Arc Avenue Road Lighting Scheme Road Lighting Risk Assessment

Oct 2023

Document Details

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Scheme	Northern Arc Avenue
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1	1	2	3	4	5
	1	2	3	4	5
	SEVERITY				

Northern Arc Avenue Road Lighting – Safety Risk Assessment | Oct 2023

7	C	Working in the vicinity of Underground services.	Presence of proposed HV cables. Damage to underground services - Striking Services resulting in disruption and injury.	Construction	3	5	15	Electrical	Not possible to eliminate hazard by design.	Inspect plans from C4 notices and desktop activities carried out to design out known 'clashes' where they are identified and verified. Affected services will be identified, with additional service checks completed before commencement of works on site. All service installations to be supplied with accurate 'as built' drawings.	2	5	10	Contractor to undertake trial holes (excavation by hand) to establish type of services and their depths. If it's not possible to achieve a safety clearance from underground utilities, then shallow foundations or cranked column root to be considered. Project drawings to highlight known service locations (incl. gas lines). Contractor to obtain accurate location of underground services / highway drainage before commencement of construction works and to verify / locate prior to commencement of any construction activity. Contractor to double-check the drawings with up-to-date C4 information.	
8	C	Provision of New Power supplies	LV assumed to be currently near all the new power supply locations	Construction	2	1	2	Electrical	There is little deviation between the location of columns therefore the existing LV supply should still be accessible.	Obtain the Utilities. Stats and topographic drawings before the design is started to establish where the electrical network is.	1	1	1	LV cable is assumed to be in good condition and accessible.	
9	C	Using Existing Power Supplies	Existing system not suitable for re-use due to faults or a change in the requirement.	Construction	3	1	3	Electrical	Existing infrastructure will be used to ensure the new design is similar, electrically, to the old design.	Existing infrastructure will be used to ensure the new design is similar, electrically, to the old design.	2	1	2	Installing contractor to confirm that the existing cable is serviceable and offers min. life	
10	C	Amendments to other interdisciplinary design	Clashes with other amenities from other disciplines	Construction	3	1	3	Electrical	There will be interdisciplinary communication between different teams to ensure there is no conflicting infrastructure.		2	1	2	The design will have to be constructed to ensure that there are no clashes between disciplines.	
11	C	Installation of work during peak periods	Installation of work during peak periods would increase the danger to both construction and the public.	Construction / Public	3	5	15	Electrical	Not possible to eliminate hazard by design.	Work should be restricted between peak periods to reduce the risk to both construction and the public.	1	5	5	Even with work restricted between peak hours, work will still commence and will therefore still present a hazard.	
12	C	Installation of columns and changing luminaries on lighting columns	Due to pavement being too narrow or in some locations because there is no suitable pavement workers may have to work in the road, increasing the chances of being hit with vehicles.	Construction	3	5	15	Electrical	Closing part of the road and installing temporary traffic lights to allow cars to use one lane of the road, whilst work is being carried out.		1	5	5	By closing one side of the road and installing temporary traffic lights it can reduce the chances of the accident occurring quite significantly, however, there still remains a possibility that a person could lose control of their vehicle and go through the temporary barriers causing injury to the workers in the road. All TTM is to be installed in accordance with Chapter 8 of the TTM.	
13	C	By working on lighting columns close to junctions and road signs could obstruct people from seeing the signs and other key pieces of information	This could result in accidents on the road between vehicles occurring because drivers have missed the signs	Construction	2	3	6	Electrical		All TTM is to be installed in accordance with Chapter 8 of the TTM.	1	2	2	By reducing the chances of the accident occurring can reduce the residual risk, however, Contractor to carry out regular visibility checks to ensure signs are not obscured during the works, either by dirt or equipment, and put out temporary signage when obstruction is unavoidable.	
14	C	Installing new lighting columns	Temporary loss of lighting during the installation could result in vehicles not having sufficient enough lighting which could lead to an accidents	Construction	2	3	6	Electrical	Hazard can be eliminated by ensuring work is carried out during the daytime when there is enough natural daylight for vehicles to drive safely	Install temporary lighting to replace the light of the lighting column if working in the dark or during the time of day when the light from the lighting column is needed	1	1	1	By ensuring there is enough light it can reduce the hazard from occurring	

P0103-150-1003 - Column Schedule Proposed																
Column/Item No.	Road Name	Physical Asset Status	Nominal column height [m]	Quantity	Lantern Tilt	Luminaire	Lamp type	Lam KLM	Optic settings	Easting	Northing	Dimming %	Column Position	Supply	Comments	
1	Proposed road	Proposed	8	1	0	URBIS AXIA 3.1, 5295 INTEGRATED LENSES, 16 OSLOM SQUARE GIANT, 870MA	LED	5.72	5295	529652.575	120688.938	100	Back of Footpath	DNO	Proposed column and lantern to be fitted in proposed location	
2	Proposed road	Proposed	8	1	0	URBIS AXIA 3.1, 5295 INTEGRATED LENSES, 16 OSLOM SQUARE GIANT, 870MA	LED	5.72	5295	529655.455	120669.731	100	Back of Footpath	DNO	Proposed column and lantern to be fitted in proposed location	
3	Proposed road	Proposed	8	1	0	URBIS AXIA 3.1, 5295 INTEGRATED LENSES, 16 OSLOM SQUARE GIANT, 870MA	LED	5.72	5295	529688.191	120694.563	100	Back of Footpath	DNO	Proposed column and lantern to be fitted in proposed location	
4	Proposed road	Proposed	8	1	0	URBIS AXIA 3.1, 5295 INTEGRATED LENSES, 16 OSLOM SQUARE GIANT, 870MA	LED	5.72	5295	529692.069	120677.899	100	Back of Footpath	DNO	Proposed column and lantern to be fitted in proposed location	
5	Proposed road	Proposed	8	1	0	URBIS AXIA 3.1, 5295 INTEGRATED LENSES, 16 OSLOM SQUARE GIANT, 870MA	LED	5.72	5295	529716.522	120699.056	100	Back of Footpath	DNO	Proposed column and lantern to be fitted in proposed location	
6	Proposed road	Proposed	8	1	0	URBIS AXIA 3.1, 5295 INTEGRATED LENSES, 16 OSLOM SQUARE GIANT, 870MA	LED	5.72	5295	529719.564	120682.781	100	Back of Footpath	DNO	Proposed column and lantern to be fitted in proposed location	
7	Proposed road	Proposed	8	1	0	URBIS AXIA 3.1, 5295 INTEGRATED LENSES, 16 OSLOM SQUARE GIANT, 870MA	LED	5.72	5295	529749.955	120704.193	100	Back of Footpath	DNO	Proposed column and lantern to be fitted in proposed location	
8	Proposed road	Proposed	8	1	0	URBIS AXIA 3.1, 5295 INTEGRATED LENSES, 16 OSLOM SQUARE GIANT, 870MA	LED	5.72	5295	529752.216	120688.073	100	Back of Footpath	DNO	Proposed column and lantern to be fitted in proposed location	
9	Proposed road	Proposed	8	1	0	URBIS AXIA 3.1, 5295 INTEGRATED LENSES, 16 OSLOM SQUARE GIANT, 870MA	LED	5.72	5295	529783.613	120709.630	100	Back of Footpath	DNO	Proposed column and lantern to be fitted in proposed location	
10	Proposed road	Proposed	8	1	0	URBIS AXIA 3.1, 5295 INTEGRATED LENSES, 16 OSLOM SQUARE GIANT, 870MA	LED	5.72	5295	529785.734	120693.065	100	Back of Footpath	DNO	Proposed column and lantern to be fitted in proposed location	
11	Proposed road	Proposed	8	1	0	URBIS AXIA 3.1, 5295 INTEGRATED LENSES, 16 OSLOM SQUARE GIANT, 870MA	LED	5.72	5295	529809.486	120713.552	100	Back of Footpath	DNO	Proposed column and lantern to be fitted in proposed location	
12	Proposed road	Proposed	8	1	0	URBIS AXIA 3.1, 5295 INTEGRATED LENSES, 16 OSLOM SQUARE GIANT, 870MA	LED	5.72	5295	529812.892	120697.112	100	Back of Footpath	DNO	Proposed column and lantern to be fitted in proposed location	
13	Proposed road	Proposed	8	1	0	URBIS AXIA 3.1, 5295 INTEGRATED LENSES, 16 OSLOM SQUARE GIANT, 870MA	LED	5.72	5295	529840.513	120718.359	100	Back of Footpath	DNO	Proposed column and lantern to be fitted in proposed location	
14	Proposed road	Proposed	8	1	0	URBIS AXIA 3.1, 5295 INTEGRATED LENSES, 16 OSLOM SQUARE GIANT, 870MA	LED	5.72	5295	529843.007	120702.247	100	Back of Footpath	DNO	Proposed column and lantern to be fitted in proposed location	
15	Proposed road	Proposed	8	1	0	URBIS AXIA 3.1, 5295 INTEGRATED LENSES, 16 OSLOM SQUARE GIANT, 870MA	LED	5.72	5295	529872.427	120723.438	100	Back of Footpath	DNO	Proposed column and lantern to be fitted in proposed location	
16	Proposed road	Proposed	8	1	0	URBIS AXIA 3.1, 5295 INTEGRATED LENSES, 16 OSLOM SQUARE GIANT, 870MA	LED	5.72	5295	529875.273	120707.408	100	Back of Footpath	DNO	Proposed column and lantern to be fitted in proposed location	
17	Proposed road	Proposed	8	1	0	URBIS AXIA 3.1, 5295 INTEGRATED LENSES, 16 OSLOM SQUARE GIANT, 870MA	LED	5.72	5295	529905.045	120728.553	100	Back of Footpath	DNO	Proposed column and lantern to be fitted in proposed location	
18	Proposed road	Proposed	8	1	0	URBIS AXIA 3.1, 5295 INTEGRATED LENSES, 16 OSLOM SQUARE GIANT, 870MA	LED	5.72	5295	529907.597	120712.462	100	Back of Footpath	DNO	Proposed column and lantern to be fitted in proposed location	
19	Proposed road	Proposed	8	1	0	URBIS AXIA 3.1, 5295 INTEGRATED LENSES, 16 OSLOM SQUARE GIANT, 870MA	LED	5.72	5295	529937.801	120735.457	100	Back of Footpath	DNO	Proposed column and lantern to be fitted in proposed location	
20	Proposed road	Proposed	8	1	0	URBIS AXIA 3.1, 5295 INTEGRATED LENSES, 16 OSLOM SQUARE GIANT, 870MA	LED	5.72	5295	529941.789	120719.485	100	Back of Footpath	DNO	Proposed column and lantern to be fitted in proposed location	
21	Proposed road	Proposed	8	1	0	URBIS AXIA 3.1, 5295 INTEGRATED LENSES, 16 OSLOM SQUARE GIANT, 870MA	LED	5.72	5295	529969.807	120745.213	100	Back of Footpath	DNO	Proposed column and lantern to be fitted in proposed location	
22	Proposed road	Proposed	8	1	0	URBIS AXIA 3.1, 5295 INTEGRATED LENSES, 16 OSLOM SQUARE GIANT, 870MA	LED	5.72	5295	529975.875	120730.222	100	Back of Footpath	DNO	Proposed column and lantern to be fitted in proposed location	
23	Proposed road	Proposed	8	1	0	URBIS AXIA 3.1, 5295 INTEGRATED LENSES, 16 OSLOM SQUARE GIANT, 870MA	LED	5.72	5295	530002.136	120759.070	100	Back of Footpath	DNO	Proposed column and lantern to be fitted in proposed location	
24	Proposed road	Proposed	8	1	0	URBIS AXIA 3.1, 5295 INTEGRATED LENSES, 16 OSLOM SQUARE GIANT, 870MA	LED	5.72	5295	530009.031	120743.972	100	Back of Footpath	DNO	Proposed column and lantern to be fitted in proposed location	
25	Proposed road	Proposed	8	1	0	URBIS AXIA 3.1, 5295 INTEGRATED LENSES, 16 OSLOM SQUARE GIANT, 870MA	LED	5.72	5295	530028.255	120773.355	100	Back of Footpath	DNO	Proposed column and lantern to be fitted in proposed location	
26	Proposed road	Proposed	8	1	0	URBIS AXIA 3.1, 5295 INTEGRATED LENSES, 16 OSLOM SQUARE GIANT, 870MA	LED	5.72	5295	530037.389	120759.387	100	Back of Footpath	DNO	Proposed column and lantern to be fitted in proposed location	
27	Proposed road	Proposed	8	1	0	URBIS AXIA 3.1, 5295 INTEGRATED LENSES, 16 OSLOM SQUARE GIANT, 870MA	LED	5.72	5295	530055.925	120791.432	100	Back of Footpath	DNO	Proposed column and lantern to be fitted in proposed location	
28	Proposed road	Proposed	8	1	0	URBIS AXIA 3.1, 5295 INTEGRATED LENSES, 16 OSLOM SQUARE GIANT, 870MA	LED	5.72	5295	530065.289	120778.080	100	Back of Footpath	DNO	Proposed column and lantern to be fitted in proposed location	
29	Proposed road	Proposed	8	1	0	URBIS AXIA 3.1, 5295 INTEGRATED LENSES, 16 OSLOM SQUARE GIANT, 870MA	LED	5.72	5295	530073.625	120802.021	100	Back of Footpath	DNO	Proposed column and lantern to be fitted in proposed location	
30	Proposed road	Proposed	8	1	0	URBIS AXIA 3.1, 5295 INTEGRATED LENSES, 16 OSLOM SQUARE GIANT, 870MA	LED	5.72	5295	530080.718	120790.125	100	Back of Footpath	DNO	Proposed column and lantern to be fitted in proposed location	
31	Proposed road	Proposed	8	1	0	URBIS AXIA 3.1, 5295 INTEGRATED LENSES, 16 OSLOM SQUARE GIANT, 870MA	LED	5.72	5295	530099.128	120812.077	100	Back of Footpath	DNO	Proposed column and lantern to be fitted in proposed location	
32	Proposed road	Proposed	8	1	0	URBIS AXIA 3.1, 5295 INTEGRATED LENSES, 16 OSLOM SQUARE GIANT, 870MA	LED	5.72	5295	530104.222	120799.461	100	Back of Footpath	DNO	Proposed column and lantern to be fitted in proposed location	
33	Proposed road	Proposed	8	1	0	URBIS AXIA 3.1, 5295 INTEGRATED LENSES, 16 OSLOM SQUARE GIANT, 870MA	LED	5.72	5295	530129.691	120818.565	100	Back of Footpath	DNO	Proposed column and lantern to be fitted in proposed location	
34	Proposed road	Proposed	8	1	0	URBIS AXIA 3.1, 5295 INTEGRATED LENSES, 16 OSLOM SQUARE GIANT, 870MA	LED	5.72	5295	530131.092	120804.503	100	Back of Footpath	DNO	Proposed column and lantern to be fitted in proposed location	
35	Proposed road	Proposed	8	1	0	URBIS AXIA 3.1, 5295 INTEGRATED LENSES, 16 OSLOM SQUARE GIANT, 870MA	LED	5.72	5295	530167.628	120817.592	100	Back of Footpath	DNO	Proposed column and lantern to be fitted in proposed location	
36	Proposed road	Proposed	8	1	0	URBIS AXIA 3.1, 5295 INTEGRATED LENSES, 16 OSLOM SQUARE GIANT, 870MA	LED	5.72	5295	530166.675	120800.540	100	Back of Footpath	DNO	Proposed column and lantern to be fitted in proposed location	
37	Proposed road	Proposed	8	1	0	URBIS AXIA 3.1, 5295 INTEGRATED LENSES, 16 OSLOM SQUARE GIANT, 870MA	LED	5.72	5295	530203.355	120811.102	100	Back of Footpath	DNO	Proposed column and lantern to be fitted in proposed location	
38	Proposed road	Proposed	8	1	0	URBIS AXIA 3.1, 5295 INTEGRATED LENSES, 16 OSLOM SQUARE GIANT, 870MA	LED	5.72	5295	530201.925	120794.317	100	Back of Footpath	DNO	Proposed column and lantern to be fitted in proposed location	
39	Proposed road	Proposed	8	1	0	URBIS AXIA 3.1, 5295 INTEGRATED LENSES, 16 OSLOM SQUARE GIANT, 870MA	LED	5.72	5295	530229.978	120811.057	100	Back of Footpath	DNO	Proposed column and lantern to be fitted in proposed location	
40	Proposed road	Proposed	8	1	0	URBIS AXIA 3.1, 5295 INTEGRATED LENSES, 16 OSLOM SQUARE GIANT, 870MA	LED	5.72	5295	530230.300	120794.835	100	Back of Footpath	DNO	Proposed column and lantern to be fitted in proposed location	
41	Proposed road	Proposed	8	1	0	URBIS AXIA 3.1, 5295 INTEGRATED LENSES, 16 OSLOM SQUARE GIANT, 870MA	LED	5.72	5295	530254.254	120815.673	100	Back of Footpath	DNO	Proposed column and lantern to be fitted in proposed location	
42	Proposed road	Proposed	8	1	0	URBIS AXIA 3.1, 5295 INTEGRATED LENSES, 16 OSLOM SQUARE GIANT, 870MA	LED	5.72	5295	530258.431	120799.604	100	Back of Footpath	DNO	Proposed column and lantern to be fitted in proposed location	
43	Proposed road	Proposed	8	1	0	URBIS AXIA 3.1, 5295 INTEGRATED LENSES, 16 OSLOM SQUARE GIANT, 870MA	LED	5.72	5295	530273.217	120822.119	100	Back of Footpath	DNO	Proposed column and lantern to be fitted in proposed location	
44	Proposed road	Proposed	8	1	0	URBIS AXIA 3.1, 5295 INTEGRATED LENSES, 16 OSLOM SQUARE GIANT, 870MA	LED	5.72	5295	530280.090	120807.144	100	Back of Footpath	DNO	Proposed column and lantern to be fitted in proposed location	
45	Proposed road	Proposed	8	1	0	URBIS AXIA 3.1, 5295 INTEGRATED LENSES, 16 OSLOM SQUARE GIANT, 870MA	LED	5.72	5295	530300.299	120837.432	100	Back of Footpath	DNO	Proposed column and lantern to be fitted in proposed location	
46	Proposed road	Proposed	8	1	0	URBIS AXIA 3.1, 5295 INTEGRATED LENSES, 16 OSLOM SQUARE GIANT, 870MA	LED	5.72	5295	530309.378	120824.140	100	Back of Footpath	DNO	Proposed column and lantern to be fitted in proposed location	
47	Proposed road	Proposed	8	1	0	URBIS AXIA 3.1, 5295 INTEGRATED LENSES, 16 OSLOM SQUARE GIANT, 870MA	LED	5.72	5295	530331.430	120859.823	100	Back of Footpath	DNO	Proposed column and lantern to be fitted in proposed location	
48	Proposed road	Proposed	8	1	0	URBIS AXIA 3.1, 5295 INTEGRATED LENSES, 16 OSLOM SQUARE GIANT, 870MA	LED	5.72	5295	530340.687	120844.481	100	Back of Footpath	DNO	Proposed column and lantern to be fitted in proposed location	
49	Proposed road	Proposed	8	1	0	URBIS AXIA 3.2, 5293 INTEGRATED LENSES, 24 OSLOM SQUARE GIANT, 900MA	LED	8.65	5293	530354.481	120874.242	100	Back of Footpath	DNO	Proposed column and lantern to be fitted in proposed location	
50	Proposed road	Proposed	8	1	0	URBIS AXIA 3.2, 5293 INTEGRATED LENSES, 24 OSLOM SQUARE GIANT, 900MA	LED	8.65	5293	530374.536	120860.642	100	Back of Footpath	DNO	Proposed column and lantern to be fitted in proposed location	
51	Proposed road	Proposed	6	1	0	URBIS AXIA 3.1, 5384 INTEGRATED LENSES , 16 OSLOM SQUARE GIANT, 870MA	LED	5.5	5384	530361.304	120889.129	100	Back of Footpath	DNO	Proposed column and lantern to be fitted in proposed location	
52	Proposed road	Proposed	6	1	0	URBIS AXIA 3.1, 5384 INTEGRATED LENSES , 16 OSLOM SQUARE GIANT, 870MA	LED	5.5	5384	530355.080	120914.730	100	Back of Footpath	DNO	Proposed column and lantern to be fitted in proposed location	
53	Proposed road	Proposed	6	1	0	URBIS AXIA 3.1, 5384 INTEGRATED LENSES , 16 OSLOM SQUARE GIANT, 870MA	LED	5.5	5384	530345.033	120941.460	100	Back of Footpath	DNO	Proposed column and lantern to be fitted in proposed location	
54	Proposed road	Proposed	6	1	0	URBIS AXIA 3.1, 5384 INTEGRATED LENSES , 16 OSLOM SQUARE GIANT, 870MA	LED	5.5	5384	530324.755	120972.683	100	Back of Footpath	DNO	Proposed column and lantern to be fitted in proposed location	
55	Proposed road	Proposed	6	1	0	URBIS AXIA 3.1, 5384 INTEGRATED LENSES , 16 OSLOM SQUARE GIANT, 870MA	LED	5.5	5384	530303.662	121002.639	100	Back of Footpath	DNO	Proposed column and lantern to be fitted in proposed location	
56	Proposed road	Proposed	6	1	0	URBIS AXIA 3.1, 5384 INTEGRATED LENSES , 16 OSLOM SQUARE GIANT, 870MA	LED	5.5	5384	530284.556	121034.875	100	Back of Footpath	DNO	Proposed column and lantern to be fitted in proposed location	
57	Proposed road	Proposed	6	1	0	URBIS AXIA 3.1, 5384 INTEGRATED LENSES , 16 OSLOM SQUARE GIANT, 870MA	LED	5.5	5384	530393.420	120892.492	100	Back of Footpath	DNO	Proposed column and lantern to be fitted in proposed location	
58	Proposed road	Proposed	6	1	0	URBIS AXIA 3.1, 5384 INTEGRATED LENSES , 16 OSLOM SQUARE GIANT, 870MA	LED	5.5	5384	530370.906	120918.192	100	Back of Footpath	DNO	Proposed column and lantern to be fitted in proposed location	
59	Proposed road	Proposed	8	1	0	URBIS AXIA 3.1, 5384 INTEGRATED LENSES , 16 OSLOM SQUARE GIANT, 870MA	LED	5.5	5384	530396.610	120879.851	100	Back of Footpath	DNO	Proposed column and lantern to be fitted in proposed location	
60	Proposed road	Proposed	8	1	0	URBIS AXIA 3.2, 5293 INTEGRATED LENSES, 24 OSLOM SQUARE GIANT, 900MA	LED	8.65	5293	530420.897	120873.284	100	Back of Footpath	DNO	Proposed column and lantern to be fitted in proposed location	
61	Proposed road	Proposed	8	1	0	URBIS AXIA 3.2, 5293 INTEGRATED LENSES, 24 OSLOM SQUARE GIANT, 900MA	LED	8.65	5293	530430.555	120849.685	100	Back of Footpath	DNO	Proposed column and lantern to be fitted in proposed location	
62	Proposed road	Proposed	8	1	0	URBIS AXIA 3.1, 5295 INTEGRATED LENSES, 16 OSLOM SQUARE GIANT, 870MA	LED	5.72	5295	530446.208	120831.892	100	Back of Footpath	DNO	Proposed column and lantern to be fitted in proposed location	
63	Proposed road	Proposed	8	1	0	URBIS AXIA 3.1, 5295 INTEGRATED LENSES, 16 OSLOM SQUARE GIANT, 870MA	LED	5.72	5295	530460.449	120815.258	100	Back of Footpath	DNO	Proposed column and lantern to be fitted in proposed location	
64	Proposed road	Proposed	8	1	0	URBIS AXIA 3.1, 5295 INTEGRATED LENSES, 16 OSLOM SQUARE GIANT, 870MA	LED	5.72	5295	530476.449	120795.609	100	Back of Footpath	DNO	Proposed column and lantern to be fitted in proposed location	
65	Proposed road	Proposed	8	1	0	URBIS AXIA 3.1, 5295 INTEGRATED LENSES, 16 OSLOM SQUARE GIANT, 870MA	LED	5.72	5295	530486.514	120777.970	100	Back of Footpath	DNO	Proposed column and lantern to be fitted in proposed location	
66	Proposed road	Proposed	8	1	0	URBIS AXIA 3.2, 5293 INTEGRATED LENSES, 24 OSLOM SQUARE GIANT, 900MA	LED	8.65	5293	530528.817	120752.496	100	Back of Footpath	DNO	Proposed column and lantern to be fitted in proposed location	
67	Proposed road	Proposed	6	1	0	URBIS AXIA 3.1, 5384 INTEGRATED LENSES , 16 OSLOM SQUARE GIANT, 870MA	LED	5.5	5384	530532.972	120724.172	100	Back of Footpath	DNO	Proposed column and lantern to be fitted in proposed location	
68	Proposed road	Proposed	6	1	0	URBIS AXIA 3.1, 5384 INTEGRATED LENSES , 16 OSLOM SQUARE GIANT, 870MA	LED	5.5	5384	530528.391	120711.573	100	Back of Footpath	DNO	Proposed column and lantern to be fitted in proposed location	
69	Proposed road	Proposed	6	1	0	URBIS AXIA 3.1, 5384 INTEGRATED LENSES , 16 OSLOM SQUARE GIANT, 870MA	LED	5.5	5384	530528.171	120711.321	100				