

South Dublin County Council Public Lighting Specification

**Public Lighting Section
South Dublin County Council**

Revision	Date	Initial
0	January 2016	CL
1	June 2016	MM
2	November 2016	GM

Contents

1	General Requirements	1
2	Health and Safety	1
3	Client and Designer Duties	2
4	Works to Partial Circuits.....	2
5	Lighting Design.....	3
6	Design Approval	4
7	Materials Specification.....	6
	7.1 Cable Specification	6
	7.2 Ducting Specification.....	6
	7.3 Inspection Chamber Specification	6
	7.4 Column Specification.....	7
	7.5 Customer Supply Pillars	10
8	Civil Works	12
	8.1 Column Installation	12
	8.2 Trenching and Reinstatement Requirements	13
9	Electrical Design	14
	9.1 General.....	14
	9.2 Unmetered Cabinets.....	15
	9.3 Cable Design and Electrical Service Design - Metered Cabinets	15
	9.4 Lighting Column.....	16
10	LED Lantern Specification	17
11	Taking in Charge	20

Appendices

Appendix A; SDCC Flow Process Chart

Appendix B; Design Checklist

Appendix C; Inspection Checklist

Appendix D; Standard Details Drawings

1 General Requirements

The Public Lighting Services of South Dublin County Council situated at County Hall, The Square, Tallaght, Dublin, is the official lighting authority for housing estates, industrial and commercial developments in South Dublin County.

All lighting schemes in housing, industrial or commercial developments carried out by developers or their contractors in those areas shall comply with the requirements of and be approved by this office, irrespective of whether the lighting is to be taken in charge or not.

This guide sets down specified standards and technical specifications which shall be complied with by developers undertaking public or private developments to assist them in providing adequate lighting to the Irish Standard for road lighting, I.S. EN 13201-2:2015 while observing ETCI wiring regulations and ESB Networks Distribution System interface requirements. This document sets out the general public lighting requirements and commissioning process for all such developments.

In addition, designers should observe the general guidance offered in BS 5489-1:2013 Code of Practice for the Design of Road Lighting. Particularly with regard to locating columns, and the calculation of maintenance factors.

Where special circumstances occur, that require deviation from this document, these deviations shall be clearly agreed in writing with South Dublin County Council's Public Lighting services in advance of any work commencing on site and as such, must be adhered to for any PL installation to be taken in charge by South Dublin County Council.

SDCC PL Section shall undertake to liaise with ESN to ensure connection agreements are in place and shall issue the electrical contractor with the MPRN Numbers required for full completion of the RECI certs once the final electrical inspection has been undertaken and approved by the SDCC PL Inspectors.

2 Health and Safety

- 2.1** No works shall take place on any public lighting asset without prior notification and written approval from South Dublin County Council Public Lighting Section.
- 2.2** A site specific risk assessment and all relevant safety documentation where works are to take place on existing public lighting assets shall be provided to South Dublin County Council at least two weeks before installation commences.
- 2.3** All persons employed on the installation of PL must have received appropriate Health and Safety training in accordance with the Safety, Health & Welfare at Work Act 2005 & The Safety Health and Welfare at Work (Construction) Regulations 2013 and training in roadside working in accordance in particular with Part 13 of the Safety, Health & Welfare at Work (Construction) Regulations 2006 as amended and the ESB Networks Code of Practice for avoiding Danger from Overhead Electricity Lines.
- 2.4** Any person who carries out specific works on PL in proximity to ESB Networks must be authorised to do so by ESB Networks. Full details of the authorisation process can be found in the publication "ESB Requirements for Work on Public Lighting on ESB Networks", June 2010.

- 2.5 Any person who carries out specific works on PL in proximity to ESB networks is to hold a PL Safety Approval Certificate issued by the Local Authority confirming that he is competent to carry out such works.
- 2.6 All PL Safety Approvals must be authorised by a Responsible Manager in the Local Authority for which the person being authorised is working at the time of approval.
- 2.7 Account shall be taken of any traffic management measures that may be required during the installation of public lighting schemes including compliance with Chapter 8 of the Traffic Signals Manual published by the Department of Transport. This includes the requirement that a traffic management plan by a holder of a current valid Traffic Management Designer CSCS card and implemented on site by a current valid FÁS CSCS Signing, Lighting and Guarding on roads license holder.

3 Client and Designer Duties

- 3.1 Developers and/or their agents shall ensure they comply with their statutory duties defined in the Safety, Health and Welfare at Work (Construction) Regulations 2013, particularly those duties detailed in Part 2, Section 7 (2) and (5).
- 3.2 Designers submitting lighting designs shall ensure they comply with their statutory duties defined in the Safety, Health and Welfare at Work (Construction) Regulations 2013, particularly those duties detailed in Part 2, Section 15.
- 3.3 The Safety, Health and Welfare at Work (Construction) Regulations 2013 clearly states that the client (developer) must appoint a competent designer to undertake all design work. This statutory duty applies to lighting and associated electrical infrastructure design. The appointed competent designer must comply with their statutory duties which are clearly defined in S.I 291.
- 3.4 Designers must prepare, record and store written documentation clearly showing how design decisions are arrived at. Under S.I 291 this information must be shared (if requested) with others that have an interest in the project. SDCC clearly has an interest in all designs carried out for installation in its locale and may request such records from designers.
- 3.5 SDCC reserve the right to have lighting designers demonstrate their competence to undertake lighting and associated electrical infrastructure designs.
- 3.6 Developers and their agents should be aware that ‘designs’ offered on an ‘advisory basis’ or on a *pro bono* basis still have to comply with the statutory duties defined in the Safety, Health and Welfare at Work (Construction) Regulations 2013.

4 Works to Partial Circuits

- 4.1 All works to partial circuits will be subject to the full testing and certifying requirements of the ETCI ET101:2008.

- 4.2** All electrical tests shall be witnessed by the South Dublin County Council Public Lighting Electrical Inspector.
- 4.3** Where works are to be undertaken on existing circuits, whether partial or whole, particular note must be taken of the requirements of Annex 63B paragraph 1 (ET101). “Should the installer become aware of any defect in any part of the installation that would impair the safety of the new work, the client must be informed in writing thereof. No new work should commence until these defects have been made good.”
- 4.4** Where existing hardware (columns, supply cabinets etc.) are to be relocated/reused or in any way retained, the contractor must certify that all retained hardware is structurally sound and without damage to the protective coatings.
- 4.5** All due care must be taken to protect existing hardware. Any damage to existing equipment (both electrical and structural) must be reported and it is the Contractor’s responsibility to supply and replace any damaged equipment in the course of their works.
- 4.6** Prior to the disconnection of any existing public lighting installations, a full Risk Assessment shall be undertaken regarding the impact of the interruption of the street lighting provision on all users, pedestrian, cyclist and vehicular. If deemed necessary, temporary lighting shall be provided.
- 4.7** Where the interruption of the street lighting provision is to be avoided by the phased scheduling of works, written agreement must be sought from South Dublin County Council for permission to temporarily re-energise sections of the circuits on a phased basis without prior inspection.
- 4.8** If granted, the permission referenced above in no way absolves the Contractor from his previously stated responsibilities regarding the inspection and testing of the renewed circuits in the presence of SDCC’s electrical inspector.
- 4.9** All electrical installation work is to be carried out by a contractor registered with RECI or ECSSA.
- 4.10** All waste is to be disposed of in accordance with the WEEE Directive. Before lanterns are disposed of they are to be offered to South Dublin County Council and delivered to their stores if requested.

5 Lighting Design

- 5.1** Lighting designers shall refer to SDCC PL specifications and ensure they comply with SDCC requirements.
- 5.2** Lighting designs shall comply with SDCC PL specifications even if there is no intention for the lighting infrastructure to be taken in charge by SDCC.
- 5.3** Lighting designers should liaise with SDCC PL Department at an early stage of the design process.

- 5.4** Lighting designers shall refer to the following Regulations, Standards, and Guidance Documents:
- 5.4.1** S.I No. 291 of 2013: Safety, Health and Welfare at Work (Construction) Regulations 2013;
 - 5.4.2** National Rules for Electrical Installations ET 101: 2008 Fourth Edition or later;
 - 5.4.3** I.S. EN 13201-2:2015 Road Lighting – Part 2: Performance Requirements;
 - 5.4.4** BS 5489-1:2013 Code of Practice for the Design of Road Lighting. Part 1: Lighting of Roads and Public Amenity Areas;
 - 5.4.5** Housing Schemes: Guidebook for ESB Networks Standards for Electrical Services (Revision 5).
- 5.5** Lighting designers shall approach the design process in a holistic manner, taking account of lighting levels in the general area and on the access points to the project/development. Maintenance access and longevity of installation shall be central to the design.
- 5.6** Lighting designers shall pay attention to the General Principles of Prevention, both for construction and for future maintenance.
- 5.7** Careful consideration shall be given to future maintenance requirements. Particularly with regard to safe access for maintenance crews to the lighting equipment, including safe ingress and egress to the equipment location.
- 5.8** The design should represent the planned construction phases and shall be self-contained within each construction phase.
- 5.9** No component of the lighting infrastructure shall pass through, or under private property.
- 5.10** Consideration shall be given to the protection of columns from vehicle strikes. Column set back guidance offered in 4.3.3.3 of *BS5489-1:2013* shall be observed.
- 5.11** When shared surfaces are used, a suitable method of column protection shall be offered that does not conflict with the ethos of shared surface design principles.

6 Design Approval

- 6.1** All lighting, lighting infrastructure and electrical designs must be approved in writing by SDCC PL department before any associated works commence on site.
- 6.2** The design approval system is a simple pass or fail process and is designed to encourage sustainable, energy efficient lighting solutions, utilising appropriate modern equipment and technology.
- 6.3** SDCC provides a check list for designers to complete and submit with their design for approval. The list should be completed along with the required supporting documents. Incomplete submissions will not be approved.

- 6.4** All exterior lighting and associated electrical infrastructure must be submitted in the following format:
- 6.4.1** Lighting performance modelling calculations by Lighting Reality® in soft format. The cover shall show:
 - 6.4.1.1** The identity of the lighting designer;
 - 6.4.1.2** The project name;
 - 6.4.1.3** The lighting classification designed to;
 - 6.4.1.4** The combined maintenance factor for the luminaire and how it was derived.
 - 6.4.2** Lighting Reality® report in PDF format.
 - 6.4.3** CAD drawing in soft format showing the following information:
 - 6.4.3.1** The site boundary;
 - 6.4.3.2** All landscaping details;
 - 6.4.3.3** All services;
 - 6.4.3.4** All private areas to be hatched and identified;
 - 6.4.3.5** Individually numbered columns with icons of a size to allow accurate assessment of the column positions;
 - 6.4.3.6** PL ducts;
 - 6.4.3.7** PL cable access chambers;
 - 6.4.3.8** Individually numbered micro pillar locations;
 - 6.4.3.9** ESB cabinet locations;
 - 6.4.3.10** Individually numbered single line circuit diagrams;
 - 6.4.3.11** All duct, column foundation or any other detail shall only show SDCC approved versions. Non approved versions shall not be included in any drawing submitted to contractors.
 - 6.4.4** Technical specifications for the proposed equipment, including TM21 and LM80 reports.
 - 6.4.5** Written details outlining the OEM warranty and the procedure for transferring warranty to SDCC after the project is taken in charge.
 - 6.4.6** Voltage drop calculations for each circuit.
 - 6.4.7** Lantern details including number of LEDs and drive current must be provided.
 - 6.4.8** Energy calculations including the designed dimming regime.
- 6.5** The substitution of PDF type files over requested soft copy versions prevent SDCC from fulfilling their statutory duties detailed in S.I. 291 and are therefore not acceptable.
- 6.6** Any changes to the originally approved lighting design must be submitted to SDCC PL for additional approval before being undertaken on site.

7 Materials Specification

7.1 Cable Specification

- 7.1.1** NYCY cable to DIN VDE 0276603 (0.61kV) must be used throughout the installation, suitably sized. Steel Wired Armour (SWA) cable is not accepted.
- 7.1.2** No jointing of cables will be accepted in any circumstances.
- 7.1.3** All cable is to be installed in ducting to SDCC's Specification.

7.2 Ducting Specification

- 7.2.1** Ducts must be single walled, colour red, high density polyethylene (H.D.P.E.).
- 7.2.2** The duct shall be 107mm outer diameter with a wall thickness of 5mm.
- 7.2.3** The duct must have the words "Public Lighting" stamped at 1m intervals. The letters must be 9mm in height.
- 7.2.4** Ducting shall be laid in fully coupled unbroken lengths, which are accessed at the cable drawing-in stage by cutting at each lighting column or other termination point. Draw wires must be provided at all termination points. Refer to SDCC PL's STANDARD DETAILS drawing, Appendix D.
- 7.2.5** Ducting shall be laid to the appropriate depth as the ETCI requirements.
- 7.2.6** Draw wires must be provided at all termination points.
- 7.2.7** At road crossings and under cobble locked surfaces, driveways etc., two lengths of ducting shall be provided. Ducting setback in relation to road edge will vary depending on the set back of rooted lighting columns. In general the ducting shall be up to 500mm in front of the column positions, with a minimum of 140mm between centre of the duct and the face of the column.
- 7.2.8** Ducting shall be properly coupled.
- 7.2.9** All ducts shall be marked with electrical marking tape at 300mm below finished ground level.

7.3 Inspection Chamber Specification

- 7.3.1** Access chambers must be provided at all access points for road crossings. Access chambers shall only be installed in Group 2 areas suitable for loading class B125 i.e. Footways, pedestrian areas and comparable areas.
- 7.3.2** Access chambers shall be "ej" manufactured FJ 60/45, to EN124, loading class B125, suitably resistant to intrusion, of at least 775mm x 625mm square.
- 7.3.3** At road crossings, access chambers should, by location, indicate the position of buried cables.

- 7.3.4** The lock shall be formed such that the replacement of both a damaged bolt and a damaged nut is provided for.
- 7.3.5** All inspection chambers on carriageways shall be of the same dimensions as those listed above.
- 7.3.6** The chamber shall be to EN 124 Group 4.
- 7.3.7** High Strength engineering bricks or in situ concrete shall be used to make up the manhole walls directly under the frame. Standard concrete blocks or bricks shall be accepted.
- 7.3.8** Chamber covers and frames shall be approved by a suitably licenced third party such as NSAI, Lloyds register or British Standards Institute of Quality Assurance Services).
- 7.3.9** Mortar shall have 1:3 cement sand dry volume ratios. The sand shall comply with BS EN 13139, BS 1200:2013.
- 7.3.10** The engineering bricks shall comply with BS EN 772.

7.4 Column Specification

7.4.1 General

- 7.4.1.1** All columns shall be of the same type within any one scheme.
- 7.4.1.2** Tubular or octagonal steel columns complying with B.S. 4360 Grade 43C shall be used.
- 7.4.1.3** They shall be protected against corrosion by hot-dip galvanising to BS EN 1461.
- 7.4.1.4** They shall comply with B.S 5649.
- 7.4.1.5** Public Lighting columns shall be designed to the BS-EN20 family of standards.
- 7.4.1.6** The columns specified in line with BS EN 40 must state a minimum 25 year Design Life, a minimum Terrain Category of TC3 and reference the relevant 10 minute mean wind velocity.
- 7.4.1.7** The lighting column manufacturer shall be registered with and certified by either NSAI, British Standards Institute of Quality Assurance Services or Lloyds Register Quality Assurance Register for the design, manufacture, supply and verification of road lighting columns and brackets under their quality assessment schedule to ISO 9001.
- 7.4.1.8** The quality assurance certification shall relate to the specific lighting column material being proposed. SDCC reserves the right to request proof of certification from the proposed column manufacturer.

- 7.4.1.9** There inner tube of the column shall not be included in Type 5 calculations, unless press stressed. Note that welding in profile does not constitute press stressed.
- 7.4.1.10** Column specification and associated windage calculations must include for 1.5m square sign and assume a 1.5m bracket length, even where the current design does not call for a sign or bracket.
- 7.4.1.11** All octagonal columns must be fabricated with longitudinal welding only.
- 7.4.1.12** All tubular columns must incorporate an anti-rotational device. For tubular columns in order to prevent the column rotating after installation, a 15mm diameter galvanised threaded bar with two fixing nuts, extending 150mm beyond each edge of the column, shall be fitted 150mm above the base of the column.
- 7.4.1.13** A vertical cable entry slot with smooth edges, rounded at top and bottom and measuring 150mm x 75mm shall be provided in the column root. The entry slot shall be in line with the column door opening.
- 7.4.1.14** The top of the entry slot shall be at 300mm below ground level.
- 7.4.1.15** A bituminous coating to a level 250mm above finished ground level shall protect the planted portion and above of both the inside and outside of each column. In order to prepare the surfaces for the bitumen, any dirt or contamination shall be removed and the surface degreased to remove any zinc salts. One coat of metal etch primer shall then be applied followed by two coats of Mebon Ruskilla Bitumen HB (MB00) Black or equivalent each coat being a minimum of 75 microns thick.

7.4.2 Column Door Specification

- 7.4.2.1** The door opening shall have a welded-in frame with an all-round weather strip. A flat steel door (specification available on request) of minimum thickness 3mm secured by one (preferred) or two triangular head bolts shall be fitted.
- 7.4.2.2** The locking triangular head bolts shall have a narrow neck under the head to take a retaining washer. The bolt threads shall be lightly greased to prevent seizing or binding. Bolts must be secured to an 8mm nut welded in place.
- 7.4.2.3** Nuts held by compression or clipped in place shall not be accepted.
- 7.4.2.4** All doors shall be of standard size and be fully interchangeable. They shall not require any site adjustment or modification to fit each column properly.

- 7.4.2.5 A baseboard, with a minimum working area equal to the door opening, shall be fitted in each column and shall be treated with three coats of intumescent varnish to prevent fire propagation.
- 7.4.2.6 The varnish shall be as manufactured by Hamron (type WD – 05) or approved equivalent and the rate of coverage shall be 2.5 sq. m per litre in order to provide Class A protection.
- 7.4.2.7 The clearance between baseboard and inside face of door when secured shall not be less than 100mm. The baseboard must be capable of being removed and replaced. Backboard fixings shall be recessed below the surface of the board so as not to impede the fixing of electrical equipment to the backboard. An earth terminal shall be provided in a readily accessible position at the bottom of the opening.
- 7.4.2.8 Plasma cut doors shall be accepted subsequent only to prior submission to and approval by SDCC Public Lighting Engineer.

7.4.3 Raise and Lowering Column

- 7.4.3.1 Columns located in areas inaccessible to standard maintenance equipment must be base-hinged columns as manufactured by Abacus Lighting.
- 7.4.3.2 Gear must be accessible by lowering the column only.
- 7.4.3.3 All base hinged columns must be delivered with a standard anti-vandal locking screw as standard.
- 7.4.3.4 The base hinged column must only be capable of being lowered with the universal lever.
- 7.4.3.5 The base hinged column must be designed to EN40, with a minimum 25 year Design Life, a minimum Terrain Category of TC3, reference the relevant 10 minute mean wind velocity.
- 7.4.3.6 They shall be protected against corrosion by hot-dip galvanising to BS EN 1461.
- 7.4.3.7 Where columns are to be installed into parks and green spaces and hinged columns are deemed inappropriate, vehicular access must be provided for maintenance actions. The minimum paved width required for the maintenance truck fitted with a hoist is 3.5m. The paved or tarmacked path must be of sufficient structural strength to support the weight of the truck and the point pressure of the truck stabilisers without incurring damage.

7.4.4 Anti-Vandal and Bespoke Columns

- 7.4.4.1 Anti-vandal columns are to be installed only in areas where a 30kph speed limit is in place.

- 7.4.4.2 The access door for the anti-vandal pole is to be installed 300mm below the full height of the column.
- 7.4.4.3 The access door for anti-vandal columns must be 400mm by 100mm in dimension.
- 7.4.4.4 They shall be protected against corrosion by hot-dip galvanising to BS EN 1461.
- 7.4.4.5 Bespoke, or decorative columns shall be accepted subsequent only to prior submission to and approval by SDCC Public Lighting Engineer.
- 7.4.4.6 Passively safe columns shall be accepted subsequent only to prior submission to and approval by SDCC Public Lighting Engineer.

7.4.5 Brackets

- 7.4.5.1 The use of outreach brackets on new installations is not encouraged by SDCC's Public Lighting Section.
- 7.4.5.2 Outreach bracket designs are to be approved prior to installation, particularly where decorative brackets are being used.
- 7.4.5.3 Where outreach brackets are required for lighting performance reasons, both the columns and brackets assemblies shall conform to the deflection requirements of Class 2 as defined in IS EN 40-3-3.
- 7.4.5.4 The removable bracket arms for the columns shall be of steel construction and protected against corrosion by hot-dip galvanising to EN 40.
- 7.4.5.5 Bracket arms and column shaft shall be of the sleeve fitting type, with the bracket fitting snugly over the column.
- 7.4.5.6 For tubular columns, the bracket shall be secured by eight hexagonal headed stainless steel screws, minimum diameter 8mm. Brackets used for columns greater than 8 metres must have 8mm nuts welded to the outer face of the bracket wall to enable secure fixing. No screws are required for octagonal bracket sleeves on octagonal columns.
- 7.4.5.7 Brackets for use with ESB owned columns shall be as per ESB Requirements.

7.5 Customer Supply Pillars

7.5.1 Unmetered Pillars

- 7.5.1.1 Customer supply pillars shall be installed in land that is open to the public and shall not be erected on ground likely to remain private / inaccessible, e.g. private gardens, ESB / Bord Gais Substation enclosures etc.

- 7.5.1.2** ESB Mini-Pillars and Customer Service Pillars shall be installed a minimum of two metres apart.
- 7.5.1.3** If this is not physically possible and only with the explicit permission of ESB Networks and South Dublin County Council Public Lighting Section these may be installed closer together and equi-potentially bonded in accordance to ET101.
- 7.5.1.4** Earthing for the ESB Mini Pillar should be in accordance with the ESB National Code of Practice for Customer Interface 4th edition 2008.
- 7.5.1.5** All electrical supplies to Public Lighting installations must be publicly accessible.
- 7.5.1.6** The Mini Pillars shall be of sheet steel construction manufactured in 3mm thick steel including door and bottom plate.
- 7.5.1.7** The Customer unmetered supply pillar shall have minimum dimensions of 150mm x 250mm x 600mm. The root depth shall be 320 mm.
- 7.5.1.8** Extension plates, measuring approx. 320mm deep shall be fitted at the bottom to enable firm cementing into the ground.
- 7.5.1.9** The pillar shall be fitted with a single flat plate door of 220mm wide x 510mm high, with two triangular head captive head locking bolts which are lightly greased.
- 7.5.1.10** The plate shall have M8 nuts welded to the inside face to secure the triangular head screw.
- 7.5.1.11** The Mini Pillar shall be protected against corrosion by hot-dip galvanising in accordance with BS EN 1461 and shall be properly vented.
- 7.5.1.12** The extension plate, including the planted portion below ground and 50mm of the above ground shall be protected by a bitumous coating.
- 7.5.1.13** A block board base plate approximately 20mm thick and treated with intumescent varnish shall be mounted in each pillar.
- 7.5.1.14** All supply pillars shall have a high voltage symbol attached to the front panel.

7.5.2 Metered supply cabinets

- 7.5.2.1** Installations above 2kVA must be supplied via a metered supply.
- 7.5.2.2** Enclosures shall be made of hot-dip galvanized sheet steel to the requirements of ISO 1461, IEC 60439-1. The degree of protection shall be IP34D in accordance with the requirements of IEC 60439-5.

- 7.5.2.3** The metered section shall be fitted with a pre-drilled steel mounting plate to take the supply boards meter, cut-out and isolator.
- 7.5.2.4** As standard the enclosure shall come with a TN-S busbar system in the lower section.
- 7.5.2.5** The entries between the lower and upper section shall be no more than 50mm in diameter and fitted with plastic breakout grommets.
- 7.5.2.6** Each section shall be fitted with two 8mm standard triangular door locks. ESB National Code of Practice for Customer Interface
- 7.5.2.7** All enclosures must conform to the ESB National Code of Practice for Customer Interface.
- 7.5.2.8** Enclosures must be installed with due care for the accessibility of the enclosure for future maintenance.
- 7.5.2.9** A concrete plinth must be installed in accordance with manufacturer's guidelines.
- 7.5.2.10** Permanent access must be provided in the form of lay-bys, footpaths or access roads.

8 Civil Works

8.1 Column Installation

- 8.1.1** All columns shall be installed and oriented, where possible, so that the access door faces away from oncoming traffic.
- 8.1.2** Columns must be erected securely and vertically in the exact positions indicated in the design drawings. Columns found to be in positions other than design locations unless previously agreed with SDCC must be relocated to the design positions.
- 8.1.3** Where columns are to be situated in the vicinity of overhead high tension cables, approval must be sought from the ESBI design offices as to the exclusion zone with regards to the intended column height. Proof of this approval will be sought by SDCC PL prior to TIC.
- 8.1.4** Columns are to be installed in line with the recommended minimum clearances from the edge of carriageway to the face of the lighting columns in Table 2 of BS5489; 2013.
- 8.1.5** Where lighting columns are to be installed in the vicinity of safety barriers, they shall be located behind the safety barrier. Care shall be taken that unhindered maintenance access to the cable access door is provided.
- 8.1.6** Columns shall be erected in line with the recommendations of EN40-1 regarding planting depths of columns. The contractor shall confirm with the column manufacturer/supplier the recommended depth for the root of the columns he

proposes to use.

- 8.1.7** Columns shall be erected by planting their root portions in excavation of suitable size and secured. The excavated hole shall be pumped free of water prior to any filling with concrete. Columns shall be erected exactly vertical in a safe and workmanlike fashion using a suitable crane for hoist.
- 8.1.8** All columns shall be set such that the centre of the column door is 1.5m above the finished ground level.
- 8.1.9** Columns shall be secured by uniformly filling the hole with concrete around the base of the column up to the bottom of the cable entry slot. The concrete used shall be in accordance with the Department of the Environment Specification for Roadworks, Clause 1502, and Concrete for Ancillary Purposes (Class E).
- 8.1.10** The final 1m of incoming and outgoing cables shall be protected by Hydrodare piping or equivalent, extending 300mm into the column. The cables shall be kept level with the bottom of the entry slot to avoid cable damage due to column settlement.
- 8.1.11** Where sleeves are used, they must have an outside diameter of 400mm minimum for 6m columns. This size may increase with increasing column base widths.
- 8.1.12** Sleeves shall be installed such that the top of the sleeve finishes below the cable entry slot.
- 8.1.13** Sleeves must be of a ridged construction.
- 8.1.14** Where sleeves are to be used to facilitate the completion of footpath construction prior to column installation a 1m sq. section of footpath must be left with temporary reinstatement to ensure the duct and cable are installed without damage. Final reinstatement must occur only after final inspection by SDCC Public Lighting Inspectors.
- 8.1.15** Where the rooting depths to EN40-1 are unachievable due to existing services or ground conditions, flange mounted columns may be used only with the prior written approval of the SDCC Public Lighting engineer.
- 8.1.16** Where flanges are approved for use they must comply with EN 40 -1. A fully calculated structural base for the mounting of the flange must be submitted for SDCC's records.

8.2 Trenching and Reinstatement Requirements

- 8.2.1** All reinstatement must be carried out in line with "Guidelines for the Opening, Backfilling and Reinstatement of Trenches in Public Roads" issued by the Department of The Environment and Local Government. This is to be used as a guideline only and has been developed specifically for SDCC in the Roadmap conditions and drawings.
- 8.2.2** All reinstatement must be carried out in line with SDCC Road Opening Licence Conditions.

- 8.2.3** All reinstatement must be carried out in line with the instructions issued by the Engineer/Inspector in writing.
- 8.2.4** All re-instatement must comply fully with the following drawings attached to each license unless otherwise instructed in writing.
- 8.2.5** SDCC-DWG2-Local and Estate Roads_Conc-V1.0.
- 8.2.6** SDCC-DWG3-Local and Estate Roads_Macadam-V1.0.
- 8.2.7** Footpath reinstatement areas are defined by the following drawing (SDCC-DWG1-Footway reinstatement guidelines-V1.00).
- 8.2.8** All footpath reinstatement is also to be carried out in line with any instructions issued by the Road Maintenance Engineer/Inspector in writing.
- 8.2.9** All footpath reinstatement is also to be carried out in line with the SDCC Road Opening Licence Conditions.
- 8.2.10** Section(s) are to be fully broken out between expansion joints and replaced with the same depth of concrete or min 100mm, where vehicular access min 150mm depth.
- 8.2.11** NOTE: In the event of a discrepancy between conditions, the most stringent will apply.

9 Electrical Design

9.1 General

- 9.1.1** The electrical services design for the scheme shall be undertaken to comply with the relevant sections of ETCI National Rules, viz ET: 101.
- 9.1.2** The detailed cable design shall be undertaken to match the calculated electrical load which would typically allow between 4 and 8 fittings to be supplied per phase. The provision of earth loop/fault level calculations and circuit disconnection (fuse rupture times) shall also be completed at the design stage. Public lighting schemes requiring cable lengths in excess of 200 meters require careful design to meet the earth loop impedance requirements of ET: 101.
- 9.1.3** Disconnection/fuse rupture times shall be in compliance with those set out in ET: 101 (National Rules for Electrical Installations) rather than those specified in BS 7671 for Public Lighting and Street Furniture.
- 9.1.4** Note: In some cases South Dublin County Council may refer the electrical services designer to other Irish, UK or European Electrical Design Standards, e.g. BS7671 (UK wiring Regulations and / or associated guidance notes) etc.
- 9.1.5** The contractor shall be responsible for measuring all cable lengths before ordering, and that installation meets the requirements of ETCI rules. In particular, that the maximum volt drop is not exceeded, that the equipment installed is of sufficient rating for the prospective fault current, that the

disconnection time is satisfactory, that the cables are of satisfactory current carrying capacity for the load under running and starting conditions and that the protective devices discriminate fully.

- 9.1.6** The use of Miniature Circuit Breakers (MCB's) shall NOT be accepted in columns or pillars.
- 9.1.7** The availability of electricity supplies shall be confirmed by the Distribution System Operator (DSO) ESB Networks prior to design of the public lighting scheme.
- 9.1.8** Where upgrades to public lights on overhead network poles is being undertaken electrical isolation boxes (IP 65) (as produced by Killarney Plastics Limited) shall be fitted on the supply connection to each luminaire. These isolator boxes shall be approved for use by ESB Networks and shall meet the requirements set out in the National Code of Practice for Customer Interface as published by ESB Networks. South Dublin County Council can advise the developer with further information if required.
- 9.1.9** Main road public lighting schemes shall have power supply infrastructure installed with a minimum of 25% spare capacity (Maximum Installed Capacity at Customer Service Pillar, Cables to be sized for 25% additional load and at least 25% additional length) to allow for future extension. The spare capacity requirements shall be advised by South Dublin County Council at the design review phase.

9.2 Unmetered Cabinets

- 9.2.1** The main supply point switch fuse shall be a BS 88 HRC fuse rated appropriately to the number of downstream circuits.
- 9.2.2** The fuses and circuit breakers shall have a minimum rupture capacity of 16kA.
- 9.2.3** All outgoing circuits shall be individually fused by means of a 20A HRC cut out type fuse.
- 9.2.4** Space shall be allocated for the ESB supplied cut-out and isolator as per the ESNB National Code of Practice for Customer Interface.

9.3 Cable Design and Electrical Service Design - Metered Cabinets

- 9.3.1** The metered cabinet shall be supplied with a modular triple pole breaking fuse switch (blade fuse type DIN 00) arrangements mounted on busbars rated to IEC 60947.
- 9.3.2** The busbars shall be rated to 400A and have continuously extruded aluminium sections, insulated with a layer of polyamide with accidental contact protection to IP2x.
- 9.3.3** The fuses shall be BS88 HRC type with a minimum rupture capacity of 16kA.
- 9.3.4** Fuse sizes and discrimination values shall be stated on the submitted electrical design for approval of SDCC public lighting engineer.
- 9.3.5** Space shall be allocated for the ESB supplied cut-out and isolator and metering

arrangements as per the ESBN National Code of Practice for Customer Interface 2008.

9.4 Lighting Column

- 9.4.1** Close protection of street lighting lanterns to be provided by a 25A rated cut-out loaded with a 6A fuse incorporating a cam lever double pole disconnection rated to IEC 60947.
- 9.4.2** The cut-out shall comply with a minimum degree of protection of IP21 internally and IP42 externally and be moulded in a material which conforms to BS 7654, e.g. the MCO40DN by Lucy Oxford. Any alternative is to be submitted to the SDCC PL engineer for approval.
- 9.4.3** All terminals shall be formed from solid brass and be electroplated for temperature rise stability.
- 9.4.4** Terminals shall have a serrated bore to ensure good contact with all types of conductors.
- 9.4.5** Switches for testing purposes shall be installed, either horizontally or vertically, in each public lighting column. These switches shall be so wired as to override the photoelectric cell during daylight hours.
- 9.4.6** The switches shall be 5A rated and must clearly indicate the “ON/OFF” position.
- 9.4.7** The switches must have a minimum IP rating of IP42.
- 9.4.8** Switches shall be securely mounted in an accessible position on the baseboard.
- 9.4.9** Connector (Link) blocks shall be used for the termination of all conductors of underground cables in columns. The Connector blocks shall conform to BS 7657:2010 and rated 100Amp for use on live and neutral connections. Each block shall incorporate five serrated cable bores (terminals) each capable of accepting cable sizes up to 35sq. The metal terminal block shall remain captured within its moulding when the cover is removed.
- 9.4.10** Connector blocks shall be solidly mounted on the column baseboards. Conductors shall not share the same terminal where spare ways are available in a connector block.
- 9.4.11** Switching control of public lighting systems shall be achieved by means of photocell control. Each individual lantern shall be switched "ON" from dusk to dawn.
- 9.4.12** An individual Photo-Electric Control Unit (PECU) which shall include a “fail safe” circuit that switches the lantern on in the event of photocell failure, shall control each lantern.
- 9.4.13** The PECU shall be a 35Lux rating with 2:1 Ratio.
- 9.4.14** NEMA socket shall be wired to the lantern control circuit and shall include connection of communications cable to driver.

10 LED Lantern Specification

In order to achieve the most energy efficient and sustainable lighting solutions possible, luminaires must meet the following criteria:

- 10.1** The luminaire shall be designed specifically to be used with LED light sources. It shall comply with all relevant EN standards and EC directives required by the CE *Community Marketing Directive*.
- 10.2** Products must be tested in laboratories independently accredited to *EN 60598* and *ISO/IEC 17025*.
- 10.3** Product quality and standard measurements will be based on *IEC/PAS 62717* and *IEC/PAS 62722*.
- 10.4** Products must be designed to *EN 60598* by organisations independently accredited to that standard.
- 10.5** A TM21 report must be provided as part of the design submission package.
- 10.6** An LM80 report must be supplied as part of the design submission package.
- 10.7** The luminaire shall be supplied with surge protection of no less than 10kVa and shall be the first component in the luminaire's internal circuitry.
- 10.8** The light source shall be modular and replaceable on site. The module should be fixed in such a way as to maximise heat transfer from the LED chip and its respective board.
- 10.9** The LED shall be a natural white. Correlated Colour Index maximum 4 400 Kelvin.
- 10.10** The optic assembly will be protected to *IP66* as defined by *EN 60529*.
- 10.11** The lumen depreciation factor shall not exceed the following values at 100 000 hours at 25°C ambient:
 - 10.11.1** When driven at 200mA, LDF \leq 10%
 - 10.11.2** When driven at 350mA, LDF \leq 10%
 - 10.11.3** When driven at 500mA, LDF \leq 10%
 - 10.11.4** When driven at 700mA, LDF \leq 20%
 - 10.11.5** When driven at 1 000mA, LDF \leq 25%
- 10.12** The driver shall be housed in a dedicated, separate chamber within the lantern. The enclosure will be protected to a minimum of *IP65* as defined by *EN 60529*. The *IP* rating must be capable of being maintained throughout the design life of the lantern.
- 10.13** The driver shall be DALI registered and capable of communication and interaction with a CMS communication module should it be required in the future.

- 10.14** The manufacturer shall ensure that the driver is compatible with the LED array being used, that the driver complies with all appropriate regulations, standards, quality criteria and directives.
- 10.15** Drivers shall utilise *Constant Lumen Output* as standard.
- 10.16** Drivers shall have over temperature protection and provide power factor correction of no less than 0.9.
- 10.17** The luminaire shall be constructed from die cast aluminium and powder coated in grey. All coloured components of the luminaire shall be of the same colour code (RAL) and have the same visual appearance when viewed together.
- 10.18** Other colours will be considered for decorative lighting applications.
- 10.19** The optic shall be protected to IP 66, the driver housing shall be protected to IP 65 as defined by *EN 60529*. The IP rating must be capable of being maintained throughout the design life of the lantern.
- 10.20** The luminaire will be constructed in a robust manner and be suitable for use in the intended application and location. The lantern shall have a minimum impact resistance of *IK08*.
- 10.21** A signed declaration of conformity, along with certificates for ENC compliance and EMC Directive compliance shall be provided. The equipment will be fully compliant with RoHS requirements.
- 10.22** The weight and projected side area should be stated for the luminaire with all equipment and angle of installation considered in order to calculate column load.
- 10.23** Covers or openings on the luminaire or the gear box required to be opened during the installation or maintenance of the light point must be captive when open.
- 10.24** All screws or fixtures required to be opened during installation or maintenance of the product must be protected against corrosion and seizure for the design life of the luminaire.
- 10.25** LED failure fraction shall not be greater than 5% of the LEDs installed in the lantern over the design life of the lantern.
- 10.26** The luminaire shall provide thermal protection for all its components to ensure the luminaire and its components operate within the stated temperature parameters through the design life of the lantern.
- 10.27** Ambient temperature related to lantern performance and tests will be in the range of -35°C to +55°C. Lumen depreciation factor will be stated at 25°C.
- 10.28** Electrical connection terminals shall be indelibly marked to indicate all wiring connections and use shrouded screws. Control equipment shall bear a clear circuit diagram in order to indicate all component connections in a concise manner.

- 10.29** An additional terminal will be required to enable overriding of the PECU by means of a 'line to test'.
- 10.30** Operating voltages shall be clearly marked within the enclosure.
- 10.31** Electrical terminals shall be capable of terminating three core 2.5mm² flexible cable.
- 10.32** Any link cables, connector blocks and plug & socket arrangements must be of a suitable IP rating for their location and application and comply with all standards or directives.
- 10.33** The complete luminaire including all component parts shall be guaranteed by the manufacturer for a minimum of ten years. Full written details of the warranty must be provided with the design submission.
- 10.34** A method statement defining how the warranty claims process should be accessed by SDCC, or its agents, written by the manufacturer on the manufacturer's headed paper and signed by an identified director, must be provided with the design submission.
- 10.35** Photometric performance, including lumen output used in designs shall be at an ambient temperature of 25⁰C. An LM79 report should be available if requested by SDCC.
- 10.36** Decorative luminaires will be considered individually, but they shall generally comply with the same requirements as a functional luminaire.
- 10.37** Circuit Wattage (connected load) averaged for constant lumen output shall be stated for each luminaire variation proposed.
- 10.38** Drive current and power factor shall be stated for each luminaire variation proposed.
- 10.39** The luminaire will be individually switched via a 5 pin NEMA socket, with all communication and power connections made at the time of assembly by the manufacturer.
- 10.40** A three pin PECU shall be used to switch the luminaire. The switch value shall be 35/18 lux.
- 10.41** Decorative luminaires shall utilise a miniature PECU with a 35/18 lux switching value. While the driver shall be enabled for dimming and communication via the DALI protocol, the communication cable shall not be connected.
- 10.42** All luminaires shall have an indelible manufacturing data label affixed inside the driver compartment, clearly visible without the need to remove components. The label shall show the following information:
- 10.42.1** Manufacturer name.
 - 10.42.2** Model number/code.
 - 10.42.3** Date of manufacture.
 - 10.42.4** Batch number, if relevant.

10.43 The manufacturer shall provide the following information in accordance with the Lighting Industry Liaison Group's *A Guide to the Specification of LED Lighting Products*:

- 10.43.1** Rated input power, identifying the amount of energy consumed by the lantern, including its power supply in Watts.
- 10.43.2** Rated luminous flux in lumens in absolute photometric values. Absolute photometry results in a LOR=1
- 10.43.3** Lantern efficacy in lumens per Watt.
- 10.43.4** Luminous intensity distribution.
- 10.43.5** Correlated colour temperature in Kelvin.
- 10.43.6** Rated colour rendering index (CRI).
- 10.43.7** Rated chromaticity co-ordinate values. Initial and maintained.
- 10.43.8** Maintained luminous flux.
- 10.43.9** Rated life in hours of the LED module and the associated rated lumen maintenance.
- 10.43.10** Failure fracture corresponding to the rated life of the LED module within the lantern.
- 10.43.11** Ambient temperature for the lantern.

11 Taking in Charge

- 11.1** Lighting equipment shall not be operated prior to inspection and approved permanent connection. It must not be operated as site lighting.
- 11.2** Temporary connections shall not be undertaken.
- 11.3** The developer or the designer/contractor should follow the check list available from SDCC when compiling information essential for the council's inspectors to complete their task and submit it with the following prior to inspection:
 - 11.3.1** Copy of written approval of original design submission and written approval of any changes.
 - 11.3.2** 'As constructed' geo referenced CAD drawing in soft format showing the following information:
 - 11.3.2.1** Street Names;
 - 11.3.2.2** House numbers;

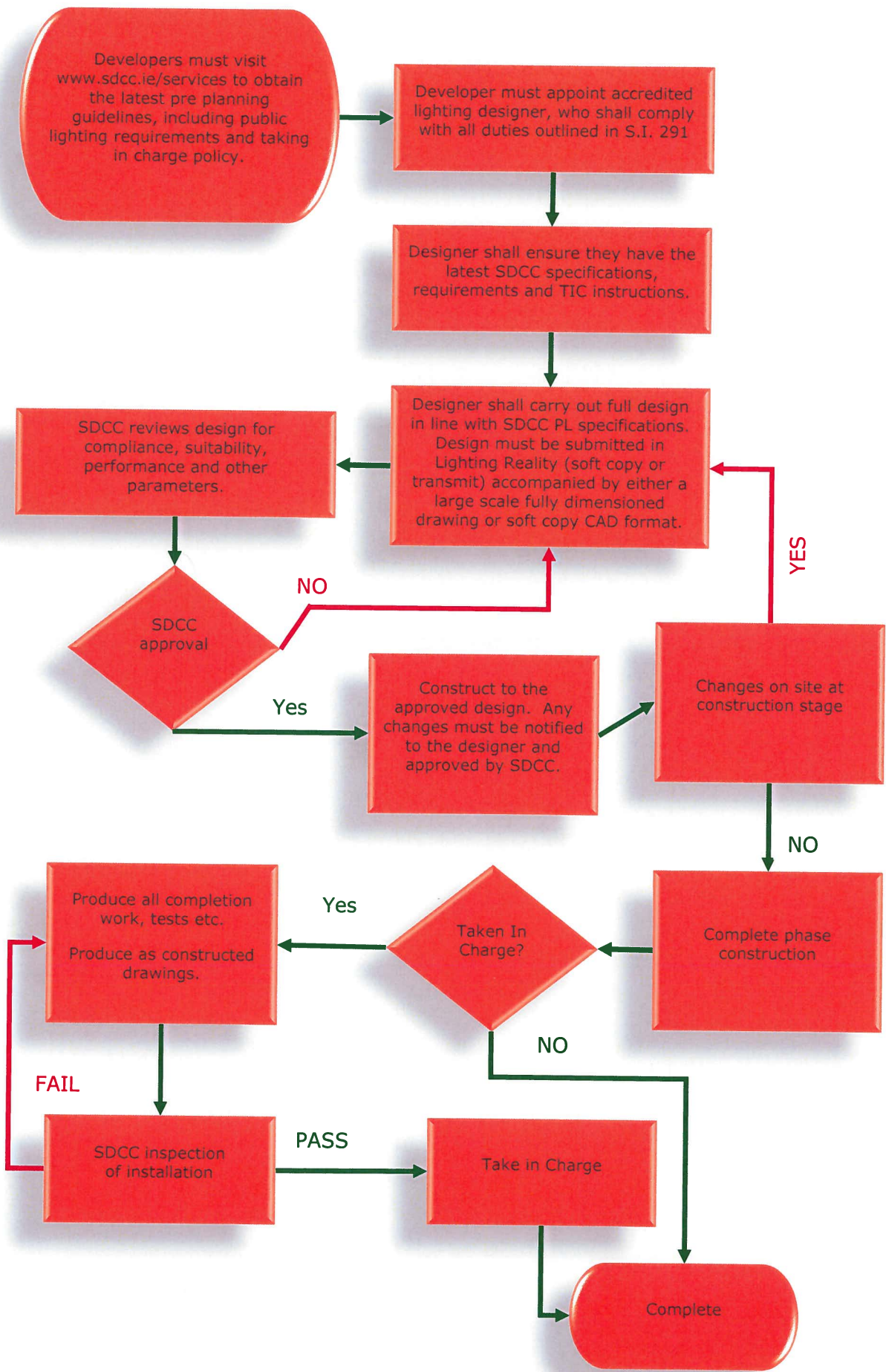
- 11.3.2.3** Individually numbered column locations. The icon scale should be such that set back can be accurately assessed;
- 11.3.2.4** Ducting locations;
- 11.3.2.5** Cable access chambers;
- 11.3.2.6** Individually numbered micro pillar locations;
- 11.3.2.7** ESB cabinet locations;
- 11.3.2.8** Individually numbered single line circuit diagrams;
- 11.3.2.9** Private areas not to be taken in charge shall be hatched and identified.

11.4 Failure to provide this information in this format will result in delays in the inspection process and ultimately non release of MPRN numbers and refusal to take in charge of the lighting infrastructure.

Appendix A

South Dublin County Council Public Lighting Flow Process Chart

South Dublin County Council Public Lighting Application Process



Appendix B

Design Checklist

Design Process Check List

To ensure that your public lighting design application meets all requirements, please complete the following check list and attach all required documentation. Approval will not be granted if documents are missing or incomplete.

No lighting infrastructure installation may commence until written approval has been received.

Project name: _____

Project location: _____

Developer: _____

Developer contact Details: _____

Planning register number: _____

Lighting designer: _____

Designer contact details: _____

Lighting class selected: _____

Approval for your lighting design cannot be processed or approved without the following documentation. Please confirm it has been completed and attached with your application:

- Lighting Reality® calculation in soft format
- Lighting Reality® Report in PDF format
- CAD drawing in soft format

Showing:

- The site boundary
- Private areas hatched and identified
- Landscaping features such as trees.
- Individually numbered column locations
- Ducting run locations
- Cable access chambers
- Individually numbered micro pillar locations
- ESB cabinet locations
- Individually numbered single line circuit diagrams
- All other services

- Technical specifications for the proposed equipment including TM 21 and LM80 report
- Written details of warranties and access to warranty procedure
- Voltage drop calculation for each circuit
- Energy calculations reflecting the designed dimming profile
- Designers risk assessment report

Sign _____

Print _____

Date _____

Appendix C

Inspection Checklist

Inspection Application Check List

To ensure that your public lighting installation can be inspected, please complete the following check list and attach all required documentation. Inspection will not be possible if documents are missing or incomplete.

No lighting infrastructure shall be operated prior to passing inspection.

Project name: _____

Project location: _____

Developer: _____

Developer contact Details: _____

Planning register number: _____

Lighting contractor: _____

Contractor contact details: _____

Inspection of your lighting installation cannot be processed or approved without the following documentation. Please confirm it has been completed and attached with your application:

Written approval of the original lighting design and any subsequent changes or alterations

'As constructed' geo referenced CAD drawing in soft format

Showing:

- The site boundary
- Street names
- House numbers
- Private areas identified by hatching
- Individually numbered column locations
- Ducting run locations
- Cable access chambers
- Individually numbered micro pillar locations
- ESB cabinet locations
- Individually numbered single line circuit diagrams
- Areas not to be taken in charge shall be hatched and identified

Voltage drop calculation for each circuit

Sign _____

Print _____

Date _____

Appendix D

Standard Details Drawing Sheet 1

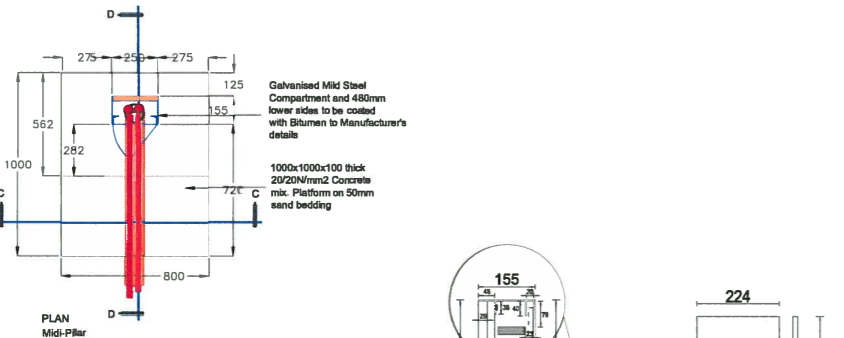
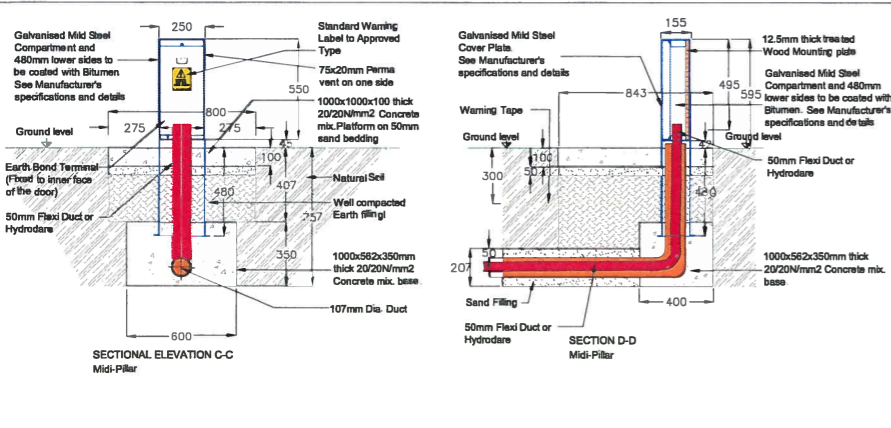


FIG-01
Midi-PILLAR

REAR ISOMETRIC VIEW OF UPPER PLATE
Scale 1 : 10

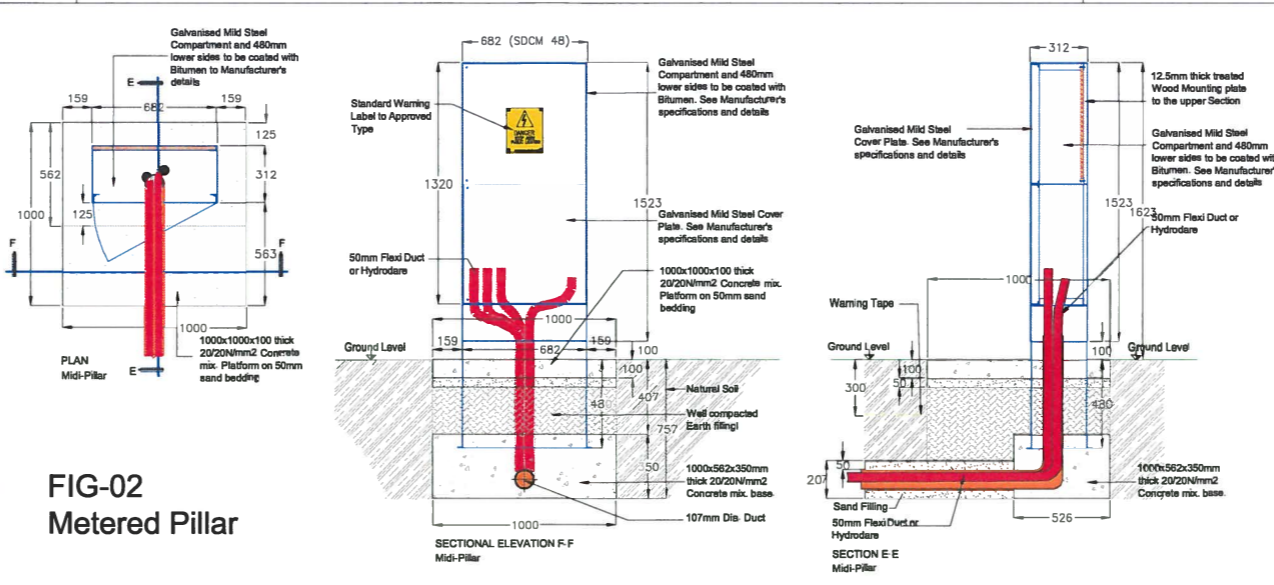
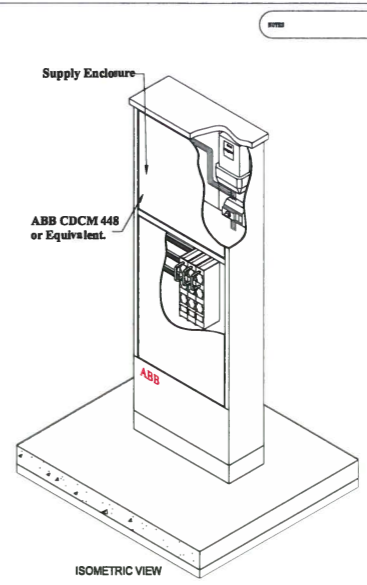


FIG-02
Metered Pillar



Metered-PILLAR
Fusing: Three Phase Pillars (Metered). South Dublin County Council specifies a modular triple pole breaking fuse-switch (blade fuse type Dia 00) arrangement mounted on busbars, to the requirements of IEC 60947. Fuses shall be HRC type with a minimum rupturing capacity (short circuit level) of no less than 16KA to BS 88. Fuse sizes and discrimination as stipulated by the engineer. The busbars shall be 400A rated and have continuously-extruded aluminium sections, insulated with a layer of polyamide, with accidental contact protection, IP2X. The busbars shall have a screen-protected contact slot. This ensures safety regardless of where on the busbar the switching device is placed. The fuse arrangement shall be to ABB or Equivalent.

Public Lighting Supply Enclosure (Metered): Enclosures shall be made of hot-dip galvanized sheet steel to the requirements of ISO 1461, IEC 60439-1. The degree of protection shall be IP34D in accordance with the requirements of IEC 60439-5. Enclosures shall have integral grounding legs which can be adjustable and have the ability to be angled to avoid protruding building foundations. All below ground parts to have heavy-duty corrosion protection. As standard the enclosure shall come with a TN-S busbar system in the lower section. (see fusing in Metered three phase pillars for more detail). The metered section shall be fitted with a pre-drilled steel mounting plate to take the supply boards meter, cut-out and isolator. The entries between the lower and upper section shall be no larger than 50mm in diameter and fitted with plastic "breakout" grommets. Each compartment shall incorporate two 8mm standard triangular door locks. All enclosures to conform to dimensions stipulated in CAD drawing SDCC-PL-024 and adhere to the ABB Kabeldon CDC type supply pillar or equivalent. A spare key shall be supplied to SDCC Public Lighting Section for each installation.

NOTE:
The enclosure must conform to the latest ESB National code of practice for customer interface.

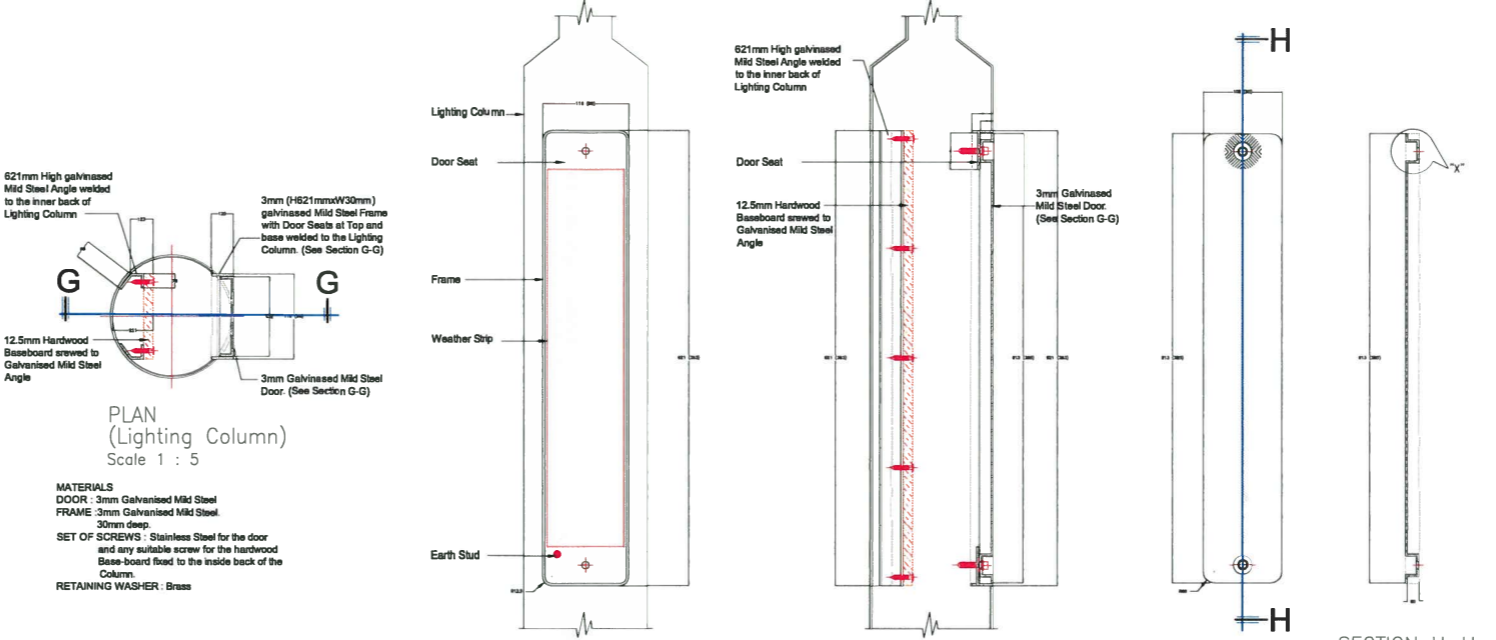


FIG-03
Lighting Column Door.

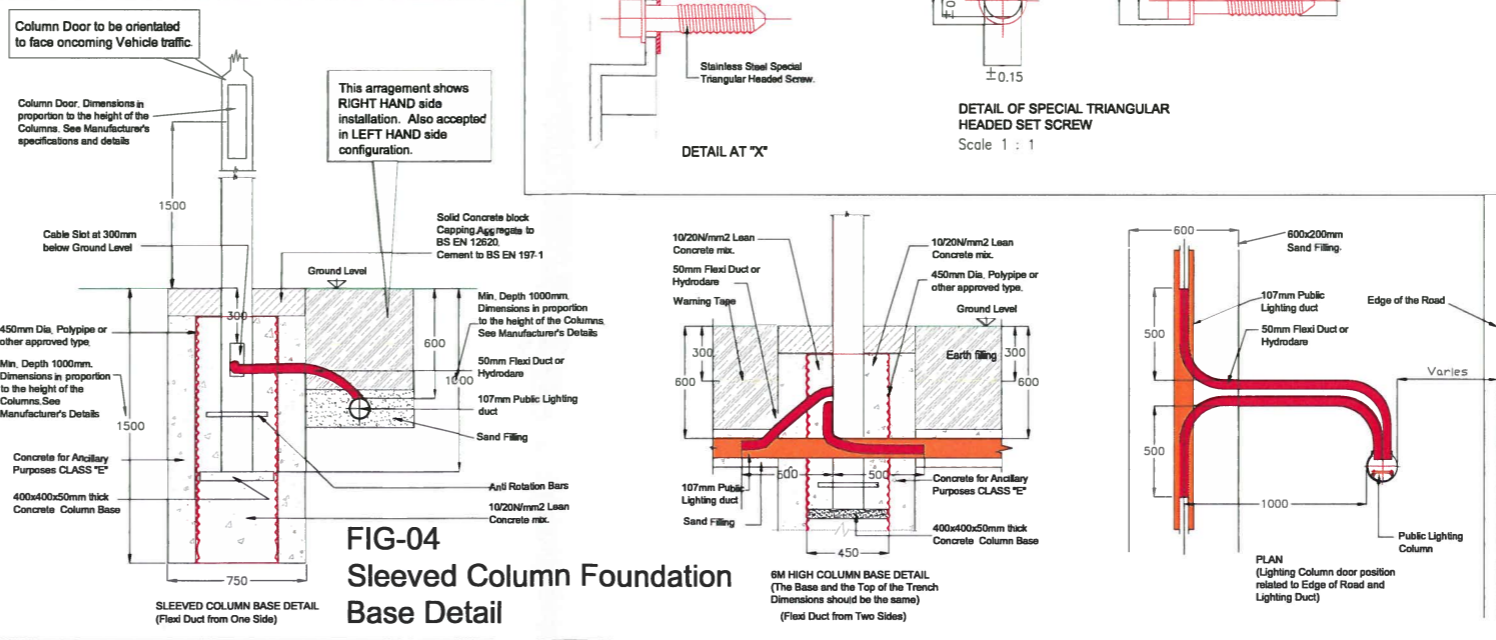


FIG-04
Sleeved Column Foundation Base Detail

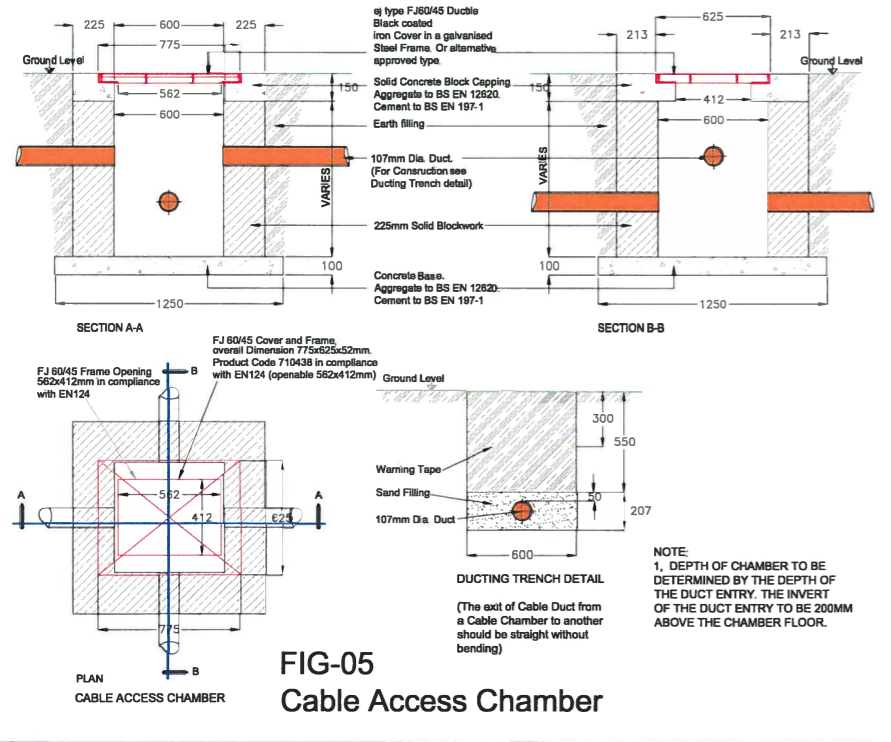


FIG-05
Cable Access Chamber

REV.	DESCRIPTION	DATE

COMHAIRLE CHONTAE ÁTHA CLIATH THEAS
SOUTH DUBLIN COUNTY COUNCIL
ELECTRICAL / PUBLIC LIGHTING SECTION

Comhairle Contae Átha Cliath Theas
South Dublin County Council
Eddie Taaffe
DIRECTOR OF LAND USE PLANNING AND TRANSPORTATION
Grainne Mowlds
Executive Engineer
Public Lighting Section

TITLE:
Standard Details Drawing
LOCATION:
South Dublin County Council's Roads and Streets

DRAWN: Ola Adewunmi	CHECKED: GM	REVISION: None added to this drawing. Plus added to Standard Column Base Detail - 08/2016
SCALE: 1:1,5,10&20	FILE NAME: G	DRG No.: SDCC/T/PL1-5
DATE: November 2016		