



Dún Laoghaire-Rathdown
County Council Comhairle Contae
Dhún Laoghaire-Ráth an Dúin

**Public Lighting Installations in
Residential and Industrial Areas**

Guidance Document – February 2015

1 General Information

1.1 Introduction

This guide is for use by developers undertaking either public or private developments to assist them in providing adequate lighting to the standards of Dun Laoghaire-Rathdown County Council. It sets out the general requirements for all such developments. Where special circumstances apply that require deviation from this document these shall be clearly agreed in writing with the public lighting section of Dun Laoghaire-Rathdown County Council in advance of any work commencing on site.

1.2 Health and Safety Requirements

The attention of the Developer is drawn to the obligations arising under the Safety, Health and Welfare at Work Act 2005 or latest approved version. Safety, Health and Welfare at Work (General Application) Regulations 2007 to 2012 or latest approved version. Safety, Health and Welfare at Work (Construction) regulations 2013 or latest approved version.

1.3 New Development Works

On satisfactory completion of the development the Council will if requested take in charge the public lighting installation subject to any conditions, which may be imposed. However should the developer fail to construct, complete, make good and maintain the works in a satisfactory manner the Council reserve right to carry out any works, which in the opinion of the Council are necessary, and to recover the cost from either the developer or the development bond.

Electronic file versions ideally in Autocad shall be supplied of the public lighting installations, wiring diagrams, lux contours and any other relevant documentation to support the maintenance of the public lighting installation.

1.4 Existing Roads

Where the development involves the construction of a local road, which will form a junction with an existing public road, the developer shall be liable for any costs which the Council or the developer may incur in upgrading or providing public lighting to light the junction so created, ideally to BS5489-1, EN13201-2003 or the latest NSAI (National Standards Authority of Ireland) versions approved, where in the opinion of the Council such work will be necessary in the interests of public safety.

Where new public lighting is replacing existing public lighting, the existing public lighting shall be kept operational until the new lighting is operational.

1.5 Procedures Prior to Taking in Charge

1.5.1 Compliance with Planning Permission

The works must be carried out in accordance with the Planning Permission/Approval, in accordance with any subsequent drawings submitted and agreed by the Public Lighting Section and in accordance with this guide. For roads that will be taken in charge by the Council independent

1.5.2 Approved Public Lighting Drawings

The developer will not make any alteration in the drawings submitted and so agreed, without the written permission of the Public Lighting Section.

1.5.3 Consultation with Public Lighting Section

It is recommended that the developer should consult with the Public Lighting Section at the earliest opportunity, preferably prior to commencing development on site.

1.5.4 Commissioning of Public Lighting

On completion of each section of the public lighting installation the developer shall furnish ESB Networks (ESBN) and a copy to the DLRCC Public Lighting Section with:

- the relevant ETCI (Electro – Technical Council of Ireland) certificate
- a location map on which the relevant lights, cable runs and mini pillars are clearly marked

In cases where the developer enters into an agreement with the Public Lighting Section for the maintenance of the lighting system prior to taking in charge, the developer shall pay the required connection fee per electrical circuit directly to the Public Lighting Section to cover the E.S.B. charges. In all other cases the developer should deal directly with the E.S.B. in relation to the public lighting connection. In this instance, the developer should notify Public Lighting Section on the number of light columns connected by the E.S.B. together with details of the lantern wattage.

Where so requested the Council will take responsibility for the energy and routine maintenance* costs prior to taking the development in charge subject to the developer entering into a written agreement with the Council covering recoupment of any costs incurred by the Council prior to the formal taking in charge. A copy of the relevant agreement is set out in Appendix 1. Where such agreement has been entered into the developer shall submit the relevant ETCI certificate, together with a location map and a cheque covering the connection cost, to the public lighting section of the Council.

** Routine Maintenance is defined as patrols, replacement of spent lamps, fuses etc. and cleaning of visors. Non-Routine Maintenance is defined as all other works not covered by routine maintenance e.g. damaged columns, lanterns, cables, photocells and resetting of skewed columns.*

1.6 Procedures for Taking in Charge

1.6.1 General Site Inspection

Following inspection by the Council and the carrying out of any tests required by the Council, the developer shall be issued with a written notification of any works which the Council consider necessary to bring the development to the required standard. All such works shall be carried out by a registered electrician employed by the developer and all costs involved shall be borne by the developer.

1.6.2 Public Lighting Operating Costs

Dun Laoghaire-Rathdown County Council will only accept responsibility for the energy and maintenance costs associated with the development when the developer has satisfied the Council that the public lighting installation has been constructed in accordance with this document and the development has been formally taken in charge by the Council.

1.6.3 Taking in Charge of Public Lighting System

Applications to the Council to have works formally taken in charge shall be made through the Building Control section of Dun Laoghaire-Rathdown County Council.

At this stage the developer shall be presented with a written notification of any additional works required by the Council to take the development in charge together with a bill for all costs incurred by the Council as a result of any defects which will have come to light subsequent to the council taking over the maintenance of the installation.

All correspondence with the Council relating to the formal taking in charge of the development shall be addressed to the Building Control Section of the Council.

2 Design

2.1 Standards

All works shall comply with latest editions of the relevant standards.

In particular the works shall be designed to take full account of the following documents: -

- Code of Practice for the design of road lighting BS5489-1:2013, EN13201-2003 or the latest Approved versions.
- Latest approved National Rules for Electrical Installations (published by ETCI) – Part 1 General Requirements & Part 2.3 Particular Requirements for Public Lighting Installations, together with latest approved ET 211, ET 101.

2.2 Junctions and Turning Bays

The developer shall take particular care to ensure that all junctions and turning bays are well lit to standard. Typical public light standard position are shown in Figure 6, Appendix 2.

2.3 **Minimum Requirements**

For roads and developments a road layout with accompanying public lighting design – pole location, lantern type, wattage, cable and fusing circuitry, lux contour diagrams etc are to be provided. The existing public lighting for the entrance and exit into the new development is to be accounted for in the design, this is to ensure that the lighting at the junction is to the lighting standards. Road sections that are to be taken in charge are to be clearly marked in the drawings.

2.4 **Cycle ways**

In the case of cycle ways the public lighting columns shall in general be located so as to provide a minimum clearance of 500mm between the face of the columns and the edges of the cycle track. Solar clocks should be used to control the lights so as to enable carrying out of day patrols. The lighting is to be the relevant lighting standards including the ILP Technical Report Number 23 “Lighting of Cycle Tracks”.

2.5 **Areas un-accessible to hoists or trucks**

Areas that are un-accessible for maintenance with a hoist truck such as pathways in parks, narrow laneways in estates etc., are to have raising and lowering columns installed to facilitate maintenance. Abacus or equivalent subject to approval by DLRCC.

2.6 **Special Areas**

Special requirements apply to the design of lighting for shared surfaces and heritage areas and the lighting of all such areas shall be specifically designed in close consultation with the Public Lighting Section of the Council.

3 **Specification**

3.1 **Introduction**

3.1.1 **Developers Responsibilities**

The Public Lighting Section of Dun Laoghaire-Rathdown County Council is the official lighting authority for housing estates, industrial and commercial developments in Dun Laoghaire-Rathdown County. All lighting schemes in housing, industrial or commercial developments carried out by developers or their contractors within the county shall comply with the requirements of and be approved by this section.

In the case of all developments, including those taken in charge, the developer shall be responsible for: -

- The design of the installation;
- Arranging the connection of the electrical supply;
- Paying any connection charges;
- All work necessary to maintain the installation;
- Paying the energy costs of the installation.

3.1.2 **Taking in Charge**

Dun Laoghaire-Rathdown County Council shall only become responsible for the energy and maintenance costs after a development has been formally taken in charge by the Council.

3.1.3 **Electrical Contractor**

All electrical work must be carried out by a competent contractor with previous experience of carrying out an equivalent public lighting installation.

3.2 **Luminance Levels**

3.2.1 **Standards**

The installed lighting shall meet BS5489-1, EN13201-2003 or the latest approved versions. Designs shall include the report from the software design package Lighting Design or equivalent showing adherence to the standards

3.3 **Lanterns**

Lanterns where unless otherwise approved are to be LEDs with the following specifications:

- Electronic driver with LED white light not greater than 4,000k
- Design life LM80 for greater than 15 years using TM21-11 test methods
- Driver current not greater than 750mA
- Impact resistance rating: <IK08
- IP rating <IP65

Colour coding stickers/painting shall be placed on the underside of lanterns to identify the total wattage (lamp and gear). There shall be no moving parts ex. fans are not permitted in the lanterns.

3.3.1 **General**

The lanterns shall comply with the requirements of BS 4533 Section 102, Luminaries, Standard and Specification (or equivalent).

3.3.2 **Construction**

The lantern shall consist of pressure die-cast aluminium outside where feasible. The lower portion of the lantern shall consist of a single piece bowl hinged to the canopy by stainless steel hinges and secured by one or more quick action stainless steel toggle fasteners. The lantern shall be of a suitably robust construction so as to be vandal resistant.

The bowl shall be made of an ultraviolet stabilised polycarbonate, which is specially toughened so as to be vandal resistant or toughened glass. The lantern shall be sealed to minimum IP 65, dust tight and jet proof. The control gear compartment shall be sealed to minimum IP 54.

3.3.3 **Threshold Increment**

Threshold increment shall be as EN13201 standards.

3.3.4 **Control**

Switching of the street lighting shall be made by solid-state photoelectric switches, each light being individual controlled, as manufactured by SELC or approved equivalent. A 5-amp tumbler switch surface mounted type tested to the BS 3676, (or equivalent). Specification for switches for household and similar fixed electrical installations shall be provided in the base compartment of the lighting column for daytime testing by short-circuiting the photoelectric switch.

Installations installed in parks and areas where a night patrol is not feasible shall be controlled by a solar clock to facilitate day time patrol inspections.

3.4 **Control Gear**

3.4.1 **Ignitors**

Energy efficient electronic control gear is to be used for lanterns.

3.5 **Columns and Bracket Arms, Surface Mounted Lighting**

3.5.1 **Construction**

Lighting columns and brackets shall generally: -

- be constructed of tubular or tapered octagonal steel;
- meet the EN 40 Lighting Column standard, Part 1 to 9, as applicable
- be of minimum column or bracket wall thickness 3 mm;
- be protected against corrosion by hot dip galvanising to BS 729 or equivalent, (Specification for hot dipped galvanised coatings on iron and steel articles);
- Comply with BS 5649 or equivalent, (Specification for materials and welding requirements).
- Plastic type columns are in general not maintainable and thus are not acceptable
- **Mains fed Bollard** type lighting pose safety problems, are difficult to maintain and thus are **not recommended**. Low voltage fed bollard lighting is acceptable where the bollard is of very robust construction and a deep rooted concrete type installation greater than 0.4m.
- Surface mounted lighting LEDs are the only type acceptable and there is to be no surface mounted lighting installed where a vehicle wheel can drive over.

The column root shall be bitumen coated. The bitumen shall extend to 250mm above ground level.

All octagonal columns are to be fabricated with longitudinal welding only. All tubular columns must incorporate a bracket anti-rotational device.

3.5.2 **Compartment Doors**

Except where specified otherwise, columns shall be flush fitted compartment doors at a height of 1.5m to centre of opening above ground level.

The door opening shall

- have a welded in frame with all round weather strip;

- Be positioned on the side away from the direction of the traffic.

A flat steel door secured by 2 screws is to be fitted. The doors and openings shall be consistent to ensure interchangeability. The door and opening shall be as shown on Figure 4, 5, Appendix 2.

3.5.3 **Base-Board**

A treated, fire resistant baseboard is to be fitted in each column. The clearance between the baseboard and the inside face of the door when fitted is to be not less than 100mm.

3.5.4 **Wiring**

A cable entry of 150mm x 75mm is to be provided in the column root, 300mm below ground level and in line with the door opening, as shown on Figure 1 and 3, Appendix 2.

The internal wiring for 6 & 8 metre columns shall be 2.5mm² stranded PVC/PVC cable. Each lantern is to be individually fused using a 6 amp MCB fuse.

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 see section 3.3.4. Incoming and outgoing cables at the minipillar shall be terminated in three 63-amp BICC type link blocks. See Figure 1, Appendix 2 for details.

Neutral blocks shall be provided for all 3 phase installations. For single phase installations neutral blocks or looping in blocks shall be BICC 63 amp type or approved equivalent and shall be fully insulated and solidly mounted on the baseboard. They shall have serrated inner surfaces on the cable terminal blocks to provide adequate gripping of the conductors. The metal terminal block shall be fixed to the back of the plastic housing to prevent it falling out when the cover is removed.

A main earth terminal shall be mounted on the baseboard to which the following shall be connected: -

- 2.5mm² PVC cable from lantern earth terminal;
- 6mm² PVC cable from the earth terminal on the column. A crimped lug shall be used for the connection to the column;

The outer sheath of the incoming and/or outgoing service cables shall be connected to the main earth terminal on the column and auxiliary mini pillar baseboard.

3.5.5 **Equipotential bonding**

If control gear is located in the base of the column, separate equipotential bonding conductors should connect all extraneous conductive parts etc. Bonding conductors should have the same cross-sectional area as those of the live conductors.

Metal structures, fences etc. in the vicinity of a mini-pillar need not be bonded to the electrical installation.

3.5.6 **Brackets**

The removable bracket arms for the columns shall be of steel construction and protected against corrosion by hot dip galvanising to EN 40: Part 4.

3.6 **Auxiliary Mini Section Pillar (also called lighting or micro- pillar)**

3.6.1 **General**

All lights are to be supplied from auxiliary mini section pillars located no closer than 2m from the ESB mini section pillars. Minipillars are to be installed in public and accessible areas. For internal wiring arrangement see Figure 1, Appendix 2.

3.6.2 **Circuits**

Recommended not more than 6 lights shall be supplied from any one circuit and not more than 4 circuits shall be taken from any one auxiliary mini section pillar.

3.6.3 **Fuses**

All outgoing circuits shall be individually fused by means of a 20-amp HRC cutout type, capable of accommodating cable sizes of up to 2.6mm². The fuses shall be rated 16kA minimum rupturing capacity and shall comply with BS 1361 (or equivalent) Specification for cartridge fuses for A.C. circuits in domestic and similar premises. The terminals of the cut-out shall be of the grooved bore type. Where there is more than one outgoing service cable a main circuit fuse shall also be provided. It shall be rated at 40-amps and shall otherwise be identical to the individual circuit fuses.

3.6.4 **Earth Terminal**

A main earthing terminal shall also be provided and all components shall be solidly secured to the baseboard. The metallic sheath of all cables in the pillar shall be connected to the earth terminal and wrapped to minimise deterioration. The baseboard shall be approximately 20mm thick.

3.6.5 **Construction**

The overall dimensions of the auxiliary mini section pillar shall be 900mm x 150mm x 150mm. Extension plates measuring 300mm deep shall be fitted at the bottom to ensure firm concreting into the ground. Ground level shall be clearly marked.

The pillar shall be vented and shall be fitted with a simple lift-out door. The lock operating section of the key shall have a triangular head. The mini section pillar shall be as shown on Figure 7, Appendix 2.

The main shell shall be 3mm thick steel, with the door and bottom plate being 2mm thick. The pillar shall be galvanised to BS 729, (or equivalent).

3.6.6 Earthing

All auxiliary mini pillars irrespective of what type of service cable used shall be earthed using an earth rod and the supply neutralised.

A main earth terminal shall be mounted on the baseboard to which the following shall be connected: -

- 6mm² PVC cable from the earth terminal on the pillar. A crimped lug shall be used for the connection to the pillar;
- 10mm² PVC cable from the earth electrode;
- 6mm² PVC cable from the neutral link.

An earth electrode shall be installed at all auxiliary mini pillars. This shall: -

- consist of a bare copper or hot-dip galvanised iron pipe or rod;
- be at least 16mm diameter;
- be driven vertically into the soil for a length not less than 1.2m

If problems arise when driving earth rods due to other underground services a horizontal earth electrode as outlined below may be used. This shall consist of either:-

- 4.5m of bare copper or galvanised iron rod of 16mm diameter
- Or
- At least 4.5m of bare copper or galvanised steel wire of at least 25mm² cross-sectional area buried in the soil at least 500m deep.

The earthing lead shall exit the pillar via the service cable entry opening. The earth electrode connection shall be: -

- enclosed in a galvanised steel box (approx. 100mm³) with an inspection cover;
- Protected against corrosion by a suitable weatherproof tape, (“DENSO or equivalent”).

All to be buried underground after inspection to avoid damage by vandals.

3.6.7 Equipotential bonding

In addition to the earthing guidelines in the above subsection, for mini-pillars unavoidably less than 2m from an ESB supply pillar, the earth terminals on each pillar must be bonded to one another with 10mm² copper conductor.

Metal structures, fences etc. in the vicinity of a mini-pillar need not be bonded to the electrical installation.

3.7 Installation

3.7.1 General

All work shall be in accordance with: -

- the latest edition of the Electro-Technical Council of Ireland’s National Rules for Electrical Installations;

- The Code of Practice for the Erection of Street Lighting Equipment issued by the Association of Street Lighting Contractors.

3.7.2 Column Installation

No trees should be installed within 3m of an existing PL column. Where a PL is required within this distance dwarf variety type trees is required. Columns shall be 6 meters or greater in height. The excavation shall be 600mm in diameter and shall be 1m deep for 6m columns to 1.3m deep for 8m columns see figure 4, Appendix 2. Columns shall be erected exactly vertical in a safe and workman-like fashion using a crane or suitable hoist.

The installation shall be carried out in 3 stages as follows: -

- **Binding concrete** – 600mm diameter excavation shall be filled with concrete to a depth of 50mm.
- **Concrete surround** – the column shall be installed at the centre of the excavation and concrete to a depth of 150mm below the service cable entry slot shall be placed into the excavation. Care shall be taken to ensure that the concrete does not cover this entry slot.
- **Service cable** – the final 1m of incoming and outgoing service cable up to the entry slot shall be protected by 50mm flexible hydrodare piping, which shall extend 30mm into the column. The cable shall be kept level with the bottom of the entry slot to avoid damage due to column settlement. See Figure 3, Appendix 2.

The concrete used shall be in accordance with the Department of the Environment Specification for Road Works, Clause 1502, and Concrete for Ancillary Purposes (Class E). Holes shall be pumped free of any water before being filled with concrete.

Installed columns shall comply in general with **Table 3-2:**

Table 3-2 – Column Details

Mounting Height	Column Base	Shaft (for tubular columns)	Planting Depth	Outreach Bracket
6 metre	140mm O.D.	76mm O.D.	1 metre	1 metre
8 metre	168mm O.D.	68mm O.D.	1.3 metre	1.5 metre

Note:

For column setback from kerb please see table 2 in the latest NSAI approved BS5489 -1 document.

On busy road sections where feasible the columns should be placed behind the footpath/cyclepath to minimise the potential of vehicle impact.

Columns shall be installed in accordance with the details shown on Figure 4, Appendix 2.

3.7.3 Ducting

Reference:

- “Guidelines for the Opening, Backfilling and Reinstatement of Trenches in Public Roads, Department of the Environment, Heritage and Local Government”, 2002 or latest approved.
- DLRCC Directions for Road Works Control November 2008 or latest approved.

Ducting to be installed in public areas to facilitate maintenance. Underground cables must be protected by enclosing them in concrete pipe, or polythene pipe ducting of high density to IS 135 Class B, or other pipe coloured red having a high resistance to impact. In any case the minimum standard acceptable is EN 50086-2-4 with a 750 Newton load rating for 5% deflection. The ducting shall be laid at a depth of 0.6m below finished ground level and warning marker tape installed over the ducting as per ETCI ET101.

The cable ducts shall be **RED in colour** (Cables between the ESB supply minipillar and the Public Lighting minipillar shall run in 125mm diameter ducting or as specified by ESB Networks) and **stamped with the legend ‘Public Lighting Duct’**, the initials PL or other acceptable markings to clearly distinguish them from ducts for any domestic power supply company.

Ducts shall be laid in fully coupled unbroken lengths at the appropriate depths specified in ET 101.

In residential developments ducts run in verges and footpaths are nominal 100mm diameter red duct stamped public lighting . A spare 100 mm. duct shall be laid across all driveway aprons.

At road crossings cables shall be run in 100 mm. diameter PVC duct. A spare 100mm duct shall also be provided.

Ducts between the ESB supply minipillar and the public lighting minipillar shall run in a 50mm solid wall red ESB duct or as specified by ESN.

3.7.4 Overhead conductors

Overhead conductors should have a vertical clearance of at least 5m above the ground. Greater clearances may be necessary for thoroughfares such as roads, railways and waterways.

Overhead conductors should have cross-sectional area of at least 6mm², and should be suitable for catenary installation.

The ESB must be consulted if overhead conductors are adjacent to ESB overhead lines. Clearance is needed for columns erected within 35m of ESB overhead lines.

Cable or wire under ESB high voltage lines should be laid underground.

3.7.5 Surface wiring on columns

Cables fixed externally to columns require additional mechanical protection such as metal tubing within 3m of the ground.

3.7.6 Cable

In general for single-phase circuits two-core cable with separate earth return path shall be used. Cables shall be 3 x 6mm² NYCY type to VDE specification 0271/5 or appropriate gauge.

Cable joints are not permitted. Cables shall be looped from column to column on each circuit. If faults develop on service cables before commissioning, the section of cable involved shall be replaced. Repairs using cable joints are not acceptable.

3.7.7 **Column Numbering**

Columns shall be numbered, as previously agreed with the public lighting section of the Council. Columns will be numbered using Council approved stickers. Black 50mm stickers on a white square background extended a minimum of 3mm outside the number. The white background shall wrap completely around the column and overlap itself for security of bonding if the column is painted. Numbers shall face towards the kerb and on-coming traffic and shall be at the height agreed with the Council.

**AGREEMENT TO PAY PUBLIC LIGHTING CHARGES
ON ESTATES NOT YET TAKEN-IN CHARGE**

1. _____ (hereinafter called “the Developer”) agrees to pay **Dun Laoghaire-Rathdown County Council** (hereinafter called “the Council”), the sum € _____ per annum (subject to an annual review as stipulated in paragraph 2 below), payable in quarterly instalments commencing on _____, in respect of Public Lighting operating and routine maintenance costs, for development works known as “**DEF Housing Estate**”, until such time as these development works are formally taken-in-charge by the Council.
2. The agreed sum of € _____ per annum shall be subject to adjustment on each anniversary date, in accordance with the movement of the Consumer Price Index in the intervening period.
3. This agreement shall not in any way diminish the Developer’s responsibility to undertake such non-routine maintenance as may be necessary; in order to keep the Public Lighting System in proper operating condition, until such time as the said development works are formally taken-in-charge by the Council.

Routine Maintenance: Patrols, replacement of spent lamps, cleaning of visors, fuses etc.

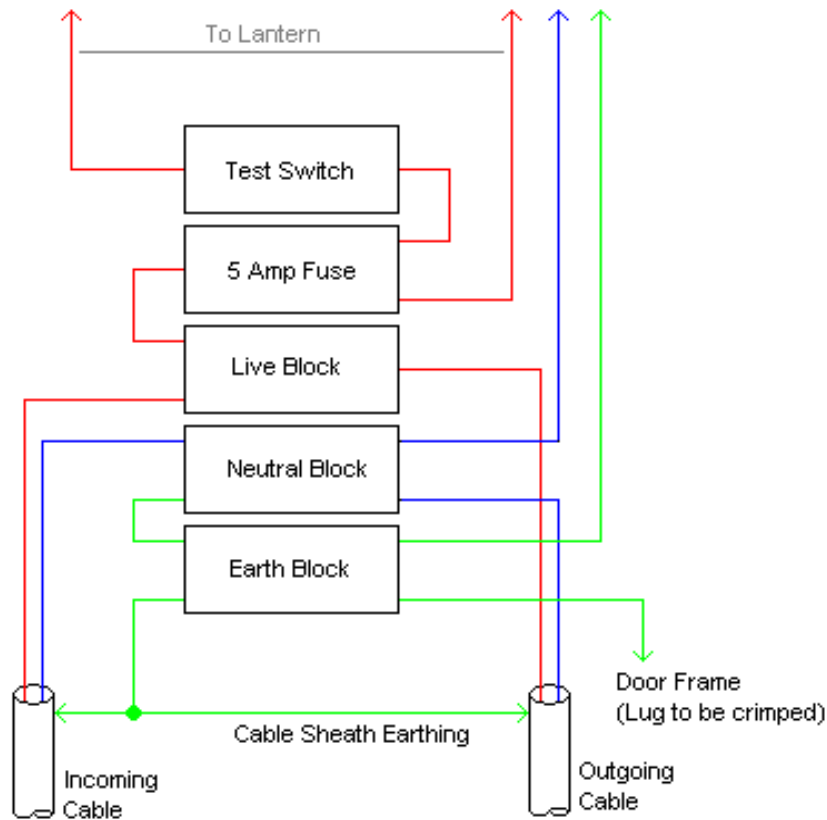
Non-Routine Maintenance: Damaged cable, lanterns, columns, components, skewed columns inter alia.

Date for Taking in Charge _____

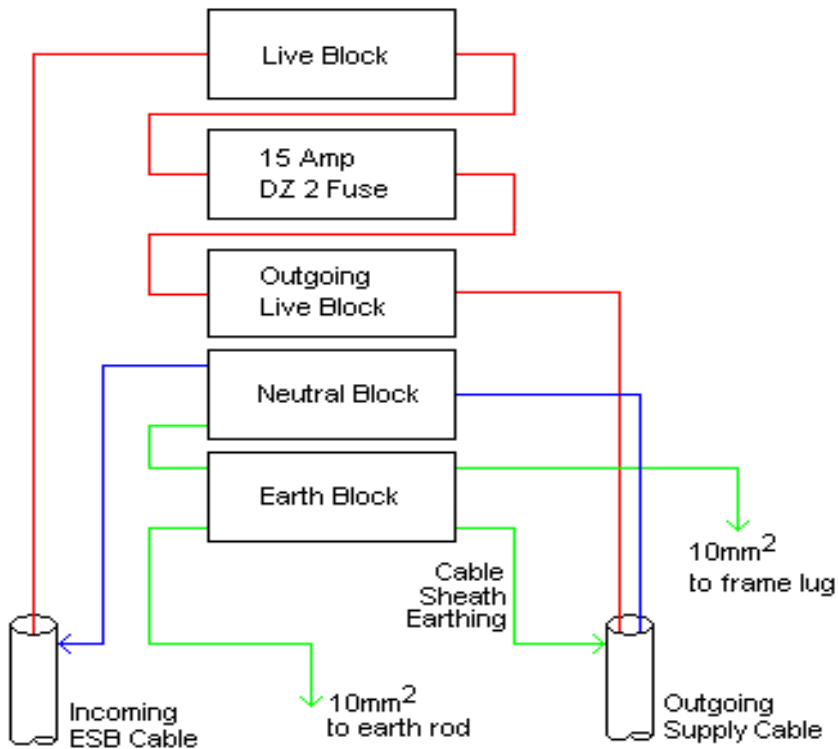
Signed on behalf of Developer _____ Date _____

Signed on behalf of DLRCC _____ Date _____

Public Lighting Internal Arrangement for Mini-Pillar and Column



Public Lighting Column: (Internal Arrangement)



Public Lighting Mini Pillar: (Internal Arrangement)

Appendix 2 Figure 1. Electrical Diagram

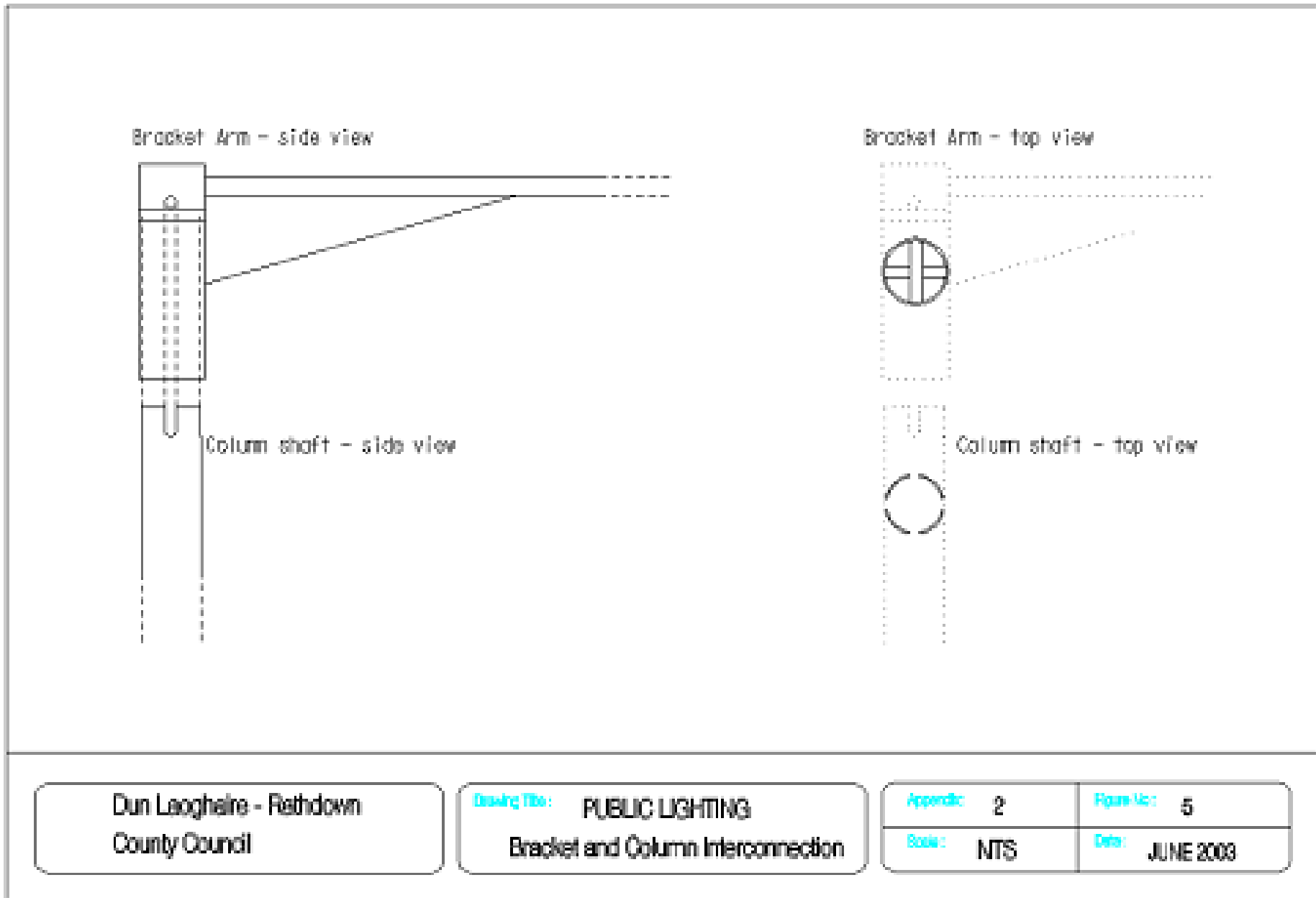
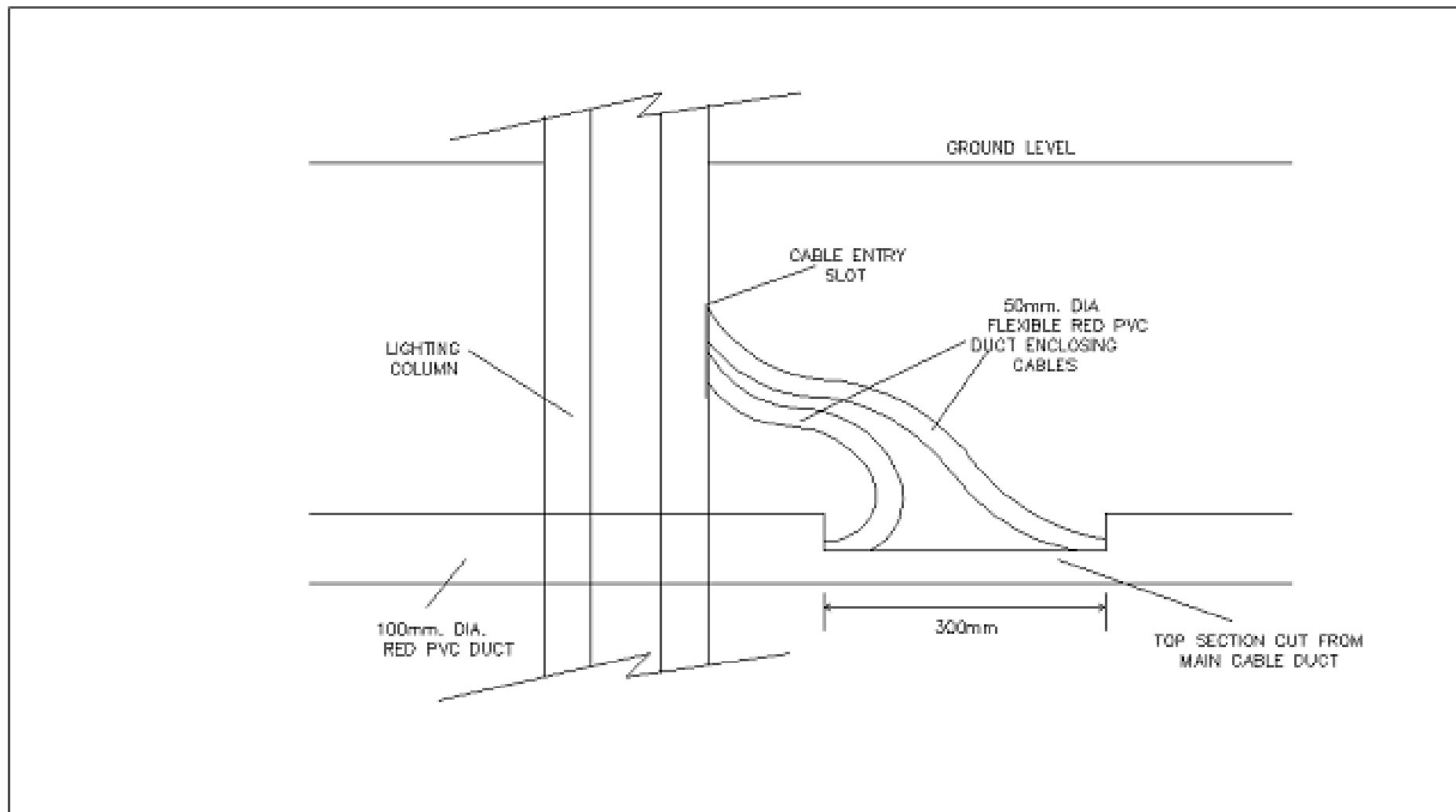


Figure 2. Bracket and Column Interconnection



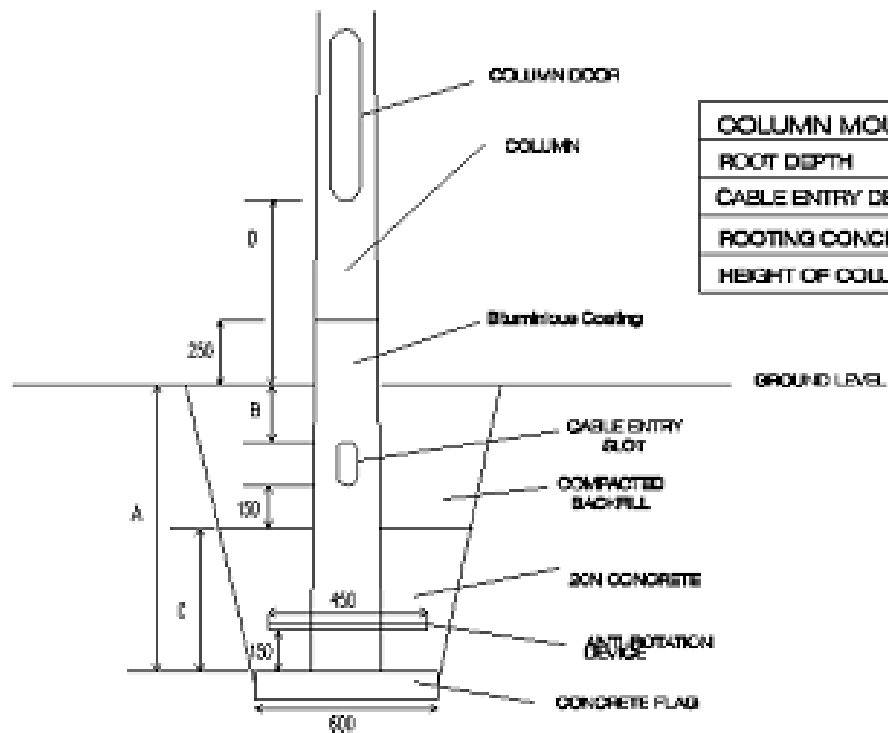
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Drawing Title:
PUBLIC LIGHTING
CABLE DUCT ENTRY

Appendix: 2
Scale: NTS

Figure No: 4
Date: JUNE 2003

Appendix 2 Figure 3. Cable Duct Entry



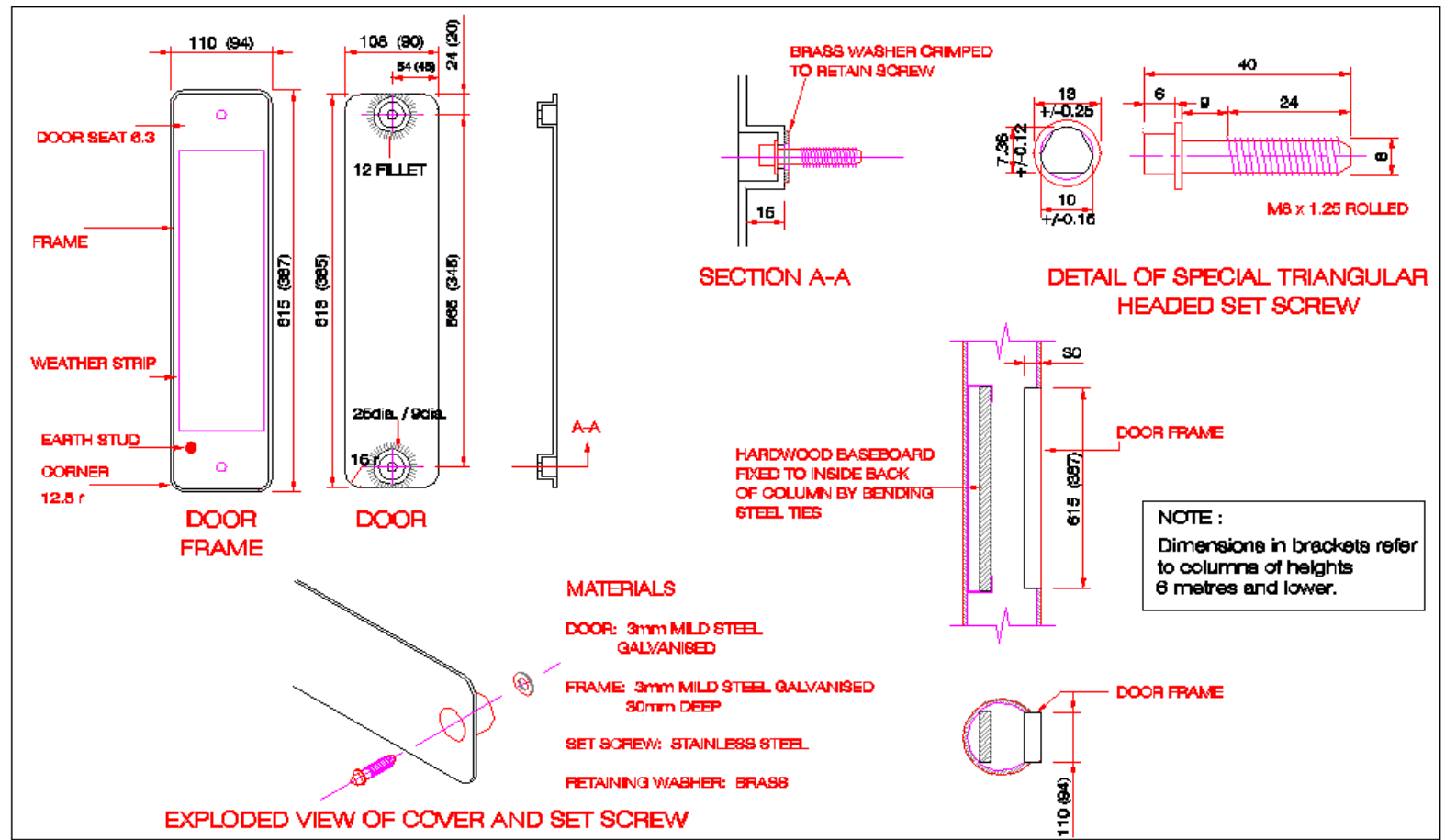
COLUMN MOUNTING HEIGHT		14m	13m	12m	10m	8m	6m
ROOT DEPTH	A	2.0m	2.0m	1.7m	1.6m	1.2m	1.0m
CABLE ENTRY DEPTH	B	0.3m	0.3m	0.5m	0.3m	0.3m	0.3m
ROOTING CONCRETE DEPTH	C	1.3m	1.3m	1.0m	0.8m	0.7m	0.5m
HEIGHT OF COLUMN DOOR	D	1.0m	1.5m	1.5m	1.0m	1.5m	1.5m

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Drawing Title:
PUBLIC LIGHTING
COLUMN ROOTING

Appendix:	2	Figure No.:	3
Scale:	NTS	Date:	JUNE 2003

Appendix 2 Figure 4. Column Rooting

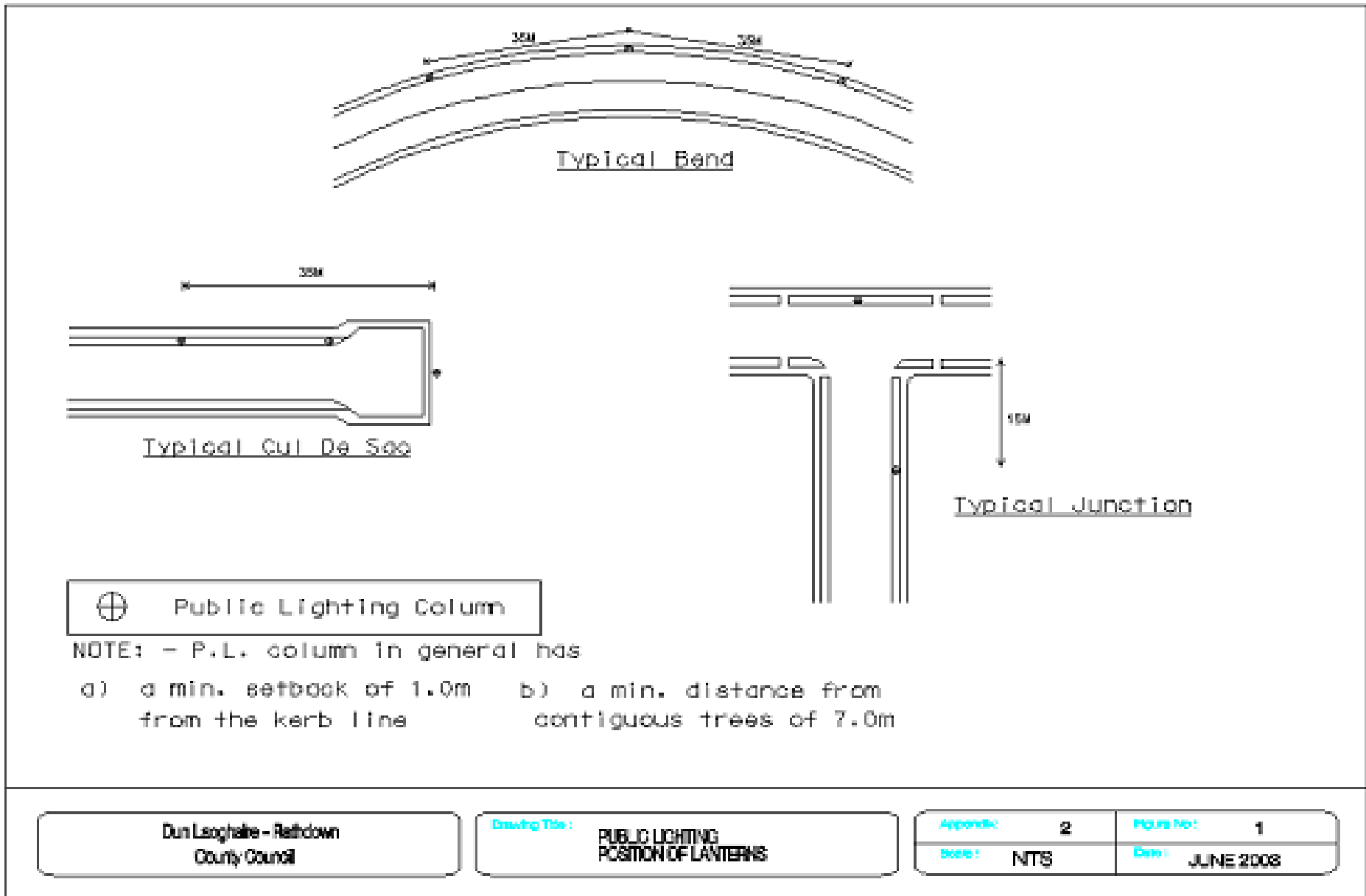


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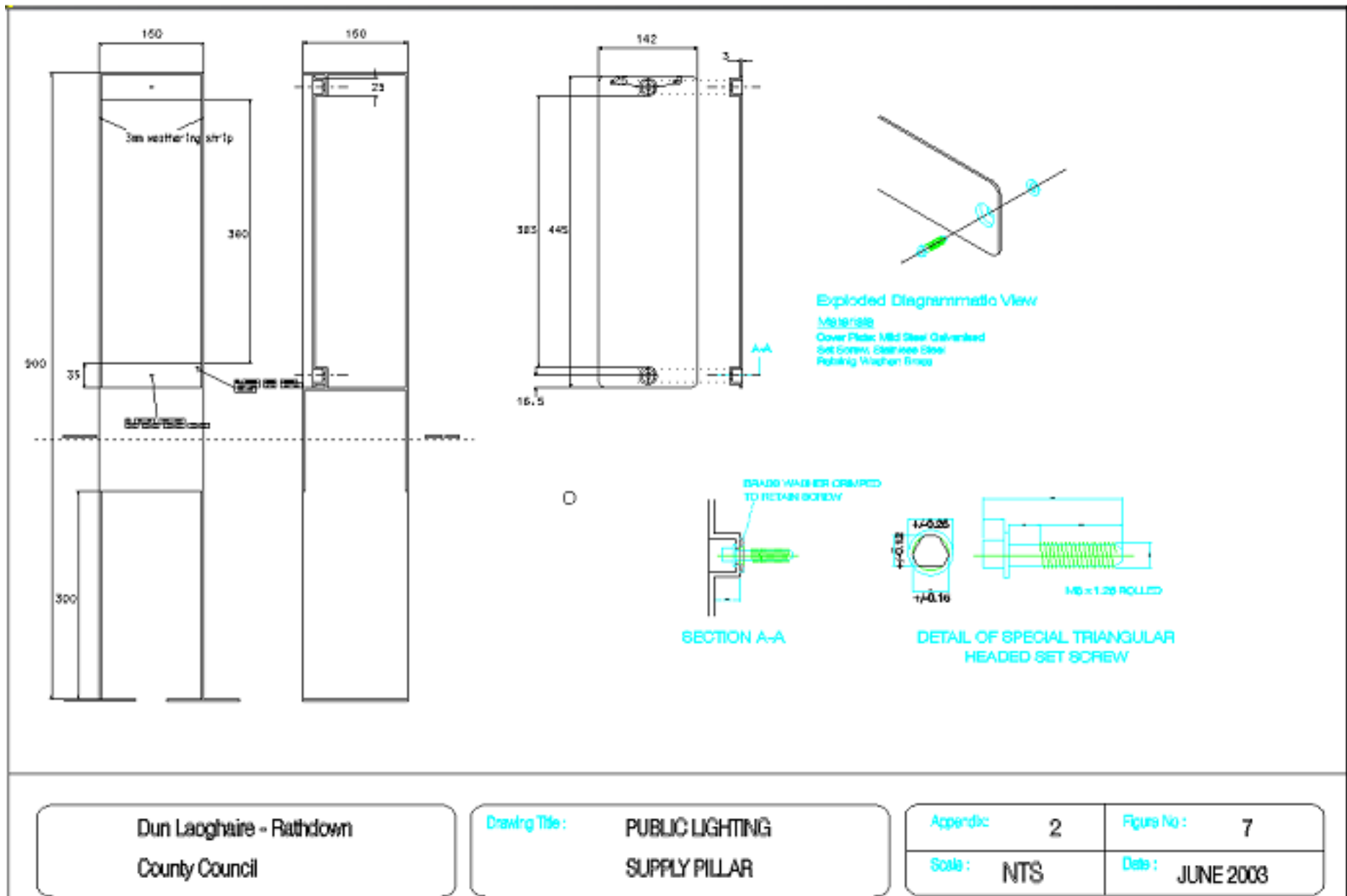
Drawing Title : PUBLIC LIGHTING
COLUMN COVER

Appendix:	2	Figure No.:	2
Scale:	NTS	Date:	JUNE 2003

Appendix 2 Figure 5. Column Cover



Appendix 2 Figure 6. Position of Lanterns



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Drawing Title: PUBLIC LIGHTING
SUPPLY PILLAR

Appendix 2
Scale: NTS

Figure No: 7
Date: JUNE 2003

Appendix 2 Figure 7. Supply Pillar