
CHRISTCHURCH CITY COUNCIL

CONSTRUCTION STANDARD SPECIFICATION

PART 5 – LIGHTS

CSS: PART 5 2014

TABLE OF CONTENTS

1.0	FOREWORD	1
2.0	RELATED DOCUMENTS	1
3.0	SCOPE OF WORK	2
4.0	APPROVAL OF MATERIALS, OPERATORS/CONTRACTORS, EQUIPMENT, LABORATORIES AND WORKMANSHIP	2
5.0	EXISTING SERVICES AND TREES	3
6.0	HAZARD IDENTIFICATION	3
6.1	Polychlorinated Biphenyls (PCBs)	3
7.0	EXCAVATION	3
7.1	Excavations in Legal Road	3
7.2	Excavations Within and Adjacent to Private Property	3
7.3	Measurement of Work and Basis of Payment	4
8.0	INSTALLATION	4
8.1	Installation of Standards and Arms	4
8.2	Luminaires	5
8.3	Panels and Terminations	5
8.4	Internal Wiring	5
8.5	Measurement of Work and Basis of Payment	6
9.0	COMPLETION PROCEDURES AND CERTIFICATION	6
9.1	Measurement of Work and Basis of Payment	6
10.0	COMMISSIONING	7
10.1	Measurement of Work and Basis of Payment	7
11.0	BACKFILLING	7
11.1	Materials	7
11.2	Quality Assurance	7
11.3	Measurement of Works and Basis of Payment	8
12.0	DEFECTS LIABILITY	8
13.0	SURPLUS MATERIALS	8
13.1	Return of Surplus Materials	8
13.2	Disposal of Unfit Materials	9
13.3	Measurement of Works and Basis of Payment	9
14.0	RESTORATION	9

14.1 Measurement of Works and Basis of Payment.....9

APPENDICES

- 1 Road Lighting Valuation – Removed Equipment
- 2 Road Lighting Valuation – New Equipment
- 3 Road Lighting Valuation – Pole and Arm Codes
- 4 Compliance Requirements Checksheet

STANDARD DETAILS

Streetlights	SD 501	Typical streetlight installation underground supply
	SD 502	Typical streetlight installation low voltage distribution pole
	SD 503	Typical streetlight installation HV/LV distribution pole – type 1
	SD 504	Typical streetlight installation HV/LV distribution pole – type 2
Fuse Panels	SD 510	Road lighting pole fuse panel connection details
	SD 511	Road lighting pole fuse panel new subcircuit connection details
	SD 512	Road lighting pole fuse panel 3 phase connection details
	SD 513	detail deleted Revision 7.0

1.0 FOREWORD

This Specification forms Part 5 of the Christchurch City Council Civil Engineering Construction Standard Specification (abbreviated as CSS). All parts of the CSS should be read in conjunction with each other and the Infrastructure Design Standards (abbreviated as IDS).

The full Specification includes the following Parts:

CSS: Part 1 2014 - General
CSS: Part 2 2014 - Earthworks
CSS: Part 3 2014 - Utility Drainage
CSS: Part 4 2014 - Water Supply
CSS: Part 5 2014 - Lights
CSS: Part 6 2014 - Roads
CSS: Part 7 2014 - Landscapes

Part 5 of the Standard Specification includes those Standard Details (SD) relating to this part only. The Standard Details (SD) are not to scale and all units are in millimetres (mm) unless otherwise shown. All rights reserved on Standard Details.

2.0 RELATED DOCUMENTS

The following documents shall be read and form part of this standard specification, together with revisions, replacements and amendments up to the date of calling tenders. The requirements of this specification supersede the requirements of any related documents listed or referred to within this specification. Where this document is referred to in a contract, the requirements of that contract supersede the requirements of this specification.

NZS 3910: 2003	Conditions of contract for building and civil engineering construction
AS/NZS 1158.0: 2005 and Amdt 1-2005	Road lighting - Introduction
AS/NZS 1158.1.1: 2005 and Amdt 1-2005	Road lighting - Vehicular traffic (Category V) lighting - Performance and design requirements
AS/NZS 1158.1.3: 1997	Road lighting - Vehicular traffic (Category V) lighting - Guide to design, installation, operation and maintenance
AS/NZS 1158.3.1: 2005 and Amdt 1-2005	Road lighting - Pedestrian area (Category P) lighting - Performance and design requirements
AS/NZS 1158.6: 2010	Road lighting – Lighting for roads and public spaces - Luminaires

AS/NZS 3000: 2007 Electrical installations
Ministry of Health Code of Practice for Safe Management of PCBs (2008)
<http://www.health.govt.nz/publication/safe-management-pcbs-code-practice>
National Code for Utility Operators' Access to Transport Corridors
<http://www.nzuag.org.nz/national-code/CodeNov11.pdf>
Christchurch City Council Schedule of Local and Special Conditions to the National Code of Practice for Utility Operator's Access to Transport Corridors 2013
Electricity Act 1992
Electricity (Safety) Regulations 2012
Radiocommunications (Radio) Regulations 1993

3.0 SCOPE OF WORK

This specification sets out the requirements for the installation of lighting for legal roads, service lanes, cycleways and pedestrian accessways where these lights will be administered by the Christchurch City Council, as part of the electricity operator's streetlighting network.

The requirements for cabling and supply within legal road are not included, as these shall be constructed to the Electricity Network Operator's requirements. Where cabling will be vested and is outside of the legal road, it shall be constructed to the same standards as the adjacent electricity network.

4.0 APPROVAL OF MATERIALS, OPERATORS/CONTRACTORS, EQUIPMENT, LABORATORIES AND WORKMANSHIP

'Approved' in this document means approved by the Engineer unless otherwise specified.

Schedules of approved materials and contractors can be found on the Christchurch City Council web page at:
www.ccc.govt.nz/business/constructiondevelopment/approvedmaterials.aspx
www.ccc.govt.nz/business/constructiondevelopment/approvedcontractors.aspx

Unless otherwise specified, all construction materials and permanently installed equipment shall be new. Selected materials are specified in CSS: Part 1 - General.

Tenderers may offer alternative or recycled materials or equipment from that scheduled, provided that the Engineer has approved the alternatives prior to tendering.

Approved testing laboratories are IANZ accredited to carry out the particular test being requested.

5.0 EXISTING SERVICES AND TREES

All work in the vicinity of existing services or trees shall be carried out in accordance with CSS: Part 1 - General.

6.0 HAZARD IDENTIFICATION

The Contractor's Health & Safety Plan must include the means for dealing with all hazards likely to be encountered on the site.

6.1 Polychlorinated Biphenyls (PCBs)

Best attempts have been made to remove Polychlorinated Biphenyls (PCBs) from the streetlighting system however the Contractor should be aware of the possible presence of equipment containing PCBs. Any equipment suspected of containing PCBs must be handled in accordance with the "Ministry of Health Code of Practice for Safe Management of PCBs".

If any equipment is found that contains (or is suspected to contain) PCBs, the Engineer shall be notified immediately. Equipment suspected of containing PCB's should be returned to the Council's Street Lighting Maintenance Contractor, for removal of PCB's, before disposal.

7.0 EXCAVATION

All excavations shall be carried out in accordance with the requirements of CSS: Part 1 - General and the Electricity Operator.

7.1 Excavations in Legal Road

Excavations carried out in legal roads shall be carried out in accordance with CSS: Part 1 clause 28.0 - Excavation.

Where the Engineer has not obtained a Network Works Access Permit for the works, the Contractor shall apply for a Corridor Access Request (CAR) at www.beforeudig.co.nz and forward it to the Council.

7.2 Excavations Within and Adjacent to Private Property

All work in private property shall be carried out in accordance with CSS: Part 1 - General.

The Contractor shall provide adequate support to the excavation when working in close proximity to the road boundary to prevent any damage or subsidence into the excavation. Any subsidence or damage shall be remedied immediately to the property owner's satisfaction at the Contractor's cost.

7.3 Measurement of Work and Basis of Payment

Excavation shall include sawcutting and excavating to the required depth and width, trench support where necessary, removal and suitable disposal of excavated material from site, and all costs incidental to the work.

Excavation shall be included in the rate for the relevant scheduled item.

8.0 INSTALLATION

All works, materials and equipment shall comply with the Electricity Act, the Electricity (Safety) Regulations, the Radiocommunications (Radio) Regulations, AS/NZS 3000 Electrical installations, the Electricity Network Operator's requirements and any other relevant regulation, standard or code of practice.

All cabling and supply work shall be carried out to the Electricity Network Operator's requirements, including where the cabling will not be taken over by the electricity network operator.

8.1 Installation of Standards and Arms

All poles and arms shall be assembled, lifted and installed to the manufacturer's specifications and recommendations and in accordance with SD 501, SD 502, SD 503 or SD 504. All metal poles arms and brackets shall be hot dipped galvanised. Paint poles for a length from 100mm above the ground level mark to 400mm below it with an approved protective coating.

Holes shall not be excavated until the Engineer has approved the marked location. The Engineer may amend the specified location on site.

The pole shall be installed within 0.1m of the approved marked location, unless a tighter tolerance is specified. Poles shall be firmly installed at the specified height above final ground level to ± 50 mm of the manufacturer's ground level. Poles shall be within 1° of vertical.

For overhead supply, the light fitting's optical centre in the installation shall be within 400mm of the specified vertical location. For underground supply, the height, measured from the manufacturer's ground level mark to the optical centre of the light fitting, shall be within 200mm of the specified height.

Where flange mounted poles, excluding slip based poles, are used the flange and holding down bolts shall be covered.

The base compartment door of the pole shall face towards the adjacent footpath.

Poles installed shall be frangible where setbacks for rigid poles do not comply with the requirements of IDS clause 11.4.10 – Pole setback from road or path.

Where poles are to be installed against the boundary line, the Contractor shall ensure that the poles are installed in the legal road and that no aerial trespass occurs.

8.2 Luminaires

Luminaires shall be manufactured, tested and certified in accordance with AS/NZS 1158.6 Road lighting – Lighting for roads and public spaces - Luminaires. Housings shall have an ingress protection rating of a standard appropriate to the requirements of the luminaire or control gear.

Unless otherwise specified, lamps shall be high-pressure sodium. They shall be either tubular or elliptical as specified, to match the luminaire optical system. The luminaires shall have control gear in the head, installed to the manufacturer's recommendations. Lamps shall be compatible with this control gear and comply with all relevant codes.

The luminaire control gear housing shall also include a Metway fuse terminal block FTB1 or a 'Safeclip' type SC 32/H front wired 32 amp, 415 volt fuse carrier with an appropriately rated HRC fuse link.

Control gear shall be complete with an approved multi pulse superimposed ignitor (details can be found at the following web address - www.ccc.govt.nz/business/constructiondevelopment/approvedmaterials.aspx). The ignitor shall be matched to the control gear and lamps.

8.3 Panels and Terminations

Panels and terminations shall comply with SD 510, SD 511 and SD 512 and the Electricity Operator's requirements.

8.4 Internal Wiring

Tough plastic sheathed cable (TPS), 1.5mm² copper twin and earth shall be used to connect between the fuse panel and each lamp fitting and shall be continuous without joints.

8.5 Measurement of Work and Basis of Payment

Installation shall include excavation and disposal of spoil, completion procedures and certification, commissioning, backfilling and restoration. Installation shall be paid by lump sum or per light installed, as specified.

Cable shall include supply, excavation and disposal of spoil, installation, backfilling and restoration and shall be paid by lump sum.

9.0 COMPLETION PROCEDURES AND CERTIFICATION

Certification, testing and commissioning shall be carried out in accordance with the Electricity Act, the Electricity (Safety) Regulations, AS/NZS 3000, any other relevant regulation, standard or code of practice and the Electricity Network Operator's requirements for connecting to their network. Documentation of this shall be provided through the Contract Quality Plan.

All lighting shall be inspected and the Certificate of Compliance, (including the inspection section), completed and returned to the Engineer. The Contractor's Completion Certificate shall also be completed and returned (see Appendix VIII of IDS: Part 3 - Quality Assurance). The Contractor shall provide all test certificates, showing that each luminaire and associated equipment meets the requirements of this specification and the relevant Electricity Regulations, standards and codes of practice.

The Contractor shall provide records of all removed assets and all newly installed assets to the Engineer/Engineer's Representative. The forms 'Road Lighting Valuation – Removed Equipment' and 'Road Lighting Valuation – New Equipment' can be used to provide this information (see appendices). 'Road Lighting Valuation – Pole and Arm Codes' set out in the appendix shall be used when completing these forms.

The Contractor shall compile field-generated as-builts. Where the work is within the road boundary, the as-builts shall show the location of lighting equipment in relation to the legal boundary. Where work is outside the legal road, the as-builts shall include the location of lighting equipment including cables, to the requirements of the relevant Electricity Operator.

Non-complying installations must not be commissioned.

9.1 Measurement of Work and Basis of Payment

Completion procedures and certification shall include all tests, certification and inspection necessary to fulfil the requirements of this clause.

10.0 COMMISSIONING

The existing lighting must be kept operating until the new lighting is commissioned. New and existing lighting shall not operate simultaneously. If it is necessary, for construction purposes, to remove the existing lighting prior to commissioning the Contractor shall provide temporary lighting. Temporary lighting shall comply with AS/NZS 1158.1.1 “Road lighting” or AS/NZS 1158.3.1 for that lighting category and shall be approved by the Engineer.

The Contractor must be present when commissioning is carried out.

Where the lighting is to be commissioned in stages, it shall begin at one end and continue through to the other end. When staging commissioning, it is crucial that hazard situations are not created (e.g. by stopping the commissioning prior to an intersection).

Lights may only be commissioned after all test and compliance certificates have been received and approved by the Engineer. Where it is necessary to stage the liveing of an installation, individual lights may be commissioned after the Engineer has received the ‘Test Certificate’ and a ‘Contractor’s Completion Certificate’ for that light. The compliance certificate and a final ‘Contractor’s Completion Certificate’ for the complete works shall be received and approved by the Engineer when all lights are commissioned.

The works shall not be considered complete, in accordance with NZS 3910 “Conditions of contract for building and civil engineering construction” until commissioned and all completion certification is received.

10.1 Measurement of Work and Basis of Payment

Commissioning shall include the provision of temporary lighting, where required.

11.0 BACKFILLING

Backfilling shall be carried out in accordance with CSS: Part 1 - General.

11.1 Materials.

Poles shall be backfilled with CCC SAP 40, unless otherwise specified.

Backfill to trenches shall be the specified imported material, unless the Engineer approves the use of the excavated material as backfill.

11.2 Quality Assurance

The Contractor shall provide records of compliance tests carried out on backfill as required by CSS: Part 1 - General.

Records of these tests shall be supplied at regular intervals, to provide confirmation of ongoing testing. Details of the proposed methods and frequency of such activities, and the reporting of these, shall typically be set out in the Contractor's Contract Quality Plan.

11.3 Measurement of Works and Basis of Payment

Backfill to subgrade level shall include the supply of materials, placement, compaction and testing. It shall also include the provision of records of backfill testing.

12.0 DEFECTS LIABILITY

The following criteria shall be met at the end of the defects liability period:

- *all poles and arms shall be assembled, lifted and installed to the manufacturer's specifications and recommendations.*
- *poles shall be at the specified height above final ground level to $\pm 50\text{mm}$ of the manufacturer's ground level.*
- *poles shall be within 1° of vertical.*
- *the pole shall be within 0.1m of the approved location, unless a tighter tolerance is specified.*
- *the light fitting's optical centre shall be within 400mm of the vertical location in the group for overhead supply or within 200mm for underground supply.*

Minor lighting failures and defects within the defects liability period shall be rectified within 24 hours of reported failure unless otherwise specified. Failure to respond may result in the Engineer making arrangements to have the work done by others at the Contractor's cost.

The Council's Maintenance Contractor will repair equipment damaged by vandalism or motor vehicle accidents.

13.0 SURPLUS MATERIALS

13.1 Return of Surplus Materials

All road lighting fittings and equipment are the property of the Christchurch City Council. All recycled materials, owned by the Council but not specifically required for this contract, shall be returned to the Council. The Engineer shall specify which fittings are suitable for recycling.

Any damage done to these fittings by the Contractor shall be made good at the Contractor's expense.

The Contractor shall return recycled materials to Council's streetlighting maintenance contractor (currently Connetics) within normal working hours.

13.2 Disposal of Unfit Materials

The Contractor shall dispose of all materials the Engineer has verified as unfit for recycling.

13.3 Measurement of Works and Basis of Payment

Transport of new unused or recycled materials or disposal of unfit materials shall be included in the rates for the replacement items being constructed.

14.0 RESTORATION

Restoration shall be carried out in accordance with CSS: Part 1 - General and the Network Works Access Permit (WAP) conditions where applicable.

14.1 Measurement of Works and Basis of Payment

Restoration from subgrade level shall include additional sawcutting where necessary and additional sealing width as detailed in CSS: Part 1 clause 30.0 – Restoration and Final Surfacing.

Restoration shall be included in the rate for the relevant scheduled item.



CHRISTCHURCH CITY COUNCIL
 PO BOX 237 CHRISTCHURCH NEW ZEALAND

ROAD LIGHTING VALUATION – NEW EQUIPMENT

Date: _____ Contractor: _____
 Location: _____ Order/Contractor Number: _____
 Drawing Number: _____

DRAWING REFERENCE	QUANTITY	LAMP		POLE AND ARM		OTHER	CCC SUPPLY CONTRIBUTION (\$)	ORION SUPPLY CONTRIBUTION ** (\$)	SUBTOTAL *** (\$)
		WATTAGE AND TYPE	MAKE AND MODEL	VALUE * (\$)	POLE TYPE				
Removal of Existing Equipment									
Other (provide details):									
Total									

* Values include both materials and installation costs.
 ** Material (cable) cost only
 ***Excluding Orion Contribution



**CHRISTCHURCH CITY
COUNCIL**

PO BOX 237 CHRISTCHURCH
NEW ZEALAND

**ROAD LIGHTING VALUATION-
POLE AND ARM CODES**

POLE TYPE	
CODE	DESCRIPTION
CH	Concrete - Highway
CPS	Concrete - Prom - short or 5.6m steel pole and arm
CPE	Concrete - Prom - extended or 7.3m steel pole and arm
CS	Concrete - Suburban
FLC	Flood light coffin
S11	Steel - 11m
S14	Steel - 14m
S3	Steel - 3" water pipe
S4	Steel - 4" water pipe
SB	Steel - Bridge pole
SD	Steel - decorative
SE	Steel - Spunlite Edinburgh
SN	Steel - Spunlite Norwich
SO	Steel - Spunlite Oxford
SP	Steel - Pedestrian crossing pole
Unknown	Unknown

ARM TYPE	
CODE	DESCRIPTION
D1	Decorative - 1m outreach
DD1	Decorative - 1m outreach double
H12	Spunlite - H12, flange mount 2m outreach
H20	Spunlite - H20, flange mount 3m outreach
M2	2m outreach
P10	Spunlite - P10, cap mount 1m outreach
P11	Spunlite - P11, cap mount 1.5m outreach
S02	Spunlite - S02, side mount 1m outreach
S12	Spunlite - S12, side mount 2m outreach
S20	Spunlite - S20, side mount 3m outreach
Unknown	Unknown

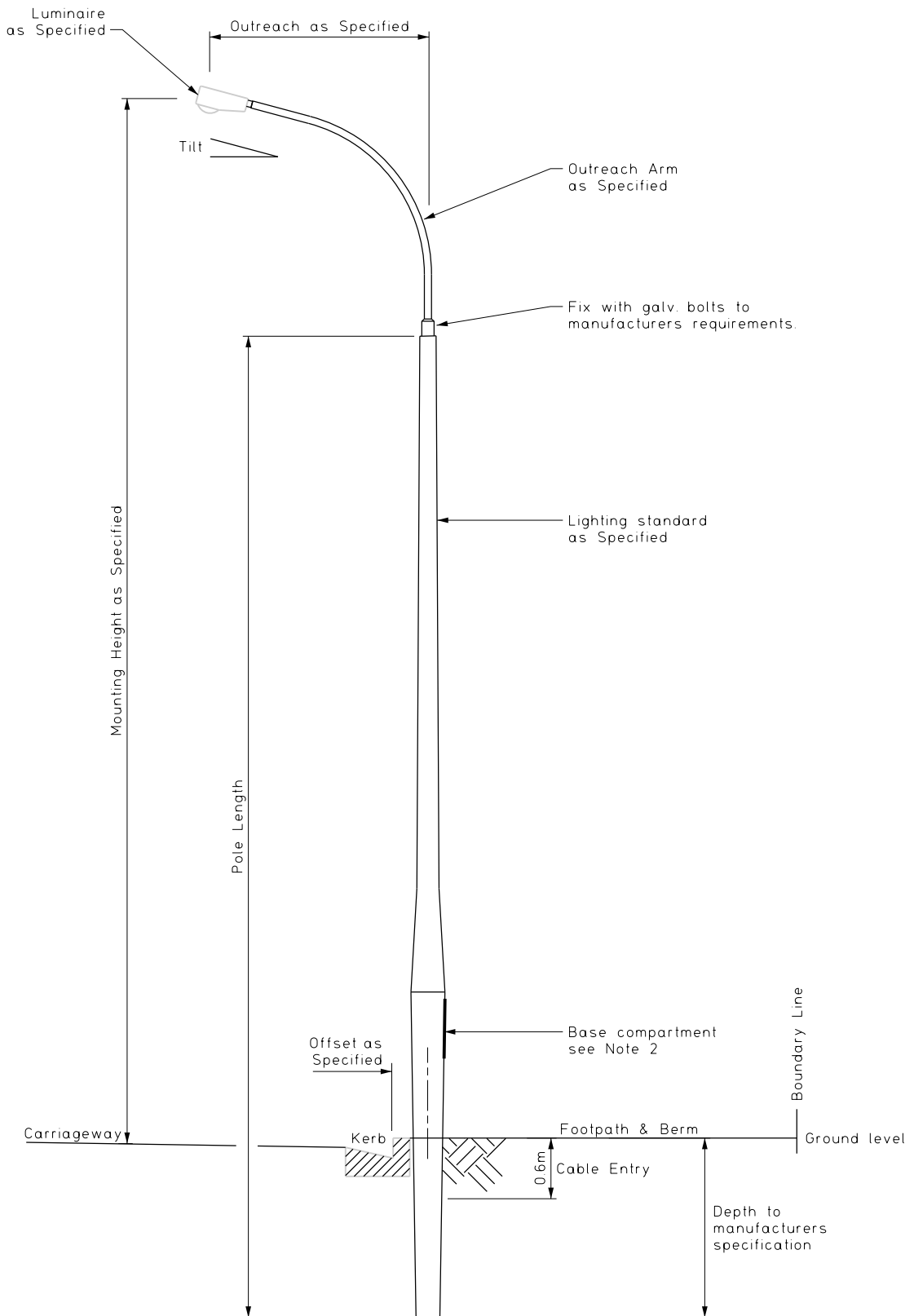
COMPLIANCE REQUIREMENTS CHECKSHEET - LIGHTING

ITEM	CSS REF	TASK	TEST STD/ DESCRIP	COMPLIANCE REQUIREMENTS	TEST FREQ.	PASS YES/NO	TEST BY	ACTIONS
1		EXCAVATION						
	Pt 5 7.0	Trench Width	manuf reqs	<i>specify</i>				
	Pt 5 7.0	Trench Depth	manuf reqs	<i>specify</i>				
	Pt 5 7.0	Trench formation	inspect	Sawcut edges of excavation prior				
	Pt 5 7.1	Excavation in legal road	inspect	Complies with road opening notice				
2		INSTALLATION						
	Pt 5 8.0	Work standards	inspect	Complies with AS/NZS 3000, and regs				
	Pt 5 8.0	Work standards	inspect	Complies with Network Operator's requirements				
	Pt 5 8.1	Standards	<i>Specify</i> SD	Within 0.1m location, 50mm height, 1° vert, painted				
	Pt 5 8.1	Light fitting	inspect	Complies with manufacturer's requirements. All metal parts galvanised				
	Pt 5 8.1	Light fitting – overhead supply	measure	Within 400mm of design vert position				
	Pt 5 8.1	Light fitting – underground supply	measure	Within 200mm of design height				
	Pt 5 8.1	Flange mounted pole installation	inspect	Cover flange and bolts				
	Pt 5 8.1	Pole installation in category V roads	inspect	Frangible where required				
	Pt 5	Pole installation	inspect	Installed within legal road, no aerial				

ITEM	CSS REF	TASK	TEST STD/ DESCRIP	COMPLIANCE REQUIREMENTS	TEST FREQ.	PASS YES/NO	TEST BY	ACTIONS
	8.1			trespass				
	Pt 5 8.2	Luminaires	AS/NZS 1158.6	Complies with standard				
	Pt 5 8.2	Luminaires	inspect	Specified ingress protection rating				
	Pt 5 8.2	Lamps	inspect	High pressure sodium, match optical system, compatible with control gear				
	Pt 5 8.2	Lamps	inspect	Complies with codes				
	Pt 5 8.2	Control gear	inspect	Control gear in head, approved material, housing includes specified fuse				
	Pt 5 8.3	Panels and terminations	manuf reqs	Specify SD				
	Pt 5 8.4	Internal wiring	inspect	TPS cable				
3		COMPLETION						
	Pt 5 9.0	Certification, testing and commissioning	manuf reqs	Process followed				
	Pt 5 9.0	Documentation	inspect	Certificate of Compliance, Contractor's Completion Certificate, test certificates, Road Lighting Valuation received.				
	Pt 5 9.0	As-built	manuf reqs	Locate all poles and cables, in relation to legal boundaries				
4		COMMISSIONING						
	Pt 5 10.0	One system of lights operating at a time	inspect	Adequate lighting available over whole site.				
5		BACKFILLING						
	Pt 5 11.1	Backfill material to poles	CCC SAP 40	Complies with grading				

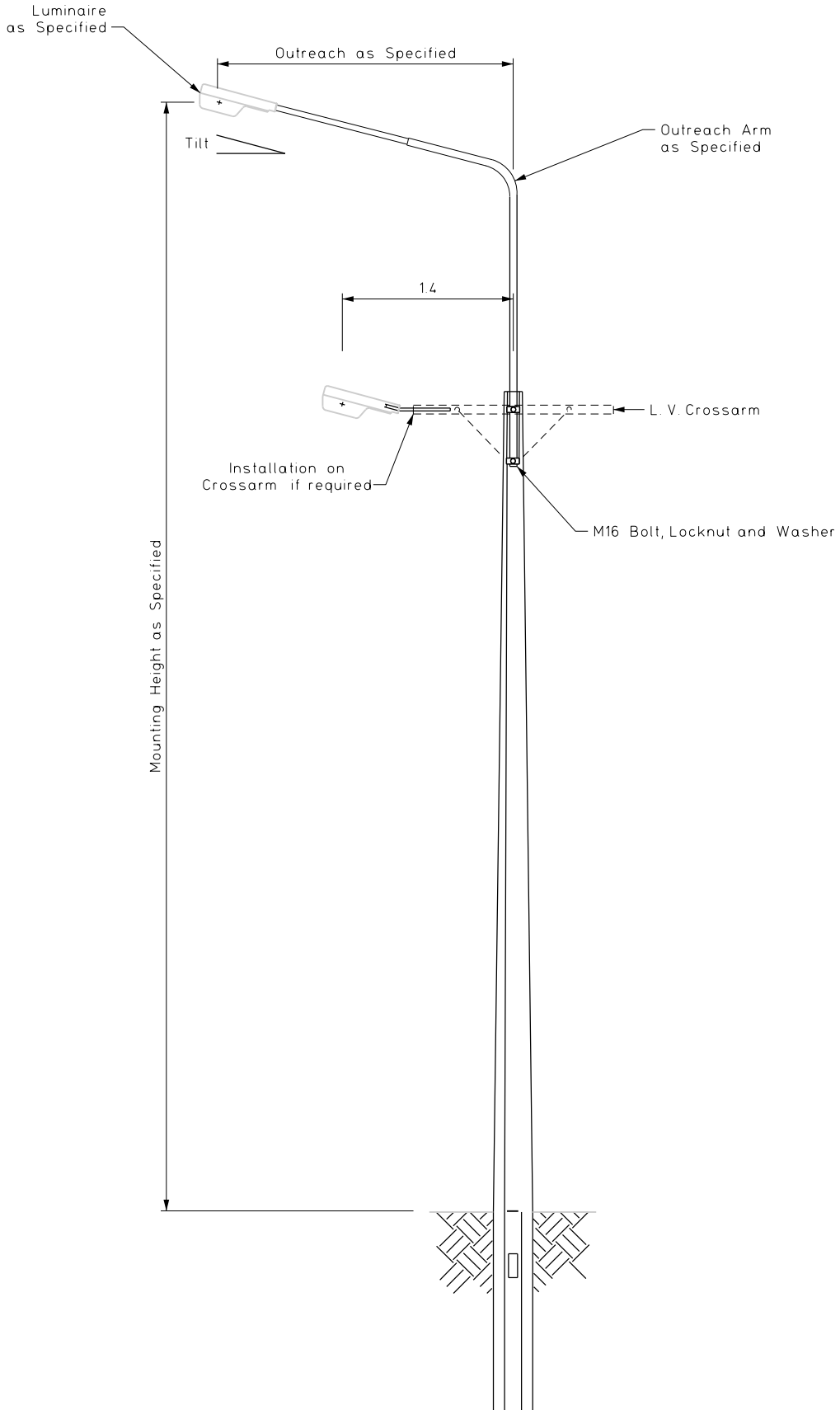
ITEM	CSS REF	TASK	TEST STD/ DESCRIP	COMPLIANCE REQUIREMENTS	TEST FREQ.	PASS YES/NO	TEST BY	ACTIONS
	Pt 5 11.1	Backfill material	<i>specify</i>	Complies with grading				
	Pt 5 11.2	Compaction of backfill	Clegg hammer	35 in road, ROW or commercial crossing, 25 elsewhere				
	Pt 5 11.2	Compaction of backfill	MDD by ND	2150kg/m ³ in road, ROW, commercial crossing or path, 70% elsewhere				
	Pt 6 6.5	Presealing surface shape - path	measure	Max 10mm gap, cumulative total gap under 25mm				
	Pt 1 28.1	Subgrade surface shape - berm	measure	75mm below existing surface				
	Pt 6 11.4	Presealing surface shape - road	measure	Max 12mm gap, cumulative total gap under 25mm in both directions				
7		SURPLUS MATERIALS						
	Pt 5 13.0	Surplus materials	inspect	Recycled materials returned to council, unfit materials disposed of				
8		RESTORATION						
	Pt 1 28.1	Surface preparation	inspect	Sawcut edges in permanent surfaces, strip to fender where within 1.5m				
	Pt 1 30.1	Asphaltic concrete supply – AC 5	TNZ M/10	Complies with specification				
	Pt 1 30.2	Asphaltic concrete supply – AC 7	TNZ M/10	Complies with specification				
	Pt 6 6.6	Tackcoat application	inspect	Tackcoat adheres to complete surface				
	Pt 6 6.7	Asphaltic concrete laying		Air voids between 2.5% and 11% Mix temperature within 10° of delivery temperature				
	Pt 6 6.8	Sealed surface shape - path	measure	Max 5mm gap, cumulative total gap under 20mm for longitudinal 3m straightedge and under 10mm for transverse 1m				

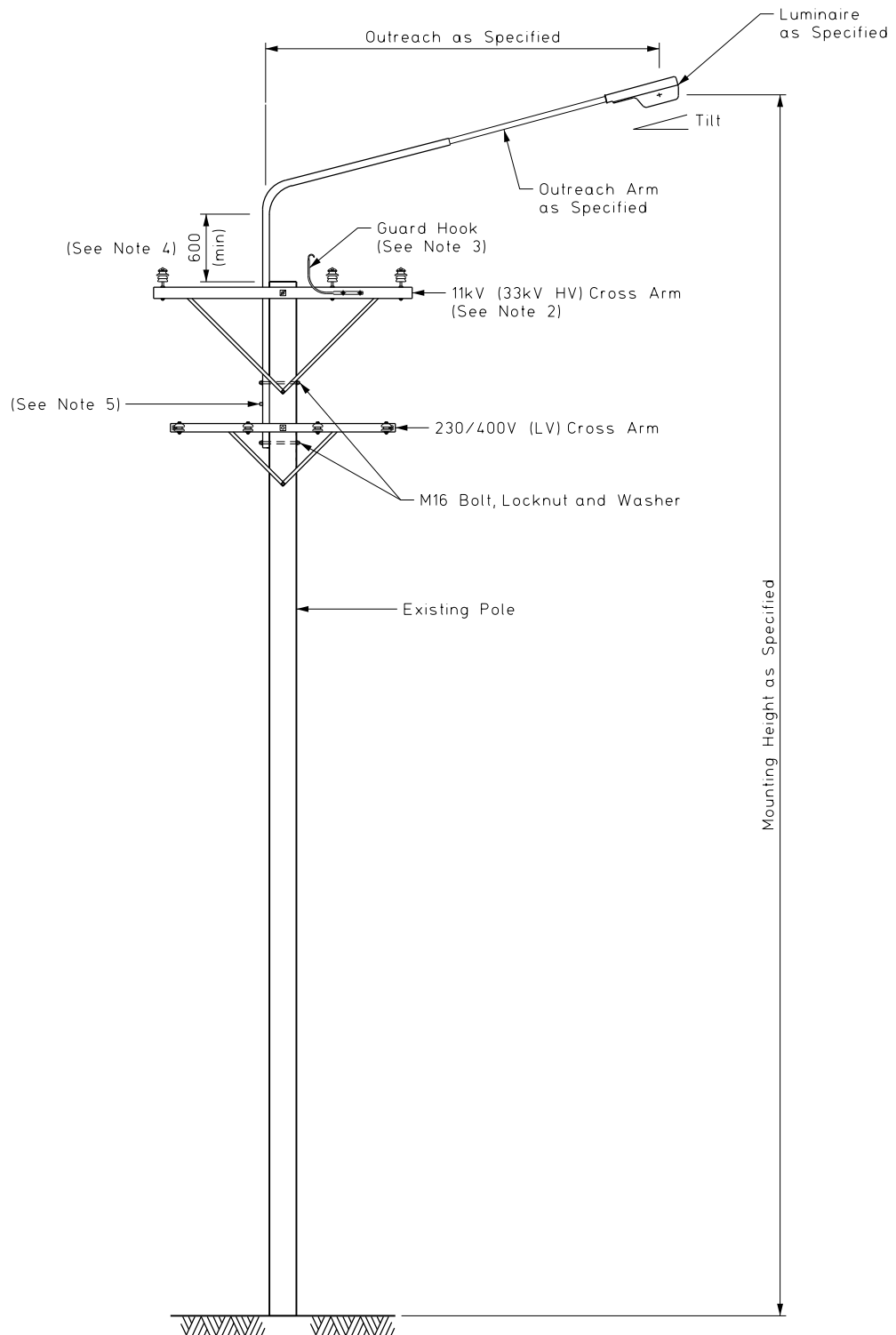
ITEM	CSS REF	TASK	TEST STD/ DESCRIP	COMPLIANCE REQUIREMENTS	TEST FREQ.	PASS YES/NO	TEST BY	ACTIONS
	Pt 2 9.5.3	Finished surface shape - berm	measure	straightedge +10mm, -0mm of existing level				
	Pt 6 14.4	Chipsealed surface shape - road	measure	Surface to be convex, mate-ins to be flush				
	Pt 6 17.5	AC surface shape - road	measure	Max 5mm gap, cumulative total gap under 10mm for longitudinal 3m straightedge				
	Pt 1 28.1	Surfacing	inspect	Bandage AC edges, overlap chipseal				



Notes

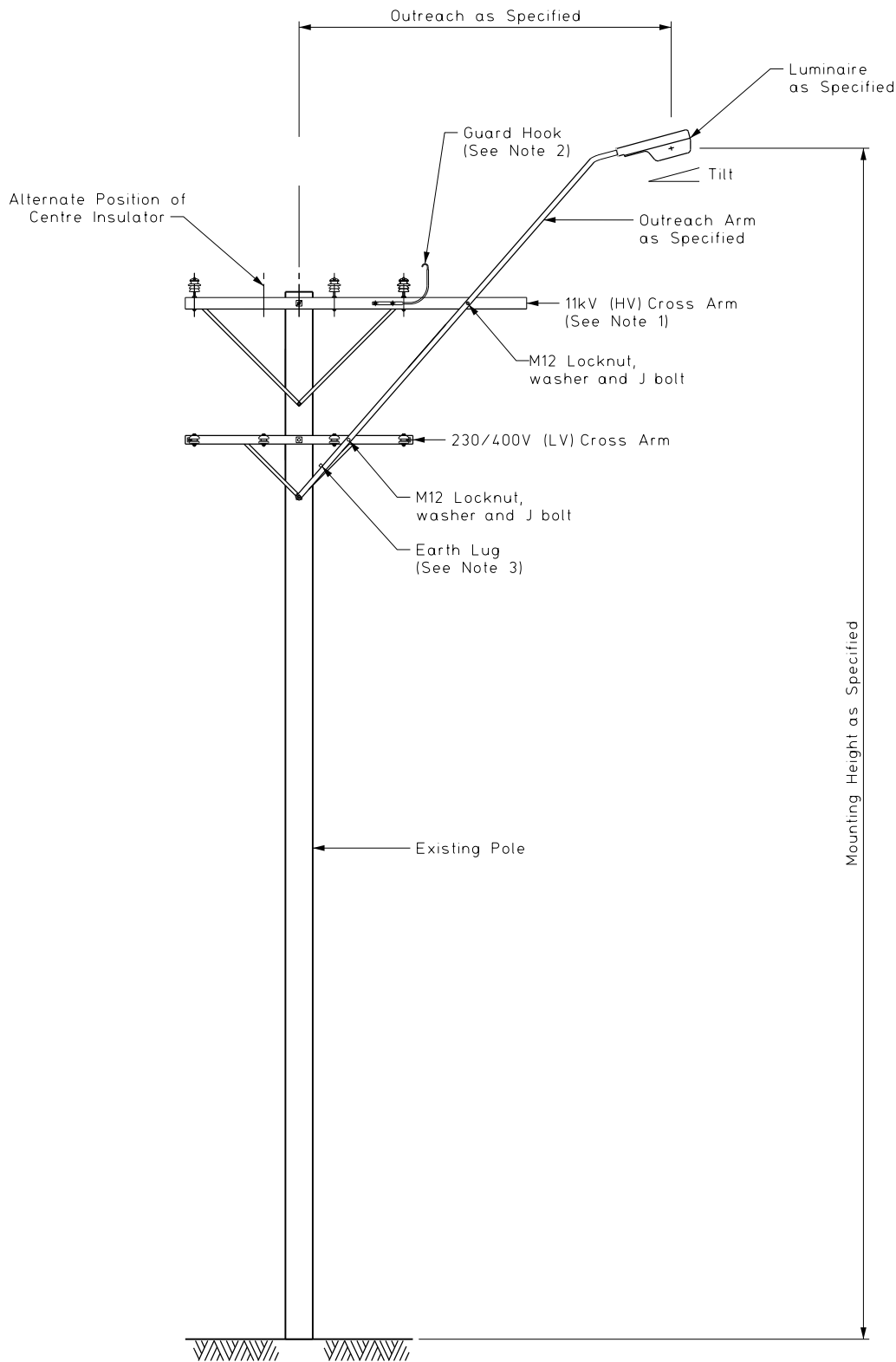
1. Offset for roadways without a kerb, is taken from the white edge line.
2. Base compartment door is to face the adjacent footpath. Door is to be secured with 6mm(or 8mm) allen key setscrews. Setscrew threads to be coated with longlife anticorrosive grease.





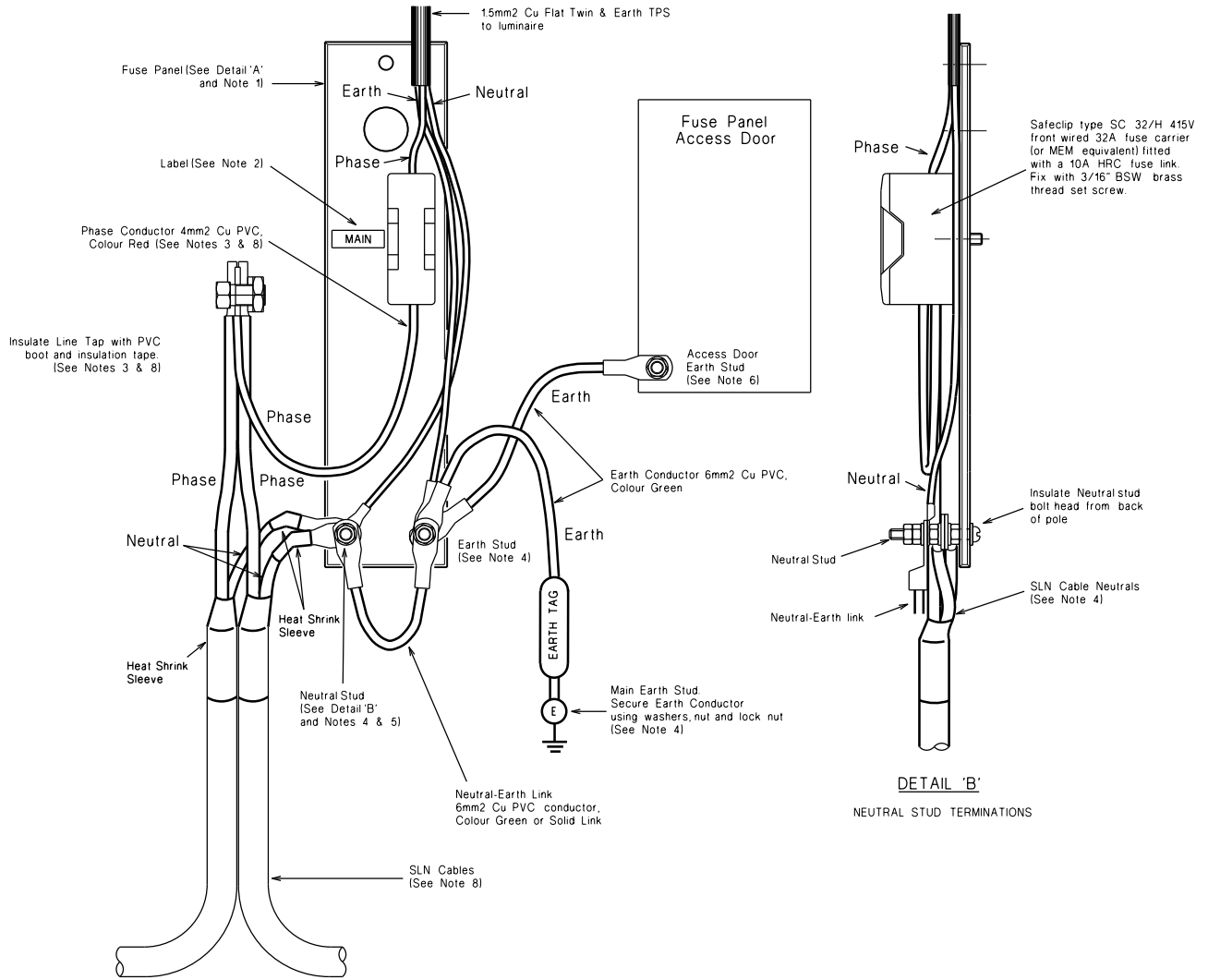
Notes

1. Outreach arm to be mounted on front or back of pole depending on location of centre insulator.
2. Replace the existing 11kV cross arm with a 2.3m 33kV cross arm to allow for the clearances specified in note 4.
3. Guard hook to be fitted to centre insulator at a suitable position so as to achieve a min. clearance of 350mm between the guard hook and the outreach arm and a min. clearance of 210mm between the guard hook and centre insulator.
4. The position of the outreach arm can be varied (up or down) to achieve a different mounting height for the luminaire providing the distance between the internal bend of the outreach arm and the top of the pole is not less than 600mm.
5. 25 x 25 x 4 flat earthing lug, with 8 ϕ hole, welded to outreach arm in approx. position shown. Earthing conductor to be (min.) 16mm² Cu PVC (Green insulation)

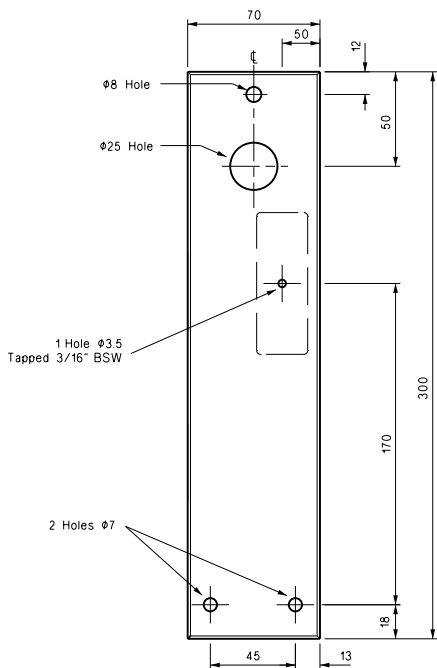


Notes

1. Replace the existing 11kV cross arm with a 3.0m x 0.1m x 0.1m cross arm to allow for the clearances specified in note 2. This arm to have the same drilling arrangement as the standard 2.0m cross arm.
2. Guard hook to be fitted to outside insulator in a suitable position so as to achieve a min. clearance of 300mm between the guard hook and the outreach arm and a min. clearance of 210mm between the guard hook and outside insulator.
3. 25 x 25 x 4 flat earthing lug, with 8 ϕ hole, welded to outreach arm in approx. position shown. Earthing conductor to be (min.) 16mm² Cu PVC (Green insulation)



TYPICAL INSTALLATION ASSEMBLY

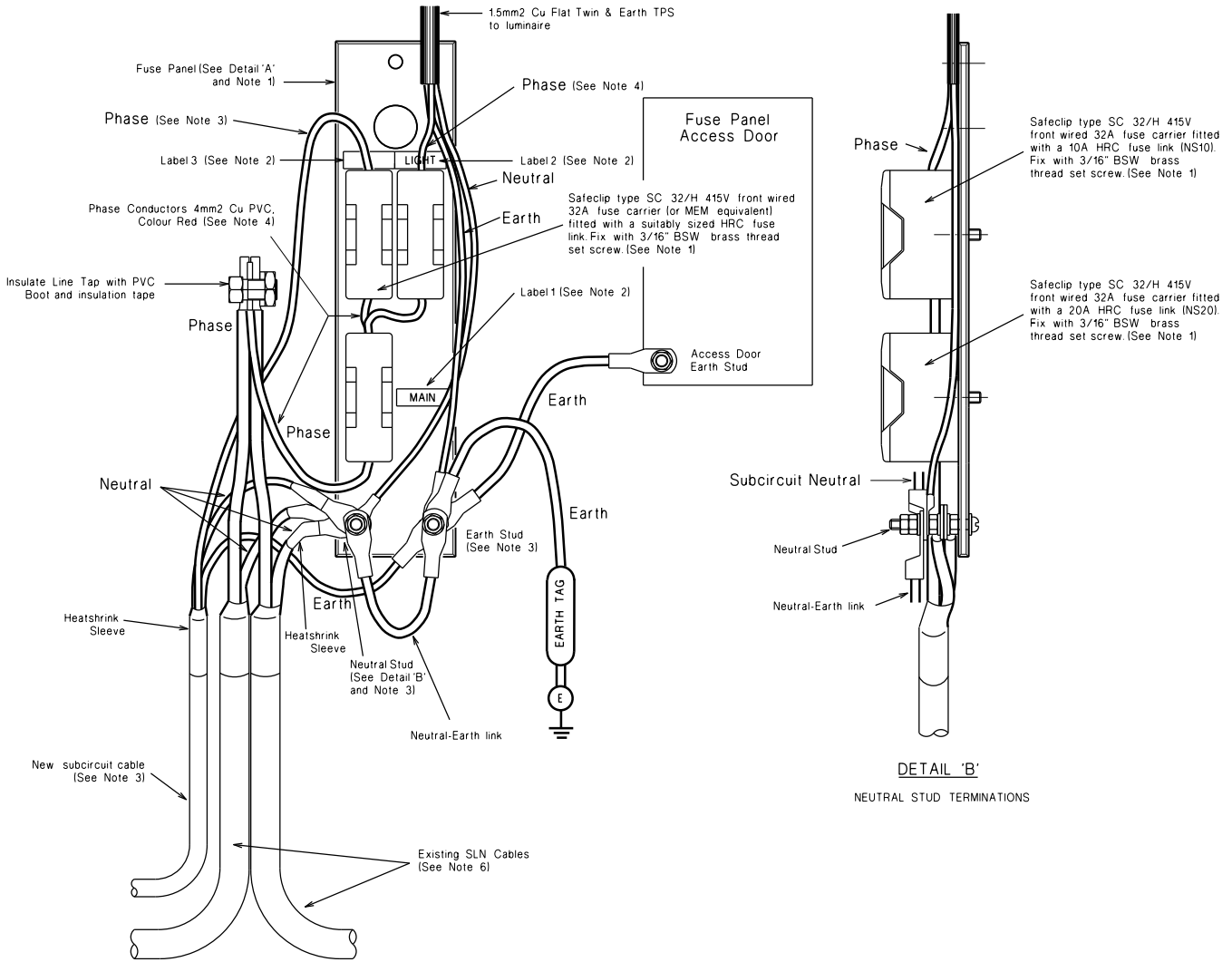


DETAIL 'A' MATERIAL: 6mm Formica P1, or similar electromechanical grade laminate

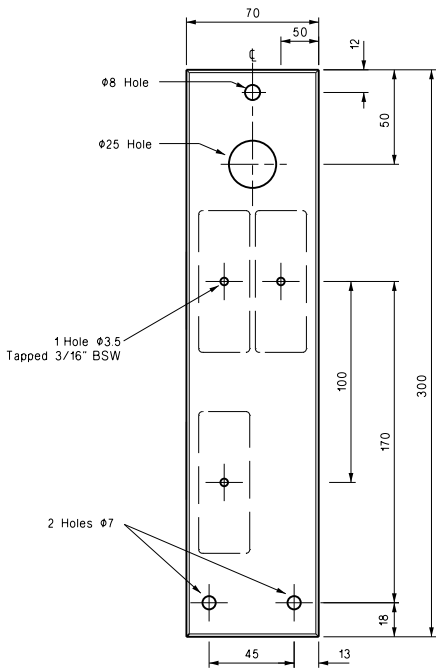
NOTES

1. Fuse panel to be secured to inside of pole, opposite door opening. Secure with suitable size nut and spacer behind panel. For concrete poles use Ø25 mounting hole. For steel poles use Ø8 mounting hole.
2. Suitable label to be mounted adjacent to fuse.
3. For installations where only one SLN cable is to be terminated, the phase conductor can be terminated directly into the fuse carrier, eliminating the need for a line tap connection and 4mm² phase conductor.
4. The SLN cable neutrals are to be secured onto the Neutral stud with their own nuts independently of the other neutral connections. The TPS neutral and Earth-neutral link to be installed last so that any future removal of these will not result in the SLN cable neutrals being disconnected.
5. Earth and Neutral studs to be made up from M6 x 50 Brass Screws, nuts and washers. Refer to Note 4 for the specific requirements of the Neutral Stud connections.
6. For concrete poles, and steel poles that are painted or have a door gasket around the opening, provide a 6mm² Cu PVC Green earth conductor from Earth Stud to be bonded to the door with a 6mm stud, washers, nut and locknut. NB. All paint must be removed from the earthing connection area.
7. Ownership details are as follows:
Orion - SLN cables including line tap and 4mm² phase conductor to bottom of the Main Fuse.
CCC - Everything other than above.
8. All Orion owned equipment (SLN cables, line taps etc) shown are typical only. Refer to Orion's standards and specifications for specific requirements, in particular Network Operating Standard NW 21 72 01.

ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE STATED



TYPICAL INSTALLATION ASSEMBLY



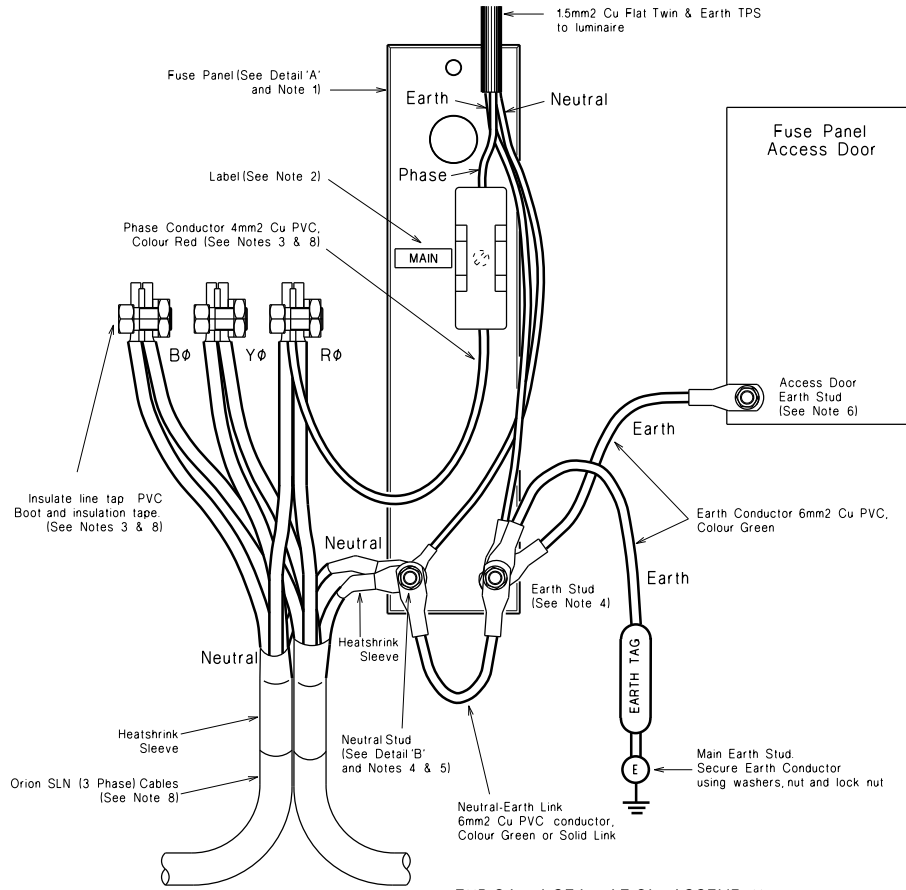
DETAIL 'A' MATERIAL: 6mm Formica P1 or similar electromechanical grade laminate

NOTES

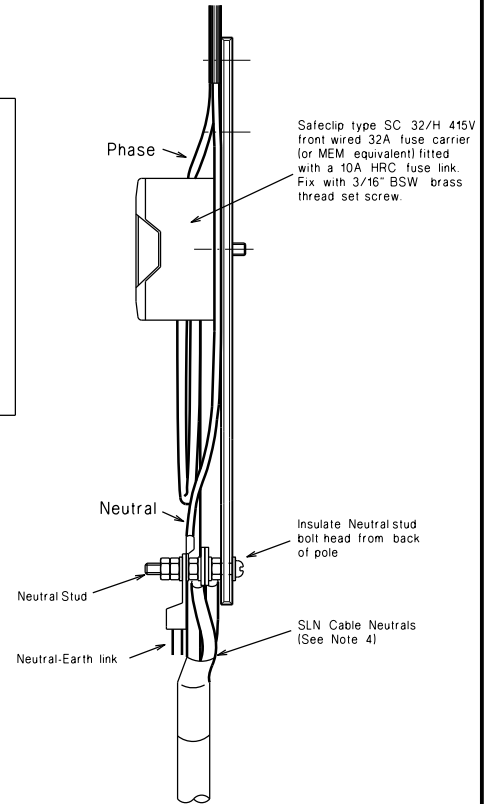
- Two new fuse holders to be installed onto existing fuse panel as shown. The lower left fuse becomes the Main Fuse and the other fuses become the subcircuit fuses which feed the light and new load (eg Bus Shelter). The size of the subcircuit fuse link to be determined by the Designer prior to installation.
- Suitable label to be mounted adjacent to each fuse identifying it's function Refer to Label Schedule.
- The new subcircuit cable shall be a suitably sized twin + NS (or 3 core) cable. The phase conductor to be terminated into the top of it's subcircuit fuse. The neutral and earth conductors to be connected to the neutral and earth studs, as shown.
- The existing phase conductor, from the line tap, is to be reterminated into the bottom of the (new) Main Fuse and two 4mm² Cu PVC (red) conductors are to be connected from the other side of the Main Fuse into the bottom of each respective subcircuit fuse as shown. The existing phase conductor, feeding the light, is to be reterminated into the appropriate fuse holder as shown.
- Ownership details are as follows:
Orion - SLN cables including line tap and 4mm² phase conductor to bottom of the Main Fuse. Neutral connections to Neutral Stud.
CCC - Everything other than above.
- All Orion owned equipment (SLN cables, line taps etc) shown are typical only. Refer to Orion's standards and specifications for specific requirements, in particular Network Operating Standard NW 21 72 01.

LABEL SCHEDULE	
LABEL No.	WORDING
1	MAIN
2	LIGHT(S)
3	(TO SUIT FUNCTION)

ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE STATED

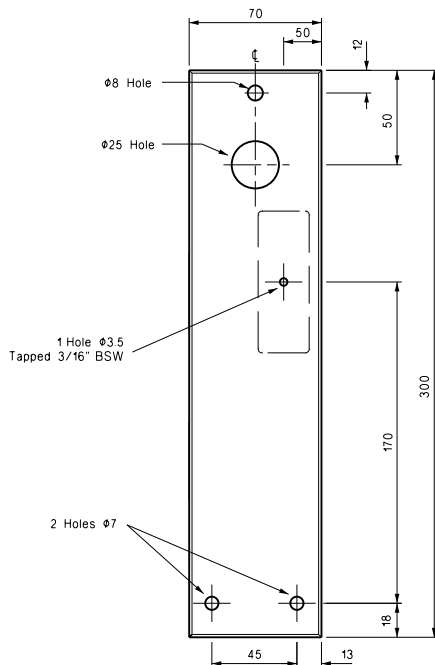


TYPICAL INSTALLATION ASSEMBLY



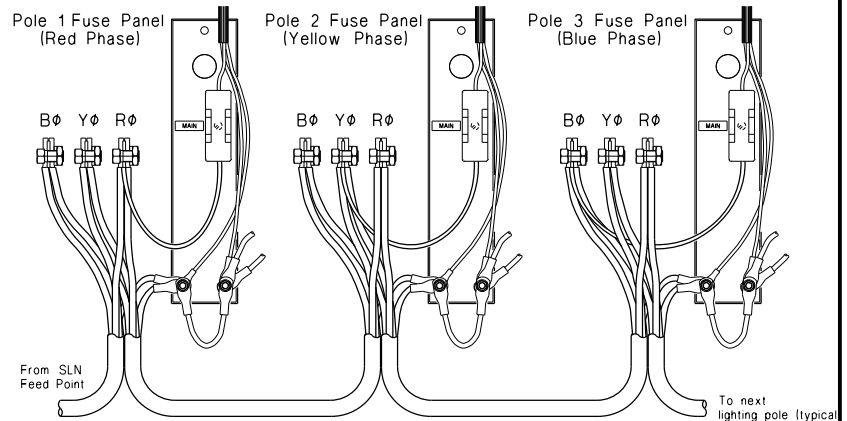
DETAIL 'B'

NEUTRAL STUD TERMINATIONS



DETAIL 'A' MATERIAL: 6mm Formica P1 or similar electromechanical grade laminate

ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE STATED



TYPICAL THREE PHASE CABLE TERMINATION DETAILS

NOTES

1. Fuse panel to be secured to inside of pole, opposite door opening. Secure with suitable size nut and spacer behind panel. For concrete poles use $\varnothing 25$ mounting hole. For steel poles use $\varnothing 8$ mounting hole.
2. Suitable label to be mounted adjacent to fuse.
3. For installations where only one SLN cable is to be terminated, the phase conductor can be terminated directly into the fuse carrier, eliminating the need for a line tap connection and 4mm² phase conductor.
4. The SLN cable neutrals are to be secured onto the Neutral stud with their own nuts independently of the other neutral connections. The TPS neutral and Earth-neutral link to be installed last so that any future removal of these will not result in the SLN cable neutrals being disconnected.
5. Earth and Neutral studs to be made up from M6 x 50 Brass Screws, nuts and washers. Refer to Note 4 for the specific requirements of the Neutral Stud connections.
6. For concrete poles, and steel poles that are painted or have a door gasket around the opening, provide a 6mm² Cu PVC Green earth conductor from Earth Stud to be bonded to the door with a 6mm stud, washers, nut and locknut. N.B. All paint must be removed from the earthing connection area.
7. Ownership details are as follows:
Orion - SLN cables including line tap and 4mm² phase conductor to bottom of the Main Fuse.
CCC - Everything other than above.
8. All Orion owned equipment (SLN cables, line taps etc) shown are typical only. Refer to Orion's standards and specifications for specific requirements, in particular Network Operating Standard NW 21 72 01.

