

Network Standard

NETWORK

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NW000-S0037

NS119 STREET LIGHTING DESIGN AND CONSTRUCTION



ISSUE

For issue to all Ausgrid and Accredited Service Providers' staff involved with street lighting work, and is for reference by field, technical and engineering staff.

Ausgrid maintains a copy of this and other Network Standards together with updates and amendments on www.ausgrid.com.au.

Where this standard is issued as a controlled document replacing an earlier edition, remove and destroy the superseded document

DISCLAIMER

As Ausgrid's standards are subject to ongoing review, the information contained in this document may be amended by Ausgrid at any time. It is possible that conflict may exist between standard documents. In this event, the most recent standard shall prevail.

This document has been developed using information available from field and other sources and is suitable for most situations encountered in Ausgrid. Particular conditions, projects or localities may require special or different practices. It is the responsibility of the local manager, supervisor, assured quality contractor and the individuals involved to make sure that a safe system of work is employed and that statutory requirements are met.

Ausgrid disclaims any and all liability to any person or persons for any procedure, process or any other thing done or not done, as a result of this Standard.

All design work, and the associated supply of materials and equipment, must be undertaken in accordance with and consideration of relevant legislative and regulatory requirements, latest revision of Ausgrid's Network Standards and specifications and Australian Standards. Designs submitted shall be declared as fit for purpose. Where the designer wishes to include a variation to a network standard or an alternative material or equipment to that currently approved the designer must obtain authorisation from the Network Standard owner before incorporating a variation to a Network Standard in a design.

External designers including those authorised as Accredited Service Providers will seek approval through the approved process as outlined in NUS181 Approval of Materials and Equipment and Network Standard Variations. Seeking approval will ensure Network Standards are appropriately updated and that a consistent interpretation of the legislative framework is employed.

Notes: 1. Compliance with this Network Standard does not automatically satisfy the requirements of a Designer Safety Report. The designer must comply with the provisions of the Workplace Health and Safety Regulation 2011 (NSW - Part 6.2 Duties of designer of structure and person who commissions construction work) which requires the designer to provide a written safety report to the person who commissioned the design. This report must be provided to Ausgrid in all instances, including where the design was commissioned by or on behalf of a person who proposes to connect premises to Ausgrid's network, and will form part of the Designer Safety Report which must also be presented to Ausgrid. Further information is provided in Network Standard (NS) 212 Integrated Support Requirements for Ausgrid Network Assets.

2. Where the procedural requirements of this document conflict with contestable project procedures, the contestable project procedures shall take precedent for the whole project or part thereof which is classified as contestable. Any external contact with Ausgrid for contestable works projects is to be made via the Ausgrid officer responsible for facilitating the contestable project. The Contestable Ausgrid officer will liaise with Ausgrid internal departments and specialists as necessary to fulfil the requirements of this standard. All other technical aspects of this document which are not procedural in nature shall apply to contestable works projects.

INTERPRETATION

In the event that any user of this Standard considers that any of its provisions is uncertain, ambiguous or otherwise in need of interpretation, the user should request Ausgrid to clarify the provision. Ausgrid's interpretation shall then apply as though it was included in the Standard, and is final and binding. No correspondence will be entered into with any person disputing the meaning of the provision published in the Standard or the accuracy of Ausgrid's interpretation.

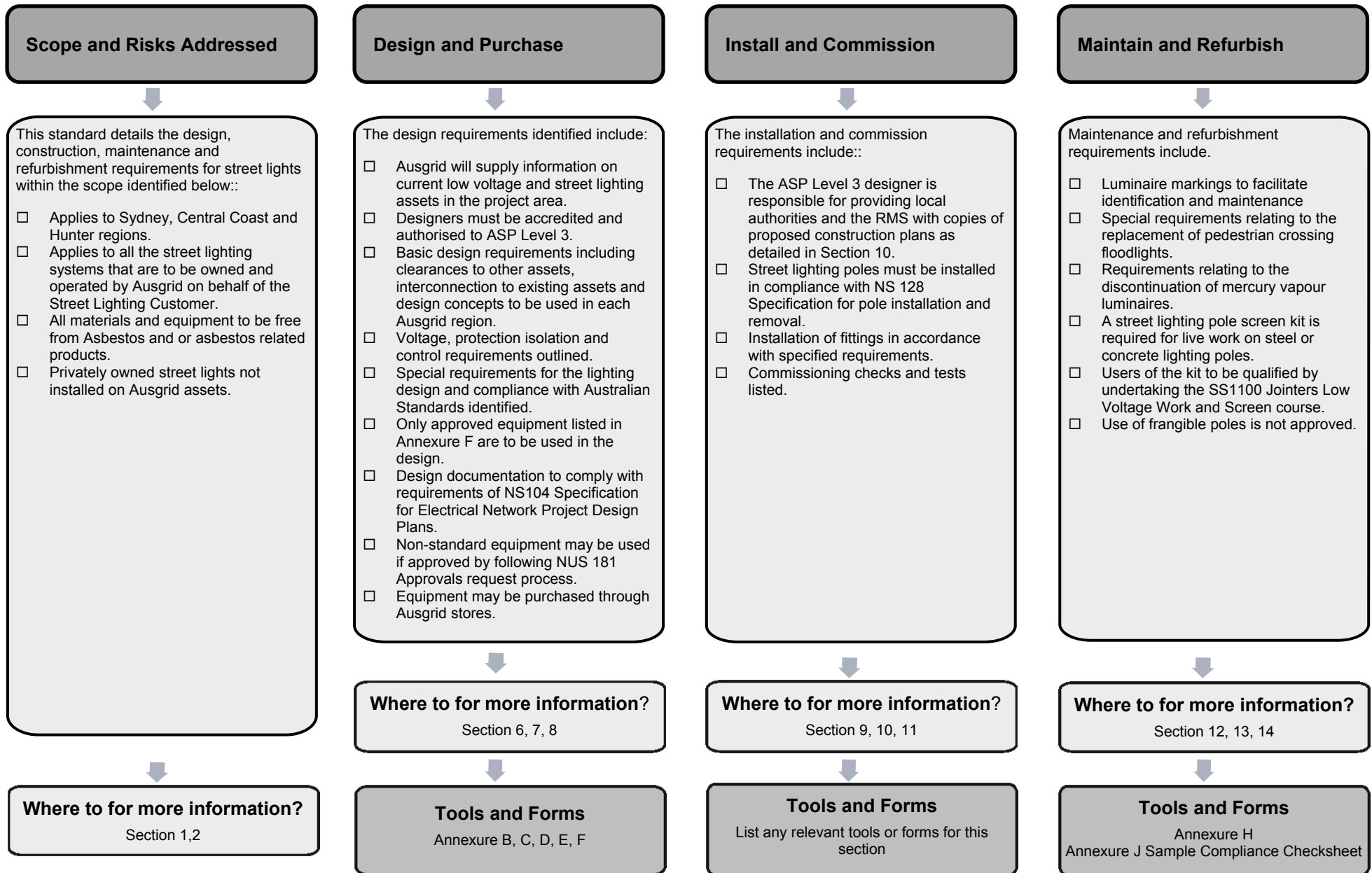
KEYPOINTS

This standard has a summary of content labelled "KEYPOINTS FOR THIS STANDARD". The inclusion or omission of items in this summary does not signify any specific importance or criticality to the items described. It is meant to simply provide the reader with a quick assessment of some of the major issues addressed by the standard. To fully appreciate the content and the requirements of the standard it must be read in its entirety.

AMENDMENTS TO THIS STANDARD

Where there are changes to this standard from the previously approved version, any previous shading is removed and the newly affected paragraphs are shaded with a grey background. Where the document changes exceed 25% of the document content, any grey background in the document is to be removed and the following words should be shown below the title block on the right hand side of the page in bold and italic, for example, Supersedes – document details (for example, "Supersedes Document Type (Category) Document No. Amendment No.").

KEY POINTS OF THIS STANDARD



Network Standard NS119 Street Lighting Design and Construction

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1.0 PURPOSE

Network Standard NS 119 details the design and construction requirements for street lights in the Sydney, Central Coast and Hunter regions.

2.0 SCOPE

Where a street lighting project is determined to be contestable by Ausgrid, the Customer shall use an Accredited Service Provider to complete the electrical design and construction work. Refer to Ausgrid's Electricity Supply document ES4 Service Provider Authorisation.

This Network Standard shall apply to all streets lighting systems which are to be owned and operated by Ausgrid on behalf of the Street Lighting Customer. The Customer may choose to have the system designed and constructed by accredited designers and accredited contractors respectively.

Refer to Annexure A for information on privately owned street lights.

3.0 REFERENCES

3.1 Ausgrid documents

- Bush Fire Risk Management Plan
- Company Form (Governance) - Network Document Endorsement and Approval
- Company Procedure (Network) - Production / Review of Network Standards
- Company Procedure (Governance) - Network Document Endorsement and Approval
- Customer Installation Safety Plan
- Electrical Safety Rules
- Electricity Network Safety Management System Manual
- ES 4 Service Provider Authorisation
- NS104 Specification for Electrical Network Project Design Plans
- NS110 Design and Construction Standard for URDs
- NS122 Pole Mounted Substation Construction
- NS124 Specification for Overhead Connections (100 to 400 Amps)
- NS127 Specification for Low Voltage Cable Joints and Terminations
- NS128 Specification for Pole Installation and Removal
- NS130 Specification for Laying of Underground Cables up to 11kV
- NS148 Overhead Line Support, Street Light Column, Pit and Pillar Numbering
- NS161 Specification for Testing of Underground Cables
- NS167 Positioning of Poles and Lighting Columns
- NS183 Installation of Private Attachments on Ausgrid Poles
- NS212 Integrated Support Requirements for Ausgrid Network Assets
- NUS100 Field Recording of Network Assets
- NUS181 Approval of Materials and Equipment and Network Standard Variations
- NUS199 Safe Electrical Working on Low Voltage Assets
- Public Electrical Safety Awareness Plan
- Public Lighting Management Plan
- Tree Safety Management Plan

3.2 Other standards and documents

- AS/NZS 1158 series - Lighting for roads and public spaces
- AS/NZS 1477 PVC pipes and fittings for pressure applications

- AS/NZS 1798 Lighting Poles and Bracket Arms - Preferred Dimensions
- AS/NZS 3100 Approval and test specification – General requirements for electrical equipment
- AS/NZS 4026 Electric cables – For underground residential distribution systems
- AS/NZS 4676 Structural design requirements for utility service poles
- AS/NZS 4677 Steel utility service poles
- AS/NZS 7000 Overhead Line Design – Detailed procedures
- AS 2700 Colour standards for general purposes
- AS 4282 Control of the obtrusive effects of outdoor lighting
- ENA Doc 001-2008 National Electricity Network Safety Code
- WorkCover Code of Practice for work near overhead power lines

3.3 Acts and regulations

- Electricity Supply (General) Regulation 2014 (NSW)
- Electricity Supply (Safety and Network Management) Regulation 2014
- Electricity Supply Act 1995
- Work Health and Safety Act 2011
- Work Health and Safety Regulation 2011 (NSW)

4.0 DEFINITIONS

Ausgrid	Ausgrid is an electricity distribution authority pursuant to the NSW Government Gazette No. 70 of 30 June 1993.
Accredited Service Provider (ASP)	An individual or entity accredited by the NSW Government Trade & Investment in accordance with the Electricity Supply (Safety and Network Management) Regulation 2014 (NSW).
Business Management System (BMS)	Ausgrid's integrated policy and procedure framework that contains the approved version of documents.
Customer	A customer may be a developer or a Street Lighting Customer.
Document control	Ausgrid employees who work with printed copies of document must check the BMS regularly to monitor version control. Documents are considered "UNCONTROLLED IF PRINTED", as indicated in the footer.
Lighting Designer	A Lighting Designer is qualified by training and experience to undertake Australian Standard compliant lighting designs. The Lighting Designer may be engaged by an Accredited Service Provider.
Luminaire	The street light fitting. The luminaire normally consists of the lamp, reflector, control gear (including a photoelectric control switch), etc all included in a protective case with a glass or plastic visor.
Network Standard	A document, including Network Planning Standards, that describes the Company's minimum requirements for planning, design, construction, maintenance, technical specification, environmental, property and metering activities on the distribution and transmission network. These documents are stored in the Network Category of the BMS repository.
Review date	The review date displayed in the header of the document is the future date for review of a document. The default period is three years from the date of approval however a review may be mandated at any time where a need is identified. Potential needs for a review include changes in legislation, organisational changes, restructures, occurrence of an incident or changes in technology or work practice and/or identification of efficiency improvements.
RMS	Roads and Maritime Services, a NSW Government agency.
Service Pillar	An insulated pillar whose primary function is to serve as a connection point for the consumer's mains supplying one or more installations. It also has provision for supplying community facilities such as street lighting.
Street Lighting Customer	The Body controlling the area to be lit and responsible for the applicable Street Lighting charges, eg Local Councils.
Steel Lighting Pole	The steel support structure for an underground supplied street light. It normally consists of a pole with an outreach arm.

5.0 INTRODUCTION

5.1 Street lighting asset life cycle

This Standard will ultimately be structured to describe from beginning to end the street lighting life cycle activities. While structured in this way for ease of reference, the Standard should always be read in its entirety. Currently, the Standard focuses on Design activities.

6.0 PLAN

6.1 Planning

Ausgrid shall supply the lighting and electrical designer(s) information on Ausgrid's current Low Voltage and street lighting assets as well as connection points in the project area. This information is presented in the form of Design Information.

The Accredited Service Provider shall provide all information to allow Ausgrid to determine the most appropriate method of supply.

7.0 DESIGN

7.1 Electrical design

7.1.1 Electrical design information

Ausgrid shall provide the electrical designer with electrical design information with sufficient details to define the scope of the electrical design.

Detailed design of street lighting requirements must use the types of cables, pillars and other electrical equipment specified in this and other referenced Standards.

7.1.2 Qualification of the electrical designer

An electrical designer shall be an accredited and authorised Level 3 Accredited Service Provider.

7.1.3 Clearances between installed street lighting equipment and exposed conductors

Refer to Ausgrid's Electrical Safety Rules.

- Where erected on a pole using LVABC, the streetlight shall be erected so that no rubbing of the LVABC conductor insulation or protective sheath shall occur on the bracket or luminaire.

7.1.4 Replacement of pillar standards

If a luminaire at an existing pillar-standard is no longer required because of the new design, the pillar-standard is to be replaced by a distribution pillar, see NS 127. Where this occurs, rag-bolts must be cut off below the level of the pre-cast pillar base.

7.1.5 Overhead supplied street lighting system

The following requirements apply to all of the Sydney, Central Coast and Hunter regions.

Connection to low voltage mains shall be in accordance with NS 124.

Streetlights installed on wood poles shall be single insulated and not earthed, relying on the insulating properties of the wood to provide additional protection for workers and the public.

The luminaire is directly connected to the overhead low voltage mains via 2 core 2.5mm² PVC insulated and PVC sheathed cable. The cable shall be run in flexible PVC conduit which is firmly attached to the pole by saddles.

- Existing overhead pole mounted construction will remain as is unless substantial work is required on the installation – e.g. mains brought down in a storm.

Protection shall be by means of a 10A HRC fuse installed in the base of the street lighting bracket (in Sydney and Central Coast regions) or on the pole (in the Hunter region).

- For retrofit situations only, the fuse may be placed inside the luminaire.

The street light shall be individually controlled by a photoelectric cell.

- Supply to the street light must not be taken from any dedicated street lighting circuits which are switched circuits, and which will be progressively made redundant.

Street lighting loads must be balanced over the three distributor phases. The electrical designer must indicate on the low voltage/street lighting plan the phase to which each luminaire is to be connected.

7.1.6 Underground supplied street lighting system

7.1.6.1 Single insulated and double insulated street lighting systems

Ausgrid has two types of insulation systems for underground street lighting. Both the 'single insulated' and 'double insulated' street lighting systems comply with AS/NZS 3100.

For the Sydney and Central Coast regions, the double insulated system is used. Equipment used to construct the double insulated system are shown in Annexure B.

Note: Older style concrete lighting poles shall also comply with double insulated system requirements.

For the Hunter region, the single insulated system is used. Equipment used to construct the single insulated system are shown in Annexure C.

7.1.6.2 Cabling

Ausgrid requires that where underground low voltage mains are available for supply to street lights, individually controlled street lights shall be supplied by underground cable from the nearest pillar.

- In older areas where the SL cable has deteriorated the lights shall be connected to LV mains rather than replacing the SL cable.

The cabling concept for underground street lighting systems adopted by Ausgrid is:

Sydney and Central Coast regions have:

For lights which are near the underground low voltage network, a standalone arrangement with each steel lighting pole and luminaire is supplied from the nearest pillar with 16mm² Copper 2 core insulated and sheathed cable. 2 core 2.5mm² Copper XLPE insulated and PVC sheathed cable shall extend from the base of the steel lighting pole to each luminaire.

For dedicated street lighting circuits, where the low voltage network does not extend to the location of the lights, a looped arrangement with steel lighting poles supplied by a circuit of four-core 16mm² Copper double insulated distributor cable compliant with AS4026. 2 core 2.5mm² Copper XLPE insulated and PVC sheathed cable shall extend from the base of the steel lighting pole to each luminaire.

Hunter region has:

For lights which are near the underground low voltage network, a standalone arrangement with each steel lighting pole and luminaire being supplied from the nearest pillar. 2 core 2.5mm² Copper XLPE insulated and PVC sheathed cable shall extend from the base of the steel lighting pole to each luminaire.

The 16 to 50mm² copper dropper cable connection to the 2.5mm² copper street lighting cable shall be made using 3-way street lighting terminal blocks (stockcode 177501) on both the active and neutral conductors.

For dedicated street lighting circuits, where the low voltage network does not extend to the location of the lights, a looped arrangement with steel lighting poles supplied by a circuit of two-core or four-core, 6mm² or 16mm² Copper double insulated distributor cable. 2 core 2.5mm² Copper XLPE insulated and PVC sheathed cable shall extend from the base of the steel lighting pole to each luminaire.

Note: An earth conductor is not required on the 6mm² or 16mm² cable circuit.

The installation must comply with the requirements of NS 130.

- In particular, the cable must be taken from the pillar into the same trench as the LV distributor to a point at right angles to the steel lighting pole and then directly to the pole.
- New or replacement installations of street lighting cables shall not have underground tee joints. If it is necessary for a tee connection to be made in a street lighting circuit (for example, to enable a branch in the circuit), the tee connection must be made at a terminal block in a steel lighting pole or at a dedicated connection pillar.

The electrical designer shall ensure that the cables meet the load and voltage drop limits for the particular project.

Street lighting loads must be balanced over the three distributor phases. The electrical designer must indicate on the low voltage/street lighting plan the phase to which each luminaire is to be connected. For four-core cable, all cores shall be terminated at each pole so that the lamp may be connected to any phase in the future.

7.1.6.3 Voltage limits

The installation should be designed so that no lights will normally be operating outside the voltage range of 230 Volts +10%. This will be achieved within the low voltage design, if the street lighting circuit or low voltage distributor to which street lights are attached is designed in accordance with NS 110.

7.1.6.4 Protection

Where underground supplied street lights are supplied from a dedicated street lighting circuit, the circuit should be fused according to its rating, but should not use fuses larger than 32 Amps which are to be housed in a street lighting control point (SLCP) pillar as specified in NS 127. The fuse shall be HRC type.

In the base of each steel lighting pole, a 10A HRC fuse shall be used to protect the luminaire wiring and hardware.

In the Hunter region, where a steel lighting pole is supplied from a 2.5mm² service connected to the nearest pillar, then it shall be protected by a 10 Amp in-line HRC fuse (stockcode 177552) installed in the pillar, instead of at the base of the pole.

7.1.6.5 Isolation

Facilities must be made available through a link or fuse located in the base of the steel lighting pole sufficient for the isolation of the luminaire/s to occur if remedial or maintenance work is required on the luminaires by Ausgrid or its contractors in accordance with the Ausgrid Electrical Safety Rules.

7.1.6.6 Control

Streetlight shall normally be controlled by a photoelectric cell (PE cell) integrated into the luminaire.

- For refurbishment work, a pole mounting NEMA PE cell base is available.

Where a dedicated street lighting circuit is required, the street lights shall have integral photoelectric (PE) cell control and the street lighting cables shall be permanently energised. Protection shall be by a 32 amp fuse per phase at the source of supply, and each street light shall be supplied through a 10 amp fuse in the base of the lighting pole.

- If the type of luminaire approved by Ausgrid does not have integral PE cell base and a pole mounted NEMA PE cell base cannot be used, then a single NEMA PE cell shall be installed at

the Street Lighting Control Point, to control the separate street lighting circuit. In this case, the street lighting conductors shall of necessity be de-energised during daylight hours.

In some locations, individual PE cells are ineffective, e.g. CBD areas with high rise buildings, wall mounted lights in underpasses. In these situations, the streetlights shall be controlled by a PE cell that will act as the switching device for a street lighting control point that will include the switching mechanism to energise the street lighting supply. Pole-mounted SLCP enclosures (stockcode 72793) are detailed in Ausgrid drawing A1-19398. Street lights controlled by a circuit PE cell shall include a by-pass switch to facilitate fault finding and other maintenance work.

PE cells should be placed so that they are not interfered with by artificial light sources.

7.1.6.7 Conduits

Conduits for low voltage domestic services and street lighting cables shall be in accordance with NS 130.

The street lighting supply cables shall be mechanically protected where they enter and leave a direct buried steel lighting pole by means of appropriate 50mm Class B conduit bends.

7.1.6.8 Insulated spigots and double insulated luminaire requirements

In the Sydney and Central Coast regions, luminaires for side entry mounting and post top luminaires (which are all single insulated) shall be mounted on the insulated spigots specified in Annexure B.

7.1.6.9 Steel pole to luminaire wiring requirements

The luminaire must be electrically connected to the supply panel in the base of the steel pole by;

- a 2.5mm² copper conductor 2 core PVC-insulated and PVC-sheathed cable, in Sydney and Central Coast regions, and
- a 2.5mm² copper conductor 2 core and earth PVC-insulated and PVC-sheathed cable in the Hunter region.

The cable shall be suitably mechanically restrained at the luminaire and panel, and be protected from mechanical damage.

7.1.6.10 Earthing of luminaires and steel lighting poles

Luminaires must not be earthed to the steel lighting pole in the Sydney and Central Coast regions.

Luminaires must be earthed to the steel lighting pole in the Hunter region.

7.2 Lighting design

7.2.1 Lighting design brief

The Street Lighting Customer is to provide the lighting designer with sufficient information to define the scope of the lighting design. The design brief will state whether Australian Standard compliance is required, and if so will nominate a lighting sub-category.

- Refer to AS/NZS 1158 series for sample lighting design briefs.

7.2.2 Qualification of the lighting designer

The Lighting Designer shall be qualified by appropriate training and experience to undertake Australian Standard compliant lighting designs.

7.2.3 Australian standard compliance

The lighting design is to comply with Australian Standard AS/NZS 1158 unless otherwise specified by the Street Lighting Customer.

- All pedestrian crossing lighting designs must comply with AS/NZS 1158.4.

The lighting designer shall provide documentation demonstrating compliance with AS/NZS 1158 series, to the Street Lighting Customer.

Note: As stated by AS/NZS 1158 series, the lighting designer shall state the maintenance factor used in the lighting design and the basis for calculating that maintenance factor. To enable calculation of the maintenance factor, the IP rating of approved luminaires and brands and part numbers of approved lamps are shown in Annexure F. Ausgrid currently has a luminaire cleaning and lamp replacement maintenance cycle of 30 months.

7.2.4 Street lighting equipment

The lighting design shall utilise Ausgrid's approved street lighting equipment, as shown in Clause 7.3

7.2.5 Lighting of cul-de-sacs

If the luminaire is to be installed at the end of a cul-de-sac, an aeroscreen luminaire shall be used to minimise obtrusive light.

7.2.6 Placement of steel lighting poles

Frangible and non-frangible steel lighting poles should be located in accordance with NS 167 and AS/NZS 1158. It is acknowledged that some older suburbs have very narrow footpaths, which preclude compliance with the setbacks preferred in modern road design. Where roll kerbs are provided in the subdivision, the lateral location of the standard must be at the direction of the road controlling authority.

The spacing of the poles and lights shall be determined by lighting design.

The pole shall be installed vertically with the outreach arm projecting at right angles to the kerb and towards the road's centre line. This situation does not take precedence over the requirements of special designs.

7.2.7 Rag-bolt mounted steel lighting poles

Wherever possible e.g. in greenfield sites, in uncongested footpath, the steel lighting pole shall be the rag-bolt mounted type. Direct buried steel lighting poles are available but their use shall be limited to where rag-bolt mounted poles cannot be installed.

Note: In the Maitland City Council area, all steel lighting poles shall in future be on ragbolt assemblies.

The rag-bolt foundation constructed in accordance with A3-514087 is a suitable foundation for steel lighting poles up to 12m with single or double 3m outreach arms. Note that the rag-bolt foundation design no longer includes an earth coil.

7.2.8 Pedestrian crossing lighting

The Designer shall note that the approved floodlights in Annexure F are the asymmetrical type. Therefore the design shall accurately describe installation parameters to ensure that lights can be installed to the compliant design. In the planning stage, field confirmation of the pole locations may be required to ensure that aim points of the design are accurate. Clause 12.3 contains additional information.

Note: The Australian Standard for pedestrian crossing lighting specifies vertical illuminance values at ground level and at 1.5m above ground. Therefore, in general for a two-way street, two floodlights are needed in total to achieve vertical illuminance values from the two directions of travel. These light technical parameters are meant to allow drivers approaching the pedestrian crossing to clearly see persons using the crossing. The use of floodlights directly above the pedestrian crossing, while providing horizontal illuminance of the crossing, will not comply with the lighting technical parameters because vertical illuminance will not be achieved.

7.2.9 Poles with 'pole mounted substations'

Refer to NS 122 for restrictions on street lighting equipment near Pole Mounted Substations. In particular, floodlights shall not be installed on poles containing Pole Mounted Substations.

7.2.10 Decorative lighting

Decorative (or prestige) lighting can be provided to meet the requirements of the applicable part of AS/NZS 1158 or greater where required by the Street Lighting Customer.

A limited range of decorative steel lighting poles and luminaires are available. See Annexure D.

Notes:

1. Decorative luminaires in the Sydney and Central Coast Regions:
 - Where post top mounted, must be attached to steel lighting poles using the insulated spigot specified in Annexure B.
 - Where side mounted or top entry mounted, shall be double insulated and externally marked 'DI'.
2. Decorative luminaires in the Hunter Region shall be single insulated and externally marked 'SI'.
3. Ausgrid will consider additions to the standard range of decorative steel lighting poles and luminaires if:
 - Sufficient Street Lighting Customers request a particular item.
 - The item is compatible with other hardware normally used.
 - The item has suitable photometric characteristics, is readily serviceable, uses durable components and there is assurance of ongoing availability of spare parts.

7.2.11 Painting of street lighting furniture

Where the Street Lighting Customer requires a coloured steel lighting pole, an Australian Standard colour shall be selected from the range of colours specified in Australian Standard 2700 "Colour Standards For General Purposes". The painting process shall use a two-part polyurethane paint finish applied over the exterior galvanised surface of the steel pole and bracket arm. The surface preparation and the application of the finish coats shall be to the paint manufacturer's directions.

Powder coat finishes shall NOT be used on steel poles and bracket arms. Powder coat finishes may be used on decorative luminaires. The Customer shall advise Ausgrid of the Australian Standard Colour coding for the paint finish as part of the Asset Information provided at hand over.

Note: All painting or re-painting will be at direct cost to the Street Lighting Customer.

Where it is necessary for Ausgrid to replace a painted steel pole and/or luminaires, the following will apply:

- **General Steel Lighting Pole:** will be replaced with equivalent galvanised but unpainted type.
- **Decorative:** will be replaced with the closest matching colour available.
- **Luminaires:** will be replaced with an equivalent luminaire of the nearest colour.

This clause does not obligate Ausgrid to replace pre-2010 special non-standard decorative poles, luminaires or colours in a like-for-like fashion.

7.3 Approved street lighting equipment list

Street lighting designs must specify equipment approved by this Network Standard. Annexure F lists specific equipment which comply with Ausgrid specifications contained in Annexure E.

7.3.1 Construction arrangement

See Annexures B, C and G.

7.3.2 Photometric data for luminaires

Annexure F shows the photometric data (I-tables) associated with approved luminaires.

7.4 Design documentation

Lighting design documentation shall comply with the relevant parts of AS/NZS 1158 series, and be provided to the Street Lighting Customer.

All electrical design documentation shall comply with NS 104 Specification for Electrical Network Project Design Plans.

8.0 PURCHASE

8.1 Equipment specifications

See Annexure E.

8.2 Approved equipment list

See Annexure F.

8.3 Approval of non standard equipment

The approved street lighting equipment range is periodically reviewed by Ausgrid in consultation with the Street Lighting Customers. Equipment supply tenders are periodically issued and contracts established.

Currently, materials may also be approved using the NUS 181 process.

8.4 Stores and materials

Accredited Service Providers and Contractors must use only approved products on the network. The approved range of lighting equipment has been nominated by Ausgrid in consultation with its Street Lighting Customers and alternatives will not be considered.

To purchase materials from Ausgrid, the Project Manager must contact the "Customer Services Manager - Logistics" on telephone number (02) 9394 6001. All materials will be made available for the Customer to pick up from:

Somersby Warehouse
Lot 11 Kangoo Road
Cnr Wella Way
Somersby NSW 2250

9.0 TRANSPORT

9.1 Transport of poles

The lengths and outreach sizes of steel lighting poles have been specified with transport in mind.

9.2 Transport of lamps

Lamps shall be transported in individual lamp sleeves and boxes, preferably in original packaging to minimise damage during transport.

9.3 Transport of luminaires

New luminaires should be transported in original packaging to minimise damage during transport.

10.0 INSTALL

10.1 Construction planning

The Accredited Service Provider is responsible for providing local authorities and the RMS (as appropriate) with copies of the proposed construction plans at least 40 days before work is to commence, and must comply with any special requirements of these authorities.

- This requirement is to ensure that the proposed electrical works comply with the Electricity Supply Act Section 45.

10.2 Installation of steel lighting poles

Steel lighting poles must be erected in accordance with the applicable requirements of Network Standard NS 128 Specification for Pole Installation and Removal. In particular, the centre line of installed poles must be vertical, and poles must be stable. Backfilling must be in accordance with Clause 12.6 of NS 128. Burial depths shall normally be in accordance with AS 1798, but where abnormal soil conditions apply, refer to AS 4676.

10.2.1 Finished ground levels

The construction of the subdivision sometimes involves significant changes in the ground level. Because the electricity supply assets are progressively installed as the subdivision is constructed, it is important that the assets are installed relative to the finished ground levels.

Refer to Network Standard NS 130 for the installation level of rag-bolt assemblies.

10.3 Installation of bracket arms

Installation of bracket arms on wood poles shall comply with Work Health and Safety Act 2011 (NSW) with respect to controlling and lifting of loads.

10.4 Installation of pole wiring

For safety and reliability reasons, all items of equipment within steel lighting poles which are intended to be attached to supports must be firmly attached, so that no item will dislodge and become hazardous, especially when access covers are opened.

- In particular, Allen keys provided by manufacturers must be removed from inside link covers.

10.5 Labelling of street lighting assets

Wood poles and steel lighting poles shall be numbered and labelled in accordance with NS 148.

11.0 COMMISSION

11.1 Compliance and commissioning checks / tests

Prior to commissioning, the following visual checks shall be performed by the Compliance Officer:

- Verify that the installation has been installed consistent with the certified design.
- Verify that the correct insulation system has been constructed, i.e. double insulated in the Sydney and Central Coast regions; and single insulated in the Hunter region.
- Verify that the correct wattage and type of luminaire has been installed.
- Verify that the luminaire mounting height is as recorded in iAMS field data capture sheet.
- Verify that approved street lighting materials have been used for the construction.
- Verify that all street lights switch on at dusk and operate correctly. This is achieved by covering the photoelectric cell, excluding all light.
- Where underground cabling is involved, undertake relevant cable tests in NS 161.

12.0 MAINTAIN

12.1 Asbestos

All materials and equipment used for construction of Ausgrid's assets are to be free from Asbestos and or Asbestos related products. Suppliers are expected to comply with the Work Health and Safety Act 2011 (NSW) together with the Work Health and Safety Regulation 2011 (NSW) and confirm in writing that all products supplied to Ausgrid contain no Asbestos related materials.

12.2 Luminaire markings including lamp Shape

Luminaire markings must be in accordance with AS/NZS 1158.6. The luminaires are generally marked with coded information on its exterior to facilitate their identification and maintenance.

For example:

S250 C 09	means sodium 250W, clear (tubular) lamp. The luminaire was manufactured in 2009.
M400 99	means mercury 400W lamp. The luminaire was manufactured in 1999.
S150 D A 07	means sodium 150W, diffused (elliptical) lamp, aeroscreen. The luminaire was manufactured in 2007.
MH400 03	means metal halide 400W lamp. The luminaire was manufactured in 2003.

Additionally in the Sydney and Central Coast regions, the codes 'DI' and 'SI' have been specified by Ausgrid for luminaires.

DI	means double insulated luminaire
SI	means single insulated luminaire, and therefore insulating spigots are required for mounting.

12.3 Pedestrian crossing floodlights

In the past, pedestrian crossing floodlights approved by Ausgrid were the 'symmetrical type', i.e. the maximum intensity of the floodlight was at right angle to the glass visor.

In compliance with the revised Australian Standard and to reduce upward waste light, the floodlights now approved by Ausgrid are the 'asymmetrical' type, i.e. the light is 'thrown forward'. Therefore the maximum intensity of the new floodlight is not perpendicular to the glass visor.

For maintenance situations, i.e. where the floodlights' heights and distances from the pedestrian crossing are generally not altered, the replacement asymmetrical floodlight should be mounted with glass visor pointing to the centre of the pedestrian crossing area, and then brought back to the vertical approximately 21 degrees, to cater for the 'forward throw' angle of the maximum intensity of the floodlight. This guideline should be sufficient to ensure that the maximum intensity of the floodlight is aimed within the pedestrian crossing boundaries for the purpose of maintenance. Where the floodlight as a consequence is not installed with the glass visor flat to the horizontal, an approved glare hood shall be installed to minimise glare and upward waste light.

For new construction which is accompanied by a lighting design, the floodlight will be installed with the glass visor flat on the horizontal. Therefore a glare hood will not be required. Note that to comply with strict Australian Standard requirements, the brightest spot of the newly designed pedestrian crossing may be located outside of the pedestrian crossing boundaries.

12.4 Spot maintenance

Spot maintenance personnel shall determine the component which has failed, and replace that component as well as any other component which may have a related failure pattern.

Annexure H lists spare parts available for the maintenance of legacy street lights.

Where a local Council requests Ausgrid to undertake work to address a glare complaint, the Council will be required to pay applicable charges for the work.

- The exception is when a glare complaint is received within three months of completion of any Ausgrid-driven work.

12.5 Street lighting compendium

A Street Lighting Compendium is available by request, listing all luminaires currently connected to Ausgrid's street lighting system. This document contains some current and many legacy luminaires, and should be used for reference only during maintenance tasks.

12.6 Removal of overhead street lighting circuits

This clause applies to existing street lights that are connected to a dedicated overhead street lighting circuit, where an overhead low voltage mains circuit is also available.

12.6.1 Incidental work

When replacing an existing luminaire, ensure that the new luminaire is;

- directly connected to overhead low voltage mains, and
- controlled individually by a photoelectric cell.

12.7 Discontinuation of mercury vapour luminaires

AS/NZS 1158.1.1 no longer allows the use of new high pressure mercury luminaires in Category V lighting schemes. Therefore, if a 250W, 400W or 700W mercury vapour luminaire has failed and cannot be made operable by replacing the lamp and/ or PE cell, the luminaire is to be replaced in its entirety with the corresponding high pressure sodium type luminaire.

Table 1 Replacements for mercury vapour luminaires

Existing Luminaire	Replacement Luminaire
250W mercury vapour (all types)	150W high pressure sodium
400W mercury vapour (all types)	250W high pressure sodium
700 W mercury vapour (all types)	400W high pressure sodium

If a luminaire requires a new cover then only those covers that are available from the Warehouse will be replaced. If suitable covers are not available from the store, the mercury vapour luminaire is to be replaced in its entirety with the high pressure sodium luminaire.

13.0 REFURBISH

13.1 Street lighting pole screening kit

Where live work on steel or concrete lighting pole is required, such work shall be performed in accordance with the Electrical Safety Rules, particularly Clauses 6.2.9 'screening' and 10.6.3 'earthed situations'.

The use of the street lighting pole screening kit depicted in Figure 1 is an approved precaution to screen the conductive pole from live conductors. The complete kit is available on the stockcode listed in Table 1. This kit should be adjustable for all sizes of pole door openings.

Note that additional screening between live conductors may be required to safely undertake the work.

The user of this kit shall have received training in SS1100 "JOINTERS LIVE LOW VOLTAGE WORK AND SCREENING".



Figure 1 Assembled Kit

Table 2 Screening Kit Contents

Street Lighting Pole Screening Kit Contents	Stockcode
1 x Yellow 'Ripstop' storage bag 1 x Top & bottom PVC outer pole covers with magnetic fasteners 2 x Large plastic screening inserts 2 x Small plastic screening inserts 1 x Polycarbonate clip with securing flap 1 x Silicon end cap for screening of pole tongue 2 x Velcro straps for storage and use on non metal poles 1 x Insulation ground mat with pole cut out	180336

14.0 REPLACE

14.1 Use of frangible poles

In accordance with AS/NZS 1158.1.3, where a lighting pole is replaced due to damage or age, a rigid lighting pole should be placed at the stated setback from the kerb. Ausgrid has not approved the ongoing use of frangible steel lighting columns (slip base or energy absorbing) as we are not convinced of the safety advantages they provide and do not believe there is a net risk benefit to Ausgrid in their use. Further consideration to alternative technologies may be considered in the future

15.0 RECORDKEEPING

The table below identifies the types of records relating to the process, their storage location and retention period.

Table 3 – Recordkeeping

Type of Record	Storage Location	Retention Period*
Approved copy of the network standard	BMS Network sub process Standard – Company	Unlimited
Draft Copies of the network standard during amendment/creation	TRIM Work Folder for Network Standards (Trim ref. 2014/21250/78)	Unlimited
Working documents (emails, memos, impact assessment reports, etc.)	TRIM Work Folder for Network Standards (Trim ref. 2014/21250/78)	Unlimited

* The following retention periods are subject to change eg if the records are required for legal matters or legislative changes. Before disposal, retention periods should be checked and authorised by the Records Manager.

16.0 AUTHORITIES AND RESPONSIBILITIES

For this network standard the authorities and responsibilities of Ausgrid employees and managers in relation to content, management and document control of this network standard can be obtained from the Company Procedure (Network) – Production/Review of Network Standards. The responsibilities of persons for the design or construction work detailed in this network standard are identified throughout this standard in the context of the requirements to which they apply.

17.0 DOCUMENT CONTROL

Content Coordinator : Street Lighting Engineering Manager

Distribution Coordinator : Engineering Information and Services Manager

Annexure A – Privately Owned Street Lights

A.1 Not installed on Ausgrid assets

Where the Street Lighting Customer decides to assume complete responsibility for their street lighting installation, then Ausgrid's only requirements are that the installation conforms to:

- Australian Standard AS/NZS 3000; and
- NSW Service and Installation Rules.

Note: Examples of private street lighting installations are Community Title Developments or schemes which do not comply with this Network Standard.

A.2 Recording of connections to the Ausgrid network

All private lighting installations are to be shown in the GIS as connection points only. Refer to Network Standard NUS 100.

Annexure B – Double Insulated System Construction

The double insulated street lighting system shall be constructed with the following components and methods:

B.1 Steel lighting pole panel wiring arrangement

B.1.1 Incoming cable

The incoming cable:

- shall be double insulated (i.e. sheathed) cable up to the cable saddle, and
- shall be clipped under the saddle, and
- shall have all single insulated coloured cores continuously mounted on the surface of, and within the perimeter of the insulating panel,

to comply with Double Insulation requirements in AS/NZS 3100.

All cores are to be colour identified. The phase order of neutral, A, B and C (Black, Red, White, Blue) shall be maintained at the terminal block.

B.1.2 Panel cable

The insulating panel is supplied by the manufacturer with components pre-wired. The pre-wired cables on the panel are SDI (single double insulated - white sheathed) cable.

The cables on the insulating panel shall be tied to each other as shown in B.2 to satisfy the restraint requirement. Ties must be installed at locations shown in B.2 so that if any one cable becomes detached from its termination, it is so retained in position that the live conductor cannot come into contact with either the panel or the metal pole.

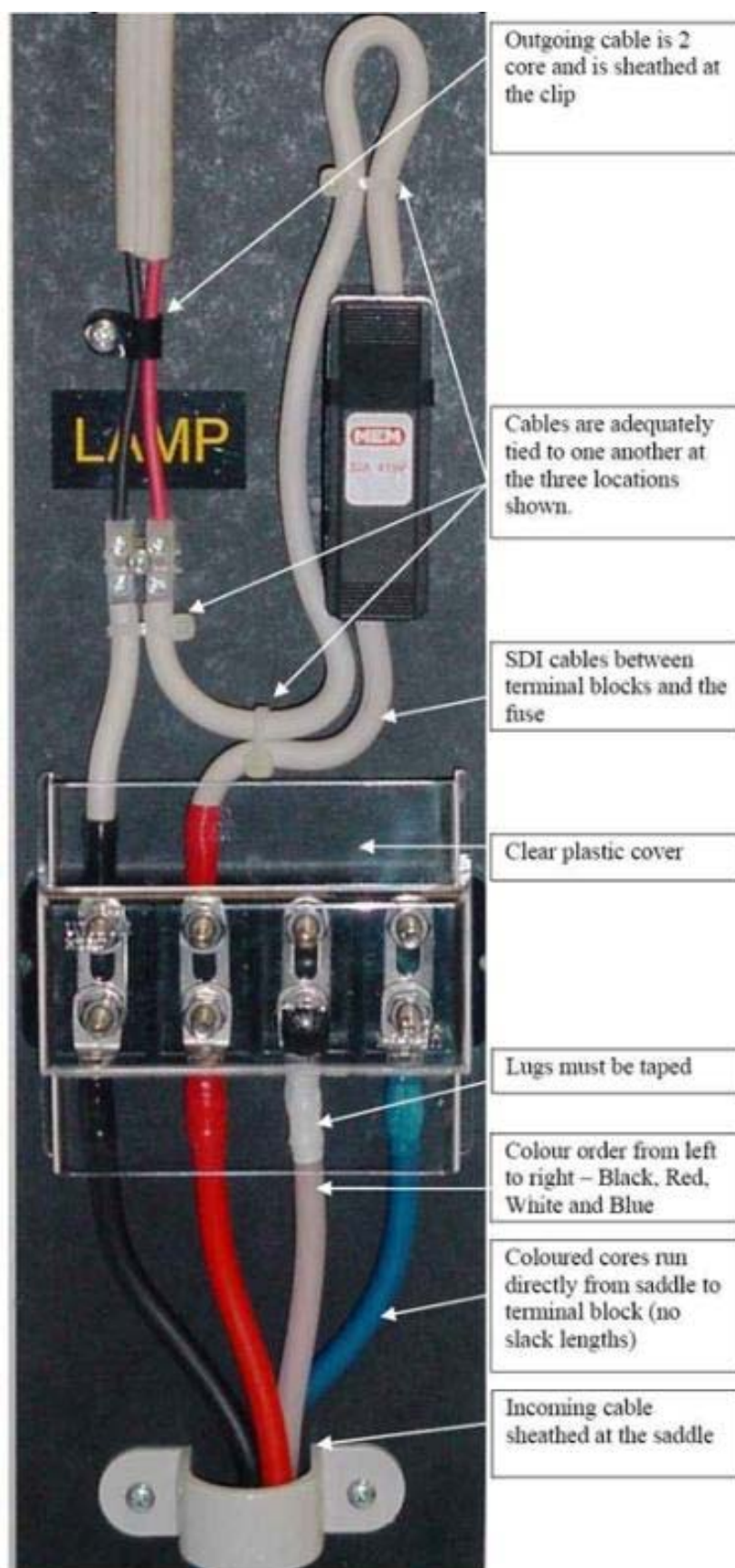
B.1.3 Outgoing cable

The outgoing street lighting cable shall be 2 core cable.

Both the basic and supplementary (sheath) insulation layers shall only be stripped back as far as necessary.

The 2 core (sheathed) cable shall be saddled to the clip provided on the insulating panel. Both the neutral and active cores shall be terminated in the two-way terminal block. It is not acceptable to terminate the active core at the fuse holder terminal.

B.2 Double insulation of the steel lighting pole panel



B.3 Insulating spigots at the luminaire

Double insulation of the luminaire installation shall be achieved by one of the two means below:




- installing a luminaire with the marking 'DI' on the luminaire body, or
- if the luminaire is not marked 'DI', installing an insulated spigot with the luminaire.

Note: In the current luminaire supply contract, all luminaires (Category V and Category P) will be manufactured to be single insulated, therefore insulating spigots shall be installed with all new luminaires on steel poles.

B.3.1 Insulating spigots

The approved spigots are listed in the table below:


Table B1 Approved Spigots

Luminaire Category	Description	Stockcode	Photo
Cat V Side Entry	Insulating Spigot 42mm ID to 42mm OD	176441	
Cat P Side Entry	Insulating Spigot 42mm ID to 34mm OD (clamp type)	177351	
Cat P Side Entry	Insulating Spigot 42mm ID to 34mm OD (threaded type)	68866	
Cat V and P Post Top	Insulating Spigot 34mm ID to 76mm OD	68874	

B.3.2 Floodlights for pedestrian lighting

To maintain double insulation on floodlights the following insulating brackets shall be used:

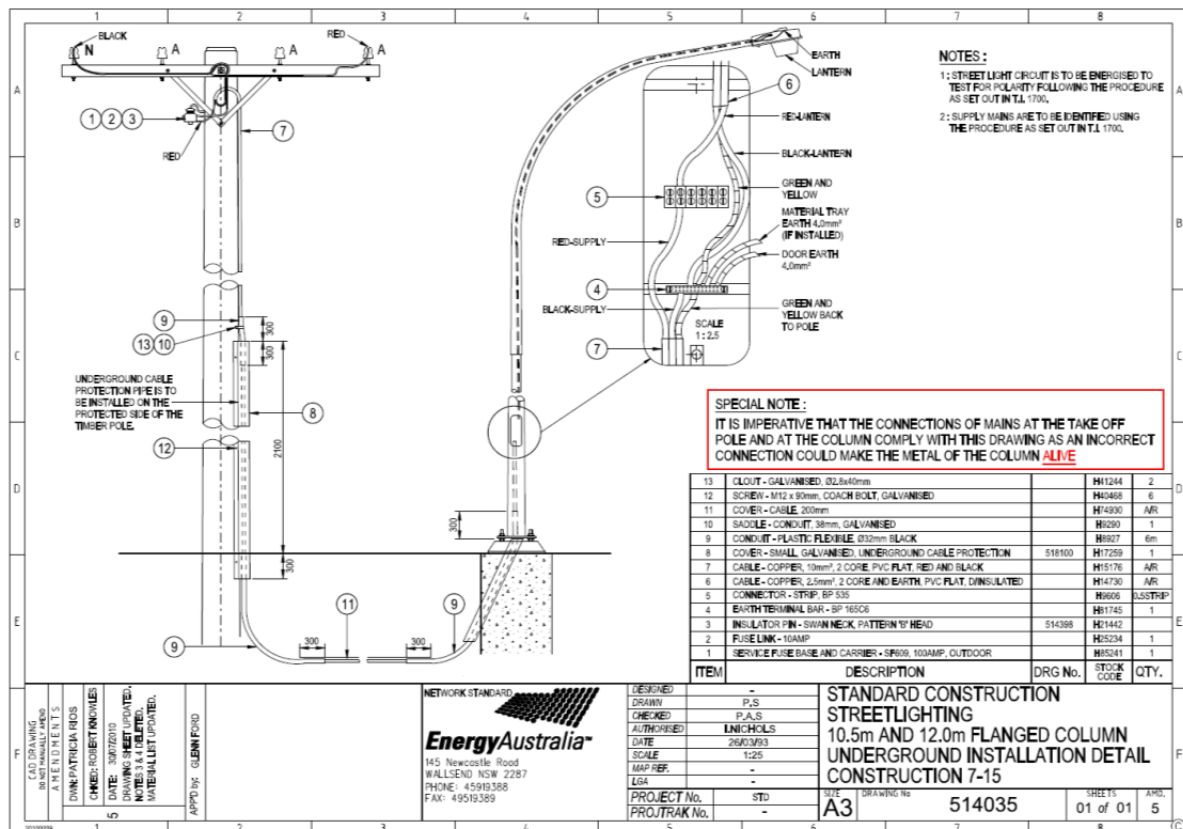
Table B2 Double Insulated Brackets

Description	Stockcode	Photo
44mm diameter floodlighting bracket	72249	
72mm diameter floodlighting bracket	72223	

B.3.3 Cabling

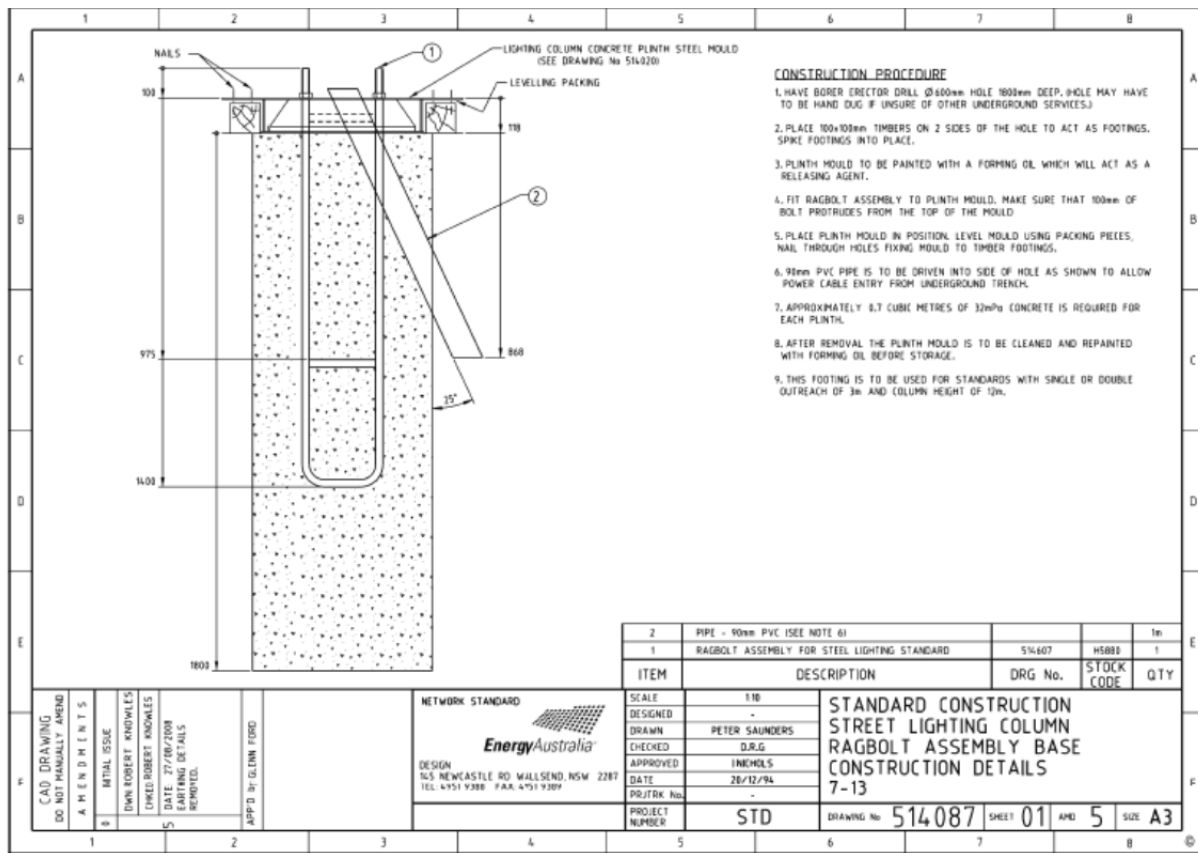
All cabling from the base of the pole to the luminaire or floodlight shall be double insulated twin (two-core) cable. The cable shall be suitably fixed and supported (eg by saddling cable to the choke panel and at the luminaire terminal block).

Annexure C – Single Insulated System Construction



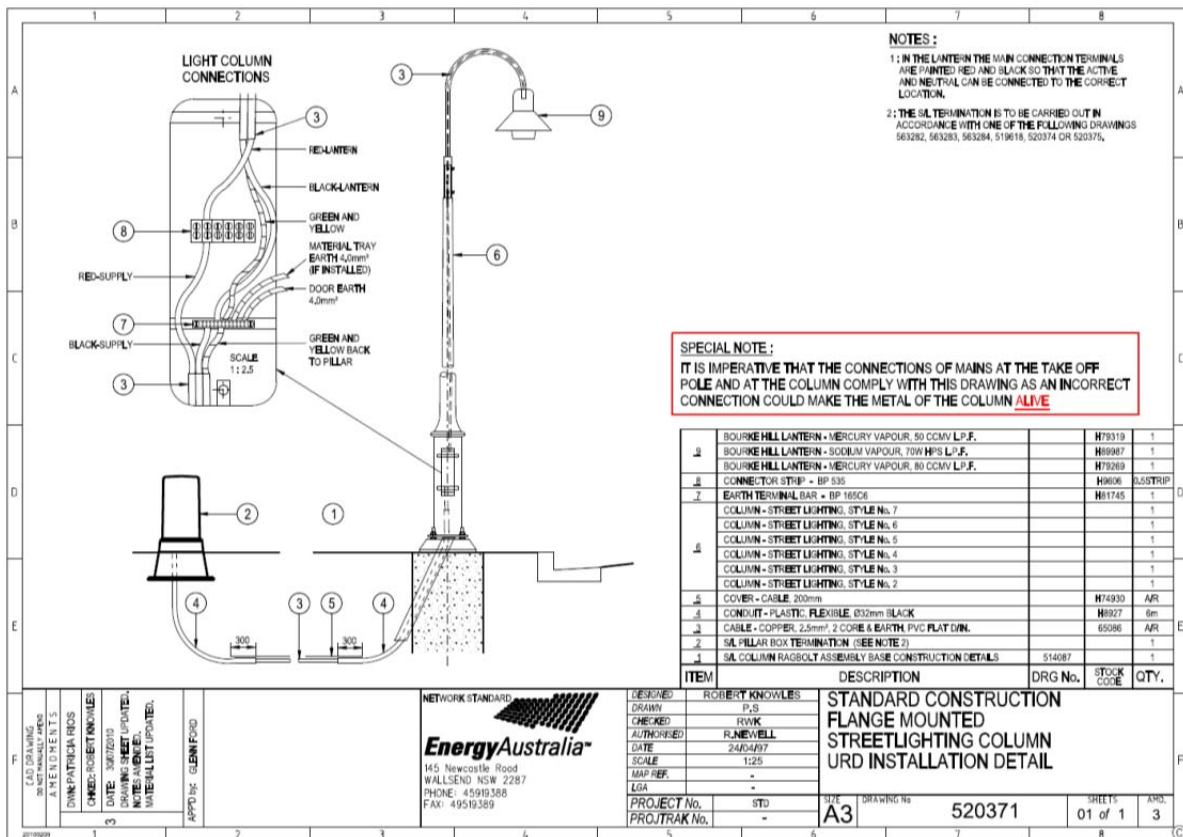
C.2 Rag Bolt Foundation for Steel Lighting Pole

For the latest version of this drawing go to the NS119 Reference Drawing List.



C.3 Pillar Fed Steel Lighting Pole

For the latest version of this drawing go to the NS119 Reference Drawing List.



Annexure D – Proposed Decorative Lighting Styles

D.1 Overview

The current decorative lighting practices in the Sydney and Central Coast regions are under review. The Hunter region's decorative lighting practices may also be subject to change as a result of the Sydney and Central Coast review. In the meantime, current practices prevail.

The following styles of components are proposed to be available in the near future. Once available, specific makes and models with stockcodes will be listed in this Appendix.

The equipment specification will contain requirements on Australian Standard interfaces and some functional requirements. The equipment will be largely interchangeable across the range (mix and match), and is also expected to be interchangeable across time because the interfaces are standardised.

D.2 Luminaire styles

The following four styles of luminaires will be made available.

D.2.1 Park pathway (functional)

A low-mounting post-top luminaire complying with Upward Waste Light Ratio requirements in AS/NZS 1158. The luminaire must have a minimum vandal resistance rating of IK08. The luminaire shall have superior photometric performance for pathway lighting applications, i.e. asymmetrical distribution.

D.2.2 Park pathway (decorative)

A low-mounting spherical post-top luminaire complying with Upward Waste Light Ratio requirements in AS/NZS 1158. The luminaire must have a minimum vandal resistance rating of IK08. The luminaire shall have superior photometric performance for pathway lighting applications, i.e. asymmetrical distribution.

D.2.3 Area lighting (functional)

A high-mounting post-top luminaire complying with Upward Waste Light Ratio requirements in AS/NZS 1158. The luminaire must have a minimum vandal resistance rating of IK06. The luminaire shall have superior photometric performance for area lighting applications, i.e. symmetrical distribution.

D.2.4 Decorative roadway (side entry and top entry versions)

Side entry and top entry luminaires complying with Upward Waste Light Ratio requirements in AS/NZS 1158. The luminaire must have a minimum vandal resistance rating of IK08 for low wattage, low mounting; or IK06 for high wattage, high mounting. The luminaire shall have superior photometric performance for road lighting applications, i.e. asymmetrical distribution.

D.3 Pole styles

The standard decorative luminaire mounting heights shall be 6m and 10.5m.

Therefore the pole sizes will be 4.5m and 9m (for attachment of decorative arms to achieve 6m and 10.5 mounting height respectively) and 6m and 10.5m (for use in post top applications)



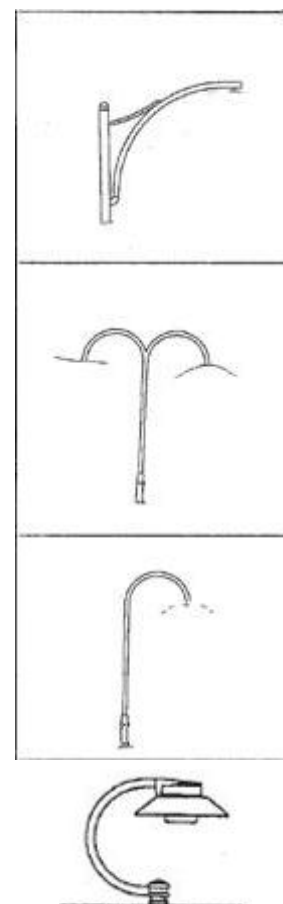
D.4 Bracket arm styles

For side and top entry luminaires, the bracket arm may be chosen from the following range.

These arms will be of two size ranges: small arms to achieve 6m mounting height, and large arms to achieve 10.5m mounting height.

For the Double Insulated street lighting system, double insulated luminaires shall be used.

For the Single Insulated street lighting system, standard single insulated luminaires shall be used.



Annexure E – Equipment Specifications

E.1 Warning

Specifications contain equipment that is used to construct new street lighting assets as well as to maintain older style assets.

Although specifications are reviewed regularly, the equipment listing and stockcode information shall not be read as currently approved.

E.2 Specification for steel lighting poles, bracket arms and rag bolt assemblies

Due to the size of the specification, it is available on request from Ausgrid.

E.3 Specification for street lighting equipment (luminaires, lamps and control gear)

Due to the size of the specification, it is available on request from Ausgrid.

Annexure F – Approved Equipment List

Some equipment is only approved for specific regions. Where this is the case, the equipment list is marked to indicate the applicable region(s). Where the equipment list is not marked with any regions, the equipment is applicable to all regions of Ausgrid.

F.1 Wood poles

See NS 128 for a listing of wood poles available.

F.2 Steel lighting poles

F.2.1 Post Top Poles for Sydney and Central Coast Regions

Stock code	Pole Mounting Height	Outreach	Mounting Method	Pole Drawing No.	Panel Size	Link Panel Stockcode	Spigot Size	DI Spigot Stockcode
137935	4.5m Hyde Park	-	In-Ground mounted	B1-117778	125mm x 610mm	150797	34mm	68874
90001	4.5m Rocks	-	In-Ground mounted	B1-63060	125mm x 610mm	150797	34mm	68874
72082	4.5m Rocks	-	Base Plate mounted	B1-63060	125mm x 610mm	150797	34mm	68874
72017	4.5m Post Top Continuous tapered	-	In-Ground mounted	B1-66271	125mm x 420mm	66845	34mm	68874
72033	7m Post Top Continuous tapered	-	In-Ground mounted	B1-66271	125mm x 610mm	150797	34mm	68874
72025	8.5m Post Top Continuous tapered	-	In-Ground mounted	B1-66271	125mm x 610mm	150797	34mm	68874
89953	10.5m Post Top Reduced tapered	-	In-Ground mounted	B1-66271	125mm x 610mm	150797	34mm	68874

F.2.2 Poles with Curved Outreach Arms for Sydney and Central Coast Regions

Stockcode	Pole Mounting Height	Outreach	Mounting Method	Pole Drawing No.	Panel Size	Link Panel Stockcode	Spigot Size	DI Spigot Stockcode
179415	6m See Saw	-	Base Plate Mounted 350 PCD	Ingal			34mm	177351
71993	6.5m	1 x 1.5m	In-Ground mounted	B1-66272	125mm x 420mm	66845	42mm	177351
100115	6.5m	1 x 2m	Base Plate Mounted	B1-66273	125mm x 420mm	66845	42mm	177351
72058	6.5m	1 x 3m	In-Ground mounted	B1-66272	125mm x 420mm	66845	42mm	177351
79889	7.5m	1 x 2m	In-Ground mounted	B1-66272	125mm x 610mm	150797	42mm	177351
108415	7.5m	2 x 2m	In-Ground mounted	B1-66272	125mm x 610mm	150797	42mm	177351
72108	9m	1 x 2m	In-Ground mounted	B1-66272	125mm x 610mm	150797	42mm	176441
181711	9m	1 x 4.5m	Base Plate Mounted	B1-115041	125mm x 610mm	150797	42mm	176441
79897	10.5m	1 x 2m	Base Plate Mounted	B1-66273	125mm x 610mm	150797	42mm	176441
72157	10.5m	1 x 2m	In-Ground mounted	B1-66272	125mm x 610mm	150797	42mm	176441
72173	10.5m	2 x 2m	In-Ground mounted	B1-66272	125mm x 610mm	150797	42mm	176441
90027	10.5m	1 x 6m	In-Ground mounted	B1-66637	125mm x 610mm	150797	42mm	176441
127266	10.5m	1 x 4.5m	In-Ground mounted	B1-66637	125mm x 610mm	150797	42mm	176441
181885	10.5m	1 x 4.5m	Base Plate Mounted	B1-115041	125mm x 610mm	150797	42mm	176441
72140	12m	1 x 2m	Base Plate Mounted	B1-66273	125mm x 610mm	150797	42mm	176441
72199	12m	2 x 2m	Base Plate Mounted	B1-66273	125mm x 610mm	150797	42mm	176441
72132	12m	1 x 2m	In-Ground mounted	B1-66272	125mm x 610mm	150797	42mm	176441
79905	12m	1 x 4.5m	In-Ground mounted	B1-66637	125mm x 610mm	150797	42mm	176441
181886	12m	1 x 4.5m	Base Plate Mounted	B1-115041	125mm x 610mm	150797	42mm	176441
104679	12m	1 x 6m	In-Ground mounted	B1-66637	125mm x 610mm	150797	42mm	176441

F.2.3 Poles with Curved Outreach Arms for Hunter Region

Stockcode	Pole Mounting Height	Outreach	Mounting Method	Pole Drawing No.	Panel Size	Link Panel Stockcode	Spigot Size	DI Spigot Stockcode
H83543	10.5m impact absorbing	1 x 2m	Base Plate Mounted 350 PCD	A3-154416	-	-	42mm	-
H6145	10.5m	1 x 2m	Base Plate Mounted 350 PCD	A3-154416	-	-	42mm	-
H7230	10.5m	1 x 3m	Base Plate Mounted 350 PCD	A3-154416	-	-	42mm	-
H6810	12m	1 x 3m	Base Plate Mounted 350 PCD	A3-154416	-	-	42mm	-
H6828	6.5m	1 x 1.5m	Base Plate Mounted 350 PCD	A3-154416	-	-	34mm	-

F.3 Bracket arms for wood poles

Stockcode	Description	Type	Spigot Size (OD)	Drawing	Upcast angle
72280	2 m arm projection	Type 1	42mm	A1-23227	5 deg
72264	3 m arm projection	Type 2A	42mm	B1-58188	5 deg
72272	4.5 m arm projection	Type 3A	42mm	B1-59737	5 deg
72298	2 m arm projection, front mounting	Type 4	42mm	A1-34083	5 deg
72413	2 m arm projection, back mounting	Type 5	42mm	A1-34083	5 deg
72314	6 m arm projection	Type 6	42mm	B1-63736	5 deg
72256	4 metre arm projection, 4 metre uplift	Type 7	42mm	B1-66439	5 deg
72348	500 mm arm projection	-	34mm	A2-48728	10 deg
72389	500 mm arm projection, wall mounted	-	42mm	A2-48729	10 deg
72330	500 mm arm projection, wall mounted	-	34mm	A2-32329	10 deg
72322	500 mm arm projection, horizontal mounted	-	34mm	A2-62405	0 deg
90043	1.2 m arm projection complete with insulating spigot (insulating spigot supplied by Ausgrid for fitting by supplier)	-	42mm	A1-116325	10 deg
72421	2m arm projection	-	34mm	A1-32330	5 deg
72447	3.5 m arm projection	-	34mm	A1-46911	10 deg
72397	4 m arm projection	-	34mm	A1-36355	10 deg
H5979	1.2 m arm projection	-	34mm	A2-515414	
H65938	3 m arm projection	-	42mm	A2-515156	
H66282	3 m arm projection, 3 m uplift	-	42mm	A2-515413	
H86439	4.5 m arm projection, 2.5m uplift	-	42mm	A1-514066	
H5995	1.5 m arm projection, 3 m uplift	-	42mm	A2-515415	
H106450	Post Top Conversion Outreach	-	34mm	A2-519502	
72439	Pedestrian crossing luminaire bracket arm	-	42mm	29188	

F.4 Frangible steel poles

Currently, the structural requirements of frangible steel lighting poles shall be specified by the relevant roads authority.

In the future, Ausgrid will specify and have approved frangible steel lighting poles for use for new and retrofit situations.

F.5 Hunter Region prestigious lighting system

Stockcode	Description	Drawing
H120469	PLS 1 Street Lighting 4.5 m Pole	A2-565780
H120477	PLS 8 Outreach Arm - Single Hook Arm	A2-520427
H120691	PLS 9 Outreach Arm - Double Hook Arm	A2-565306
H125237	PLS 10 Outreach Arm - Curve Fancy Straight Out Arm	A2-520430
H120683	PLS 16 Spigot Adaptor	A3-520422

F.6 Rag bolt assemblies to suit base-plate mounted poles

Stockcode	Description	PCD	Length	Drawing
H5880	Rag Bolt Assembly	350	1400mm	A2-514607

F.7 Outreach extension

Stockcode	Description	Drawing
79962	1 metre outreach arm extension for use on pole with 1.5m or 2m outreach arm	A2-65411

F.8 Insulating spigots for use in the Sydney and Central Coast regions

F.8.1 Insulating Spigots

Stockcode	Description	Drawing
176441	Insulated Spigot 42mm ID to 42mm OD	A2-125149
177351	Insulated Spigot 42mm ID to 34mm OD (clamp type) For use on newer and current poles and pillar standards	A2-151959
68874	Insulated Spigot 34mm ID to 76mm OD	A3-43238

F.8.2 Other Insulating Brackets

Stockcode	Description	Drawing
72249	44mm diameter floodlighting bracket	A2-62980
72223	72mm diameter floodlighting bracket	A2-62980

F.9 Non-insulating spigots

Stockcode	Description	Drawing
132258	Angled Spigot 42mm ID to 42mm ID (tube)	A2-117697
H77149	Spigot 42mm ID to 34mm OD	A3-514011

F.10 Steel pole link panels for use in the Sydney and Central Coast regions

Stockcode	Description	Drawing
150797	610 mm x 125 mm Link panel	A1-24969
66852	651 mm x 100 mm Link panel	A1-116216
66845	420 mm x 125 mm Link panel	A2-62525

F.11 Luminaires

F.11.1 Cat V Road Lighting Luminaires (with NEMA PE cell base, lamp and PE cell to be ordered separately)

Stock Code	Description	To suit pole spigot	Manufacturer	Model	Manufacturers Part No.	I table	Design Lumens	IP rating of luminaire optical chamber	Notes	Stockcode of lamp used
177243	100W HPS Category V Luminaire	42mm	SYLVANIA	Roadster	PR47K01	98358	9000	IP66		182081
182539	150W HPS Category V Active Reactor Luminaire	42mm	SYLVANIA	Roadster	PRE42K01L	98370	15000	IP66	with Glareshield I-table is 202200	182070
182538	250W HPS Category V Active Reactor Luminaire	42mm	SYLVANIA	Roadster	PRE43K01L	98354	28000	IP66	with Glareshield I-table is 200178	182069
182516	400W HPS Category V Active Reactor Luminaire	42mm	SYLVANIA	Roadster	PRE44K01L	98382	48000	IP66		182068
57000	1000W HPS Category V Luminaire		SYLVANIA	Nightstar Profile	S51102	S51102	130000	IP54		12260
179811	100W HPS Category V Luminaire, Aeroscreen	42mm	SYLVANIA	Roadster	PR47K31	98385	9000	IP66		12328
182676	150W HPS Category V Active Reactor Luminaire, Aeroscreen	42mm	SYLVANIA	Roadster	PR42K31	PRE42K10L	15000	IP66		182070
182677	250W HPS Category V Active Reactor Luminaire, Aeroscreen	42mm	SYLVANIA	Roadster	PR43K31	PRE43K10L	28000	IP66		182069
182678	400W HPS Category V Active Reactor Luminaire, Aeroscreen	42mm	SYLVANIA	Roadster	PR44K03	PRE44K10L	48000	IP65		182068

F.11.2 Cat P Road Lighting Luminaires (with D2 PE cell base.)

Stock Code	Description	To suit pole spigot	Manufacturer	Model	Manufacturers Part No.	Table	Design Lumens	IP rating of luminaire optical chamber	Stockcode of lamp used
58289	70W HPS Category P Luminaire	34mm	SYLVANIA	Suburban	JS41K01	203352	5600	IP64	12120
177886	70W HPS Category P Luminaire, Aeroscreen	34mm	SYLVANIA	Urban	JA41K31	95633	5600	IP64	12120
182481	72W CMI Category P3 Luminaire	34mm	SYLVANIA	Urban	JA11K05	201045	7700	IP65	182483
182482	72W CMI Category P3 Luminaire Aeroscreen	34mm	SYLVANIA	Urban	JA11K06	95635 ¹	7700	IP65	182483
182726 ²	22W LED Category P Luminaire ³	34mm	SYLVANIA	StreetLED	JL99K01L22	214201	2105	IP66	N/A
182725 ²	22W LED Category P Luminaire Aeroscreen ³	34mm	SYLVANIA	StreetLED	JL99K02L22	StreetLED 22W - Aero	2105	IP66	N/A

¹ Photometrics are the same as the 80W Sylvania urban with a higher initial design lumens.

² 22W LED supersedes 29W. 22W should be used for all future installations.

³ Refer to Appendix I for details on weather sealing the luminaire.

F.11.3 Pedestrian Floodlights (with NEMA PE cell base, lamp and PE cell to be ordered separately)

Stock Code	Description	Manufacturer	Model	Manufacturer's Part No.	Table	Design Lumen s	IP rating of luminaire optical chamber	Stock code of lamp used
181741	150 W, SON-T, narrow beam (low glare) floodlight with 1.5m tail.	SYLVANIA	Sylflood Asymmetrical	XS42K01	TBA	15000	IP65	12195
57752	250 W, SON-T, narrow beam (low glare) floodlight with 1.5m tail.	SYLVANIA	Sylflood Asymmetrical	XS43K01	202115	28000	IP65	12294
57513	400 W, SON-T, narrow beam (low glare) floodlight.	SYLVANIA	Sylflood Asymmetrical	XS44K01	202118	48000	IP65	12278



F.11.4 Other Luminaires for Sydney and Central Coast Regions (historical range)

Stock Code	Description
57455	Carousel 125W MBF post top luminaire
57471	Carousel 70W HPS post top luminaire
58222	Rocks non-integral luminaire E40 lamp base
58396	Macquarie non-integral luminaire E27 lamp base
126813	Bathurst 80W MBF post top luminaire with NEMA PE base
144840	Bathurst non-integral luminaire E27 lamp base
90217	Parkway non-integral luminaire E40 lamp base

F.11.4 Other Luminaires (Cont.)

Stock Code	Description	To Suit Spigot	Manufacturer	Model	Manufacturer's Part No.
H120451	42W CFL top entry decorative, G12 Holly	AS 1158 top entry fixing	Interlux	Bourke Hill style	B7166.78
176769	42W CFL top entry decorative, N61 Black	AS 1158 top entry fixing	Interlux	Bourke Hill style	B7166.78
178153	42W CFL top entry decorative, R55 Claret	AS 1158 top entry fixing	Interlux	Bourke Hill style	B7166.78
176772	42W CFL top entry decorative, colour to be specified	AS 1158 top entry fixing	Interlux	Bourke Hill style	B7166.78
176112	50W MV decorative, colour to be specified (gooseneck bracket supplied with luminaire)	76mm	Sylvania	Nostalgia	
176111	80W MV decorative, colour to be specified (gooseneck bracket supplied with luminaire)	76mm	Sylvania	Nostalgia	
H120436	42W CFL post top, colour to be specified	76mm	Artcraft	Flinders Encounter	

F.11.5 Luminaire Special Visors

Stockcode	Description	Photo
90266	Acrylic Glare shield Visor for Sylvania Roadster Luminaire	 A photograph of a white, dome-shaped acrylic glare shield visor. The visor is shown from a top-down perspective, revealing its internal structure and a central lens area. The brand name 'MAXIMATT' is visible on the inner surface. The visor is mounted on a white base with a red cap on the right side.
179214	Pathway Acrylic Visor for Sylvania Suburban / Suburban-Eco Luminaire	 A photograph of a clear, dome-shaped acrylic visor. The visor is shown from a top-down perspective, revealing its internal structure and a central lens area. The visor is mounted on a white base with a red cap on the right side.

F.12 Lamps

F12.1 High Pressure Sodium Lamps

Stockcode	Wattage	Cap Type	Lamp Type	Special Note	Manufacturer	Manufacturer's Part Number	Initial Lumens
12120	70 W high pressure sodium	E 27	SON-E	with internal igniter. Lamp length must be 156mm or less.	Philips	SON 70W I	5600
182081	100 W high pressure sodium	E 40	SON-T	-		SON-T PLUS 100W GES	9000
81505	150 W high pressure sodium	E 40	SON-E	-	Philips	SON 150W E	14500
182070	150 W high pressure sodium	E 40	SON-T	-	Philips	MASTER SON-T PIA Plus 150W/220 E40 1SL	15000
H118521	150 W high pressure sodium	E 40	SON-T	double arc tube standby lamp	Osram	NAV T150W/TT	14000
12187	250 W high pressure sodium	E 40	SON-E	-	Philips	SON 250W E	27000
182069	250 W high pressure sodium	E 40	SON-T	-	Philips	MASTER SON-T PIA Hg-Free 250W/221 E40 SLV	28000
H118513	250 W high pressure sodium	E 40	SON-T	double arc tube standby lamp	Osram	NAV-T250W/TT	27000
12088	400 W high pressure sodium	E 40	SON-E	-	Philips	SON 400W	48000
182068	400 W high pressure sodium	E 40	SON-T	-	Philips	MASTER SON-T PIA Hg-Free 400W/221 E40 SLV	48000
12260	1000 W high pressure sodium	E 40	SON-T	-	Philips	SON-T 1000W	130000

F.12.2 High Pressure Mercury Lamps

Stock Code	Wattage	Cap Type	Lamp Type	Special Note	Manufacturer	Manufacturer's part number	Initial lumens
182091	50 W high pressure mercury	E 27	MBF/U		Osram	HQL 50W 4Y	2000
182094	80 W high pressure mercury	E 27	MBF/U	-	Osram	HQL 80W 4Y	4000
182095	125 W high pressure mercury	E 27	MBF/U	-	Osram	HQL 125W 4Y	6800
11890	125 W high pressure mercury	E 40	MBF/U	-	Sylvania	HSL-BW125/E40	6300

F.12.3 Ceramic Metal Halide Lamps

Stock Code	Wattage	Cap Type	Lamp Type	Special Note	Manufacturer	Manufacturer's part number	Initial lumens
182483	72 W Ceramic metal halide	E27	CMI		Sylvania	CMI70W/HOR	7700

F.12.4 Fluorescent lamps

Stock Code	Wattage	Length	Colour Temp	Special Note	Manufacturer	Manufacturer's part number	Initial lumens
180174	42W, 4 pin, GX24q-4 cap, CFL compact fluorescent amalgam lamp, colour rendering index 84. Part number Sylvania LYNX-CFTE-42W/840, or similar.	149 mm	4000K	-	Osram	Dulux T/E 42W/840	3200

F.13 Photo-electric cells

Stockcode	Description
182715	10 Amp nominal, NEMA twist-lock socket-type photoelectric control switch. For use with Cat V luminaires.
150425	3 Amp nominal, D2 type photoelectric control switch for Category P luminaire.
176581	Blanking Cap for NEMA photoelectric switch base. For use with Cat V luminaires on switched street lighting circuit.
74922	Base for NEMA twist-lock socket-type photoelectric control switch complete with mounting bracket.

F.14 Miscellaneous

Stockcode	Description
177501	Three-way street lighting terminal block 16 – 50mm ² copper to 2.5mm ² copper
72793	Pole-mounted SLCP enclosure, drawing A1-19398
177552	10A in-line fuse for use in LV pillar
180336	Street lighting pole screening kit

Annexure G – Other Reference Construction Drawings

The following drawings are for reference only. They may not necessarily describe the current approved equipment range nor contain accurate details.

G.1 Wood Pole Bracket Arms

For the latest version of this drawing go to the NS119 Reference Drawing List.

TYPE	DIMENSION	DRG. NO.	STOCK CODE	FIXING MATERIAL REQUIRED	INDICATING HEIGHT	ILLUSTRATION
A	1200 mm REACH	A2-15414	5979	1 ONLY M12 M.S. GALV. ROD TO 2011 PILE DIA. 2 ONLY M12 > 30 mm TO EACH SIDE	10.25m	<p>ARM TYPE 25 H.B.</p>
B	2000 mm REACH	A2-14598	5987	1 ONLY M12 M.S. GALV. ROD TO 2011 PILE DIA. 2 ONLY M12 > 30 mm TO EACH SIDE	9.7m	<p>2 METRE BRACKET</p>
C	3050 mm REACH	A2-15156	65938	1 ONLY M12 M.S. GALV. ROD TO 2011 PILE DIA. 2 ONLY M12 > 30 mm TO EACH SIDE	9.7m	<p>3 METRE BRACKET</p>
D	3000 mm REACH	A2-15413	66262	1 ONLY M12 M.S. GALV. ROD TO 2011 PILE DIA. 2 ONLY M12 > 30 mm TO EACH SIDE	9.5m	<p>3 > 3 METRE BRACKET</p>
E	1500 mm REACH	A2-15415	5995	BRACKET TOWERS COMPLETE WITH EQUIPMENT - 10% AND REL.	10.5m	<p>FOR BRACKET FOR TOWER POLE</p>
F	1500 mm REACH	A1-14056	66439	1 ONLY M12 M.S. GALV. ROD TO 2011 PILE DIA. 2 ONLY M12 > 30 mm TO EACH SIDE	9.0m	<p>4.5 METRE BRACKET</p>
G						

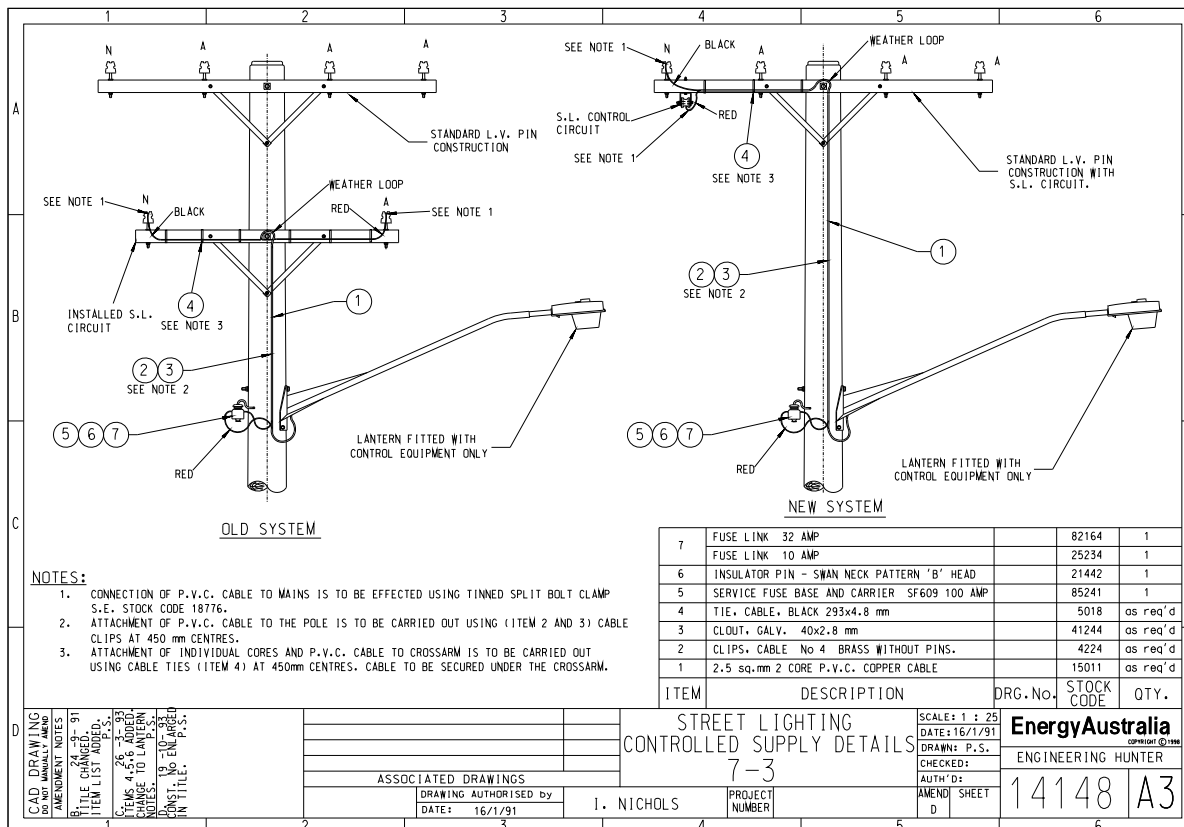
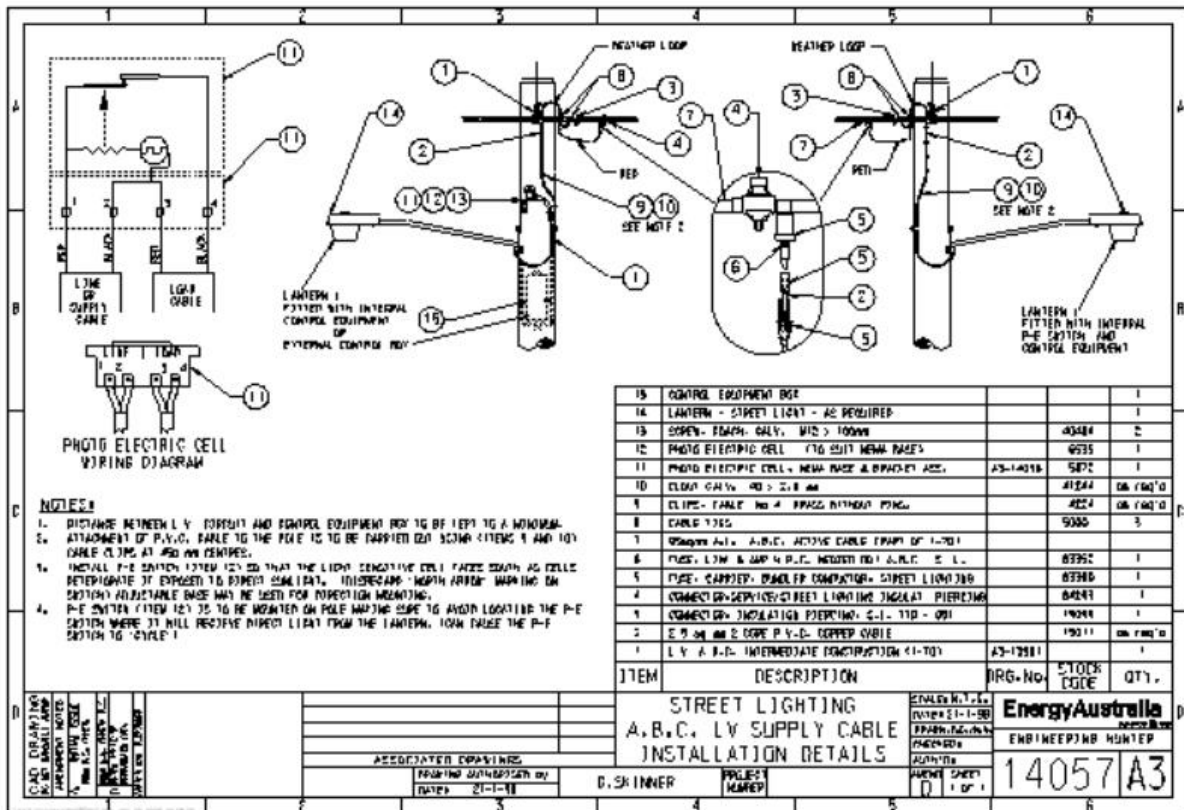
STANDARD STREET LIGHTING BRACKETS 7-2

DATE: 27-04-15
 DRAWING AUTHORIZED BY: J. NICHOLLS
 PROJECT NUMBER: 13953
 SHEET: A3

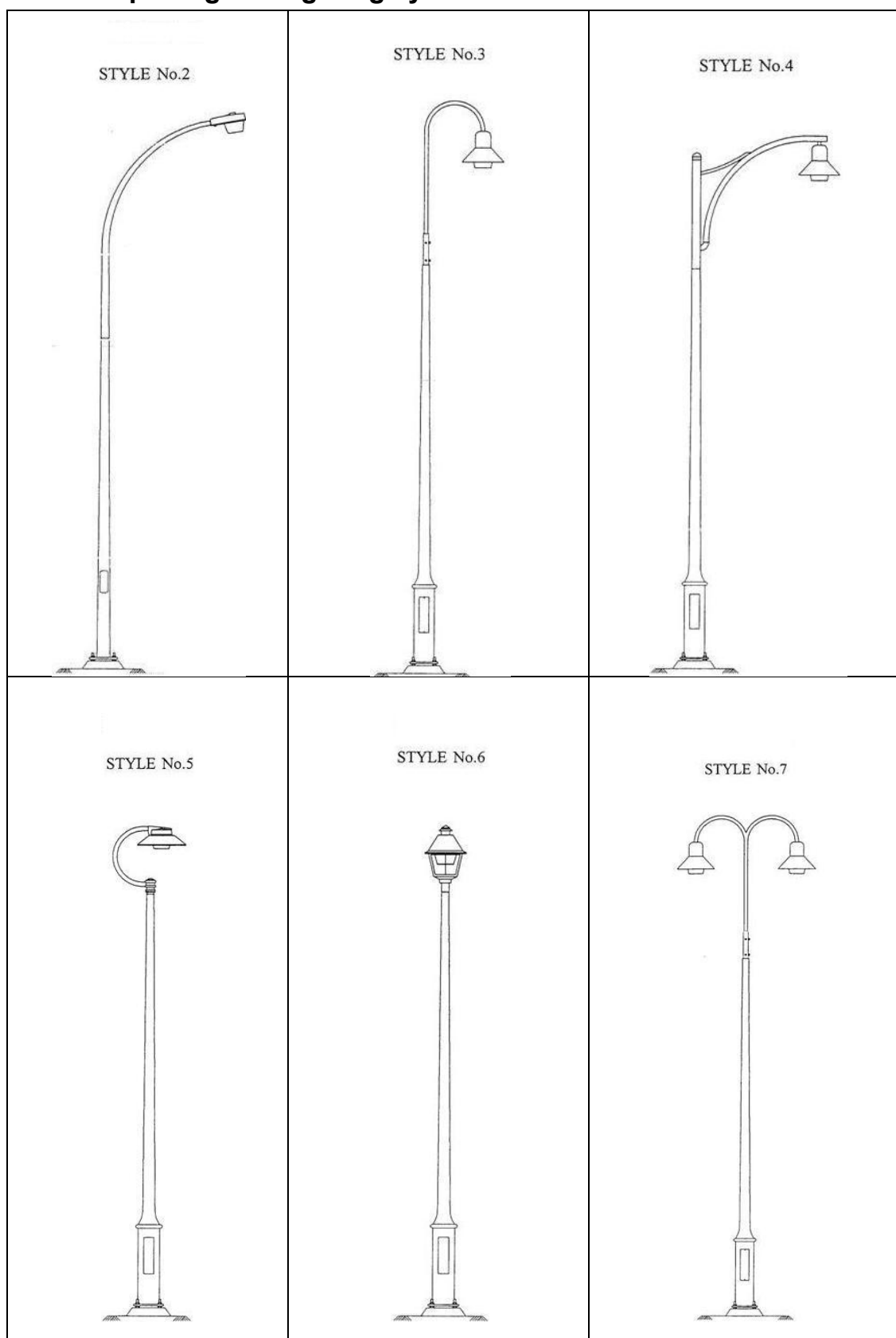
EnergyAustralia
 ENGINEERING WATER

G.2 Overhead mains fed arrangements

For the latest version of this drawing go to the NS119 Reference Drawing List.



G.3 Hunter prestigious lighting system



URD street lighting options

Component Description	Stock Code	Style No.2		Style No.3		Style No.4		Style No.5			Style No.6		Style No.7	
		29W LED	70W HPS	42W CFL	70W HPS	42W CFL	70W HPS	50W MV	80W MV	70W HPS	42W CFL	70W HPS	42W CFL	70W HPS
Columns & Outreach Arms														
Column – 6.5m x 1.5m Curved & Ragbolt; Not Painted	H6828	Yes	Yes											
Column 4.5m Ragbolt & Painted, Colour = G12 Holly	179692			Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Column 4.5m Ragbolt & Painted, Colour = N61 Black	179693													
Column 4.5m Ragbolt & Painted, Colour = R55 Claret	179691													
Column 4.5m Ragbolt & Painted, Colour = Other than Holly or Black or Claret, (Specify the colour)	H120469													
Hook Arm, Painted, Colour = G12 Holly	179679			Yes	Yes									
Hook Arm, Painted, Colour = N61 Black	179680													
Hook Arm, Painted, Colour = R55 Claret	179678													
Hook Arm, Painted, Colour = Other than Holly or Black or Claret, (Specify the colour)	H120477													
Double Hook Arm, Painted (Specify the colour)	H120691												Yes	Yes
Curve Fancy Straight Out Arm, Painted, Colour = G12 Holly	179676					Yes	Yes							
Curve Fancy Straight Out Arm, Painted, Colour = N61 Black	179677													
Curve Fancy Straight Out Arm, Painted, Colour = R55 Claret	179675													
Curve Fancy Straight Out Arm, Painted, Colour = Other than Holly or Black or Claret, (Specify the colour)	H125237													
Spigot Adaptor, Painted (Specify the colour)	H120683							Yes	Yes	Yes	Yes	Yes		
Ragbolt Assembly	H5880	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Component Description	Stock Code	Style No.2		Style No.3		Style No.4		Style No.5			Style No.6		Style No.7	
		29W LED	70W HPS	42W CFL	70W HPS	42W CFL	70W HPS	50W MV	80W MV	70W HPS	42W CFL	70W HPS	42W CFL	70W HPS
Luminaires														
29W LED - Basic Type Not Painted (Default luminaire)	182726	Yes												
70W HPS - Basic Type Not Painted	58289		Yes											
42W CFL - Top entry – Painted, Colour = G12 Holly	H120451			Yes		Yes							Yes	
42W CFL - Top entry – Painted, Colour = N61 Black	176769													
42W CFL - Top entry – Painted, Colour = R55 Claret	178153													
42W CFL - Top entry – Painted, Colour = Other than Holly or Black or Claret, (Specify the colour)	176772													
70W HPS - Top entry - Painted					Yes		Yes							Yes
50W MV - Side entry – Painted (Specify the Colour)	176112							Yes						
80W MV - Side entry – Painted (Specify the Colour)	176111								Yes					
70W HPS - Side entry - Painted										Yes				
42W CFL - PostTop - Painted											Yes			
70W HPS - PostTop - Painted												Yes		
Photoelectric Cell	150425	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes			Yes	Yes

Annexure H – Spare Parts for Maintenance of Legacy Street Lights

H.1 Steel lighting poles

H.1.1 Post Top Poles

Stockcode	Pole Mounting Height	Outreach	Mounting Method	Pole Drawing No.	Panel Size	Link Panel Stockcode	Spigot Size	DI Spigot Stockcode
79921	3m Macquarie	-	In-Ground mounted	B1-116157	100mm x 651mm	66852	76mm	not available
79913	3m Macquarie	-	Base Plate mounted	B1-116157	100mm x 651mm	66852	76mm	not available
72041	3m Post Top Continuous tapered	-	In-Ground mounted	B1-66271	none available	none available	34mm	68874

H.1.2 Poles with Curved Outreach Arms

Stockcode	Pole Mounting Height	Outreach	Mounting Method	Pole Drawing No.	Panel Size	Link Panel Stockcode	Spigot size	DI Spigot Stockcode
72074	6.5m panel door facing road	1 x 1.5m	In-Ground mounted	B1-66272	125mm x 420mm	66845	42mm	177351
89938	6m Pillar Standard	1 x 3m	Base Plate Mounted	B1-63283	pillar panel	73817 (link panel) or 176631 (three way)	42mm	177351

H.2 Rag bolt assemblies to suit base-plate mounted poles

Stockcode	Description	PCD	Length	Drawing
79996	No.1 Rag Bolt Assembly	350	1400mm	A1- 63284
80028	No.2 Rock Rag Bolt Assembly	350	1000mm	A1- 63735

H.3 Strengthening sleeve

Stockcode	Description	Drawing
H114348	Strengthening sleeve for steel poles	A3-520510

H.4 Insulating spigots

Stockcode	Description	Drawing
68866	Insulated Spigot 42mm ID to 34mm OD (threaded type) For use on older style poles and pillar standards only	A3-41826

H.5 Legacy decorative arm

Stockcode	Description	Drawing
175084	1m Village outreach arm	Polo drawing OL/OR8
181899	Single gooseneck bracket 900mm diameter painted in G12 Holly Green for connection to luminaire with AS/NZS 1158.6 Fig 2.1 top entry fixing type (three grub screws fixing). Bracket to be fixed to pole top which has 76mm O.D. 78mm long smooth spigot (Sydney post top insulating spigot). Height of the gooseneck arm to be 1.5m	Ingal part number YEASGLHK900-C155P1
181898	Double gooseneck bracket 900mm diameter painted in G12 Holly Green for connection to luminaire with AS/NZS 1158.6 Fig 2.1 top entry fixing type (three grub screws fixing). Bracket to be fixed to pole top which has 76mm O.D. 78mm long smooth spigot (Sydney post top insulating spigot). Height of the gooseneck arm to be 1.5m	Ingal part number YEADBLHK900-C155P1

H.6 Luminaires

H.6.1 Legacy Luminaires

Stock Code	Description
176219	100W metal halide aeroscreen luminaire
176231	70W metal halide aeroscreen luminaire
179582	80W MBF Bourke Hill double insulated luminaire, colour to be specified, for Essential Energy (formerly Country Energy) project only
179702	250W HPS luminaire; colour = black
179703	150W HPS luminaire; colour = black
181901	80W MV Toorak or similar luminaire with D2 pe cell base, top entry mounting as per AS/NZS 1158.2.1 Painted G12 Holly Green.
181902	80W MV Toorak or similar luminaire with D2 pe cell base, side entry mounting. Painted G12 Holly Green.
57364	Category V Luminaire (no gear rated for up to 700W MBF or 400W HPS) – Rexel Optispec

H.7 Lamps

H.7.1 High Pressure Sodium Lamps

Stock Code	Wattage	Cap Type	Lamp Type	Special Note
12161	50 W high pressure sodium	E 27	SON-E	with internal igniter
150524	70W high pressure sodium	E 27	SON-T	without igniter, to suit Sylvania's 'Multikat' floodlight. SHP-T70/CL/E or equivalent.
12146	100 W high pressure sodium	Mogul (E 39)	SON-E	with nominal lamp voltage of 55 V
H5408	250 W high pressure sodium	E 40	SON-E	with internal igniter

H.7.2 High Pressure Mercury Lamps

Stock Code	Wattage	Cap Type	Lamp Type	Special Note
11874	250 W high pressure mercury	E 40	MBF/U	-
11833	400 W high pressure mercury	E 40	MBF/U	-
11866	700 W high pressure mercury	E 40	MBF/U	-
11940	1000W high pressure mercury	E 40	MBF/U	slim type 350mm long x 165mm diameter

H.7.3 Fluorescent Lamps

Stock Code	Wattage	Length	Colour Temperature
11981	18W or 20W, 250V Bi-pin, hot cathode tubular fluorescent lamp	600 mm	4300K
12005	36 W or 40 W, 250V, Bi-pin, hot cathode tubular fluorescent lamp	1200 mm	4300K
12013	65/80W, 250V, Bi-pin, MCFE rapid start, hot cathode tubular fluorescent lamp	1500 mm	4300K
12021	26W CFL		2700K
180321	14W, Bi-pin, G5 cap, hot cathode tubular fluorescent lamp, colour rendering index 84. Part Number Osram FH 14W/840 Lumilux, or similar.	563 mm	4000K

H.7.4 Metal halide Lamps

Stock Code	Wattage	Cap Type	Lamp Type
176203	70 W metal halide coated ovoid lamp, for universal burning. Colour temperature 3000K. Part number OSRAM HQI-E70W/WDL or similar.	E 27	HPI-E
12344	70W metal halide lamp, double ended. Lamp voltage 95V, lamp current 1A, 5000 lumens, colour temperature 3000K.	-	-
176204	100 W metal halide coated ovoid lamp, for universal burning. Colour temperature 3000K. Part number OSRAM HQI-E100W/WDL or similar.	E 27	HPI-E
146191	250 W metal halide tubular lamp, for horizontal burning. Part number PHILIPS HPI PLUS 250W GES or similar.	E 40	HPI-T
12336	400 W metal halide tubular lamp, for horizontal burning, lamp voltage 120 / 125V.	E 40	HPI-T
175522	400 W metal halide coated ovoid lamp, for universal burning, and for use with constant wattage control gear. Part number M400/C/U or similar.	E 40	HPI-E
180341	1000 W metal halide tubular lamp, for horizontal burning. To fit in Philips HNF901 Puma floodlight.	E 40	HPI-T

H.7.5 Tungsten Halogen Lamps

Stock Code	Wattage	Cap Type	Lamp Type
16501	1500W tungsten halogen lamp	R75-15	TH
16535	750W tungsten halogen lamp		TH
16550	500W tungsten halogen lamp		TH

H.8 Photo-electric cells

Stockcode	Description
H7125	Base for "D2" type photoelectric control switch.

H.9 Luminaire spare parts

H.9.1 Fluorescent Luminaire Spare Parts

Stockcode	Description	Manufacturer of Luminaire
69302	Polycarbonate visor for Thorn Stradalux 2/20 W tubular fluorescent luminaire. Covers to be supplied with stainless steel hinges or clips fixed to cover. Part Number STRPOLV	Thorn Lighting
69344	Polycarbonate visor for Feature Lighting 2/20 W tubular fluorescent luminaires. Part Number N5880	Aldridge Railway Signals
69393	Polycarbonate visor for GEC 2/20 W tubular fluorescent luminaire. Part Number ASTPD	GEC Lighting
69146	Tapered Bowl to suit 4 x 20W 'Vela' luminaire	Aldridge Railway Signals
69153	Tapered Bowl to suit 4 x 40W 'Vela' luminaire	Aldridge Railway Signals
H7222	Visor to suit 1 x 40W FAMCO fluorescent luminaire	Gilford Electric Co. Pty Ltd
69070	2/20W twin fluorescent vandal proof cover, to all details on Ausgrid Dwg No. A2-63641	-
69336	Acrylic cover for Philips Wangi 2/20W Fluorescent luminaire	Philips

H.9.2 Gough Lighting Spare Parts

Stockcode	Description	Part Number
173336	Visor for 125W GL500/200479-C Luminaire.	200980-HA

H.9.3 Eye Lighting Spare Parts

Stockcode	Description	Part Number
H75960	Shade for EYE CHX250 Floodlight.	HS-O Guard

H.9.4 Crouse-Hinds Lighting Spare Parts


Stockcode	Description	Part Number
69138	Impact resistant glass visor for 1000W OV50 luminaire	

H.9.5 Philips Lighting Spare Parts


Stockcode	Description	Part Number
147264	Shade for Philips HNF901 medium beam floodlight.	HNF901Hood1

H.9.6 GEC Lighting Spare Parts

Stockcode	Description	Part Number	Photo
65649	Slip on visor gasket to suit GEC Optispec luminaire	OPCGAS	
69369	Visor with hinges to suit GEC Optispan luminaire	OPNAB	
176142	Visor with hinges to suit 400W GEC Optispan luminaire	OPNAB 400	
90241	Toughened glass cover to suit GEC 'Solar Flood' floodlight	SOLGLA	
H75986	Visor to suit GEC Optimum luminaire	OPMDIF	

Stockcode	Description	Part Number	Photo
69385	Visor, 110mm shaded, to suit GEC Optispan luminaire. The 110mm shaded area at mounting end of luminaire shall be made with scratch resistant black paint inside the visor. (see photo)	OPNABBLK	
69377	Plastic Visor for GEC Clearway Z8426 High semi cut off luminaire	GEC Z8426	
179742	Diffuser clip for Optispan luminaire	OPNDIF CLIP	
H6218	Visor for GEC Parkway luminaire		
99853	Visor to suit GEC Optipsec luminaire	OPCAB	
69187	Visor to suit GEC Optispec luminaire, high temperature for 700W	OPCHTAB	

H.9.7 Sylvania Lighting Spare Parts

Stockcode	Description	Part Number	Photo
175251	Acrylic Visor for Sylvania Urban series luminaire	J00000	
H7303	Visor to suit Sylvania M.T.H. series mercury vapour luminaire	L00000	
69211	Acrylic Visor for 150W/250W B3000 series Sylvania street light luminaire	P00000	
69229	Acrylic Visor for 400W Sylvania B2229 series luminaire	T00000	
179165	Acrylic Visor for Sylvania Suburban luminaires	JS00000	
69294	Flat acrylic visor for Sylvania B2229 series luminaire		
180175	42W compact fluorescent electronic control gear (ECG) cassette, with MOV surge arrester fitted, for Sylvania Suburban-Eco luminaire	JS00097	
H109272	Radio and TV interference suppression capacitors kit	LA00003	
180072	Wire guard kit for Suburban luminaire		
179741	Kit of 3 cocky clips for Suburban luminaire	PR00010	

H.9.8 Pierlite Lighting Spare Parts

Stockcode	Description	Part Number
180265	2 x 14W T5 tubular fluorescent electronic control gear (ECG) tray, with MOV surge arrester fitted, for Pierlite Greenstreet luminaire	GS/TRAY214/NL
180266	Acrylic Visor, lamp and gear, grey and clear, for Pierlite Greenstreet luminaire	GS/DIFF

H.9.9 Decorative Luminaire Spare Parts

Stockcode	Description	Part Number
58842	'Rocks' prismsphere refractor for new style luminaire, large hole	Compulite CPS 450
100099	'Rocks' prismsphere refractor for old style luminaire, 185mm hole to suit old style caribe fitter	Compulite CPS450-185
175022	'Rocks' prismsphere refractor complete with locking ring. New style caribe fitter	Compulite CPS450-LR
175023	Rocks' sphere conversion ring to fit CPS-450 to old style caribe fitter	Compulite CPS-CON
69120	Sylvania Macquarie sphere, without base casting, lampholder and lower reflector.	CF00010
145987	Visor for Sylvania Hyde Park Pearl Ball luminaire	Z52174
H6218	Diffuser for GEC Parkway Post top luminaire	
H7167	Prismatic Glass diffuser to suit Sylvania twin door B2227 Luminaire	
69237	460mm Frosted Sphere cover for 26W PLC Post top luminaire	
175381	Diffuser visor for GEC Boston 1 and Boston 2	
H103580	Acrylic diffuser cover to suit Bathurst post top lantern	GEC BATAD
177185	Visor and black shade assembly for Zumtobel Bega 9484 Olympic Village luminaire	99484.77

H.10 Chokes, boxes and panels

H.10.1 Mercury Chokes

Stockcode	Description
H69229	50W Encapsulated Mercury Vapour Ballast, for use in Sylvania Urban luminaire
H69237	80W Encapsulated Mercury Vapour Ballast, for use in Sylvania Urban luminaire
99838	125W Encapsulated Mercury Vapour Ballast
59188	250W Encapsulated Mercury Vapour Ballast
59162	400W Encapsulated Mercury Vapour Ballast
59121	700W Encapsulated Mercury Vapour Ballast

H.10.2 Mercury Choke Panels

Stockcode	Description	Panel size	Drawing
66746	125W mercury vapour control panel for 4.5 & 6.5m steel lighting poles	125mm x 420mm	A1- 119084
66795	125W mercury vapour control panel	125mm x 610mm	A1- 24969
66787	250W mercury vapour control panel	125mm x 610mm	A1- 24969
66779	400W mercury vapour control panel	125mm x 610mm	A1- 24969
66761	700W mercury vapour control panel	125mm x 610mm	A1- 24969
66753	1000W mercury vapour control panel	125mm x 610mm	A1- 24969

H.10.3 Mercury Choke Boxes

Stockcode	Description	Drawing
69021	125 W mercury vapour control box	A1- 66145
68973	250 W mercury vapour control box	A1- 66145
68981	400 W mercury vapour control box	A1- 66145
68999	700 W mercury vapour control box	A1- 66145

H.10.4 Sodium Chokes

Stockcode	Description
58941	70 W Encapsulated high pressure sodium ballast with two terminals, suitable for operation with internal igniter lamp
59048	250 W Encapsulated high pressure sodium ballast
59022	400 W Encapsulated high pressure sodium ballast
H121608	600 W (415 V) Encapsulated high pressure sodium ballast

H.10.5 Sodium Choke Panels

Stockcode	Description	Panel size	Drawing
89995	100 W High pressure sodium control panel	125mm x 610mm	A1- 56312
66829	100 W (55 V) High pressure sodium control panel for Rocks lighting pole	125mm x 610mm	A1- 56312
66720	150 W High pressure sodium control panel	125mm x 610mm	A1- 56312
66803	250 W High pressure sodium control panel	125mm x 610mm	A1- 56312
66811	400 W High pressure sodium control panel	125mm x 610mm	A1- 56312

H.10.6 Sodium Choke Boxes

Stockcode	Description	Drawing
68916	150 W High pressure sodium control box	A1- 66145
68924	250 W High pressure sodium control box	A1- 66145
68932	400 W High pressure sodium control box	A1- 66145
146266	1000 W High pressure sodium control box	A1- 66145
H6080	250 W High pressure sodium ballast gear tray, suitable for use in steel lighting pole. Gear trays shall have ballast, igniter, terminal block and fuse	

H.10.7 Metal Halide Choke Panels

Stockcode	Description	Panel size	Drawing
66860	70W Metal Halide control panel	100mm x 650mm	A1- 116183
175521	400W Metal Halide control panel, with Atco constant wattage control gear CWMH400-03.	125mm x 610mm	Similar to A1- 24969

H.10.8 Metal Halide Choke Boxes

Stockcode	Description	Drawing
146209	250 W Metal Halide control box	A1- 66145
146217	400 W Metal Halide control box	A1- 66145
146225	1000 W Metal Halide control box	A1- 66145

H.10.9 Other Choke Panels

Stockcode	Description
77909	650 mm x 100 mm x 12 mm Blank panel
77925	610 mm x 125 mm x 12 mm Blank panel
77933	420 mm x 125 mm x 12 mm Blank panel

H.10.10 Other Items

Stockcode	Description
H7141	Igniter to suit up to 400 W high pressure sodium lamp

H.10.11 Fluorescent Chokes

Stockcode	Description
59196	18/20 W 240V 50 Hz Low loss Switch start ballast for use in fluorescent street lighting luminaire, with 8kV impulse withstand.
H5898	Single 20 W 240V Switch start fluorescent ballast.
H5903	40 W 240V Fluorescent Switch start ballast with 457mm leads.

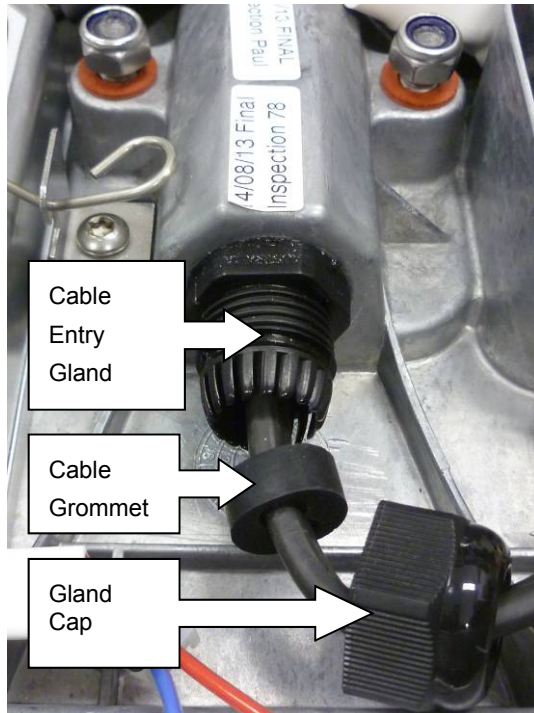
H.10.12 Fluorescent Starters

Stockcode	Description
58867	Interchangeable glow-starters for use with 18 W lamps, for both parallel and series 2 x 18 W circuits.
58909	Interchangeable glow-starters for use with 36 W lamps.

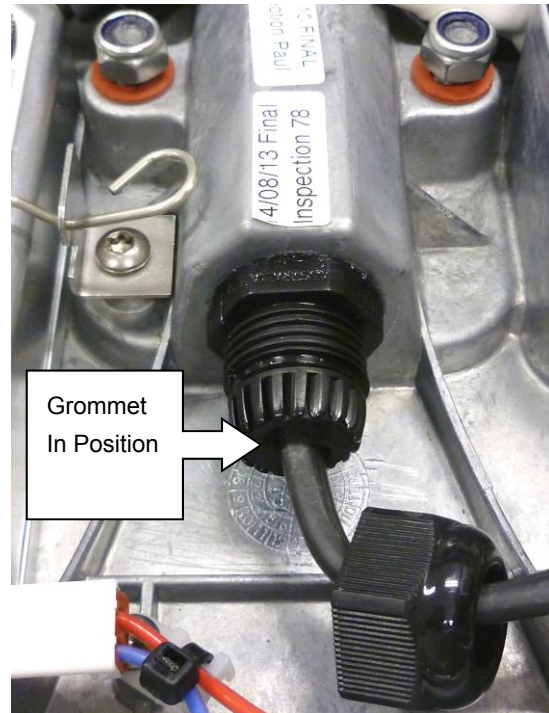
Annexure I – Weather Sealing Requirements of 29W LED StreetLED Luminaire

Weather Sealing Procedure (suits 2 and 3-core cable installation)

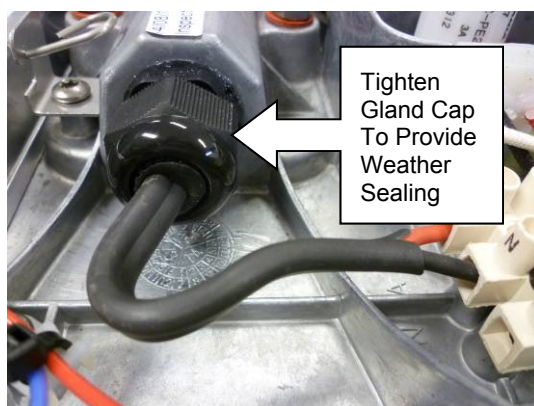
1. Slide Cable Grommet and Gland Cap Over Cable



2. Push the Cable Grommet into the Cable Entry Gland



3. Tighten the Gland Cap to Provide Weather Sealing



4. Finished Arrangement



Annexure J – Sample Compliance Checklist



Network Standard Checklist Form

NS119 Street Lighting Design and Construction

Project Identification:	
Prepared by: <Name & Position Title>	Date:

This checklist is for internal Ausgrid use only and does not apply to ASPs or contractors who have specific compliance requirements in relation to Contestable project works. The checklist is unique for each network standard and is available within BALIN and the BMS as a separate form that can be amended as required, completed and saved in TRIM with the other project documentation.

This section is used to identify compliance checks that when applied to the work associated with this Network Standard will satisfy an audit process to establish that the requirements of the standard have been followed. It is expected that applicable items would normally be checked as Comply (Yes) as non-compliance is generally not tolerated.

Where non-compliance is the result of specific site conditions or design decisions this needs to be identified in the notes section of the form for each non-compliance and approval sought from an appropriately authorised Ausgrid manager responsible for design approval per NS261 Compliance Framework for Network Standards.

Should additional information be available to document non-compliance decisions, these can be attached to the checklist form. The checklist and any attached explanatory notes should be saved in the project document repository.

Item	Description	Refer Clause	Completed/ Actioned
	Scope		
	Network Standard NS 119 details the design and construction requirements for street lights in the Sydney, Central Coast and Hunter regions.		
	Design and Purchase		
1	Ausgrid to supply current information on LV supply and existing SL assets in project area together with details of connection points.	6.1	Yes/No/NA
2	Types of cables, pillars, and other electrical equipment as specified in this and other referenced standards.	7.1.1	Yes/No/NA
3	Designer must be accredited and authorised Level 3 Accredited Service Provider.	7.1.2	Yes/No/NA
4	Clearances between street lighting equipment and exposed conductors must comply with Ausgrid's electrical safety rules.	7.1.3	Yes/No/NA
5	Where an existing SL pillar to be removed and no longer required it is replaced with a distribution pillar.	7.1.4	Yes/No/NA
6	SL connections to LV mains are in accordance with NS124 Specifications for Overhead Connections (100 to 400 Amps).	7.1.5	Yes/No/NA
7	Overhead SL fittings connected and protected as detailed in Clause 7.1.5	7.1.5	Yes/No/NA
8	Underground supplied street lighting systems comply with requirements of Clause 7.1.6.	7.1.6	Yes/No/NA
9	The Street Lighting Customer has supplied a lighting design brief.	7.2.1	Yes/No/NA

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Item	Description	Refer Clause	Completed/ Actioned
10	The Lighting Designer is qualified by training and experience to undertake Australian Standard compliant lighting designs.	7.2.2	Yes/No/NA
11	The lighting design complies with AS/NZS 1158.	7.2.3	Yes/No/NA
12	The lighting design utilises Ausgrid approved street lighting equipment.	7.2.4	Yes/No/NA
13	The aeroscreen luminaire is used at the end of cu-de-sacs.	7.2.5	Yes/No/NA
14	Placement of street lighting poles is in accordance with the requirements of Clause 7.2.6.	7.2.6	Yes/No/NA
15	Rag-bolt mounted street light poles used wherever possible.	7.2.7	Yes/No/NA
16	The lighting design for pedestrian crossings meets the Australian Standard vertical illuminance requirements.	7.2.8	Yes/No/NA
17	Floodlights not installed on poles containing pole mounted substations.	7.2.9	Yes/No/NA
18	Requirements for decorative lighting designs met in accordance with Clause 7.2.10.	7.2.10	Yes/No/NA
19	Where painted street lighting furniture is used the requirements of Clause 7.2.11 are met.	7.2.11	Yes/No/NA
20	Street lighting equipment used in the street lighting design must be from the approved list in Annexure F.	7.3	Yes/No/NA
21	Lighting design documentation complies with AS1158 and NS104 Specification for Electrical Network Project Design Plans.	7.4	Yes/No/NA
22	Equipment used in the lighting design meets the specifications as identified in Annexure E.	8.1	Yes/No/NA
23	Equipment used in the street lighting design is from the approved list in Annexure F.	8.2	Yes/No/NA
24	Non-standard equipment has been submitted using NUS181 process.	8.3	Yes/No/NA
Install and Commission			
25	The Accredited Service Provider has submitted appropriate notifications to local authorities and the RMS.	10.1	Yes/No/NA
26	Street Lighting poles installed in accordance with NS128 Specification for Pole Installation and Removal.	10.2	Yes/No/NA
27	Commissioning and compliance checks undertaken as required.	11.1	Yes/No/NA
Maintain and Refurbish			
28	All materials and equipment Asbestos free.	12.1	Yes/No/NA
29	Luminaire markings comply with requirements Clause 12.2	12.2	Yes/No/NA
30	Pedestrian crossing lighting adjusted to suit asymmetrical design of replacement luminaires as required.	12.3	Yes/No/NA
31	Removal of existing street lighting circuits where new luminaires use photocell controls.	12.6	Yes/No/NA
32	Mercury vapour luminaires replaced with equivalent sodium vapour luminaires.	12.7	Yes/No/NA
33	Street lighting pole screening kit used as appropriate.	13.1	Yes/No/NA
34	Users of street lighting pole screening kit have been appropriately trained.	13.1	Yes/No/NA

Notes:

The signatures panel of this document has been removed for privacy considerations. The remainder of the document is unchanged.