

**PART R52****INSTALLATION OF LIGHTING FOR ROADS AND PUBLIC SPACES****CONTENTS**

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Attachment R52A Street Lighting Pole Assembly Instructions

**1. GENERAL**

This Part specifies the requirements for the installation of lighting for roads and public spaces.

Documents referenced in this Part are listed below:

- AS 2053: Conduits and Fittings for Electrical Installations
- AS 3000: Electrical Installations
- AS 4676: Structural Design Requirements for Utility Service Poles

The work must comply with the following (in order of precedence):

1. AS 3000: Electrical Installations;
2. Contract specific drawings and the **Contract Specific Requirements** (if any);
3. the DPTI standard drawings referred to in DPTI Technical Standards and Guidelines, Road Lighting (available from: <http://www.dpti.sa.gov.au/standards>); and
4. any other relevant Australian Standard.

Where necessary, the Contractor must liaise with SA Power Networks regarding the removal of SA Power Networks' poles and must co-ordinate this work in conjunction with the installation and operation of the Principal's light poles.

**2. MATERIALS**

Materials must comply with the following:

- |                                      |   |
|--------------------------------------|---|
| Poles, Outreaches and Footing Units: | Part R50 "Supply of Lighting Components"                |
| Luminaries:                          | Part R51 "Supply of Luminaries"                         |
| Conduits and Junction Pits:          | Part R53 "Installation of Conduits and Pits"            |
| Footing Reinforcement:               | Part CC05 "Steel Reinforcement"                         |
| Concrete:                            | Part CC26 "Normal Class Concrete"                       |
| Flexible Conduit:                    | Flexible Conduit to AS 2053                             |
| Other Conduit:                       | Heavy Duty Rigid PVC Conduit to AS 2053 (colour orange) |

If the Contractor supplies frangible poles, the Contractor must provide evidence demonstrating compliance with requirements of AS 4676 (refer Part R50) at least 14 days prior to delivery of the poles. Provision of the documentation shall constitute a **HOLD POINT**.

**3. POLE FOOTINGS**

### 3.1 **General**

If separate payment is to be made for the construction of squat, eccentric or offset type footings, the rate is deemed to allow for any initial attempt to construct a pile footing.

### 3.2 **Setting Out**

The positions of the footings must be set out from the coordinates given in the Geometric Details document, on the drawings or as referenced by chainage and offset.

The direction of the outreach must be as shown on the drawings.

The access hatch on poles must be positioned on the rear of the pole so that it can be easily and safely accessed. If this is not practical, it must be positioned on the side opposite to the on-coming traffic.

The level and slope of the concrete surround must match the specified finished levels and slopes for the surrounding ground.

### 3.3 **Setting Up**

Where steel footing units are used, the footings units must be firmly supported to prevent movement during pouring of concrete. Where holding down bolts are used, the bolts must be firmly held in position by a jig. The use of welding to secure the position the bolts is not permitted. All conduits must be plugged to prevent the entry of concrete during pouring.

Prior to pouring concrete a **HOLD POINT** must apply.

The level of the top of the footing mounting plate or holding down bolts must be determined from the specified finished levels for the surrounding ground. The mounting plate must be set to within 2 mm of the horizontal across diameters to ensure verticality of the pole.

Footing units or bolts must be placed within the following tolerances:

#### Vertical

Height of base (slip base poles)	+0,-10 mm
Height of threaded rod (I/A poles)	± 5 mm

#### Horizontal

Distance from face of kerb	- 20 mm, + 50 mm
Chainage along kerb line	± 100 mm

### 3.4 **Concrete**

Concrete must be compacted by use of a pencil vibrator. The surface of the concrete footing surround must be a wood float finish with the edges arrised with an edging tool.

The exposed part of the steel footing unit or exposed bolts must be cleaned immediately after pouring of concrete is completed. All vent holes must be left clean and have any anti-corrosive tape completely removed from the hole.

Where steel footing units are used, the concrete inside the footing unit must be dished down by approximately 25 mm to the bottom of the conduit drainage holes to ensure that no water pools in the base. It must be a smooth finish.

Backfill must not cover the concrete surround.

## 4. **TRENCHING, BORING AND BACKFILL**

Excavation and backfill of trenches must comply with Part R07 "Trench Excavation and Backfill".

Under-road boring must comply with Part R06 "Boring".

Reinstatement of any existing pavements to be retained must comply with Part R08 "Reinstatement of Existing Pavements".

## 5. **ASSEMBLY AND ERECTION OF POLES**

### 5.1 **General**

Poles must be assembled in accordance with the manufacturer's instructions or if the Principal has supplied the poles, the assembly instructions included at the end of this Part.

If Impact Absorbing submerged base poles are used, a **HOLD POINT** shall apply prior to backfilling to confirm anti-corrosive treatment and grouting has been correctly applied.

Where the poles have base plates, wedges or pads must be used to support the plate during the grouting process. Thin levelling nuts must not be used to support the plate.

After erection, all poles must be vertical. Poles must be marked with the DPTI identification no. (as shown on the drawings) using a self-adhesive label which:

- (a) has a white background with black numbers;
- (b) has numbers at least 40mm high using a bold, sans-serif font;
- (c) is horizontally attached to the poles at a height of 1.7m, and
- (d) is positioned 45° towards the oncoming traffic so that it can be easily read from an approaching vehicle.

## 5.2 Slip Base Poles

At least 2 days prior to installation, the Contractor must provide a copy of the current Calibration Certificate for the torque wrench. The certificate must not be dated 12 months earlier than the Date of Acceptance of Tender. Provision of the Certification shall constitute a **HOLD POINT**.

Threads must be cleaned to allow hand tightening of clamping bolts prior to torque being applied. The clamping bolts must be tightened to the torque specified on the drawings using a calibrated torque wrench. The Contractor must provide a copy of certification that all clamping bolts have been correctly tensioned in accordance with this Clause.

## 6. ELECTRICAL WORK

### 6.1 General

All electrical installations must be carried out by an electrical worker who is licensed to perform any electrical works. The installations must comply with AS 3000 and the Service Rules and Conditions of Supply of SA Power Networks.

### 6.2 Working in the Vicinity of Existing Overhead Cables

The Contractor must:

- (a) comply with the requirements of the Technical Regulator when working in the vicinity of existing overhead electricity cables;
- (b) ensure that at least one person trained in working near overhead cables is present while work is taking place near overhead cables; and
- (c) obtain approval from the Technical Regulator before working within the restricted zone as outlined in the Office of the Technical Regulator document "Working near overhead power lines" available from <http://www.statedevelopment.sa.gov.au/resources/office-of-the-technical-regulator>.

Provision of the approval and evidence of training shall constitute a **HOLD POINT**.

### 6.3 Inspection

The Contractor must:

- (a) arrange for Certificates of Compliance of all electrical work;
- (b) provide copies of the certificates to the Principal; and
- (c) ensure that any applicable fees are paid for the connections.

## 7. SUPPLY POINTS

### 7.1 General

If the Principal has made arrangements for supply point locations, the locations will be shown on the drawings. The Contractor must confirm the position of the supply points before installing conduit runs to these points.

If the Contractor is to arrange service points, the Contractor must:

- (a) complete and submit a SA Power Networks Form;
- (b) provide a copy of the form to the Principal; and the DPTI Electrical Asset Management group.

- (c) provide Certificates of Compliance to the Principal in accordance with the Electricity Act.

## **7.2 Temporary Supply and Service Points**

For details of any temporary overhead supply points and/or service points refer to the **Contract Specific Requirements**.

## **8. SERVICE POINTS**

### **8.1 General**

SA Power Networks underground supply must be connected to lighting circuits in accordance with SA Power Networks service supply rules and regulations.

SA Power Networks Stobie pole supply must be connected to lighting circuits in accordance with relevant DPTI Standard Drawings.

### **8.2 Layout**

The layout of switchboards and general circuit arrangement of service points must be substantially as shown on the drawings.

### **8.3 Location**

Services fuses must not be located in DPTI switchboards.

Isolation pit & fuse must be installed in accordance with DPTI standard drawings. Three phase installation must have all phases identified on both sides of the isolation fuse with heat shrink.

## **9. WIRING**

### **9.1 Combination / Combo Mast Arm poles**

Unless specified otherwise, combination/combo mast arm poles must be fed from the traffic signal controller.

### **9.2 Four Way Lighting Poles**

Four way lighting poles must have two circuits fed from the same phase.

### **9.3 Conductors**

Notwithstanding AS 3000, all neutrals must have black primary insulation.

All active and neutral conductors must be double insulated and comply with AS3000.

### **9.4 Circuit breakers**

All circuit breakers must be as specified in the Contract specific drawings or standard drawings.

### **9.5 Jointing**

All joints below ground must be waterproofed using DPTI approved epoxy jointing kits. "Tee-offs" must be of equivalent size to a "Scotchcast" 90-B1 or larger.

### **9.6 Cable Lengths**

Spare cable must be installed in each junction pit equal to the length plus the width of the junction pit. Spare cable must be installed neatly in a loop and suitably cable tied.

### **9.7 Earthing**

All earthing electrodes must be 13 mm diameter copper sheathed steel stakes. Earth electrodes must be provided in accordance with S A Power Networks Supply and Installation rules and must be identified and protected in accordance with AS 3000.

## **10. LUMINAIRES**

### **10.1 General**

Luminaires must be the type specified on the drawings, with integral control gear

**10.2 Mounting**

Unless otherwise specified, luminaires must be mounted horizontally with zero degree upcast

**10.3 Conductors**

All single insulated conductors in the luminaires must have a heat rating appropriate for the expected temperatures in their location in the housing.

**11. LAMPS**

Unless specified otherwise, luminaires must be LED of the wattage and type specified on the drawings.

**12. OTHER LIGHTING**

Any other lighting must be as specified in the **Contract Specific Requirements** or on the drawings.

**13. ACCEPTANCE**

The Contractor must demonstrate that all lamps are operational prior to acceptance. All pits and infrastructure must be free of vermin and debris at the time of asset handover.

**14. REMOVAL OF EXISTING POLES AND FOOTINGS**

Where specified, the Contractor must remove DPTI lighting poles and footings shown on the drawings. The Contractor must provide 2 week's notice prior to removal. Unless specified otherwise, backfill of holes resulting from removal of existing footings must be in accordance with Clause 4 "Trenching, Boring and Backfill".

Unless specified otherwise in the **Contract Specific Requirements**, ownership of the poles, footings and luminaries is vested in the Contractor, who must remove them from the site.

**15. HOLD POINTS**

The following is a summary of Hold Points referenced in this Part:

CLAUSE REF.	HOLD POINT	RESPONSE TIME
2	AS4676 compliance certificate (frangible poles only)	7 working days
3.3	Prior to pouring concrete footing	3 working days
5.1	Submerged base impact absorbing poles – prior to back-filling	3 working days
5.2	Calibration certificate for the torque wrench.	1 day
6.2	Provision of the approval and evidence of training prior to working near overhead poles	2 hours

**16. VERIFICATION REQUIREMENTS AND RECORDS**

The following is a summary of records to be supplied by the Contractor to demonstrate compliance with this Part:

CLAUSE REF	RECORD
5.2	Holding Down Bolt Tension Verification Certificate
6.3	Certificates of Compliance of all Electrical Work
7.1	SA Power Networks Connection Test and Certificates of Compliance
Refer Part CH30	Position Verification Certificate

**ATTACHMENT R52A****STREET LIGHTING POLE ASSEMBLY INSTRUCTIONS**

The outreach is attached to the column by means of a forced tapered fit. Carrying out the following procedure will achieve an effective joint.

1. Place column and outreach on timber bearers.
2. Check that joint area of both sections is clean and undamaged.
3. All columns have top OD of 100 mm and nominal lap joint length of 300 mm. Mark the minimum overlap length slightly under at approximately 250 mm.
4. Line up the top and bottom section so that the base plate, the door and the outreach arm are in the correct relationship.
5. To achieve the specified overlap a pulling force of up to 1.5 tonne must be applied. During assembly, the joint area may be vibrated by tapping with a mallet, or length of wood.
6. The force can be applied in a variety of ways, depending on the equipment available. The following methods have been found satisfactory:
  - (a) With columns having mounting height of 7.5 m, or greater, a "Tirfor" Model T7 winch can be placed in the door opening and the wire rope secured at the top and bottom openings of the outreach and column.
  - (b) A winch can be supported against the column base and the rope passed up through the column, secured at the tip of the outreach.
  - (c) A hydraulic puller / press with the appropriate pole clamps can also be used.
7. Ensure that the correct rotational orientation is maintained as the sections are forced together.
8. After assembly, the joint must be snug and the top section must cover the minimum overlap mark.
9. Any damage to the poles (e.g. to galvanising) must be repaired in accordance with Part R50 "Supply of Lighting Components".

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