

SUPERSEDED

Specification (Measurement)

**Transport and Main Roads Specifications
MRS94 Road Lighting**

November 2022

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SUPERSEDED

1 Introduction

This Specification applies to the supply and installation of Rates 2 and 3 Road Lighting Equipment.

This Specification does not apply to Rate 1 Road Lighting.

This Specification shall be read in conjunction with MRS01 *Introduction to Specifications*, MRS50 *Specific Quality System Requirements*, MRS94 *Road Lighting*, MRS263 *Standalone Solar (PV) Power Systems* and other Specifications as appropriate.

This Specification forms part of the Transport and Main Roads Specifications Manual.

Energy Queensland have introduced a new Rate 4 tariff for LED upgrades. Definitions in Table 1.

Table 1 – New Rate 4 tariff for LED upgrades

Existing	New	Description
Rate 1		Public Lighting is supplied, installed, owned and maintained by Energy Queensland.
Rate 2		Public Lighting is supplied by Transport and Main Roads and owned and maintained by Energy Queensland.
Rate 3		Public Lighting is supplied, owned, installed and maintained by Transport and Main Roads. Energy Queensland only provides a point of supply for the installation.
	Rate 4	Transport and Main Roads funds the replacement of a Rate 1 luminaire with an LED luminaire and gift the LED luminaire to Energy Queensland. Ownership and maintenance of the public lighting remains with Energy Queensland.

2 Measurement of works

2.1 Standard Work Items

In accordance with the provisions of Clause 2.1.3 of MRS01 *Introduction to Specifications*, the Standard Work Items covered by this Specification are listed in Table 2.1.

For Standard Work Items relating to Solar Power, refer to MRS263 *Standalone Solar (PV) Power Systems*.

Table 2.1 – Standard Work Items

Standard Item No.	Description	Unit of Measurement
Road Lighting		
60701	Supply of [<i>fixed base</i> <i>slip base</i> <i>energy absorbing</i>] road pole, [<i>height</i>] mm vertical height	each
60702	Supply of [<i>single</i> <i>double</i>] road lighting outreach arm, [<i>length</i>] mm long	each
60703	Supply of road lighting outreach arm extension, 1.5 metres long	each
60704	Supply of road lighting luminaire headframe, [<i>number of spigots</i>] way headframe	each
60705	Supply of pedestrian crossing floodlight bracket, [<i>length</i>] mm long	each
60706	Supply of underbridge road lighting bracket, [<i>height</i>] mm high	each

Standard Item No.	Description	Unit of Measurement
60707	Supply of wall mounted road lighting bracket, [<i>length</i>] mm long	each
60708	Supply of road lighting luminaire, [<i>name of manufacturer</i>], [<i>type of luminaire</i>]	each
60709	Supply of pedestrian crossing floodlight, [<i>with</i> <i>without</i>] louvre, [<i>name of manufacturer</i>], [<i>type of luminaire</i>]	each
60710	Installation of [<i>fixed base</i> <i>slip base</i> <i>energy absorbing</i>] road lighting pole	each
60711	Installation of road lighting outreach arm	each
60712	Installation of road lighting outreach arm extension	each
60713	Installation of road lighting luminaire headframe	each
60714	Installation of pedestrian crossing floodlight mounting bracket	each
60715	Installation of underbridge road lighting bracket	each
60716	Installation of wall mounted road lighting bracket	each
60717	Installation of road lighting luminaire	each
60718	Installation of pedestrian crossing floodlight	each
60719	Supply and installation of [<i>base plate mounted</i> <i>slip base</i> <i>energy absorbing</i>] road lighting pole, [<i>height</i>] mm vertical height, [<i>length</i>] mm long [<i>single</i> <i>double</i>] outreach arm, [<i>with</i> <i>without</i>] outreach arm extension [<i>with underground cabling and fused junction box in pit</i> <i>with aerial supply</i> <i>with loop in loop out cabling</i>]	each
60720	Supply and installation of [<i>base plate mounted</i> <i>slip base</i> <i>energy absorbing</i>] high mast road lighting pole, [<i>height</i>] mm vertical height, [<i>number of spigots</i>] way headframe, [<i>with underground cabling and fused junction box in pit</i> <i>with aerial supply</i> <i>with loop in loop out cabling</i>]	each
60721	Supply and installation of pedestrian crossing floodlight mounting bracket	each
60722	Supply and installation of underbridge road lighting bracket, [<i>height</i>] mm high	each
60723	Supply and installation of wall mounted road lighting bracket, [<i>length</i>] mm long	each
60724	Supply and installation of road lighting luminaire, [<i>name of manufacturer</i>], [<i>type of luminaire</i>]	each
60725	Supply and installation of pedestrian crossing floodlight, [<i>with</i> <i>without</i>] louvre, [<i>name of manufacturer</i>], [<i>type of luminaire</i>]	each
60726	Supply and installation of cabling for luminaire on bridge balustrade with loop in, loop out supply	each
60727	Principal supplied Smart Lighting Controller (SLC), [<i>photocell</i> <i>astro-clock</i>] type configuration for Transport and Main Roads Rate 3 LED luminaire / floodlight only. (handling and storage charges only)	each
60728	Installation of SLC, [<i>photocell</i> <i>astro-clock</i>] type configuration for Transport and Main Roads Rate 3 LED luminaire / floodlight only	each
60729	Provision of asset data capture activities	lump sum

Standard Item No.	Description	Unit of Measurement
Removal of existing equipment		
60791	Removal of road lighting equipment for salvage, [<i>description</i>]	each
60792	Removal of road lighting equipment for disposal, [<i>description</i>]	each
60793	Removal of road lighting luminaire	each
60794	Removal of pedestrian crossing floodlight	each
60795	Removal of SLC	each

2.2 Work Operations

Item 60701 Supply of [*fixed base* | *slip base* | *energy absorbing*] road pole, [*height*] mm vertical height

Work Operations incorporated in the above item include:

- a) Work Operations listed in Clause 2.1.5 of MRS01 *Introduction to Specifications*
- b) supply and fabrication of road lighting pole
- c) for base plate mounted poles, supply and installation of eyebolt and bushing for aerial supply if appropriate
- d) for slip base poles, supply of slip base mount, shear washer and clamping bolts, clamping bolt tethering system and
- e) supply of all fixing bolts, nuts and washers as appropriate.

Item 60702 Supply of [*single* | *double*] road lighting outreach arm, [*length*] mm long

Work Operations incorporated in the above item include:

- a) Work Operations listed in Clause 2.1.5 of MRS01 *Introduction to Specifications*, and
- b) supply and fabrication of road lighting outreach arm including stainless steel clamping setscrews.

Item 60703 Supply of road lighting outreach arm extension, 1.5 metres long

Work Operations incorporated in the above item include:

- a) Work Operations listed in Clause 2.1.5 of MRS01 *Introduction to Specifications*, and
- b) supply and fabrication of road lighting outreach arm extension including galvanised fixing bolts, nuts and washers.

Item 60704 Supply of road lighting luminaire headframe, [*number of spigots*] way headframe

Work Operations incorporated in the above item include:

- a) Work Operations listed in Clause 2.1.5 of MRS01 *Introduction to Specifications*, and
- b) supply and fabrication of road lighting luminaire headframe including cap, terminal block and stainless steel clamping setscrews.

Item 60705 Supply of pedestrian crossing floodlight mounting bracket, [length] mm long

Work Operations incorporated in the above item include:

- a) Work Operations listed in Clause 2.1.5 of MRS01 *Introduction to Specifications*, and
- b) supply and fabrication of pedestrian crossing floodlight mounting bracket, clamps and bolts, nuts and washers.

Item 60706 Supply of underbridge road lighting bracket, [height] mm high

Work Operations incorporated in the above item include:

- a) Work Operations listed in Clause 2.1.5 of MRS01 *Introduction to Specifications*, and
- b) supply and fabrication of underbridge road lighting bracket.

Item 60707 Supply of wall mounted road lighting bracket, [length] mm long

Work Operations incorporated in the above item include:

- a) Work Operations listed in Clause 2.1.5 of MRS01 *Introduction to Specifications*, and
- b) supply and fabrication of wall mounted road lighting bracket.

Item 60708 Supply of road lighting luminaire, [name of manufacturer], [type of luminaire]

Work Operations incorporated in the above item include:

- a) Work Operations listed in Clause 2.1.5 of MRS01 *Introduction to Specifications*, and
- b) supply of luminaire, High Intensity Discharge (HID) lamp if required and:
 - i. PE cell for Rate 2, or
 - ii. shorting plug for Rate 3.

Item 60709 Supply of pedestrian crossing floodlight, [with | without] louvre, [name of manufacturer], [type of luminaire]

Work Operations incorporated in the above item include:

- a) Work Operations listed in Clause 2.1.5 of MRS01 *Introduction to Specifications*
- b) supply of floodlight and HID lamp if required
- c) supply of external control gear for Rate 2, and
- d) supply of floodlight louvre, if applicable.

Item 60710 Installation of [fixed base | slip base | energy absorbing] road lighting pole

Work Operations incorporated in the above item include:

- a) Work Operations listed in Clause 2.1.5 of MRS01 *Introduction to Specifications*
- b) supply and installation of luminaire terminal panels
- c) for slip base pole, installation of slip base mounts, shear washer, clamping bolts and nuts, clamping bolt tethering system and cable clamping blocks
- d) for energy absorbing and slip base poles, supply and installation of cable clamping blocks

- e) supply, installation and termination of all internal cabling from terminal panel, slip base connectors or aerial connectors as appropriate, to luminaires including, as appropriate, flexible conduit and all connectors, bushings, lugs, bolts, nuts and washers
- f) installation of pole, as appropriate
- g) supply, installation and termination of cabling from terminal panel or slip base connectors to pit including supply and installation of fused junction box in pit, if applicable, and
- h) testing of installation.

Item 60711 Installation of road lighting outreach arm

Item 60712 Installation of road lighting outreach arm extension

Item 60713 Installation of road lighting luminaire headframe

Work Operations incorporated in the above items include:

- a) Work Operations listed in Clause 2.1.5 of MRS01 *Introduction to Specifications*
- b) supply and installation of internal cabling in outreach arm, outreach arm extension, or luminaire headframe, as appropriate, and
- c) attachment of outreach arm, outreach arm extension or luminaire headframe to pole or outreach arm, as appropriate.

Item 60714 Installation of pedestrian crossing floodlight mounting bracket

Work Operations incorporated in the above item include:

- a) Work Operations listed in Clause 2.1.5 of MRS01 *Introduction to Specifications*, and
- b) installation of pedestrian crossing floodlight mounting bracket on outreach arm.

Item 60715 Installation of underbridge road lighting bracket

Item 60716 Installation of wall mounted road lighting bracket

Work Operations incorporated in the above items include:

- a) Work Operations listed in Clause 2.1.5 of MRS01 *Introduction to Specifications*
- b) installation of bracket to underside of bridge deck or to wall or to pole, as appropriate, including masonry anchors
- c) supply and installation of fused junction box and earth stake in pit, and
- d) supply, installation and termination of all internal cabling from pit to luminaire including, as appropriate, all connectors, lugs, bolts, nuts and washers.

Item 60717 Installation of road lighting luminaire

Item 60718 Installation of pedestrian crossing floodlight

Work Operations incorporated in the above items include:

- a) Work Operations listed in Clause 2.1.5 of MRS01 *Introduction to Specifications*
- b) installation of luminaire or floodlight

- c) connection of luminaire or floodlight control gear to lighting circuit, and
- d) testing of installation.

Item 60719 **Supply and installation of [base plate mounted | slip base | energy absorbing] road lighting pole, [height] mm vertical height, [length] mm long [single | double] outreach arm, [with | without] outreach arm extension [with underground cabling and fused junction box in pit | with aerial supply | with loop in loop out cabling]**

Work Operations incorporated in the above items include:

- a) Work Operations listed in Clause 2.1.5 of MRS01 *Introduction to Specifications*
- b) supply, fabrication and assembly of road lighting pole, outreach arm, outreach arm extension including all clamping setscrews, eyebolt and eyenut, if applicable, and fixing bolts, nuts and washers
- c) supply and installation of luminaire terminal panels
- d) for slip base poles, supply and installation of slip base mount, shear washer, clamping bolts and nuts and cable clamping blocks
- e) for energy absorbing and slip base poles, supply and installation of cable clamping blocks
- f) supply, installation and termination of all internal cabling from terminal panel, slip base connectors or aerial connectors as appropriate, to luminaires including, as appropriate, flexible conduit and all connectors, bushings, lugs, bolts, nuts and washers
- g) installation of pole, as appropriate
- h) supply, installation and termination of cabling from terminal panel or slip base connectors to pit including supply and installation of fused junction box in pit, if applicable, and
- i) testing of installation.

Item 60720 **Supply and installation of [base plate mounted | slip base | energy absorbing] high mast road lighting pole, [height] mm vertical height, [number of spigots] way headframe, [with underground cabling and fused junction box in pit | with aerial supply | with loop in loop out cabling]**

Work Operations incorporated in the above item include:

- a) Work Operations listed in Clause 2.1.5 of MRS01 *Introduction to Specifications*
- b) supply, fabrication and assembly of road lighting pole and headframe including all clamping setscrews, eyebolt and eyenut, if applicable, and fixing bolts, nuts and washers
- c) supply and installation of luminaire terminal panels
- d) for slip base poles, supply and assembly of slip base mount, shear washer, clamping bolts and nuts and cable clamping blocks
- e) for energy absorbing poles, supply and assembly of cable clamping blocks
- f) supply, installation and termination of all internal cabling from terminal panel, slip base connectors or aerial connectors as appropriate, to luminaires including, as appropriate, flexible conduit and all connectors, bushings, lugs, bolts, nuts and washers

- g) installation of pole, as appropriate
- h) supply, installation and termination of cabling from terminal panel or slip base connectors to pit including supply and installation of fused junction box in pit, if applicable, and
- i) testing of installation.

Item 60721 Supply and installation of pedestrian crossing floodlight mounting bracket

Work Operations incorporated in the above item include:

- a) Work Operations listed in Clause 2.1.5 of MRS01 *Introduction to Specifications*, and
- b) supply, fabrication and installation of pedestrian crossing floodlight mounting bracket, clamps and bolts, nuts and washers.

Item 60722 Supply and installation of underbridge road lighting bracket, [height] mm high

Work Operations incorporated in the above item include:

- a) Work Operations listed in Clause 2.1.5 of MRS01 *Introduction to Specifications*
- b) supply, fabrication and installation of underbridge road lighting bracket including masonry anchors
- c) supply and installation of fused junction box and earth stake in pit, and
- d) supply, installation and termination of all internal cabling from pit to luminaire including, as appropriate all connectors, lugs, bolts, nuts and washers.

Item 60723 Supply and installation of wall mounted road lighting bracket, [length] mm long

Work Operations incorporated in the above item include:

- a) Work Operations listed in Clause 2.1.5 of MRS01 *Introduction to Specifications*
- b) supply, fabrication and installation of wall mounted road lighting bracket including masonry anchors
- c) supply and installation of fused junction box and earth stake in pit, and
- d) supply, installation and termination of all internal cabling from pit to luminaire including, as appropriate, all connectors, lugs, bolts, nuts and washers.

Item 60724 Supply and installation of road lighting luminaire, [name of manufacturer], [type of luminaire]

Work Operations incorporated in the above item include:

- a) Work Operations listed in Clause 2.1.5 of MRS01 *Introduction to Specifications*, and
- b) supply and installation of luminaire, HID lamp if required and:
 - i. PE cell for Rate 2, or
 - ii. shorting plug for Rate 3.

Item 60725 Supply and installation of pedestrian crossing floodlight, [with | without] louvre, [name of manufacturer], [type of luminaire]

Work Operations incorporated in the above item include:

- a) Work Operations listed in Clause 2.1.5 of MRS01 *Introduction to Specifications*
- b) supply and installation of floodlight and HID lamp if required
- c) supply and installation of external control gear for Rate 2, and
- d) supply and installation of floodlight louvre, if applicable.

Item 60726 Supply and installation of cabling for luminaire on bridge balustrade with loop in, loop out supply

Work Operations incorporated in the above item include:

- a) Work Operations listed in Clause 2.1.5 of MRS01 *Introduction to Specifications*
- b) supply and installation of luminaire terminal panel
- c) supply, installation and termination of internal cabling from terminal panel to luminaire
- d) supply and installation of cabling from terminal panel to pit including supply and installation of fused junction box in pit if applicable, and
- e) transport of all components to Principal's storage facility or designated site storage area for re-use.

Item 60727 Principal supplied SLC [photocell | astro-clock] type configuration, for Transport and Main Roads Rate 3 LED luminaire / floodlight only. (handling and storage charges only)

These items are used only where SLC are supplied by the principal to the Contractors nominated storage site. Work Operations incorporated in the above item include:

- a) Work Operations listed in Clause 2.1.5 of MRS01 *Introduction to Specifications*
- b) principal supply of SLC, and
- c) handling and storage, as required.

Item 60728 Installation of SLC, [photocell | astro-Clock] type configuration. Transport and Main Roads Rate 3 LED luminaire / floodlight only.

Work Operations incorporated in the above item include:

- a) Work Operations listed in Clause 2.1.5 of MRS01 *Introduction to Specifications*
- b) installation of SLC on Transport and Main Roads Rate 3 LED luminaire or floodlight, and
- c) testing of SLC in accordance with the referenced document SLC Installation Guide.

Item 60729 Provision for asset data capture activities for SLC connected Luminaires

Work Operations incorporated in the above item include:

- a) Work Operations listed in Clause 2.1.5 of MRS01 *Introduction to Specifications*, and
- b) provision of asset data capture activities as per the Contractor data requirements stated in referenced document *Smart Lighting Asset Data Capture Requirements*.

Item 60791 Removal of road lighting equipment for salvage, [description]

Work Operations incorporated in the above item include:

- a) Work Operations listed in Clause 2.1.5 of MRS01 *Introduction to Specifications*
- b) de-energisation of circuits
- c) disconnection of electricity supply to pole
- d) removal of pole / outreach arm / outreach arm extension / luminaire headframe, as appropriate
- e) removal of internal cabling and internal electrical components
- f) dismantling of pole and components, where appropriate, and
- g) transport of all components to Principal's storage facility or designated site storage area for re-use.

Item 60792 Removal of road lighting equipment for disposal, [description]

Work Operations incorporated in the above item include:

- a) Work Operations listed in Clause 2.1.5 of MRS01 *Introduction to Specifications*
- b) de-energisation of circuits
- c) disconnection of electricity supply to pole
- d) demolition of existing installation, as appropriate, and
- e) disposal of demolished materials.

Item 60793 Removal of road lighting luminaire

Work Operations incorporated in the above item include:

- a) Work Operations listed in Clause 2.1.5 of MRS01 *Introduction to Specifications*
- b) de-energisation of luminaire
- c) disconnection of luminaire control gear from lighting circuit, and
- d) removal of luminaire.

Item 60794 Removal of pedestrian crossing floodlight

Work Operations incorporated in the above item include:

- a) Work Operations listed in Clause 2.1.5 of MRS01 *Introduction to Specifications*
- b) de-energisation of floodlight
- c) disconnection of floodlight control gear from lighting circuit
- d) removal of floodlight, and
- e) transport of all components to Principal's storage facility or designated site storage area for re-use.

Item 60795 Removal of smart lighting controller (SLC)

Work Operations incorporated in the above item include:

- a) Work Operations listed in Clause 2.1.5 of MRS01 *Introduction to Specifications*
- b) de-energisation of luminaire
- c) removal of SLC, and
- d) transport of SLC to Principal's storage facility or designated site storage area.

2.3 Method of measurement of road lighting components

This specification provides Standard Work Items for:

- a) supply only
- b) installation only, and
- c) supply and installation,

of road lighting components.

Any combination of Standard Work Items relating to these methods of measurement may be used in the Schedule of Rates. However, where a Standard Work Item for supply and installation of a particular component or group of components is included in the Schedule of Rates, no supply only nor installation only Standard Work Item shall also apply to that component or group of components, as applicable.

2.4 Supply of materials

Any materials to be supplied by the Principal will be as stated in the Principal Supplied Material List, Form C7827. All other material shall be supplied by the Contractor.

The responsibility for transport to the Site of materials supplied by the Principal shall be as stated in the Principal Supplied Material List, Form C7827. Transport to the Site of all other materials shall be the responsibility of the Contractor.

2.4.1 Supply of SLC

Where listed in the Principal Supplied Materials List (Form C7827), SLC's shall be supplied by the principal.

2.4.1.1 Supply locations

SLC units supplied by the principal will be made available at the point of delivery and by the transport mode shown in the Principal Supplied Materials List (Form C7827).

2.4.1.2 Time of delivery

The time of delivery shall generally conform to the construction program supplied by the contractor with its tender.

Should on site construction be delayed, the Contractor may be required to accept delivery of the smart lighting control units at any time after the programmed date and to store the units at no cost to the Principal.

2.4.1.3 Acceptance of SLC units by the Contractor

The Contractor shall check the SLC units and packaging for physical quality and condition upon taking delivery and shall immediately report to the Administrator any defects. **Nonconformance**

2.4.1.4 Damage to SLC units

In the event of any SLC unit sustaining damage after having been accepted by the Contractor, such as cracking of the outer housing, bent pins or other deformation, the unit shall be set aside and returned to the Administrator. **Nonconformance** The cost of replacing the damaged SLC unit shall be borne by the Contractor.

2.4.1.5 Supply quantity

The Contractor should ensure that an additional 2% of total SLC's are made available prior to the commencement of works. All unused SLC's shall be returned to the administrator upon handover of the project.

2.4.1.6 Defect liability periods

The defects liability period shall be as per the nominated length specified in the relevant project contract documentation. Where a fault / damage occurs inside this period, the following shall apply. Where a fault / damage occurs and the Contractor has followed correct handling and installation procedures, the replacement costs shall be borne by the Principal. Where a fault / damage occurs due to the poor handling or workmanship of the Contractor. **Nonconformance** The cost of replacing the damaged unit shall be borne by the Contractor.

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