

Superseded

Specification (Measurement)

**Transport and Main Roads Specification
MRS98 Standalone Solar (PV) Powered Lighting**

July 2017

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1 Introduction

This Specification applies to the supply, installation, testing, commissioning and maintenance handover documentation (including the provision for operator training) of Standalone Solar (PV) Powered Lighting.

This Specification shall be read in conjunction with MRS01 *Introduction to Specifications*, MRS94 *Road Lighting*, MRTS98 *Standalone Solar (PV) Powered Lighting* and other Specifications as appropriate.

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

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.

Table 2.1 – Standard Work Items

Standard Item No.	Description	Unit of Measurement
Stand-alone Solar (PV) powered lighting system		
61001	Supply of Standalone Solar (PV) Powered Lighting, with [fixed base slip base impact absorbent] road pole, [height] mm vertical height, [with without] road lighting outreach arm. Details of outreach arm, where applicable, single [length] mm long	each
61002	Installation of Standalone Solar (PV) Powered Lighting, with [fixed base slip base impact absorbent] road pole, [height] mm vertical height, [with without] road lighting outreach arm. Details of outreach arm, where applicable, single [length] mm long	each
61003	Supply and Installation of Standalone Solar (PV) Powered Lighting, with [fixed base slip base impact absorbent] road pole, [height] mm vertical height, [with without] road lighting outreach arm. Details of outreach arm, where applicable, single [length] mm long	each
Auxiliary devices		
61031	Supply of [Solar Panels PV Charger/Controller Batteries Luminaire]	each
61032	Installation of [Solar Panels PV Charger/Controller Batteries Luminaire]	each
61033	Supply and Installation of [Solar Panels PV Charger/Controller Batteries Luminaire]	each
Removal for salvage or disposal		
61061	Removal of Standalone Solar (PV) Powered Lighting equipment for salvage, [description]	each
61062	Removal of Standalone Solar (PV) Powered Lighting equipment for disposal, [description]	each
61063	Removal of Standalone Solar Powered Lighting luminaire	lump sum

2.2 Work Operations

Item 61001 Supply of Standalone Solar (PV) Powered Lighting, with [fixed base | slip base | impact absorbent] road pole, [height] mm vertical height, [with | without] road lighting outreach arm. Details of outreach arm, where applicable, single [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 a Solar Panel in accordance with the requirements of MRTS98, sufficient for load
- c) supply a PV charge controller and inverter where applicable in accordance with the requirements of MRTS98
- d) supply batteries and associated protective devices in accordance with the requirements of MRTS98, sufficient for load
- e) supply of luminaire and lamp.

Item 61002 Installation of Standalone Solar (PV) Powered Lighting, with [fixed base | slip base | impact absorbent] road pole, [height] mm vertical height, [with | without] road lighting outreach arm. Details of outreach arm, where applicable, single [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) installation of solar panels in accordance with the requirements of MRTS98, sufficient for load
- c) installation of PV charge controller and inverter where applicable in accordance with the requirements of MRTS98
- d) installation of batteries and associated protective devices in accordance with the requirements of MRTS98, sufficient for load
- e) installation of luminaire and lamp.

Item 61003 Supply and Installation of Standalone Solar (PV) Powered Lighting, with [fixed base | slip base | impact absorbent] road pole, [height] mm vertical height, [with | without] road lighting outreach arm. Details of outreach arm, where applicable, single [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 and installation of solar panels in accordance with the requirements of MRTS98, sufficient for load
- c) supply and installation of PV charge controller and inverter where applicable in accordance with the requirements of MRTS98
- d) supply and Installation of batteries and associated protective devices in accordance with the requirements of MRTS98, sufficient for load
- e) supply and Installation of luminaire and lamp.

Item 61031 Supply of [Solar Panels | PV Charger/Controller | Batteries | 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 a Solar Panel in accordance with the requirements of MRTS98, sufficient for load, where applicable
- c) supply a PV charge controller and inverter where applicable in accordance with the requirements of MRTS98, where applicable
- d) supply, where applicable, batteries and associated protective devices in accordance with the requirements of MRTS98, sufficient for load, where applicable
- e) supply, where applicable, of luminaire and lamp.

Item 61032 Installation of [Solar Panels | PV Charger/Controller | Batteries | Luminaire]

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 Solar Panels in accordance with the requirements of MRTS98, sufficient for load, where applicable
- c) installation of PV charge controller and/or inverter where applicable in accordance with the requirements of MRTS98, where applicable
- d) installation, where applicable, of batteries and associated protective devices in accordance with the requirements of MRTS98, sufficient for load, where applicable
- e) installation, where applicable, of luminaire and lamp.

Item 61033 Supply and Installation of [Solar Panels | PV Charger/Controller | Batteries | 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 Solar Panels in accordance with the requirements of MRTS98, sufficient for load, where applicable
- c) supply and installation of PV charge controller and/or inverter where applicable in accordance with the requirements of MRTS98, where applicable
- d) supply and Installation, where applicable, of batteries and associated protective devices in accordance with the requirements of MRTS98, sufficient for load, where applicable
- e) supply and Installation, where applicable, of luminaire and lamp.

Item 61061 Removal of Standalone Solar (PV) Powered 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 battery supply
- 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 solar panels, pole and components, where appropriate
- g) removal of batteries, and
- h) transport of all components to Principal's storage facility or designated site storage area for re-use.

Item 61062 Removal of Standalone Solar (PV) Powered 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 battery supply
- d) demolition of existing installation, as appropriate, and
- e) disposal of demolished materials.

Item 61063 Removal of Standalone Solar (PV) Powered 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.

2.3 Method of measurement of Standalone Solar (PV) Powered Lighting

This Specification provides Standard Work Items for:

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

of Standalone Solar (PV) Powered Lighting. 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 C6827. 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 C6827. Transport to the Site of all other materials shall be the responsibility of the Contractor.

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