Transport Roads & Maritime Services

QA SPECIFICATION R307

MAINTENANCE OF STREET LIGHTING

RNIC-QA-R307

VERSION FOR:
DATE:

RMS QA SPECIFICATION R307

MAINTENANCE OF STREET LIGHTING

REVISION REGISTER

Ed/Rev Number	Clause Number	Description of Revision	Authorised By	Date
DRAFT	All	First Issue prepared by Traffic Equipment and Standards.		10.05.2013

CONTENTS

CLAUSE **PAGE**

RMS QA SPECIFICATION R307

MAINTENANCE OF STREET LIGHTING

1 GENERAL

1.1 SCOPE

This Specification sets out the minimum requirements for the routine and non-routine maintenance of all the equipment associated with the street lighting so that they remain in good condition, operate as designed and meet the specified requirements. Equipment to be replaced as required under this Specification include but are not limited to

a) Luminaires,
b) Lamps and starters,
c) Control gear,
d) Cable inside post from control gear to lamp head,
e) Contactors,
f) Circuit breakers,
g) Photoelectric cells,
h) Other Sundries required for repairs, and
i) Plug Bases..

The work to be executed under this Specification requires you to provide emergency call out, and repair work on accident damaged equipment, on a twenty-four (24) hours per day seven (7) days per week basis.

The requirements for routine maintenance are specified in Clause 3 and those for non-routine maintenance are specified in Clause 4. Enhancements and reconstruction work for region-specific locations will be included as required,

Locations and inventory are listed in Annexure R307/A1.

1.2 TERMS AND DEFINITIONS

In this Specification, unless otherwise required by the subject or context, the following words and expressions will have the following meanings:

Term/Acronym	Definition
~~**After hours**~~	~~Any hours outside the normal hours.~~
RMS	The Roads and Maritime Services of TfNSW

Cabinet	An approved housing for power distribution, MEN connection, and optionally installation of smart devices to control and communicate with a group of street lights. Solar-powered street lights may have a dedicated housing for each pole for installation of control gear.
Control gear	An electronic, electrical, or electro-mechanical device for the purpose of driving the street light.
Day	Working day unless otherwise stated.
Deficiency	The visible or measurable evidence of failure or other undesirable condition that is at or exceeding its intervention Level or that is likely to become a Hazard (as reasonably determined by you) before the next scheduled or required inspection. This may affect the safety, serviceability, structural capacity or appearance of the asset.
Defective lens	A lens that, because of dust or burning, allows the transmission of very poor light.
Enclosure	A part providing an appropriate degree of protection from of equipment against external influences and against contact with live parts (AS/NZS 60529).
Efficacy	A comparison of light output to energy consumption. Efficacy is measured in lumens per Watt.
Fault	Any malfunction of equipment to be rectified immediately.
Fault-dispatch	On receipt of fault from any source, the action of forwarding that fault to the service crew.
Footing and post	A concrete base, including all conduit bends, rag bolt assemblies and reinforcement cages, pits, and a post used primarily for the support of a street light. Footings and posts maintained by other authorities are not included in this definition.
Functional check	The regular inspection of the street light to ensure their safety and general operating condition.
High-pressure sodium (HPS)	A high-intensity discharge lamp, which utilises sodium vapour in a high-pressure arc tube as the primary light-producing element. HPS lamps produce a golden yellow colour light. The typical useful life of the lamp is 14,000 hours. With an efficacy of 100, the HPS lamp is a cost-effective light source.
Housing	See Definition for Cabinet. Other names that may be used are Cabinet or Cubicle.
IS	In Service.
LED	Light Emitting Diode
Lamp	The replaceable unit, which is the source of the light. Also known as a globe or bulb.
Luminaires	The apparatus housing the lamp and controls the light distribution.
Light source	As defined in AS/NZS2144-2002.

Maintain or maintenance	These terms shall include, regardless of cause and in addition to all other work specified, the following: a) The repair and/or replacement of all defective, damaged or worn-out components or parts thereof to ensure the proper operation of the lights. b) The regular inspection and servicing of all lights and associated equipment
MEN	Multiple earthed neutral (MEN) system
Mercury vapour (MV)	Mercury high-intensity discharge lamps use mercury as the primary light-producing element. Although this lamp produces a white light, the colour rendering ability with this light is poor. The typical average useful life of the lamp is 12,000 (similar to that of a HPS lamp). The efficacy of the MV lamp is 55 lm/W however this deteriorates significantly with age.
Non-routine maintenance	The repair and/or replacement of equipment damaged or defective through any cause and shall require: (a) A twenty-four (24) hours per day seven (7) days per week fault attendance service for the purpose of inspection, identification and repair of reported site malfunctions. (b) An adequate back-up service to enable permanent repairs and rectification of all site deficiencies. (c) A fully equipped workshop facility for the purpose of testing and repairing equipment removed from the maintenance site.
Normal hours	6am to 6pm Monday to Friday, excluding public holidays.
PE	Photoelectric
Preventive maintenance	The regular inspection, adjustment and minor servicing that is required to keep the street lights including its support structures in good operating order.
Principal	The authorised delegate of RMS who instructs all stakeholders servicing the requirements of this Specification.
Principal's Representative	A delegate of the RMS who is authorised to act on behalf of the Principal.
Response time	The time elapsed from the initial receipt of a fault attendance call to the initial attendance at the site.
Routine maintenance	Regular inspection and servicing of all on-site equipment and must include: (a) Functional Checks (b) Preventative Maintenance
Supports	All structural components, brackets, outreaches, clamps and parts thereof, used to support street lights.
WAE	Work-as-executed.
Work site	Street lighting site.
~~**Work zone**~~	~~Work area as defined in the Tender documents.~~

You/Your	the Contractor/the Contractor's.

1.3 RELEVANT SPECIFICATIONS

This Specification shall apply to all equipment and techniques used in the maintenance of street lighting unless otherwise agreed in writing by the Principal. Technical requirements of the completed works shall be in accordance with RMS's Specifications and/or, in its absence, the Manufacturer's Specifications and Operation & Maintenance manuals. In absence of relevant Specifications or requirements within this or other RMS Specifications, published Australian Standards apply.

The relevant Specifications applicable to this document are

a) QA R151 "Street Lighting", and
b) QA 3851 "Steel Tapered Lighting Columns".

2 PARTS AND EQUIPMENT

2.1 SUPPLY

For the purpose of maintaining the street lights under this Specification, you shall supply all parts and equipment items. Replacement parts and equipment shall be new. If any second hand equipment or material is considered for reuse, the Principal's Representative must approve its use, in writing.

Any second hand equipment approved by the Principal's Representative for use under this contract shall conform to the requirements of the Specification under which the equipment was originally purchased.

2.2 HOLDING STOCK

At all times, you shall hold adequate stock levels of parts and equipment in storage for the street lighting maintenance including emergency fault repairs, in accordance with this Specification.

Any equipment issued to you or paid for by RMS remains the property of the Principal and must be returned or replaced as directed by the Principal.

The quantities of spares held by you shall be reconciled during the course of the contract by the Principal.

2.3 DAMAGED, DEFECTIVE, OBSOLETE OR REDUNDANT EQUIPMENT

All other damaged, defective, obsolete or redundant parts and equipment shall be removed from the site and be stored at your premises, but shall remain the property of the Principal. Such items will be inspected by the Principal at a time that is mutually agreeable. Items may be redeployed at the discretion of the Principal at the Principal's cost. Items that are declared by the Principal to be obsolete or damaged beyond repair must be disposed of by you after seeking the approval from the Principal.

The cost of disposal of such items must be borne by you. Any items that can be recycled shall be recycled.

2.4 STORAGE FACILITIES

You shall load, unload, haul and store all parts and equipment if and as necessary supplied by the Principal or you at your cost.

You shall maintain secured and enclosed storage facilities sufficient to accommodate for the parts and equipment. All equipment shall be stored at your risk and responsibility.

3 ROUTINE MAINTENANCE

3.1 GENERAL

For routine street lighting maintenance, you shall undertake regular nightly inspections once every two (2) months and provide a report on the following:

a) lamp outages, and

b) damaged or missing diffuser.

3.2 FUNCTIONAL CHECK SERVICE

Each street light switchboard maintained under this Specification shall be activated and checks performed once a year for testing correct operation during normal hours shall include but not limited to the following:

a) Turn all switches OFF & ON to stop dust build-up
b) Turn all circuit-breakers OFF and reset
c) Check for high resistance joints,
d) Clean PE cell faces then cover to test functionality,
e) Check MEN and earthing
f) Luminaire cleaning and inspection,
g) Inspect for any sign of vermin damage in the cabinet.
h) Remove any Graffiti on cabinet,
i) Trim all trees that interfere with solar-panels (where used) and light output of luminaires,
j) Check all support structures for their integrities,
k) Installation, maintenance and replacement of post identification label as per Annexure R307/F1, and
l) Installation, maintenance and replacement of supply point identification labels as per Annexure R307/F2.

3.3 PREVENTIVE MAINTENANCE SERVICE

Each street light installation maintained under this Specification shall be maintained at least once every three (3) months for the following:

a) A mowing strip two (2) meters wide, cut around the cabinet,

b) A mowing strip two (2) meters wide, cut from the roadway to the cabinet, and

c) Remove any weeds or grass near cabinet.

3.4 ROUTINE MAINTENANCE RECORDS AND REPORTS

You shall keep and maintain accurate records of all replacements, alterations and repairs made to any equipment within the requirements of the Specification, as per Appendix R307/B.

You shall enter all routine and non-routine works carried out by you in an Asset Management system agreed with the Principal on a once a month basis.

4 NON-ROUTINE MAINTENANCE

4.1 GENERAL

For non-routine maintenance of street lights, you shall fault-dispatch and/or attend street light sites on a 'call-out' basis to inspect and repair reported faults in the equipment or operation of the street lights.

4.2 FAULT ATTENDANCE

4.2.1 Fault Attendance Service

Provide a fault attendance service for all street light failures arising from any cause, shall be repaired within the time set out in Clause 5.1.1.

Typical causes of street lighting faults shall include but shall not be limited to

a) Control gear malfunctions,
b) accident damage,
c) storm damage,
d) vandalism,,
e) vermin damage,
f) fire damage,
g) PE cell failure, and
h) blown lamps.

All repair works must be in accordance with RMS Specification listed in Clause 1.3 as amended.

You shall retain records of all repair details for at least a period of five (5) years, and have them readily available for inspection by the RMS Principal. You shall use the inspection report form given in Annexure R307/B to record all maintenance details.

4.2.2 Procedure

In the event of a fault call, you shall attend the site as soon as possible, but under no circumstances must the maximum response time for fault attendance, specified in Clause 5.1.1 (for each type of fault), elapse between you receiving the call and the initial attendance at the site.

The fault shall be rectified as soon as practicable after arrival at the site.

You shall inform the Principal of

a) any items not satisfactorily repaired within the prescribed times, and

b) an estimate of the time required to complete the works.

5 REQUIREMENTS APPLICABLE TO BOTH ROUTINE AND NON-ROUTINE MAINTENANCE

5.1 GENERAL

Each street light shall be maintained to the following standards:

a) The light output of each individual lamp shall not fall below its minimum intended design output (Point horizontal illuminance value that complies with AS/NZS 1158),

b) Ensure all support structures for lighting are structurally sound, in accordance with RMS document "Procedures Manual For Structural Integrity Inspection And Condition Assessment Of Traffic Asset Structures",

c) Attend all response times as set out in Clause 5.1.1,

d) If more than two (2) consecutive lamps are out of service at any one time a seven (7) day response will apply,

e) Condition based replacement of HPS lamps in three (3) years, LED light sources in ten (10) years, luminaires in fifteen (15) years, or as recommended by the manufacturer whichever is earlier

If any of the above conditions are not met you shall take action to rectify the problem. If any of the above condition create an unsafe situation, you shall make the site safe within two (2) hours of notification. Final repairs shall be completed within thirty (30) days of notification.

5.1.1 Performance Indicators

All faults shall be attended to within the following maximum response times:

a) response time for all hazardous situations to public & motorists or faults is four (4) hours,

b) response time for non-hazardous situations to public & motorists or faults is seven (7) days, and

c) response time to repair all lamp outages is thirty (30) days.

Ensure the percentage of lamp failure does not exceed five percent (5%) at any one time, in accordance with AS/NZS 1158.

5.1.2 Condition Monitoring

You shall determine the luminance outputs within each light grid, make an assessment of the luminance condition, and rate the level in accordance with AS/NZS 1158 once every year.

5.2 DRAWINGS

Where supplied by the Principal, one set of drawings shall be stored in the lighting cabinet (if provided) at each site and one shall be stored at your office.

Any drawings that are different to the site conditions shall be marked in red to show details of these and any 'work as executed' (WAE) variations must be forwarded to the Principal within seven (7)

days. The copy of such drawings stored in the lighting cabinet (if provided) must be marked in red to indicate that the current issue is being amended.

The Principal will amend the drawings and will issue you with two (2) copies of the amended drawings.

All drawings issued to you shall be returned to the Principal at the completion of a Contract.

5.3 MAINTENANCE OF RECORDS AND REPORTS

You shall provide all reports by the first week of each reporting period, using the form(s) as provided in Annexure R307/B

In the comments field you shall record any problems, design faults, equipment approaching/passing their serviceable life and any other fault trends.

ANNEXURE R307/A – PROJECT SPECIFIC DETAILS

A1 LIST OF STREET LIGHT LOCATIONS AND INVENTORY

Not Used.

(This annexure will be filled in accordance with the scope of a Contract.)

A2 SCHEDULE OF STORES ISSUED FOR STREET LIGHT MAINTENANCE

Not Used.

(This annexure will be filled in accordance with the scope of a Contract.)

ANNEXURE R307/B – INSPECTION REPORT FORM

Contractor.....Date.....

ID	Monthly								Yearly						Comments
	A	A%	B.a	B.a%	B.b	B.b%	B.c	B.c%	C	C%	D	D%	E	E%	

NOTES:

A. Inspections completed
B. Availability
    a. Damaged
    b. Equipment failures (e.g. Lamps)
    c. Service failures (e.g. Power Supply)
C. Fault Attendances
D. Functional Checks
E. Preventative Maintenance completed

ANNEXURE R307/C – HAZARD RECTIFICATION REPORT FORM

Contractor.....Date.....

Location of accident Road and Supply point number	
Time contractor was informed of accident	
Date of accident and repair crew arrival time Was Incident or fault a dangerous situation Y/N	
Time site was made safe and final repair Date/time	
Description of replaced equipment and cost of equipment plus materials	
Police attendance Yes/No	
Details of any vehicles involved	
Number of hours claimed for complete repair	
Comments	

ANNEXURE R307/D – FUNCTIONAL CHECK SERVICE REPORT

Location **DATE** .....

……

.....

ITEM	CHECKED	CLEANED	REPAIRED	COMMENTS	FFA
1. Switches	*	*			
2. Circuit Breakers	*		*		
3. Joints (cable)	*		*		
4. PE Cell	*	*			
5. Contractors	*		*		
6. Check all lamps and control gear	*			No. of DW lamp replaced ( )	

If any item requires further attention, mark that item with ✓ in the "FFA" column
Enter date as dd/mm/yy and time as 24 hour time

Signed: ..... **Date sent to RMS: .....**

ANNEXURE R307/E – PREVENTIVE MAINTENANCE SERVICE REPORT

Location..... **DATE** .....

……

……

ITEM	CHECKED	CLEANED	REPAIRED	COMMENTS	FFA
1. Mowing around cabinet	*	*			
2. Mowing roadway to cabinet	*	*			
3. Remove Graffiti on cabinet	*	*			
4. Check Vermin damage in cabinet	*	*			
5. Check poles for rust or damage	*		*		
6. Check lanterns for damage or missing diffuser	*		*		
7. Trimming of trees	*	*			

If any item requires further attention, mark that item with ✓ in the "FFA" column
Enter date as dd/mm/yy and time as 24 hour time

Signed: ..... Date sent to RMS: .....

ANNEXURE R307/F

F1 STREET LIGHT IDENTIFICATION LABEL

Pole ID	Description	Example (old RTA)
R **M** **S**	Name of Authority	
W **A**	Three initials of location of street lighting scheme (eg: Warringah Freeway WAR)	
R **1**	Supply point no. 1	
0 **0** **1**	Pole identifier (eg: Pole number 1001)	

Notes:

1. Approximate size of lettering 25mmH, 23mmW.
2. Labels to be spray painted using stencil.

SP-XXX-ZZ

Details

Dimensions of label	200 mm Wide X 150 mm High
Lettering	27 mm High, black lettering
Material	Class 2 Reflective material
Recommended installation height from ground	2400, label is be clearly visible

Explanation of label legend

SP stands for Supply Point and XXX is the supply point identification number. ZZ will be the post number. Post numbering should start from the post closest to the supply point

F2 SUPPLY POINT IDENTIFICATION LABEL

Transport Roads & Maritime Services

SP-XXX

Details

Dimensions of label	200 mm Wide X 150 mm High
Lettering	27 mm High, black lettering
Material	Class 2 Reflective material

Example (old RTA)

Explanation of label legend

SP stands for Supply Point and XXX is the supply point identification number.