ROADS AND MARITIME SERVICES (RMS)

QA SPECIFICATION R301

MAINTENANCE OF TRAFFIC CONTROL SIGNALS

REVISION REGISTER

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Ed 1/Rev 1	2.3.3, 4.2, 5.2, Annex D & E	Clarifications for Repair time, operational availability, classification of High and Normal Operational Priority of ITS Assets and reporting	Craig Moran	31/01/14
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GUIDE NOTES

(Not Part of Contract Document)

Transport Roads & Maritime Services

NSW GOVERNMENT

QA SPECIFICATION R301

MAINTENANCE OF TRAFFIC CONTROL SIGNALS

IC-QA-R301

VERSION FOR: DATE:

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CLAUSE **PAGE**

FOREWORD

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REVISIONS TO PREVIOUS VERSION

This document has been released as RMS Specification R301 Edition 1 Revision 0.

All revisions to the previous version (other than minor editorial and project specific changes) are indicated by a vertical line in the margin as shown here, except when it is a new edition and the text has been extensively rewritten.

PROJECT SPECIFIC CHANGES

Any project specific changes have been indicated in the following manner:

(a) Text which is additional to the base document and which is included in the Specification is shown in bold italics e.g. ***Additional Text***.

(b) Text which has been deleted from the base document and which is not included in the Specification is shown struck out e.g. ~~Deleted Text~~.

RMS QA SPECIFICATION R301

MAINTENANCE OF TRAFFIC CONTROL SIGNALS

1 GENERAL

1.1 SCOPE

This document sets out the special requirements for the Maintenance of Traffic Control Signals (TCS) (the "Services"). The Specification is formed only when this document is read together with RMS QA R300 ITS Maintenance Services – General Requirements. The details herein include the Services relevant to TCS, so that they remain in good condition, operate as designed and meet the specified performance requirements. The TCS Equipment to be maintained under the Services includes, but not limited to,

a) TCS Controller;

b) TCS lanterns (including at least two (2) LED/QH aspects);

c) TCS target board;

d) Controller cabinet/housing (where used);

e) Controller housing labels;

f) Integrated-loop detector (ILD) (includes the loops, interface and detector controller boards);

g) Ramp metering (where used);

h) Communication equipment, cables, pits and conduits;

i) Conspicuity devices (also called advance/flashing warning lights);

j) Emergency centre priority schemes (e.g. Fire Brigade, Police, Ambulance);

k) Power supply equipment (including cables, power regulators, surge protection, pits and conduits, etc.);

l) Power backup equipment (including UPS, batteries and charging units, power regulators, photovoltaic cells where applicable, backup power generators, etc.);

m) Mast arms;

n) Posts and attachments;

o) Reflective tape on exposed posts;

p) Pedestrian push button assemblies;

q) associated inter-system cabling (including to interface of TFS, enforcement cameras, etc);

r) Support structures; and

s) Access walkways.

The Services may exclude

- pavement markings;
- road signs; and
- computer cabins.

1.2 DEFINITIONS AND ABBREVIATIONS

The following definitions and abbreviations, in combination with those listed in R300, are applicable to this Specification.

1.2.1 Definitions

Term	Description
Conspicuity devices	In the context of TCS, an electronic sign with at least two (2) LED/QH aspects associated with a signalised intersection, used to deliver advance warning to road users of road conditions that may require extra alertness; also called advance/flashing warning lights.
Enclosure	A housing providing an appropriate degree of environmental protection against contact with live parts (AS/NZS 60529).
Power backup equipment	Includes UPS, batteries and charging units, power regulators, photovoltaic cells where applicable, backup power generators, etc.
Supply Point (also known as Connection Point)	The junction of the electricity distributor's low voltage network conductors with the consumer's mains, i.e. the point at which the power supply is connected to the Utility network.
Supports	All structural components, brackets, clamps, straps and parts thereof, used to support the TCS Equipment.
Site/work site	Traffic Control Signal site

1.2.2 Abbreviations

Term	Description
AC	Alternating current
DC	Direct Current
EPV	Elevated platform vehicle (same as elevated work platform)
ILD	Integrated-loop detector; includes the loops, interface and detector controller boards.
LED	Light Emitting Diode; a solid-state semiconductor lighting technology
O&M	Operations and Maintenance
OEM	Original Equipment Manufacturer
QH	Quartz Halogen; an incandescent lighting technology
RCD	Residual Current Device
TCS	Traffic Control Signal; a system of lanterns that use LED/QH light sources to control vehicular and pedestrian traffic, also called Traffic Signals.
UPS	Uninterruptible Power Supply

1.3 RELEVANT DOCUMENTS AND ORDER OF PRECEDENCE

This document must be read together with RMS QA R300 – ITS Maintenance Services – General Requirements. Other relevant RMS Maintenance Specifications, RMS Equipment specifications, O&M manuals and Australian Standards are listed in **Annexure R301/A**.

In the event of any conflicting requirements between documents, the order of precedence must be:

1. Statutory and legislated requirements;
2. This Specification - R301 together with RMS QA R300 (this document);
3. Other RMS ITS Maintenance specifications;
4. RMS ITS Equipment specifications;
5. O&M manuals; and then
6. Australian Standards.

In the absence of specific requirements within this, other RMS Maintenance Specifications, RMS Equipment specifications or O&M manuals, Australian Standards must apply.

2 MAINTENANCE SERVICES

You must undertake maintenance services of the TCS Equipment in your Zone in accordance with the approved Asset Maintenance Plan and Forward Works Program.

Technical requirements of the completed works must be in accordance with RMS SI/TCS/8. In the absence of specified requirements within this or other relevant RMS specifications, Australian Standards apply.

2.1 ASSET INSPECTION

Asset Inspection Services must include

a) a Structural Integrity Check to check support structure is structurally sound,

b) NDT of base and support structure up to 2m height above ground,

c) structural review and results by a certified structural engineer at least once every five (5) years.

2.2 PLANNED MAINTENANCE

Planned Maintenance Services must include a

a) Functional Check Service at least

- three (3) monthly frequency or as specified, whichever is more frequent for Power Backup Systems.
- six (6) monthly for all other TCS Equipment.

with submission of the checklists in **Annexure R301/B**, and

b) Routine Maintenance Service at least

- three (3) monthly or as specified, whichever is more frequent for Power Backup Systems.
- twelve (12) monthly every year, for all other TCS Equipment,

with submission of the cover page and checklists in **Annexure R301/C**.

2.3 REACTIVE MAINTENANCE

2.3.1 Fault Attendance Service

You must provide a fault attendance service on twenty-four (24) hours per day, seven (7) days per week basis for all TCS faults.

Typical causes of TCS faults include, but are not limited to,

a) TCS Controller and associated equipment malfunctions,

b) Communication equipment malfunctions,

c) Power supply equipment failures,

d) Power backup equipment failures,

e) Inductive loop failures,

f) wiring faults,

g) overheating,

h) moisture or dust ingress,

i) accident damage,

j) storm damage, and

k) vandalism.

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

2.3.2 Procedure

You must make arrangements to continually monitor the Fault Management System(s) for TCS.

These systems, hosted by TMC, RMS currently include:

- SCATS Fault Management (F Man.)
- PC inventory; and
- DETFAULTS file for detector loops availability data and
- FMS web page on the TMC intranet,

You will be provided with access (e.g. remote login via VPN) to these systems. You may also develop your own software interface to access the above systems.

Upon fault notification, you must review the nature and urgency of the problem and prioritise your response. You must dispatch appropriately skilled resource(s)/technician(s) to attend the site as soon as possible, but in any case within the specified response time. Notification of the fault is either via phone callout or at the start of shift of your qualified resource(s)/technician(s). It is expected that your skilled resource(s)/technician(s) review their current faults at the start of their shift to determine their work priorities.

Upon arriving on site you must log the time of attendance in FMAN together with your initial findings and any other relevant information (e.g. estimated time to repair). Alternatively, if FMAN is unavailable, you may notify the TMC by phone.

Annexure R301/E2 provides Traffic Signal specific fault reporting status codes.

In the event of detector faults, you must follow the process in **Annexure R301/H**.

In addition to above, you must log all fault attendance details in the form in **Annexure R301/I**.

You must assess whether the condition of the site poses any safety hazards to motorists or the public and make the site safe as a matter of priority.

In the event of a power failure, you must first contact the electricity distributor from off-site to ascertain that the cause of the outage is upstream of the TCS supply point. You must still ascertain from site that there are no other power equipment failures at the TCS site and then enter the appropriate fault response details in FMAN.

In the event of a communications failure, you must first contact the service providers i.e. Telstra, Optus etc to ascertain that the failure is external to the TCS system. Once confirmed, you must log communications faults with the appropriate third party communications service provider and follow-up to expedite rectification of the fault. You must still ascertain from site that there are no other communication equipment failures at the TCS site and then enter the appropriate fault response details in FMAN.

2.3.3 Response Time and Repair Time

Response times for initial site attendance upon notification of TCS faults are detailed in R300 (Clause 6.2.1 Response Times and **Annexure D**).

Please also refer to definitions of Response time and Repair effectiveness given in R 300.

2.3.4 Repetitive Failures

Where the same reported fault requires callouts on three (3) occasions within a fourteen (14) day period you must carry out root cause analysis, identify and implement appropriate actions to prevent recurrence.

Where these actions recommend replacement or major renewal of the TCS asset and these works have not been included in the current Forward Works Program (FWP) you must submit a Business Case to RMS for approval. The Business Case must be based on a life cycle cost comparison of the proposed action against a “business as usual” maintenance approach. If RMS agrees with your recommendations the renewal or replacement works will be included in the next FWP.

2.3.5 Requests for RMS Assistance

Where a technical problem cannot be resolved by you, you may request assistance from RMS. When requesting assistance you must be able to demonstrate to RMS that the technical problem is outside your scope of services, e.g. system integration issues with RMS or TMC systems.

If the technical problem cannot be resolved by the RMS remotely, a site meeting will be arranged by RMS at a mutually agreeable time. You must attend the site meeting with relevant documents and information related to the technical problem.

2.4 INCIDENT SUPPORT

An Incident Support report should be raised when;

- an incident is known to your team
- or when informed by the TMC
- or by the relevant SMC Service Provider.

In the event of an incident, response time and repair time for Reactive Maintenance applies.

On site attendance, you must assess whether the condition of the site poses any safety hazards to the public and make the site safe as a matter of priority.

You must also prioritise and rectify all other faults and defects as if for Reactive Maintenance.

You must record the Incident Support details in FMAN. If FMAN is not available the report form in **Annexure R301/D** may be used on site.

You must assist RMS with all insurance claims and recovery actions arising from the incident.

Incident Support reports must be submitted as part of your monthly report to RMS.

3 PARTS AND EQUIPMENT

3.1 SUPPLY

You must supply all parts and equipment for the purpose of maintaining the TCS Equipment. For supply of equipment you must check and use the approved TCS Equipment and Suppliers as amended in the "Register of Approved Suppliers for ITS Equipment" ("the Register") at the RMS web link: http://www.rms.nsw.gov.au/doingbusinesswithus/downloads/approved_suppliers_for_its_equipment.html

The Register is regularly updated current by RMS. A list is provided in **Annexure R301/J** (as a guide). In the event of any conflicting or missing information between the Register and **Annexure R301/J**, the Register takes precedence.

3.2 HOLDING STOCK

At all times, you must hold adequate stock levels of parts and equipment in storage for the Reactive Maintenance of the TCS Equipment, as documented in the agreed Asset Maintenance Plan. The

recommended minimum stock levels for TCS Equipment are listed in **Annexure R301/G**. You should determine your minimum stock levels under your business and operational conditions.

3.3 DISPOSAL OF DAMAGED, DEFECTIVE, OBSOLETE OR REDUNDANT PARTS & EQUIPMENT

Due to maintenance or incidents, parts and equipment which are damaged, defective, obsolete or redundant are required to be removed from the Work Site and disposed. Such removal is to be done after formal information and agreement with RMS.

Such parts and equipment are to be distinctly and permanently marked prior to disposal by indicating their condition.

Disposal of parts and equipment is to be done as follows;

a) Repair or refurbish the parts or equipment and hold them as spares in store for future use. For purposes of quality assurance, repaired or refurbished parts are to be treated the same as Replacement parts & equipment (Clause 3.1). Their repair history is to be maintained and made available to RMS when requested.

b) Carry out disposal of parts and equipment that are beyond-economical-repair (BER) by recycling. Items being disposed must be physically disfigured prior to recycling at a certified facility. Certificate of disposal must be provided.

4 PERFORMANCE REQUIREMENTS (ASSET SPECIFIC)

You must meet the included KRAs and KPIs for performance of your Services. Performance requirements which are specific to TCS Equipment are detailed below.

As per definitions given in R 300 the following performance criteria will be measured:

a) Availability

b) Response Time

c) Repair effectiveness Time

In addition overall measurements of your performance will include the following criteria:

d) Traffic Signal Maintenance Standards

Maintain all the traffic signal installations to a high level of service and reliability as specified in **R300.**

e) Traffic Signal Routine Maintenance Activities

The routine maintenance activities at all traffic signal and associated installations must be scheduled and carried out as specified in this Specification and FWP.

f) Traffic Signal Non-Routine Maintenance Activities

Attend to all emergency calls and repair work within the response times as specified in **Annexure R301/E1** Fault Codes and Response Times and in accordance with this Specification.

For each site, complete a Routine Maintenance Service report as shown in **Annexure R301/C**.

4.1 DESIGN LIFE

Your Asset Inspection and Planned Maintenance Services must support a design life for each TCS asset, of at least;

a) five (5) years for its power supply equipment,

b) five (5) years for its power backup equipment and battery, including replacing, dating and tagging each battery with a durable label upon the battery as proof of purchase, expiry date of battery, OEM's warranty, or 400 recharge cycles to 80% depth of charge, whichever is earlier,

c) Twenty (20) years for its electronic, electrical and communications equipment, excluding the power supply equipment or as specified in TSC/4, whichever is higher, and

d) Fifteen (15) years for its display equipment, including replacing LED/QH lanterns or LED/QH conspicuity devices if the light output decreases below L70 or as specified in RMS QA R3452, whichever is higher.

Premature asset failures requiring major renewal or replacement of the asset (other than due to Incidents or Force Majeure events) may reduce your Stewardship Overall Performance KPI score.

Design life is one of the criterions out of many to determine renewal of a TCS asset. All criterions should be applied prior to determining asset renewal.

4.2 AVAILABILITY (OPERATIONAL)

RMS QA R300 defines Availability for ITS assets. Performance calculation method is provided in the contract. The performance target for TCS availability is at least **99.985%.**

Performance target for Sites with Priority 1 & 2 loops is at least **98%** serviceability.

Availability as defined in R300 will be measured monthly by you across all TCS and loops assets in your Zone.

Failure to meet the Availability performance targets will impact on your Asset Performance KPI score.

5 REPORTING AND RECORD KEEPING

5.1 REPORTING

You must provide a monthly report to RMS on work achievement against the FWP and asset performance statistics in an agreed format by the first week of each month.

You may use the service report forms in **Annexure R301/B** and **R301/C** or develop and agree to equivalent electronic reporting systems as part of your Asset Management systems.

You must report on the status of fault attendance and repairs through the appropriate Fault Management Systems in accordance with Clause 6.3 in R300.

Also provide the following end of month reports by the second week of the following month:

(a) Availability, Response Time and Repair Effectiveness (See R300 for definitions)

The report must include the following items:

(i) Availability

(ii) Response Time

(iii) Repair Effectiveness

(b) Lamp Failure Rate Report

The report must include the following items:

(i) Actual number of lamps

(ii) Actual number of lamp failures reported for each calendar month

(iii) Lamp failure rate (%)

(c) Push Button Failure Rate Report

The report must include the following items:

(i) Actual number of pushbuttons

(ii) Actual number of push button failures reported for each calendar month

(iii) Push button failure rate (%)

(d) Priority 1 & 2 loops

Detector loops

The report must include the following items, at the time of reporting:

(i) Total TCS sites.

(ii) Total number of faulty/unavailable loops.

(iii) Total number of Sites with faulty/unavailable loops.

(iv) Total number of faulty/unavailable P1& P2 loops. (See **R301/H2**)

(v) Total number of Sites with faulty/unavailable P1& P2 loops.

(vi) Percentage of Sites with faulty/unavailable P1& P2 loops. TCS loops serviceability performance (%) calculation formula: **100 x {1- [(v) / (i)]}**

(vii) Provide reasons for number faulty/unavailable loops against categories; Signal Reconstruction, Awaiting Pavement Repair, Awaiting Replacement Order, Software Change, Unreliable Equipment and Other (newly reported faults, other issues etc).

(viii) Number of loops recut and reinstated with Network Operations.

5.2 RECORD KEEPING

You must keep and maintain accurate records of all repairs, calibrations, replacements and design alterations made to any TCS Equipment/site.

All Reactive and Planned Maintenance service attendances must be recorded in the electronic fault management system. Details of each attendance must also be manually recorded with you and should include the date and details of service carried out with the technician's name.

You must maintain all necessary records to support the monthly evaluation of actual performance against the specific performance targets.

You must retain records, including all details for accidents/damages/repairs for a period of at least five (5) years.

5.3 FURTHER REQUIREMENTS

5.3.1 Loop Restoration Management

You must adhere to the detector fault procedure as per Clause H1 of **Annexure R301/H**. You must record the loop failures accurately and promptly, in the DETFAULTS file, including all the relevant information requested to assist the loop restoration process.

5.3.2 Site Inventories

You must maintain the Signal Site Inventories in the PC Inventory or any other system nominated by RMS, to ensure that the information is accurate at all times.

ANNEXURE R301/A – REFERENCE DOCUMENTS

A1 RMS ITS MAINTENANCE SPECIFICATIONS

Not used.

A2 RMS ITS EQUIPMENT SPECIFICATIONS

RMS TSC/4	Control Equipment for Road Traffic Signals
RMS R3452	LED traffic signal lanterns
RMS SI/TCS/8	Installation and Reconstruction of Traffic Light Signals
RMS ATS/4	Audio-tactile traffic signal equipment
RMS C/12	Cables for traffic signal installations
RMS ECA/2	General requirements for electronic components and assemblies for outdoor equipment
RMS FWL/1	Flashing warning lights for fixed equipment
RMS ILD/1	Controller-specific vehicle detector equipment
RMS LD/7	Vehicle loop detector equipment (rack-mounted)
RMS LSS/2	Slot sealant for vehicle detector loops
RMS MA/1	Traffic signal mast arms
RMS P/6	Traffic signal posts
RMS PB/6	Pedestrian push-button assemblies
RMS PCF/2	Pit covers and frames
RMS QHL/2	10V traffic signal lamps
RMS SI/FWL/1	Installation of advance warning signs and flashing lights
RMS SI/LD/2	Installation of vehicle detector loops for traffic light signals
RMS SI/URB/6	Installation of traffic signal cable ducts by under-road boring
RMS UGS/5	Underground mains fuse
RMS VL/11	Vehicle traffic signal lanterns

A3 O&M MANUALS

Refer to respective O&M Manuals based on make and model of Equipment of each TCS.

A4 AUSTRALIAN STANDARDS

AS2144	LED Traffic Signal Lanterns
AS 2339	Traffic Signals Posts and Attachments
AS 2353	Pedestrian Push Button Assemblies
AS 2979	Traffic Signal Mast Arms
AS 4113.2	Traffic Signal Lamps
AS 4191	Portable Traffic signals
AS 4192	Illuminated Flashing Arrow Signs
AS 4852.1	Variable Message Signs – Fixed Signs
AS 5156	Electronic Speed Limit Signs
AS 2578	Traffic Signal Controllers
AS 2703	Vehicle Loop Detector Sensors

ANNEXURE R301/B – FUNCTIONAL CHECK SERVICE REPORT

TCS ID: ……

LOCATION: …… **REPORT DATE: ……..**

GPS LATITUDE…… **GPS LONGITUDE……**

ITEM	PASSED	FAILED	REPAIRED	COMMENTS	FFA
Site - Sign-On					
1. Staff inducted, SWMS completed, attended tool box meeting onsite					
2. Obtain road occupancy licence (ROL) from TMC				ROL Number: _____ _____	
3. Contact TMC (Tango 5) for traffic control placement and clearance for maintenance, before leaving workshop. Once cleared, secure site for maintenance. Notify TMC.					
4. Record photographs of parking, location, and TCS equipment					
TCS Controller, Lanterns, Controller Cabinet and Posts					
5. Check fault log operation. Report as necessary.					
6. Check detector/arterial switch settings and operation Repair or replace or necessary				Date: _____	
7. Check relays and contacts. Repair or replace as necessary.				Date: _____	

ITEM	PASSED	FAILED	REPAIRED	COMMENTS	FFA
8. Check Push Button assemblies for smooth button operation Repair or replace or necessary				Date: _____	
9. Check Audio-Tactile system operation of both locating and crossing traffic signals Adjust sound level in accordance with guidelines if necessary Repair or replace as necessary				Date: _____	
10. Visually verify push button operation in housing with LED operation on control module					
11. Check operation of all LED/QH lanterns. Replace if failed				Date: _____	
12. Check operation and display of LED aspects. If each LED aspect has a pixel failure rate of more than 20% return to workshop with label showing origin.				Date: _____	
Uninterruptible Power Supply (UPS)					
13. In accordance with RMS QA R318. Checklist attached (Y/N)?					
Site - Sign-Off					
14. Check if site is safe					
15. Notify TMC that the TCS site secured for normal operation.					

NOTES:

1. Mark condition of each item with a ✓ in the "PASSED/FAILED/REPAIRED" columns.

2. If any item requires further attention, mark that item with a ✓ in the "for further action (FFA)" column.

3. Enter date in dd/mm/yy format and time in 24 hour format.

TIME ARRIVED: ……TIME DEPARTED: ……

TECHNICIAN: …… COMPANY: ……

SIGNATURE: …… DATE SIGNED: ……

DATE SENT TO RMS: ……

ANNEXURE R301/C – ROUTINE MAINTENANCE SERVICE REPORT

TCS ID: …… LOCATION: ……..

REPORT DATE: ……..

GPS LATITUDE…… GPS LONGITUDE……

ITEM	PASSED	FAILED	REPAIRED	COMMENTS	FFA
Site - Sign-On					
1. Staff inducted, SWMS completed, attended tool box meeting onsite					
2. Obtain road occupancy licence (ROL)				ROL Number: _____ _____	
3. Contact TMC (Tango 5) for traffic control placement and clearance for maintenance, before leaving workshop. Once cleared, switch main control switch to "MANUAL" Notify TMC that the movable median is set to manual control.					
4. Record photographs of parking, location, and TCS equipment					
TCS Lanterns					
5. Visually inspect by recording age of LED lanterns and provide comparative luminance condition against average luminosity at the intersection. TCS Lantern Luminance testing is done when there is a suspicion of LED deterioration or when specially called upon to inspect aged/deteriorated lanterns. (see 4.1.d).				**Type / Age / Condition**	

ITEM	PASSED	FAILED	REPAIRED	COMMENTS	FFA
Controller Cabinet and Posts					
6. Check Controller cabinet and ensure secure from weather or dust ingress Report if damaged					
7. Inspect electronics of TCS controller and communication equipment for symptoms of electrical or thermal fatigue. Repair or replace as specified				Symptoms found: _____ _____ _____ Date: _____	
8. Check & secure earth connection to electrode, and TCS Controller.					

ITEM	PASSED	FAILED	REPAIRED	COMMENTS	FFA
9. Check lenses and reflectors. Replace if damaged, deteriorated or emitting white light from LED/QH. Record replacements. Clean lenses and reflectors of dust and grime, from inside and outside.				Date: _____ Activity/Replacements:	
10. Check condition of Target Boards, Lanterns and Visors Replace visors if damaged Report target boards and lanterns which are damaged or have large areas of paint missing or have graffiti. Remove minor graffiti from Target Board or other surfaces. Replace missing screws, tighten loose screws Replace missing visor canoe clips with spring clips				Date: _____ Date: _____ Date: _____	
11. If Type 2 post, check top assembly plastic bag for dirt build-up. Clean or replace as necessary.				Date: _____	
12. Check aiming & alignment of lanterns. Realign and tighten nuts as required.					
13. Check post for damage. Repair any minor damage if possible or report major damage that necessitates major repair or replacement.				Date: _____	
14. Check if reflective tape per post is missing. Report only if missing 50% or more					

ITEM	PASSED	FAILED	REPAIRED	COMMENTS	FFA
15. Check condition of door seals and lubricate.					
16. Physically check main & ancillary switches/fuses. Repair or replace as necessary				Date: _____	
17. Check TCS Lanterns as required by schedule. Note total no. used as well as no. of QH lamps used Update software monitor where necessary Note number of lamps failed at switch-on, after bulk replacement					
18. Check TCS Lanterns after maintenance					
19. Check AC supply fuse box equipment for water ingress or damage. Ensure intact and undamaged Repair or report as necessary					
20. Check signs on TCS posts. Make safe if dangerous. Report as necessary. Clean overhead signs when replacing overhead lanterns.					
21. Check other sign posts. Make safe if dangerous. Report as necessary. Clean other signs as necessary					
22. Check road marking. Report if more than 20% missing.					

ITEM	PASSED	FAILED	REPAIRED	COMMENTS	FFA
23. Check communication pit and cable connections in communications box. Repair or report as necessary.					
24. Clean the cabinet, remove dust, vermin and other debris, tidy-up wiring					
25. Check housing identification labels and their condition, arrange for replacement if damaged or missing				Date: _____	
26. Check Communication and Power pits for water and other damage, clean as necessary					
27. Check cabinet (inside and outside) is secured to prevent weather damage to electronics.					
28. Check for graffiti on Control Cabinet. Remove, if graffiti found. Report date found to RMS.					
29. Check condition, replace and lubricate door locks, hinges & seals as required				Date: _____	
30. Check that log sheet and WEA drawings are complete and intact. NOTE: If WAE drawings missing, prepare at site and forward to RMS to reproduce					
31. Physically check switchboard and RCD items (where provided). Reset circuit breakers. Measure RCD tripping current (in mA)				RCD tripping current = _____ RCD tester make and model = _____	
32. Locate MEN connection inside the cabinet					

ITEM	PASSED	FAILED	REPAIRED	COMMENTS	FFA
33. Visually/physically check wiring/terminations/earthing items, tighten if required. Check and secure Earth connection. Measure Earth insulation reading using insulation tester				Reading between Earth stake & Door = _____ Reading between Earth stake & Mains Earth = _____	
34. Check if surge protector is installed				Surge protector make and model = _____	
35. Install cable entry plate and seal around the cables					
Site - Sign-Off					
36. Check if site is safe					
37. Switch main control switch to "AUTO"					
38. If TFS or tunnel safety system is integrated with a movable median, notify TMC that the movable median is set to automatic control.					

NOTES:

1. Mark condition of each item with a ✓ in the "PASSED/FAILED/REPAIRED" columns.
2. If any item requires further attention, mark that item with a ✓ in the "for further action (FFA)" column.
3. Enter date in dd/mm/yy format and time in 24 hour format.

TIME ARRIVED: …… **TIME DEPARTED: ……**

TECHNICIAN: …… **COMPANY: ……**

SIGNATURE: …… **DATE SIGNED: ……**

DATE SENT TO RMS: ……

ANNEXURE R301/D – INCIDENT SUPPORT REPORT

TCS ID: …… LOCATION: ……..…

INCIDENT DATE: …… REPORT DATE: ……..

Incident Details	
When reported	
Who reported	
Was Incident or fault a dangerous situation? (Y/N)	
Police attendance? (Yes/No) Police Report #:	
Details of any vehicles involved	
Attending supervisor and team at site. Date and time.	
Immediate Safety measures taken. Date & time.	
Power Supply Point / post identification number	

Initial Repair undertaken. Date & time	
Details of long term repair. Whom forwarded to for action.	
Description of replaced equipment and cost of equipment plus materials	
Number of hours claimed for complete repair	
Notes & Comments	

TECHNICIAN: …… COMPANY: ……

SIGNATURE: …… DATE SIGNED: ……

DATE SENT TO RMS: ……

ANNEXURE R301/E – FAULT CODES AND RESPONSE TIMES

E1 FAULT CODES AND RESPONSE TIMES FOR INITIAL FAULT ATTENDANCE

Response times for initial site attendance upon notification of TCS faults are detailed in R300 (Clause 6.2.1 Response Times and **Annexure D**). R300 categorizes ITS assets as either High Priority or Normal Priority and assigns suitable response times.

E2 FAULT REPORTING STATUS CODES

Attendance Type	Code
FUNCTIONAL CHECK	FC
GENERAL MAINTENANCE	GM
NEW SITE CONSTRUCTION	NS
MASTARM PREVENTATIVE MAINTENANCE	MM
PREVENTATIVE MAINTENANCE	PM
PASSING THROUGH	PT
RECONSTRUCTION BY CONTRACTOR	RC
SYSTEMS INSPECTION	SI
NO ATTENDANCE REQUIRED	NA
NO FAULT FOUND	NF

Status Type	Code
BLACKED OUT	BO
FLASHING YELLOW ON	FY
IN SERVICE	IS

Report Source	Code
MEMBER OF THE PUBLIC	MOP
POLICE	POL
POLICE RADIO	VKG
PUBLIC UTILITY	PU
RMS PERSONNEL	RMS
SCATS SYSTEM	SCATS
SIGNAL CONTRACTOR	CONTR
TAXI COMPANIES	TAXI
TRAFFIC CONTROL CENTRE	TCC
URBAN TRANSIT AUTHORITY	UTA

ANNEXURE R301/F – IDENTIFICATION LABELS

F1 EQUIPMENT IDENTIFICATION LABEL

NOTES:

1. TCS label format: YYYY, where YYYY is an integer identifier allocated to each TCS.
2. Label to be made from pressure sensitive non-reflective material.
3. Background colour: Golden Yellow Y14 to AS 2700.
   Lettering, logo and border: Black.
4. Artwork will be supplied by RMS.
5. Samples of the base material offered with a sample black legend shall be submitted to and approved by RMS.
6. A written four (4) year guarantee is required against any defect in colour or adhesion when the label is applied to a vertical painted surface exposed to all weather conditions.

F2 SUPPLY POINT IDENTIFICATION LABEL

This label provides identification for power connection to the TCS posts. In the case of emergency or accident, power from this post is to be disconnected.

SP-XXX-ZZ

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.

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 to be clearly visible

ANNEXURE R301/G – RECOMMENDED MINIMUM STOCK LEVELS

Item Description	Minimum Stock Level
Arrow Mask – 300 mm	10
Arrow Mask – 200 mm	20
Mask – Pedestrian – Don't Walk	10
Mask – Pedestrian – Walk	10
Audio Tactile – Proof Housing Drive Unit	12
Audio Tactile – Plug-In Module	40
Tactile Only - Plug-In Module	10
Bracket – 'L' Target Board	60
Bracket - 2 Point Lower Mounting	40
Bracket - 4 Point Lower Mounting	25
Cable Splice Kit – 29 Core Heat Shrink	18
Communication Unit – Dido	30
Communication Unit – Dusk	5
Controller – PSC MK3	0
Controller – Pedestrian	4
Controller – QTC	4
Controller – Tyco	4
Controller Housing – Key	12
Controller Module - Philips PSC-NA	16
Controller Module - Philips PSC-NC	35
Controller Module – Eclipse (Small)	5
Controller Module – Eclipse (Large)	20
Controller Module - QTC (Small)	15
Controller Module - QTC (Large)	20
Cover Yellow - Out Of Service 200 mm	60
Cover Yellow - Out Of Service 300 mm	20
Detector Module - 4 Channel	80
Detector Unit - Pole Mounted	6
Finial - Suit 29 Pt Top	40
Finial Split - Suit 29 Pt Top	6
Keypad	20
Lamp - QH - 10V 35W	9,000
Lamp - QH - 10V 50W	3,000
Lantern Complete – QH – 3 Aspect – 200 mm – Arrow	0
Lantern Complete – QH – 3 Aspect – 200 mm	0
Lantern Complete – QH – 4 Aspect – 200 mm	0
Lantern Complete – QH – 3 Aspect – 300 mm	0
Lantern Complete – QH – 1 Aspect – Pedestrian	0
Lantern Complete – LED – 2 Aspect – 200 mm – Arrow	0
Lantern Complete – LED – 2 Aspect – Pedestrian	12
Lantern Complete – LED – 2 Aspect – Bike	2
Lantern Complete – LED – 3 Aspect – 200 mm – Arrow	10
Lantern Complete – LED – 3 Aspect – 200 mm – Full	15
Lantern Complete – LED – 3 Aspect – 200 mm – Other	0
Lantern Complete – LED – 3 Aspect – 300 mm – Arrow	4
Lantern Complete – LED – 3 Aspect – 300 mm	4

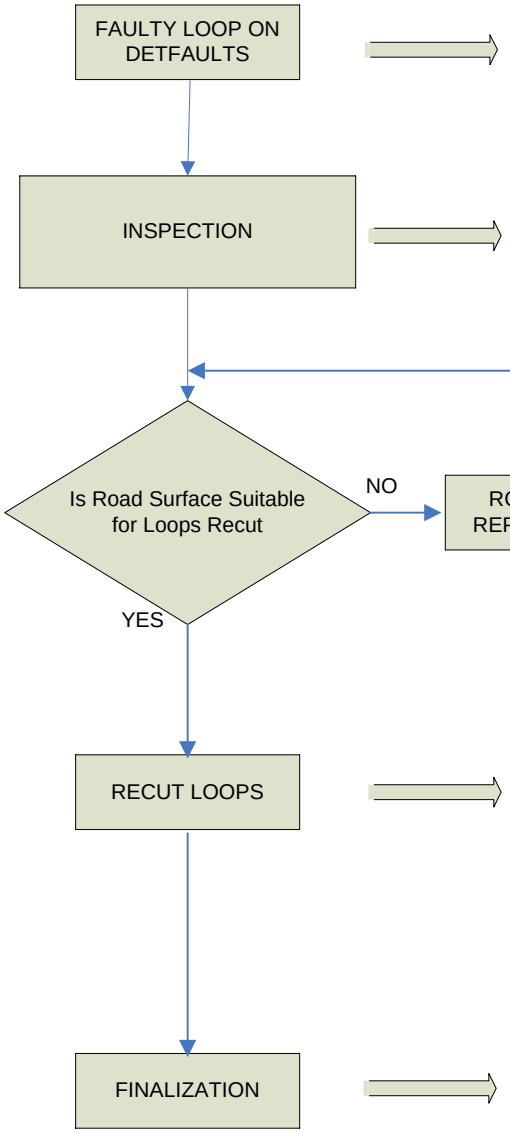
Item Description	**Minimum Stock Level**
Lantern Complete – LED – 3 Aspect – 300 mm – Other	0
Lantern Complete – LED – 4 Aspect – 200 mm – Full	4
Lid – Roadside (Assorted)	4 each
Lantern Strap – 120 mm	50
Lantern Strap – 150 mm	50
Lantern Strap – 200 mm	60
Lantern Strap – 250 mm	60
Lantern Strap – 300 mm	100
Lantern Strap – 350 mm	60
Lantern Strap – 400 mm	40
Lens – 200 mm – Red	50
Lens – 200 mm – Yellow	50
Lens – 200 mm – Green	50
Lens – 300 mm – Red	30
Lens – 300 mm – Yellow	20
Lens – 300 mm – Green	30
Post – Type 2 – 3.2 m	10
Post – Type 2 – 4.1 m	12
Post – Type 2 – 5.2 m	3
Post – Type 4	2
Post – Type 5	2
Post – Type 6	2
Post – Type 9	0
Post – Type 10	0
Post – Type 11	0
Post – Type 13	0
Push Button – Pedestrian – Assembly	20
Push Button – Pedestrian – Audio Tactile Assembly	80
Push Button – Plate – Escutcheon (Dual Arrow)	10
Stop Sign – Special	0
Target Board – 3 Aspect – 200 mm	10
Target Board – 3 Aspect – 300 mm	6
Target Board – 3+3 Aspect – 200 mm	10
Target Board – 3+3 Aspect – 300 mm	6
Target Board – 4 Aspect – 200 mm	5
Terminal Assembly – 29 Pt Top Mounting	12
Visor – Closed – 200 × 200 mm	40
Visor – Extended – 200 × 300 mm	120
Visor – Open – 200 × 200 mm	80
Visor – Closed – 300 mm	80
Visor – Open – 300 mm	60
Visor – Pedestrian – Symbolic Lantern	100
Aldridge	
Aldridge – Insert – LED – 200 mm – Arrow Green	50
Aldridge – Insert – LED – 200 mm – Arrow Amber	50
Aldridge – Insert – LED – 200 mm – Arrow Red	40
Aldridge – Insert – LED – 300 mm – Arrow Green	6
Aldridge – Insert – LED – 300 mm – Arrow Amber	8
Aldridge – Insert – LED – 300 mm – Arrow Red	6
Aldridge – Insert – LED – 200 mm – Vehicle Green	80

Item Description	**Minimum Stock Level**
Aldridge – Insert – LED – 200 mm – Vehicle Amber	40
Aldridge – Insert – LED – 200 mm – Vehicle Red	50
Aldridge – Insert – LED – 300 mm – Vehicle Green	8
Aldridge – Insert – LED – 300 mm – Vehicle Amber	6
Aldridge – Insert – LED – 300 mm – Vehicle Red	6
Aldridge – Insert – LED – Pedestrian – Don't Walk	60
Aldridge – Insert – LED – Pedestrian – Walk	60
Bob Panic Consultancy (BPC)	
BPC – Insert – LED – 200 mm – Arrow Green	15
BPC – Insert – LED – 200 mm – Arrow Amber	15
BPC – Insert – LED – 200 mm – Arrow Red	20
BPC – Insert – LED – 300 mm – Arrow Green	10
BPC – Insert – LED – 300 mm – Arrow Amber	10
BPC – Insert – LED – 300 mm – Arrow Red	10
BPC – Insert – LED – 200 mm – Vehicle Green	15
BPC – Insert – LED – 200 mm – Vehicle Amber	15
BPC – Insert – LED – 200 mm – Vehicle Red	15
BPC – Insert – LED – 300 mm – Vehicle Green	8
BPC – Insert – LED – 300 mm Vehicle Amber	8
BPC – Insert – LED – 300 mm – Vehicle Red	8
BPC – Insert – LED – Pedestrian – Don't Walk	8
BPC – Insert – LED – Pedestrian – Walk	8

Note:
Minimum stock items and levels are recommendations only. You should determine your minimum stock levels under your business and operational conditions.

ANNEXURE R301/H – HANDLING DETECTOR FAULTS

H1 PROCESS



- Detected on DETFAULTS by the Maintenance Supervisor

Maintenance Supervisor or Signal Technician is to;

- Investigate cause of the Detector fault and make temporary repairs, if possible.
- Inspect road surface for suitability to recut Loops.
- If fault is due to disturbance of road surface, determine responsibility for road surface repairs and / or Loops reinstatement.
- Determine if costs are recoverable.
- Inform Network Operations to install temporary overrides in SCATS, if traffic flow issues noted.

Maintenance Supervisor is to;

- Requests urgent road repairs with road surface repair contractor.
- Change Loop Priority in DETFAULTS to 10-50 for interim temporary arrangement for local control.
- Notes in DETFAULTS the provided work schedule by Road surface repair contractor.

Maintenance Supervisor to;

- Monitor Loops recut/reconnection by other contractors employed by RMS or Councils.
- Arrange loops recutting with your contractor, if your responsibility.
- Check that Road Occupancy Licence request to TMC is made in time by the loop repair contractor.
- Ensure that recut of Loops is done within response time.
- Inform Network Operations of completion of repairs.

Maintenance Supervisor is to ensure;

- Check satisfactory operation of detector on SCATS.
- Modify DETFAULTS by adding repair date.
- Network Operations to remove temporary overrides in SCATS.
- Ensure satisfactory operation of TCS.

Definitions

- **Maintenance Supervisor** is the responsible TCS supervisor with the stewardship ITS Maintenance Contractors and RMS regions.
- **Signal Technician** reports to the responsible Maintenance Supervisor.
- **Network Operations** is Road Network Operations at TMC Eveleigh.

H2 SETTING PRIORITIES FOR DETECTOR FAULTS

Priority 1

- Is not half-loop
- Occurs on a minor movement (not the stretch phase)
- Reduces the stretch time of the main phase and may unnecessarily call minor phases.
- Is irrelevant if the minor phases are also heavily trafficked.

Priority 2

- Is not half-loop
- Occurs on the main movement
- Is a strategic input
- If SI has 2 or more loops, and only one is faulty, the good loop/s can provide SCATS counting
- If SI has all loops faulty, Network Ops may be able to use loops at a nearby intersection to provide count.

Priority 3

Is when none of the above occurs and the faulty loop is not set to half-loop.

Priority 4

Is a half loop that is visible and can be recut without affecting other complete loops.

Priority 5

Is a half loop that is not visible and cannot be recut without affecting other complete loops or is a pushbutton.

ANNEXURE R301/I – FAULT ATTENDANCE LOG SHEET

Fault reported		TCS	Arrival at site		Site	Actual fault description	Actual fault code	Time repaired	Repair Status	Lamps replaced			Claim Details
Date	Time	Code	No	Date	Time	Status						Post #	Lantern	Aspect	Repair Time

TECHNICIAN:

…… COMPANY: ……

SIGNATURE: …… DATE SIGNED: ……

DATE SENT TO RMS: ……

NOTES:

1. Fault reported

a. Date and Time

This is the date and time that the reported fault was received by you. Enter the date only as the day and month in the format dd/mm (e.g. 01/03 for 1st March) and enter the time in twenty-four (24) hour format (e.g. 2210 for 10:10pm)

b. Code

Use the fault codes from **Annexure R301/E.**

2. TCS No

This is the unique identifier for the signal site or advance warning site and is the number shown on the labels attached to the controller housing.

3. Arrival date/time at site

Enter your arrival date in the form of dd/mm and enter the time as twenty-four (24) hour time.

4. Site status

Enter the code for the status of the site when you arrive. The site can be operating despite the fault that you are responding to (i.e. SI, BO, or FY).

5. Actual fault description

Enter a brief description of the fault to better describe it. An example is entering the details of the post and direction facing for a twisted lantern (fault code AC).

6. Actual fault code

Use the fault codes from **Annexure R301/E**. Note that the reported fault code and the actual fault code may differ.

7. Time repair completed

Enter the time in twenty-four (24) hour format that you completed the repair. If the date is different to the date you entered for the Arrival Time at Site, enter the date in the format of dd/mm on the line after your completion time.

8. Repair status

Enter the code for the status of the site when you leave. The site can be operating, despite the fault that you are repairing has not been completed (IS - In Service); not operating at all (BO - Blacked Out); or, all yellow lights are flashing (FY - Flashing Yellow).

9. Lamp replaced

Enter these details for every lamp or LED aspect that you replace. If all lamps are replaced, during a Preventive Maintenance service, enter “ALL” in the column labelled Post.

a. Post

Enter the post number. This number can be read from the TCS Layout design plan.

b. Lantern

Enter the lantern designation. This indicates the phases for which the lantern displays and can be read from the TCS Layout design plan. The designation can be something like A or A/b, etc

c. Aspect

Enter the aspect designation. This is designates the lens colour and is R (Red), Y (Yellow) or G (Green).

10. Signature

The electrician who carried out all the work listed on the Log Sheet is to sign here. If another electrician does work on any of the sites separately to the person who signs this sheet, he must fill in a separate sheet and sign that sheet. The electrician must also legibly print his name after his signature.

11. Date sent to RMS

Enter the date you sends this to the RMS (along with the other forms you are required to lodge for payment) in the format dd/mm/yy (e.g. 01/04/01 for 1 April 2001)

12. Repair Time

Repair time is actual time taken to repair the fault.

ANNEXURE R301/J – APPROVED TCS EQUIPMENT & SUPPLIERS

DESCRIPTION	RMS TYPE APPROVAL OR APPROVAL METHOD	RMS Cat. No	CURRENT SUPPLIER
CONTROLLER			
Traffic signal controller	9410-TSC3-5-1	70034344	See Note 8
Traffic signal controller	9710-TSC3-5-1	70034345	See Note 8
Traffic signal controller	0410-TSC4-1-1		See Note 8
Traffic signal controller	0608-TSC4-1-1		See Note 8
Traffic signal controller	1306-TSC4-1-1		See Note 8
VEHICLE DETECTORS			See Note 8
Integral loop detector 12 channel	9503ILD1-0-2	70031704	See Note 8
Integral loop detector 16 channel	9503ILD1-0-1	70031705	See Note 8
Integral loop detector 8 channel	9503ILD1-0-3	70031703	See Note 8
Integral loop detector 4 channel	9503ILD1-0-4	70031702	See Note 8
VEHICLE LANTERNS			See Note 8
Lantern 3 aspect 200mm (10V 35w)	9207-VL11-0-1	70015161	See Note 8
Lantern 3 aspect 200mm (10V 35w)	9610-VL11R1-0-1	70015161	See Note 8
Lantern 3 aspect 300mm (10V 50w)	9311-VL11R1-0-1	70015420	See Note 8
Lantern 4 aspect 200mm (10V 35w)	9207-VL11-0-1	70015137	See Note 8
Lantern 3 aspect 200mm LED full round	0408-R3452-R200	70015162	See Note 8
Lantern 3 aspect 200mm LED arrow	0408-R3452-A200	70015163	See Note 8
Lantern 3 aspect 300mm LED full round	0408-R3452-R300	70015426	See Note 8
Lantern 3 aspect 300mm LED arrow	0408-R3452-A300	70015424	See Note 8
Lantern 200mm LED pedestrian	0408-R3452-PED	70015110	See Note 8
Lantern 3 aspect 200mm bus	0602-R3452-BUS		See Note 8
Lantern 2 aspect 200mm bicycle	0603-R3452-BIC		See Note 8
Lantern 3 aspect 200mm LED full round	0606-R3452-R200		See Note 8
Lantern 3 aspect 200mm LED arrow	0606-R3452-A200		See Note 8
Lantern 3 aspect 300mm LED full round	0606-R3452-R300		See Note 8
Lantern 3 aspect 300mm LED arrow	0606-R3452-A300		See Note 8
Lantern 200mm LED pedestrian	0606-R3452-PED		See Note 8
Lantern 3 aspect 200mm LED full round	0801-R3452-R200		See Note 8
Lantern 3 aspect 200mm LED arrow	0801-R3452-A200		See Note 8
Lantern 3 aspect 300mm LED full round	0801-R3452-R300		See Note 8
Lantern 3 aspect 300mm LED arrow	0801-R3452-A300		See Note 8
Lantern 200mm LED pedestrian	0801-R3452-PED		See Note 8
Arrow mask 200mm	POC	70016060	See Note 8
Arrow mask 300mm	POC	70015722	See Note 8
Bracket, 'L' target board	POC	70010160	See Note 8
Spring Clip for Visor	Sample Approval	18232324	See Note 8
Disc, Blank 200mm	Sample Approval	70010410	See Note 8
Disc, Blank 300mm	Sample Approval	70010348	See Note 8
Lens Green 200mm polycarbonate	Type Approval to supply	70015854	See Note 8
Lens Green 300mm polycarbonate	Type Approval to supply	70015749	See Note 8
Lens Red 200mm polycarbonate	Type Approval to supply	70015862	See Note 8
Lens Red 300mm polycarbonate	Type Approval to supply	70015757	See Note 8
Lens Yellow 200mm polycarbonate	Type Approval to supply	70015846	See Note 8
Lens Yellow 300mm polycarbonate	Type Approval to supply	70015730	See Note 8
Visor closed type B 200mm	POC	70023822	See Note 8
Visor closed type B 200x300mm	POC	70023890	See Note 8
Visor open type A 200mm	POC	70023814	See Note 8
Visor closed type B 300mm	POC	70024306	See Note 8
Visor closed type B 300x400mm	POC	70024322	See Note 8
Visor open type A 300mm	POC	70024330	See Note 8
Target board 3 + 3 asp x 200mm	Sample Approval		See Note 8
Target board 3 + 3 asp x 300mm	Sample Approval		See Note 8
Target board 3 asp x 200mm	Sample Approval		See Note 8
Target board 3 asp x 300mm	Sample Approval		See Note 8
Target board 4 asp x 200mm	Sample Approval		See Note 8
Louvre for 200mm lantern	POC		See Note 8
			See Note 8
TRAFFIC SIGNAL LAMPS			See Note 8
Lamp 10V 35W QH TS PKX22S base	9207-QH1-0-1	18232545	See Note 8
Lamp 10V 35W QH TS PKX22S base	9207-QH1-0-1	18230623	See Note 8

DESCRIPTION	RMS TYPE APPROVAL OR APPROVAL METHOD	RMS Cat. No	CURRENT SUPPLIER
LANTERN COVERS			See Note 8
Out-of-service, 200mm yellow	POC	18231212	See Note 8
Out-of-service, 300mm yellow	POC	18231190	See Note 8
PEDESTRIAN PUSH BUTTONS			See Note 8
Pedestrian Push Button (no A/T)	9205-PB6-1-1	70010003	See Note 8
Pedestrian Push Button (no A/T)	9306-PB6R1-0-1	70010003	See Note 8
Pedestrian Push Button (Audio Tactile)	9306-PB6R1-0-3	70010011	See Note 8
Pedestrian Push Button (Audio Tactile)	9306-PB6R1-0-1	70010011	See Note 8
Arrow disc dual PB	POC	70010038	See Note 8
AUDIO TACTILE EQUIPMENT			See Note 8
Module audio/tactile plug in driver card	9305-ATS4-1-1	70010054	See Note 8
Module audio/tactile plug in driver card	9612-ATS4-2-1	70010054	See Note 8
Module audio/tactile plug in driver card	9704-ATS4-2-1	70010054	See Note 8
Housing w/proof audio tactile driver unit	9303-ATS-1-1	70010100	See Note 8
Housing w/proof audio tactile driver unit	9310-ATS4-1-1	70010100	See Note 8
Housing w/proof audio tactile driver unit	9410-ATS4-2-1	70010100	See Note 8
MAST ARMS			See Note 8
Mast arm type 5 column	Type Approval to supply	18233622	See Note 8
Mast arm type 5 Outreach Arm T5L	Type Approval to supply	18233630	See Note 8
Mast arm type 5 Outreach Arm T5S	Type Approval to supply	18233649	See Note 8
Mast arm type 4	POC	18233614	See Note 8
Bracket upper lantern support T5	POC	18233584	See Note 8
Terminal Box Types 3,4,5 M/A & 6 post	Sample Approval	18230623	See Note 8
Mast arm type 9 column	Type Approval to supply	18233607	See Note 8
Mast arm type 9 Outreach Arm 1000	Type Approval to supply	18233593	See Note 8
Mast arm type 9 Outreach Arm 1500	Type Approval to supply	18233594	See Note 8
Mast arm type 9 Outreach Arm 2000	Type Approval to supply	18233595	See Note 8
Mast arm type 9 Outreach Arm 2500	Type Approval to supply	18233596	See Note 8
Mast arm type 9 Outreach Arm 3000	Type Approval to supply	18233597	See Note 8
Mast arm type 9 Outreach Arm 3500	Type Approval to supply	18233598	See Note 8
Mast arm type 9 Outreach Arm 4000	Type Approval to supply	18233599	See Note 8
Mast arm type 9 Outreach Arm 4500	Type Approval to supply	18233600	See Note 8
Mast arm type 9 Outreach Arm 5000	Type Approval to supply	18233601	See Note 8
Mast arm type 9 Outreach Arm 5500	Type Approval to supply	18233602	See Note 8
Lantern support type 9 M/A	P.O.C	18230448	See Note 8
Terminal Box Types 3,4,5 M/A & 6 post	Sample Approval	18230623	See Note 8
POSTS			See Note 8
Post Type 1 3.9m	P.O.C	18233959	See Note 8
Post Type 1 4.1m	P.O.C	18233967	See Note 8
Post Type 2 3.2m	P.O.C	18233975	See Note 8
Post Type 2 4.1m	P.O.C	18234009	See Note 8
Post Type 2 4.6m	P.O.C	18233983	See Note 8
Post Type 6	P.O.C	18233908	See Note 8
Post, push button short type	P.O.C	18233991	See Note 8
29 pt top mounting assembly	Sample Approval	70021269	See Note 8
Finial for 29 pt top assembly	Sample Approval	70021242	See Note 8
Finial, split	Sample Approval	70021250	See Note 8
Bracket, 2 point lower mounting	Sample Approval	18230461	See Note 8
Bracket, 4 point lower mounting	Sample Approval	18230470	See Note 8
Terminal box, ELP	Sample Approval	18230607	See Note 8
Terminal box small, ELP	Sample Approval	18230275	See Note 8
CABLES			See Note 8
Cable, loop detector feeder 2 core	Sample Approval	18231107	See Note 8
Cable loop detector single core 7/0.050	Sample Approval	18231182	See Note 8
Cable, underground 7/0.050 29 core	Sample Approval	18231085	See Note 8
PAVEMENT JUNCTION BOX			See Note 8
P.J.B (Lid & frame)	Sample Approval	70010763	See Note 8
Screw, Cheese head M12x35 for D.M.R P.J.B	Sample Approval	18231344	See Note 8
FUSE			See Note 8
Fuse box, pole-mounted	Sample Approval	70010496	See Note 8
Fuse box, underground	Sample Approval	70020483	See Note 8
Cradle for U/g fuse box	POC	18231220	See Note 8
MISCELLANEOUS ITEMS			See Note 8
Base plate, type 1 post	POC	18233916	See Note 8

DESCRIPTION	RMS TYPE APPROVAL OR APPROVAL METHOD	RMS Cat. No	CURRENT SUPPLIER
Bracket, 'Z' adjustable	Sample Approval	18230631	See Note 8
Bracket, 1 pt mtng for E.L.P	POC	18230581	See Note 8
Bracket, assembly for Ped PB for E.L.P	POC	18230291	See Note 8
Bracket, offset mounting for type 2 post	POC	18230402	See Note 8
Cable joining kit, 19 core	POC	18231026	See Note 8
Cable joining kit, 29 core	POC	18231034	See Note 8
Cover, mild steel plate galvanised 600-150-12	POC	18231115	See Note 8
Cover, mild steel plate galvanised 600-300-12	POC	18231123	See Note 8
Holding down assembly T5MA & T6	POC	18234157	See Note 8
Housing support post, NA4/6	POC	18234165	See Note 8
L-Bolt for controller housing footing	POC	51313194	See Note 8
L-Bolt for type 2 post footing	POC	51313232	See Note 8
Lantern Strap 150mm	Sample Approval	18230534	See Note 8
Lantern Strap 200mm	Sample Approval	18230542	See Note 8
Lantern Strap 260mm	Sample Approval	18230550	See Note 8
Lantern Strap 300mm	Sample Approval	18230569	See Note 8
Lantern Strap 350mm	Sample Approval	18230577	See Note 8
Lantern Strap 400mm	Sample Approval	18230410	See Note 8
Lantern Strap 500mm	Sample Approval	18230411	See Note 8
Lantern Strap 600mm	Sample Approval	18230412	See Note 8
PIDG lip blade crimp lug blu	Type Approval to supply	50671534	See Note 8
PIDG lip blade crimp lug red	Type Approval to supply	50671542	See Note 8
Pit cover & frame H.D.	P.O.C	18231263	See Note 8
Pit cover & frame L.D.	P.O.C	18231239	See Note 8
Pit cover & frame L.D.	POC	18231255	See Note 8
Pit cover & frame M.D.	POC	18231247	See Note 8
Pit cover & frame MD	POC	18231271	See Note 8
Stirrup for Type 2 footing		18230433	See Note 8
Loop slot sealant		N/A	See Note 8

NOTES:

(1) The descriptions given in this column are simplified versions and do not describe the equipment in sufficient details for procurement purposes.

(2) All specifications quoted refer to the editions current at the time, including any Amendments which may have been issued.

(3) This column indicates the method by which the equipment has been, or is to be, approved for use, as follows:
"Type approval": RMS type approval;
"Sample apprv": RMS approval by sample; applicable to equipment which is a critical complementary part of another equipment requiring RMS type approval (example: target boards), or which is critical to electrical safety (example: fuse boxes);
"POC": Proof of compliance from the supplier.

(4) Suppliers' part numbers are quoted for reference only. These numbers may be changed by the suppliers/manufacturers without notice.

(5) This column indicates those suppliers who are capable of supplying the item and have recently supplied to the RMS.

(6) This column indicates those suppliers who were previously capable of supplying the item (to a current or previous but substantially identical Specification/drawing), and who have previously supplied such an item to RMS.
IMPORTANT: It may be necessary to re-confirm the capability of these suppliers to supply the item(s) to current RMS drawings/specifications or RMS approval requirements before placing purchase orders.

(7) The following supplier abbreviations are used:

(8) In accordance with Clause 2 of this document refer "Register of Approved Suppliers for ITS Equipment".