PART M12

MAINTENANCE - ELECTRICAL AND MECHANICAL - GENERAL

CONTENTS

1. GENERAL

1.1 TMC Contact Details

The contact telephone number for the Traffic Management Centre (TMC) is 1800 018 313.

1.2 Response Times

If the failure of Mechanical or Electrical or ITS Assets results in the failure of any other Asset, the shortest Response Time for any of the failed assets shall be applied.

Notwithstanding the Road Classification, for Electrical and Mechanical Defects and Activities on road network Assets in the following locations, the applicable Response Times are as per the requirements for Urban roads in the Maintenance Activity Standards (Refer Attachment 1):
Port Lincoln, Port Augusta, Whyalla, Port Pirie, Gawler, Victor Harbor, Mount Barker, Murray Bridge and Mount Gambier.

1.3 Warranties

All new and or replacement LED Luminaires and associated PE/Smart cells shall have a minimum 10 year on pole warranty from the date of installation. All other new and or replacement electrical equipment shall have a minimum five-year warranty from the date of installation. It is the Contractor's responsibility to manage the warranty process, provide warranty data and ensure that Assets are repaired or replaced under the warranty.

1.4 Works on Assets Affecting Traffic

The Contractor must notify and obtain approval from TMC prior to taking any Asset out of service which may have an effect on the travelling public.

The Contractor must also notify TMC when Works are completed. TMC must be made aware at all times of the status of all Assets in particular when Assets are 'tagged out' of service.

1.5 Security Checks

All Contractor's Staff working with sensitive ITS/communications equipment must meet any security requirements advised by the Superintendent.

1.6 Triage Process

Unless there is confirmed or potential safety issue or emergency, the Contractor must ensure that out of hours call outs are only attended on-site after fault diagnosis has been undertaken in conjunction with TMC using systems data and CCTV where available.

1.7 Consumables

Programmed Routine Maintenance activities are to be inclusive of required consumables. No additional payment will be made for consumables such as oil, grease, fuel, wire, corrosion treatment, fuses etc.

2. QUALITY REQUIREMENTS

The Contractor shall prepare and implement a Quality Management Plan that includes detailed procedures, documentation and Work Instructions for all maintenance activities including those below:

a) Work Instructions for meeting the requirements at or near rail crossings;

b) procedures for responding to signal failure (site blackout or flashing yellow) for traffic signal sites, pedestrian crossing sites and school crossing sites;

c) procedure for Emergency Response; and

d) Inspection & Test Plans.

This documentation shall be submitted during the Mobilisation Period and at least 28 days prior to the commencement of the Maintenance Period.

3. RESPONSE TIMES

All Routine Maintenance activities including rectification of Defects shall be undertaken in accordance with the timeframes provided within the relevant Maintenance Activity Standards.

Where a Defect is presenting a hazard the Contractor shall implement appropriate hazard warning and mitigation until the repair can be completed.

Notwithstanding M2 Clause 1, any Defect which reaches CIL shall be responded to within 90 minutes of the Contractor becoming aware of the Defect reaching CIL.

Rectification of any Specific Maintenance Defects shall be undertaken within the timeframes agreed to between the Superintendent and the Contractor.

4. RECORDS AND REPORTING

In addition to the records and reporting requirements in Part M4 “Inspections” and M6 “Data, Reporting and Governance”, in the case of traffic signal and ITS Defects which significantly affect the operation of the system and/or result in noticeably decreased functionality and/or traffic congestion, the Contractor shall keep the TMC updated regularly as to the status of the Defect, and the expected timeframe to correct it.

The Contractor must provide, on a monthly basis, an electronic copy of all electrical Certificates of Compliance (COC) issued for each activity in accordance with the requirements of the Office of the Technical Regulator (OTR). The COC must include details of the site location, asset number, activity carried out and drawing number (if applicable).

Records and Reporting requirements also include the capture of all Asset Register data required as per Appendix M6a “*RAMA-AM-PRC-005 Asset Data Collection Manual”*.

5. ADDITIONAL REQUIREMENTS

5.1 Fault Finding

All Works associated with the inspection, fault finding and identification of Defects are an RMS activity.

In the event that the fault finding identifies the requirement for a repair or replacement of Assets or components that have failed that is not a Routine Maintenance activity as defined in Attachment 1, the repair or replacement is an SMS activity.

5.2 Traffic Signal and ITS Operations

Traffic signals and ITS Assets shall not be switched off without prior permission from the TMC, unless there is an immediate and significant risk to the public or personnel working on the Asset. Any planned maintenance work requiring traffic signals or ITS assets to be switched off shall follow the process developed and agreed between the Contractor and TMC vide Part M5 “Transition In / Transition Out”.

If traffic signals or ITS equipment are switched off without prior permission, the Contractor shall notify the TMC immediately and follow the appropriate incident management process.

If a fault develops during the Contractor’s activities on site that results in the site not operating safely, the Contractor shall notify the TMC immediately of the relevant details.

If any signals are left not operational for more than 24 hours or are under construction, they shall have “Signals Not Operating” signs (T1-SA118) installed as per DPTI Operational Instruction 3.16 – Signals Not Operating” until such time as they are operational.

5.3 Traffic Signal and Crossing Lanterns (TSL / TSM)

Any reference to “Display Element” refers to no right turn, give way to pedestrian, turn right/left with care and RC1 lanterns associated with signalised intersections, pedestrian crossings, School (Koala) crossings, Wombat crossings, Emergency Services (Sites) and all advisory lanterns / electronic signs.

Traffic Signal and Crossings Lantern activities (TSL / TSM) refer to all pole-mounted traffic signal equipment. This includes all signal lanterns and display elements as well as push button assemblies, audio tactile units and microwave pedestrian detectors.

Lanterns for Traffic Signals and Crossings shall be cleaned as required to ensure visibility at all times.

Cleaning of these assets is an RMS activity.

Replacement lantern types shall comply with AS 2144 and Part RD-EL-S3 “Supply of LED Lanterns”. Incandescent globes are not to be used as a replacement.

5.4 Traffic Signal Controllers (TSC / TSD)

Traffic Signal Controllers (TSC / TSD) includes all Traffic Signal Controller Boxes, their electrical and electronic components, and all associated assets for vehicle detection including vehicle detection loops and pedestrian detectors.

5.5 Additional Requirements for Working on Traffic Signals at Rail and Tram Crossings

Traffic signals at rail and tram crossings are listed in Appendix M12a *“Traffic Signal Sites Near Rail”.* The Contractor shall ensure that all Staff working at these sites meet the requirements of M1 Clause 19.

5.6 Intelligent Traffic Systems (ITS) fixtures (ITS/ITT)

Intelligent Traffic Systems (ITS) fixtures (ITS / ITT) includes all ITS Assets including loops associated with ITS equipment, CCTV, all electronic signage including outback road condition signs, traffic counting devices, vehicle and arrestor bed detectors, help phones, Add Insight Bluetooth Devices and any other electrical Assets not otherwise identified separately in this Part.

“Failed Display” refers to an ITS display which is either hard to read or illegible due to part of its display becoming defective or ineffective, being inconsistent with adjacent similar displays, or loss of some or all of its brightness.

ITS visual displays and CCTV lenses shall be cleaned as required to ensure visibility at all times. Cleaning of these Assets is an RMS activity.

5.7 Field Cabinets and Enclosures (EFC/EFD)

Field cabinets and enclosures includes all cabinets and enclosures that contain switchboards/power distribution boards, power and/or communications distribution and ITS equipment as listed in this part.

It does not include traffic signal controller boxes.

5.8 Electrical Poles and Wiring (EPO/EPQ)

Electrical poles and wiring includes all Principal-owned poles and mounting assemblies associated with any electrical assets, underground cabling, pits, conduits, cables, junction boxes etc. and all associated wiring.

Any reference to poles includes gantries.

5.9 Uninterruptible Power Supply (UPS) (UPS / UPT)

UPS includes all UPS systems including all electronics, inverters, batteries etc.

UPS Asset data must also include the battery and inverter installation dates and programmed dates for changing of these Assets where this is known.

The programmed maintenance of UPS systems includes the inspection, load testing, fault finding and repair of all UPS systems to ensure these are capable of providing uninterrupted backup power for the specified minimum hours of normal device operation in the event of a power failure.

If load testing indicates that the UPS batteries cannot provide the required backup power for the specified times, the Contractor is to provide the Superintendent with a detailed report and proposal to replace the batteries as an SMS activity.

5.10 Pumps (EPU/EPV)

Pumps (EPU / EPV) includes all electrical, electronic, mechanical and structural elements associated with the effective operation of the Asset. This includes the security and integrity of the pump compound or surrounding area and keeping these areas clean.

This activity also includes the maintenance of the fountain on the corner of Glen Osmond Road / Cross Road and all required maintenance activities including the supply of all required chemicals and other consumables.

5.11 Road Lighting (ERL/ERM)

Road lighting includes:

a) Lighting where In-Pavement Lighting is embedded within the road surfacing. This also includes all Assets required to supply power to and control these Assets;

b) Decorative Lighting which is used aesthetically to light structures, monuments, landmarks, other assets and areas of interest; and

c) Road Lighting Luminaires and Control Circuits that are co-located with traffic signals on the same pole or that source their power from the traffic signal or ITS electrical supply. This includes all lighting and electrical components associated with the supply of power and control of lighting including power distribution and PE cells.

The Contractor is informed that there may be locations where legacy power feeding arrangements are present that do not meet current standards (e.g. traffic light and street lights on a pole fed from a different power supply). In this event Road Lighting includes cases where the lights would source their power from the Traffic Signal electrical supply to meet current standards. The Contractor shall advise the Superintendent if such a location is identified.

5.12 Generators

The Contractor will undertake inspections and maintenance as per manufacturer's instructions for all generators and associated Assets and infrastructure. Generators are to be kept full of fuel at all times and tested regularly to ensure they work as intended when required for the maximum time possible for that generator.

Any generator not working as intended when required during an event, will be attended immediately by the Contractor to ensure the generator is made operational in the shortest possible time.

These works are RMS activities.

Repair of damage by external parties or end of life replacements are SMS activities.

5.13 Communications Networks (COM/CON)

Communications Assets shall be maintained to enable clear communications between Assets.

5.13.1 Traffic Signals Communications (SCATS)

RMS for traffic signals communications Assets includes the LCM, UHS or Microconnect modem (and antenna and wiring if fitted).

Site to Site and Site to TMC microwave links used to transmit CCTV imagery from traffic signal sites equipped with CCTV is also included.

The communications link from the controller (i.e. the copper or fibre connection to a third party communications provider) or the SIM card to provide the 3G/4G communications path) is excluded from the scope of the Contract.

Any hardware or software upgrades required on the LCM, UHS or Microconnect modems is an SMS activity.

5.13.2 ITS Communications

RMS for ITS communications Assets includes all links from any ITS Asset up to and including the patch panel in the Computer Equipment Room (CER). This includes major ITS installations that have large optical fibre ring networks and numerous ITS cabinets housing communications equipment to communicate with the field devices.

All field communications fibre, cable, radio links, including communications rings, spur communications and associated communications equipment are included.

Hardware or software upgrades to communications equipment is an SMS activity.

5.14 Bridges and Tunnels

The Electrical and Mechanical maintenance requirements for the following Bridges and Tunnels are defined in Parts M12A to M12D as follows:

- M12A - Birkenhead Bridge;
- M12B - Port River Expressway (PREXY) road and rail bridges;
- M12C - Heysen Tunnel; and
- M12D - O-Bahn Tunnel

5.15 Waste Disposal

The Contractor shall dispose of waste materials in accordance with M8 Clause 10 "Waste Management".

5.16 Red Light/Speed Safety Cameras

The maintenance of Red Light/Speed Safety Cameras (RSC) installed at any site is limited to maintaining the cable interface from the signal controller to the RSC, poles, camera housing, flash housing, and loop detectors. In addition, reinstatement of accident damaged poles and housings (excluding cameras & flash units) may be requested under SMS. The Contractor may need to liaise with SAPOL to fix intermittent faults or reinstate poles. The cameras themselves are owned and maintained by SAPOL and are excluded from the scope pf the Contract.

6. PROGRAM EFFICIENCY

During programmed Routine Maintenance activities the Contractor shall undertake cleaning of the Assets as necessary whilst present on the site including but not limited to: lantern cleaning, removal of graffiti and gum, inspecting and clearing out pits.

During SMS activities the Contractor shall undertake programmed Routine Maintenance activities where they are due to be undertaken at the same location in the near future.

ATTACHMENT 1

MAINTENANCE ACTIVITY STANDARDS

TSL/TSM	Traffic Signal – Traffic Signals and Crossing lanterns
TSC/TSD	Traffic Signal – Traffic Signal Controllers
ITS/ITT	ITS – Intelligent Transport Fixtures
EFC/EFD	Other – Field Cabinets and Enclosure
EPO/EPQ	Other – Electrical Poles and wiring
UPS/UPT	Other – Uninterruptible Power Supplies (UPS)
EPU/EPV	Other – Pumps
ERL/ERM	Lighting – Road Lighting Luminaires and Control Circuits
COM/CON	Other – Communications Network

Traffic Signals and Crossing Lanterns (TSL / TSM)

Application: This standard applies to lanterns and associated electrical infrastructure associated with DPTI Signals and Crossings including pedestrian push buttons and microwave detectors.

Activity Type	Intervention Level	Attendance Time	Response Time	Road Class	Compulsory Intervention Level	Performance Requirement
Routine Maintenance: Fault finding, and the repair or replacement of parts required to fix faulty or non-operational lantern(s) or displays. Fault finding, and the repair or replacement of parts required to fix faulty or non-operational microwave detectors, pushbuttons and audio tactile unit. Cleaning of Lanterns as required. **Cyclical Routine Maintenance:** 6 monthly inspection. **Specific Maintenance:** Replacement of end of life components due to severe damage or degradation.	Single display element fail, amber, green (or walk) only – excluding green right turn lanterns	3 working days	3 working days	All	Possibility of display being partially viewable from adjacent approach. Insufficient number of signal faces operational to provide safe, controlled vehicle movement. Damage or misalignment of assets such that an immediate safety risk is posed, as there is ineffective notification of signal group status. Compromised efficiency of traffic flow. Non-operational assets that compromise public safety	**Lanterns:** DPTI Operational Instruction 14.2 (Traffic Signal Faces) for face functions, aiming distances, sizes, numbers, visor and louvres Lanterns and display elements functioning as new. Number of operational signal faces achieves minimum provision required for movement. Minimum signal faces are undamaged, unobstructed and fitted with appropriate visors for lantern type, Faces are aimed in the correct direction to maximise the response from drivers and reduce confusion. Critical Safety function displays are all operational. Alignment of displays consistent with site layout. **Push Buttons:** All buttons function freely, no permanent demands. **Audio Tactile Units:** All transducers working and units audible relative to changing ambient noise level.
	Single display element fail, other than amber and green – but including green right turn lanterns.	24 hours	24 hours			
	Multiple display element fail, any signal group Damaged, dislodged or missing lantern housing, doors, reflectors, reflector carrier or louver vanes	24 hours	24 hours			
	Misaligned lantern or display – no conflicting display	24 hours	24 hours			
	Single right turn red element fail > 60km/h	90 minutes	90 minutes			
	Misaligned lantern or display – with conflicting display	90 minutes	3 hours			
	Last remaining display – any major signal group	90 minutes	3 hours			
	Any signal or crossing not functioning as per the design drawing and controller comments sheet.	90 minutes	3 hours			
	Permanent PB demand	24 hours	24 hours			

Replacement of assets due to Parts no longer available.						**Microwave Detectors:** Ped detection is achieved during pedestrian movements as per the site personality operational comments, no permanent demands **Cleaning:** Lantern lenses are thoroughly cleaned, without cracks, distortion or significant discolouration
	Permanent Ped microwave demand	24 hours	24 hours		Lantern housing has no mechanical integrity, or ingress protection Push button assembly has failed	
	Public complaint of permanent PB demand against main traffic flow	90 minutes	3 hours			
	Public complaint of unsafe ped clearances	90 minutes	3 hours			
	Public complaint that PB non-operational	90 minutes	3 hours			
	Audio Tactile unit failure	90 minutes	3 hours			
	MDR Recording: Defects shall be recorded on the MDR as TSL. Specific Maintenance shall be recorded on the MDR as TSM					

Traffic Signal Controllers (TSC / TSD)

Application: This standard applies to DPTI Traffic Signal controller boxes, their electrical and electronic components.

Activity Type	Intervention Level	Attendance Time	Response Time	Road Class	Compulsory Intervention Level	Performance Requirement
Routine Maintenance: Fault finding, and the repair or replacement of parts required to fix faulty or non-operational Traffic Signal Controller Housings, Communication Systems and Logic Module Electronics. **Cyclical Routine maintenance:** 6 monthly: Planned preventative maintenance and inspection of the Traffic Signal Cabinet, controller and all connected assets including loops, pedestrian buttons. **Specific Maintenance:** Controller has been hit by a vehicle, resulting in irreparable damage. End of life replacement of failed components that are unsupported and superseded. Replacement of assets due to unavailability of parts. Outage/Failure is due to DPTI compatibility or program issue.	Any faulty non critical components.	3 working days	5 days	All	Unknown site operation. Multiple public complaints. Controller housing has been hit, is unsecured or reporting intrusion. Any issue within the controller box which results in “Flash Yellow” condition. No signal display for pedestrian movements. No signal display. Any situation which affects the safety of the public.	TMC confirm congestion below acceptable manageable levels, timing changes allow congestion impacts to be minimised. Real-time coordination of traffic flow and monitoring of operation and alarms. No driver confusion evident. Lock working and doors are secure, gaskets and filters in place providing adequate seal - Clean, free from all dust, water and all contaminants. Electronics working as designed and required, all outputs are operational. Compliant crossing display at scheduled times to provide public safety and driver confidence. Site has been verified to be compliant against personality details within site folder comments that detail demands, movements and phase operations. No corrosion present.
	School Crossing not operating outside of designated school hours.	24 hours	24 hours			
	Damaged or leaking controller housing allowing water, dust, vermin or other contaminants to enter enclosure, or door alarm present.	90 mins	24 hours			
	The logic module electronics within the controller have a “flash yellow” condition, resulting in an uncontrolled intersection.	90 minutes	3 hours			
	School Crossing not operating at designated time.	Prior to next school crossing time	Prior to next school crossing time			
	Mains Supply Fail.	90 minutes	24 hours			
	Public report of any element of a traffic signal which is not functioning	4 hours	24 hours			
	Corrosion on the controller box or any assets in the immediate vicinity.	30 days	30 days			
	MDR Recording: Routine Maintenance Defects shall be recorded on the MDR as TSC. Specific Maintenance Defects shall be recorded on the MDR as TSD					

Intelligent Transport Systems Fixtures (ITS / ITT)

Application: This standard applies to all Intelligent Transport systems fixtures as per Clause 5.6.

Activity Type	Intervention Level	Attendance Time	Response Time	Road Class	Compulsory Intervention Level	Performance Requirement
Routine Maintenance: Fault finding, and the repair or replacement of parts required to fix faulty or non-operational ITS fixtures, Loops and CCTV's Housings, Communication Systems and Electronic Modules, Add Insight Bluetooth devices etc. **Cyclical Routine Maintenance:** As per user manual, or as specified. Otherwise 6 monthly inspection of all assets and cleaning of displays and lenses where required.	Single Failed Display.	Next working day	24 hours	All	Unable to implement local speed reduction or lane control measure. No site vehicle detection. No ITS control of site. Display Elements not working or ineffective - the Heysen Tunnel and its approaches. No visual verification of hazards. Unable to implement speed reduction for incident control.	Detection of vehicles verified Full TMC control of asset, without alarms. Help Phone available for use with clear audio. Detection of vehicle site verified FP state confirmed and devices controlled. Sign is able to be controlled with known state. Clear vision and control of camera via TMC. Full TMC control of BB, without alarms. VIDS/TIDS responds to zone configuration stimulus & triggers TMS alarm. ABD triggers TMS alarm. OHD triggers TMS alarm and driver warning. Full TMS control of asset, without alarms. Network fully available for Trafficnet use.
	Partial detector failure for one movement.	3 working days	5 days			
	Single "Mid-block" VSS or LUMS site display failed.	3 working days	5 days			
	Help Phone damaged or inoperative.	Next working day	5 days			
	Full detector failure for one site.	Next working day	3 days			
	Field Processor unknown state.	Next working day	5 days			
	CMS or VMS display element fail.	Next working day	5 days			
	"Lead-in" Primary VSS site failed.	Next working day	24 hours			
	CCTV not functioning properly	24 hours	3 days			
	CCTV assessed by TMC as critical, not functioning correctly.	90 minutes	24 hours			
	Any faulty non critical components.	Next working day	5 days			
	Door Intrusion Alarm.	90 minutes	24 hours			
	Boom Barrier damaged or inoperative.	90 minutes	24 hours			
	VIDS/TIDS failure.	90 minutes	24 hours			
	Arrestor Bed Detector site failed.	90 minutes	24 hours			
	Overheight Detector site failed.	90 minutes	24 hours			
	"Lead-in" Primary LUMS site failed.	90 minutes	24 hours			
	Multiple consecutive VSS or LUMS sites failed.	90 minutes	24 hours			
	Network device failure or outage.	90 minutes	24 hours			

<table>
<tr><td rowspan="3">Specific Maintenance:
Replacement of pavement loops.

Replacement of end of life components.

Replacement of asset due to parts (or comparable parts) no longer available.</td><td>Weather detectors not working.</td><td>Next working day</td><td>5 days</td><td rowspan="3"></td><td rowspan="3"></td><td rowspan="3">Weather detectors function as intended.

Legibility:
ITS message fully legible in daylight and at night.

Performance:
ITS fixture working as designed.

Cleaning:
Displays are thoroughly cleaned.

Loops
Loops functioning properly.</td></tr>
<tr><td>Bluetooth device failure.</td><td>3 working days</td><td>5 days</td></tr>
<tr><td colspan="3">MDR Recording:
Routine Maintenance Defects shall be recorded on the MDR as ITS.

Specific Maintenance Defects shall be recorded on the MDR as ITT.</td></tr>
</table>

Field Cabinets and Enclosures (EFC / EFD)

Application: This standard applies to all Field Cabinets, CERs, Outstations, Switchboards, Power Distribution Boards, associated enclosures and their electronics
This standard does not apply to traffic signal controller boxes (controller) which are specified in Traffic Signal Controller (TSC /TSD).

Activity Type	Intervention Level	Attendance Time	Response Time	Road Class	Compulsory Intervention Level	Performance Requirement
Routine Maintenance: Damaged or leaking controller box. The electronics are not functioning and operating their respective assets as required. The communications systems are not functioning as required. **Cyclical Routine maintenance:** 6 monthly: Works to be undertaken per Controller boxes program in Attachment 2 “Controller Box Maintenance Procedure”. **Specific Maintenance:** Controller box has been hit by a vehicle. End of life components. Replacement of assets due to unavailability of parts.	Controller Box Gasket/s or penetrants seal failure allowing water, dust, vermin or other contaminants into enter enclosure. Corrosion on the controller box or any assets in the immediate vicinity. Any faulty non critical components. **MDR Recording:** Routine Maintenance Defects shall be recorded on the MDR as EFC. Specific Maintenance Defects shall be recorded on the MDR as EFD.	7 days	7 days	All	Door lock not working. Controller box equipment not functioning or communicating as designed. **Issue within the controller box which are:** • Causing a safety issue.	**Cabinet** Lock working and doors are secure. Gaskets and penetrants completely sealed. Clean, free from all dust, water and all contaminants. All corrosion treated. **Electronics** Electronics working as designed and required. **Communications** Communications systems if present are functioning properly.

Electrical Poles and wiring (EPO / EPQ)

Application: This standard applies to all DPTI electrical poles, underground cabling, pits, conduits, cables, junction boxes etc.

Activity Type	Intervention Level	Attendance Time	Response Time	Road Class	Compulsory Intervention Level	Performance Requirement
Routine Maintenance: Fault finding, and the repair or replacement of parts required to fix leaning, damaged or faulty poles, fixings and mounting assemblies. Fault finding, and the repair or replacement of parts required to fix faulty pits and conduits. Fault finding, and the repair or replacement of parts required to fix faulty cable and field wiring termination systems (pole uppers, pole-mounted or pit J-Boxes). **Cyclical Routine maintenance:** Nil. **Specific Maintenance:** Electrical Pole has been hit by a vehicle, resulting in irreparable damage. Pole or wiring system has deteriorated beyond repair, End of life components that are unsupported and superseded. Replacement of assets due to unavailability of parts. Damage/Failure is due to external provider supply/availability issue (APA, SA Water, Asphalt Works).	Corrosion on the pole or any access points.	3 working days	2 weeks	All	Corrosion presents risk of failure. Mechanical integrity compromised, risk of failure Public safety hazard Poles is in a condition which may cause a safety issue. Broken or missing pit lid that presents fall hazard. Any faulty critical components affecting safety. Corrosion or damage of terminals, screws or links that result in non-operational state. Wiring system or cables are exposed or present an immediate safety risk. Any issue which presents a safety risk to the public.	Pole is upright, has no lean and has no visible damage or significant movement. Pole, mounting assemblies and any equipment are secured and pose no public safety risk. Pit lids are all properly fitted, secure and pose no safety hazard of trip or fall. Conduit and pit system integral insulation and mechanical protection compliant. Corrosion and moisture free cable termination systems, with all termination points functional. Wiring systems, mounted or housed and insulated as per AS3000 requirements, and no safety hazard exists.
	Pole or structure on lean, greater than 5 degrees, little or no movement evident.	5 days	30 days			
	Unsecured equipment or broken mounts.	90 minutes	24 hours			
	Cracked or minor damage to pit lids surrounds or conduits.	Next working day	24 hours			
	Any faulty non critical components that do not impact on operation or safety.	Next working day	24 hours			
	Corrosion or damage of terminals, screws or links that result in operational risk.	3 working days	2 weeks			
	Presence of moisture within termination enclosures that result in operational risk.	Next working day	2 weeks			
	Cable or wiring system damage or failure resulting in non-operational display or asset.	90 minutes	24 hours			
	Pole hit or on ground.	90 minutes	24 hours			
	Impact absorbing pole hit but still vertical.	12 weeks	12 weeks			
	MDR Recording: Routine Maintenance Defects shall be recorded on the MDR as EPO. Specific Maintenance Defects shall be recorded on the MDR as EPQ.					

Uninterruptible Power Supply (UPS / UPT)

Application: This standard applies to all Traffic Signal, Power and ITS UPS systems.

Activity Type	Intervention Level	Attendance Time	Response Time	Road Class	Compulsory Intervention Level	Performance Requirement
Routine Maintenance: Repairable structural, mechanical or electrical faults or damage. Not functioning as intended. Any corrosion on any structural, electrical or mechanical elements of the Assets. **Cyclical Routine Maintenance:** UPS system: Inspect and test all UPS units to ensure the systems are functioning as designed and batteries provide power for the reserve time specified for each site. **Specific Maintenance:** Supply of and changing of UPS batteries. Replacement of all other unrepairable parts not included in routine or programmed maintenance.	UPS system has a fault, but has fallen to "Bypass" mode.	3 working days	5 days	All	UPS batteries depleted and UPS failure is imminent – resulting in no safe site operation. Explosive hazard exists.	UPS system working and providing redundancy in power fail events without compromising safe site operation. UPS maintenance performance criteria assessed and observations and status recorded.
	UPS operating in inverter mode.	90 minutes	5 days			
	UPS has "Tilt" or Over Temperature Alarm.	90 minutes	5 days			
	Presence of gas detected within site.	90 minutes	5 days			
	Any other fault which may inhibit the reliable function of the UPS during mains power loss.	3 working days	5 days			
	Any corrosion on any assets.	30 days	30 days			
	MDR Recording: Routine Maintenance Defects shall be recorded on the MDR as UPS. Specific Maintenance Defects shall be recorded on the MDR as UPT.					

Pumps (EPU / EPV)

Application: This standard applies to all electrical, mechanical and structural elements associated with pumps, pipework and pumping stations.

Activity Type	Intervention Level	Attendance Time	Response Time	Road Class	Compulsory Intervention Level	Performance Requirement
Routine Maintenance: Repairable structural, mechanical or electrical faults or damage. Not functioning as intended. Any corrosion on any structural, electrical or mechanical elements of the Assets. Pump Sump and surrounding area requires cleaning. Pump blocked or not pumping. DPTI Glen Osmond Rd fountain maintenance. **Cyclical Routine Maintenance:** Annual programmed maintenance of all mechanical and electrical components as per individual programs. **Specific Maintenance:** Major Components such as pump or motor are beyond repair, or end of life. Replacement of assets due to unavailability of parts.	Any electrical fault or intermittent electrical fault affecting the pump. Any mechanical fault, or structural damage affecting the performance of the pump. Pump not working at design capacity. Any corrosion on any assets. Any elements which are leaking, loose, damaged, cracked, corroding etc. **MDR Recording:** Routine Maintenance Defects shall be recorded on the MDR as EPU. Specific Maintenance Defects shall be recorded on the MDR as EPV.	3 working days	3 working days	All	Pump and all associated electrical and mechanical infrastructure is be a safety risk to users and the public. Pump blocked or not working. Pump not clearing stormwater effectively and affecting traffic. Any faulty critical components affecting safety to the users and general public.	**Structural** All structural elements are functioning as designed and free of corrosion and other structural defects. **Electrical** Electronics and electrical functions working as designed and required. **Mechanical** Motors, gearboxes, pulleys bearings etc. are all topped up with oil and grease and there are no signs of wear. **Pipework** No damage to pipes or any of the fixings, no leaks. **Cleanliness** Pumping station or area is clean and free of non-essential items. No leaks.

Road Lighting Luminaires and Control Circuits– (ERL / ERM)

Application: This standard applies to all in scope Road Lighting Luminaires and Road Lighting control circuits, including power distribution and PE cells where they are not fitted directly to luminaires.

Activity Type	Intervention Level	Attendance Time	Response Time	Road Class	Compulsory Intervention Level	Performance Requirement
Routine Maintenance: Fault finding, and the repair or replacement of parts required to fix faulty or non-operational: Road Lighting Luminaires and Control Circuits, and In-Pavement Lighting. **Cyclical Routine Maintenance:** Nil. **Specific Maintenance:** Replacement of end of life components that have failed and are unsupported and superseded. Replacement of assets due to unavailability of parts. Outage/Failure is due to external provider supply/availability issue (e.g. SAPN). Fault finding, and the repair or replacement of parts required to fix faulty or non-operational Decorative Lighting.	Single light not working (General).	12 weeks	12 weeks	All	All Road lighting at an intersection is not working. Pavement lighting defining lane use is not functioning or is not clearly defining the intention of the lane. Damage or other event where assets pose a safety risk.	**Lighting** Lights are operating as intended. Lights are operating when required and as programmed.
	Single light out at or adjacent to intersection, rail crossing.	7 days	7 days			
	Single light out at or adjacent to pedestrian crossing.	10 days	10 days			
	Single light out on roads defined as high use.	4 weeks	4 weeks			
	Single light out, reported as critical.	2 days	2 days			
	Loose or missing lens.	2 weeks	2 weeks			
	Light dim or flickering.	2 weeks	2 weeks			
	Pavement lighting failure, unable to define lane use.	90 minutes	24 hours			
	General Public Safety Issue.	90 minutes	3 Hours			
	MDR Recording: Routine Maintenance Defects shall be recorded on the MDR as ERL. Specific Maintenance Defects shall be recorded on the MDR as ERM.					

Communications Networks (COM / CON)

Application: This standard applies to all traffic signals and ITS Communications.

Activity Type	Intervention Level	Attendance Time (After hours)	Attendance Time (Working hours)	Response Time	Road Class	Compulsory Intervention Level	Performance Requirement
Routine Maintenance: Fault finding, and the repair or replacement of parts required to fix faulty or non-operational communications links and associated components. **Cyclical Routine maintenance:** Included in EFC. **Specific Maintenance:** Communications equipment has been damaged or vandalised, resulting in irreparable damage. Underground communications cables have been damaged due to earthworks or vermin infestation. Replacement of end of life components that have failed and are unsupported and superseded. Replacement of assets due to unavailability of parts. Failure of redundant links. Outage/Failure is due to DPTI compatibility or program issue. Outage/Failure is due to external provider supply/availability issue (e.g. SAPN).	Communications failure Vegetation impacting comms network **MDR Recording:** Routine Maintenance Defects shall be recorded on the MDR as COM. Specific Maintenance Defects shall be recorded on the MDR as CON.	90 minutes	90 minutes	3 working days	All	Any issue which presents a safety risk to the public. Refer CIL for the asset affected by the comms failure.	Operating as intended. Clear comms between assets.

ATTACHMENT 2

CONTROLLER BOX MAINTENANCE PROCEDURE

For controller boxes programmed maintenance:

Controller Cabinet

1. Observe the general operation of the signal controller for correct operation and make any repairs as required
2. Where signal sites are not on SCATS check timing against the controller timing sheet for correct operation and make any adjustments as required
3. Check site card for any faults since last service. Any fault trends indicated shall be investigated during maintenance
4. Investigate any on board logger faults and make any adjustments as required and document
5. Check all detectors for correct operation
6. Visually inspect any interconnecting communications equipment, plugs, relays, cables, antenna and other hardware and make adjustments if required
7. Inspect terminal blocks and tighten if required
8. Check site documentation for completeness, this includes site operational sheets, site drawing, connection charts and any other equipment detail that may be interfaced back into this controller
9. Inspect door lock operation replace if necessary
10. Inspect door gasket condition and replace if necessary
11. Ensure cabinet is secured to the hold down frame base firmly
12. Operate cabinet light if applicable
13. If site has road lighting controlled from the signal controller, check road lighting operation
14. Test the Photo electric cell
15. Report any attached road lights operating all the time.
16. Spray for vermin every 6 months and take corrective action if vermin damage is found
17. Vacuum and clean controller cabinets and contents
18. Remove any posters and graffiti

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