

SECTION 8 - ROUTINE INSPECTIONS

8.1.1 Routine Traffic Control Inspections - General Requirements

Under the terms of this Contract the Contractor must carry out a Periodic Inspection of each Traffic Control Installation at intervals of no more than twelve months. All new sites shall be added to the inspection programme by the Contractor following commissioning. The Contractor shall provide a detailed written electronic report creating record of the checks forming the annual inspection within 10 Working Days of the inspection being completed. An electronic data dump of all timings shall be obtained from each signal controller a copy of which shall be provided to the Authority. Should a viewer or application be required to check this data then the Contractor shall also provide a copy of the file in PDF format. The format of the written inspection form is to be agreed with Engineer and examples of current forms as used in other Authorities shall be submitted in an electronic format in the Tender return. All annual inspection and timing data shall be added and updated to the asset management facility by the Contractor within the document management element of the fault management system. Failure to supply report and achieve PI's within a suitable timescale agreed with the Service Manager will result in service credits as detailed in Section 11: Service Credits

- 8.1.2 The current maintenance date of annual inspection for each site shall be provided to the Contractor during the mobilisation period. The Contractor and Service Manager shall agree a programme for carrying out the Inspections required under this Contract one month prior to the commencement of the Contract and one month before the commencement of each subsequent Contract year.
- 8.1.3 The Contractor and Service Manager shall agree a format for the reporting and recording of the inspections required under this Contract one month prior to the commencement of the Contract. Discussion will include uploading to each Authorities Fault Management System and/or their Asset Management System / IMTRAC.
- 8.1.4 The Contractor shall be allowed to carry out the required Inspections within **2 Weeks** of the agreed programme date. The date by which the Site has had its routine inspection and optical maintenance shall be deemed to become its anniversary and be fixed for the duration of the Contract. Failure to carry out the Inspection within the agreed programme or within the allowances shall be deemed a demerit and aggregated against the Contractors PI's and KPI's and a service credit claimed.
- 8.1.5 Each Inspection will include but is not limited to a functionality test together with an electrical test and a clean of all visible surfaces to remove dust, grime and other matter that reduces the visibility or effectiveness of the equipment. The results of the inspection are entered onto a report and sent to the Service Manager within **5 Working Days** of the inspection and must include all timing settings where appropriate, the format of the report is to be agreed with the Service Manager.
- 8.1.6 At each inspection RAM batteries are to be checked or replaced in accordance with the manufacturer's instructions for both controllers and outstations.
- 8.1.7 Periodic inspections include ensuring that all outstation clocks are correctly set and that they switch correctly between GMT and BST at the appropriate times.



- 8.1.8 The Contractor shall remove and dispose off any posters, cable ties, signs boards and other advertising material from the traffic signal poles, feeder pillar and cabinet.
- 8.1.9 It will be the sole responsibility of the Contractor to ensure that Inspections are carried out in accordance with the Programme and that reports are submitted on time.
- 8.1.10 The Service Manager must, within one month of the receipt of these reports notify the Contractor in writing of any part thereof with which he disagrees and give reasons.
- 8.1.11 The Contractor must make a note in the controller logbook of all attendance on Site, stating time, date, name and brief details of all actions taken. This will be replicated electronically a copy of which is to be uploaded into the Fault Management System. The employer's staff will similarly enter their attendance on site in these logbooks. The provision and renewal of these logbooks will be the Contractors responsibility and they are to become and will remain the property of the Employer.
- 8.1.12 The Contractor shall report all faults noted during an annual inspection to the Centre and log each of these on the fault management system. The appropriate fault classification shall be applied and recorded to the fault management system and the repair time criteria shall apply.
- 8.1.13 Tests, either during routine Inspections or in the pursuance of a Fault, which are likely to result in a significant disruption of traffic, must only be carried out after consultation with the Service Manager. Routine Inspections must not be carried out between 07:30 - 09:30 hours and 16:00 - 18:00 hours Monday to Saturday.
- 8.1.14 **Dorset Council Periodic Inspections**
Dorset Council has adopted the use of an Asset Management System (currently IMTRAC) to record all periodic inspections electronically. The Contractor must use this system for the reporting and recording of all inspections for Dorset Council. All inspections are to be completed by the Contractors Engineer on site and are to be submitted to the Asset Management System before leaving site. These reports will be provided to Dorset Council electronically by submission through the Asset Management System.
- 8.1.15 The Contractor's planned periodic inspection programme must be agreed with the Service Manager and entered on Dorset Council's Asset Management System so that the date planned, and actual attendance date can be compared, and used to measure Key Performance Indicators. Dorset Council inspections must be carried out using the provided electronic periodic inspection form on the Asset Management System, whilst on site which will require the use of suitable technology such as a tablet. This will allow for suitable interaction with the form and ability to take and submit photos. The Contractor shall be responsible for providing each of the Contractor's engineering staff with a suitable device such as a tablet, capable of transmitting data to Dorset Council's Asset Management System.
- 8.1.16 **Contractor access to IMTRAC**
Dorset Council has adopted the use of an Asset Management System (currently IMTRAC) to record all periodic inspections and optical maintenance inspections electronically. The Contractor must use this system for the reporting and recording



of all inspections for Dorset Council. Access to Dorset Council's Asset Management System will be made available to the contractor on award of contract, where the Contractor will have access to the full live list of assets. The Contractor shall inform the service manager at the earliest possible time any errors or omissions that are identified within the list of sites to be maintained.

- 8.1.17 The Contractor's planned periodic inspection programme must be agreed with the Service Manager and entered on Dorset Council's Asset Management System so that the date planned, and actual attendance date can be compared, and used to measure Key Performance Indicators. Dorset Council inspections must be carried out using the provided electronic periodic inspection form on the Asset Management System, whilst on site which will require the use of suitable technology such as a tablet. This will allow for suitable interaction with the form and ability to take and submit photos. The Contractor shall be responsible for providing each of the Contractor's engineering staff with a suitable device such as a tablet, capable of transmitting data to Dorset Council's Asset Management System.

8.2 ANNUAL OVERHAUL, EQUIPMENT CHECK & ANNUAL INSPECTION

Installation Annual Inspection - General

- 8.2.1 The Contractor shall carry out an Annual Inspection of all the equipment on the Inventory.
- 8.2.2 The Contractor shall provide a full report in the agreed format within **5 Working Days** of the completion of each Annual Inspection.
- 8.2.3 The Contractor shall inform the Service Manager prior to commencing and following completion of inspections of any equipment connected to the UTC or RM System.

Annual Inspection - Controllers and other equipment inside the controller case

- 8.2.4 The inside of the Controller shall be cleaned and photographed.
- 8.2.5 All defective door seals shall be replaced.
- 8.2.6 All missing or damaged base seals shall be replaced.
- 8.2.7 All locks shall be lubricated with a suitable agent such as graphite. Any locks found to be broken to be replaced during inspection.
- 8.2.8 Ensure Traffic Control Installation 'Site Layout Drawing (SLD)' is on site and is up to date, report to Service Manager if drawing missing.
- 8.2.9 All external bolts shall be lubricated with oil, including compression bolts and locks. Any compression bolts / locks found to be broken to be replaced during inspection.
- 8.2.10 All connections, terminals will be checked for tightness, including the 'Mains' power supply connection.



- 8.2.11 All timings shall be checked. At controllers conforming to TOPAS 2500A, a copy of the printout of all timings shall be attached to the detailed report submitted to the Employer.
- 8.2.12 'VA', 'Fixed Time', and 'Manual' facilities shall be checked and any malfunction corrected.
- 8.2.13 All switches shall be functionally tested, and any malfunctions corrected.
- 8.2.14 All indicator lamps shall be checked and any faults corrected.
- 8.2.15 All 'Speed Assessment/Discrimination' facilities shall be checked for accuracy, utilising Soundmark test set where fitted, and adjusted as necessary.
- 8.2.16 All lamp Monitoring facilities shall be checked and any faults shall be corrected.
- 8.2.17 All Remote Monitoring facilities shall be checked as necessary in accordance with the manufacturer's recommendations.
- 8.2.18 All fuse ratings shall be checked. Any fuses not conforming to current standards shall be replaced with one that does.
- 8.2.19 All voltage rails shall be checked and adjusted as necessary.
- 8.2.20 All relays shall be checked and any suspect relays shall be replaced. All plug in 'Lamp Switching' relays shall be replaced. Any batteries contained in the Controller, Remote Monitoring Unit, Lamp Monitoring Unit or any other equipment covered by the Contract, shall be replaced in accordance with the manufacturer's recommendations and the fact noted on the inspection sheet.
- 8.2.21 Solar Cell dimming shall be functionally tested, the transformer tapping shall be checked and set to that specified for that site and any faults corrected.
- 8.2.22 Any Red lamp monitoring circuits shall be tested.
- 8.2.23 Any lamp monitoring units shall be checked for correct reporting of lamp faults to the UTC/RM control centre. The Contractor shall confirm the correct indication is received in the UTC/RM control centre and reset the lamp monitoring equipment prior to leaving site.

8.3 ANNUAL INSPECTION - DETECTION SYSTEMS

- 8.3.1 All external detector housing shall be cleaned internally, and the hinges and securing bolts shall be lubricated. Any missing, corroded or damaged bolts shall be replaced.
- 8.3.2 All detector connections shall be checked for tightness.
- 8.3.3 All loop detector units shall be checked for the correct frequency and sensitivity and adjusted as necessary.

- 8.3.4 Missing loop detector cards shall be replaced.
- 8.3.5 The loop detector card shall be checked and corrected as necessary.
- 8.3.6 All Above Ground Detectors (to include but not be limited to) vehicle, cycle, stop line, kerb side and on-crossing shall be checked for correct operation and alignment, and any faults corrected.
- 8.3.7 All infra-red detectors shall be checked for correct operation and alignment and any faults corrected.
- 8.3.8 All magnetometer detection to be checked for correct operation including all repeaters and cabling and any faults corrected.
- 8.3.9 The insulation and series resistance of each detector loop shall be tested and the results recorded.
- 8.3.10 Any detector fault monitoring units shall be tested for correct reporting of detector faults to the UTC/RM control centre. The Contractor shall confirm the correct indication is received in the UTC/RM control centre and reset the detector monitoring equipment prior to leaving site.

8.4 ANNUAL INSPECTIONS - STREET FURNITURE

- 8.4.1 All lanterns shall be checked for security and tightened as necessary and the alignment adjusted as necessary. All faulty lamps, lamp holders or transformers shall be replaced. Any missing or corroded rivets or bolts securing backing boards, transformers or white/reflective strips shall be replaced. All pole top terminals shall be cleaned, connections checked and any defective terminal blocks replaced.
- 8.4.2 All box signs shall be checked for security, and the alignment adjusted as necessary. Any defective tubes or LED's, starters, terminal blocks, ballasts or transformers shall be replaced.
- 8.4.3 The condition of all lanterns, box signs, siting screens, white strips, poles and brackets shall be reported.
- 8.4.4. Any pedestrian indicator (audible, tactile, etc) equipment shall be checked and any malfunction corrected.

8.5 ANNUAL INSPECTION - ELECTRICAL INTEGRITY TEST

- 8.5.1 The Contractor shall carry out an electrical inspection of each installation generally following the requirements of BS 7671:2018 and any subsequent amendments.
- 8.5.2 The Contractor shall submit a full and comprehensive textual report to the Employer within 10 working days of leaving site detailing his findings and identifying any remedial action taken and/or recommended, together with any components used.
- 8.5.3 The method of testing shall be such that no danger or injury to persons, animals or property or damage to equipment can occur even if the circuit being tested is defective.

- 8.5.4 The Contractor shall take all reasonable precautions under the terms of the Electricity at Work Regulations 1989 to prevent danger or injury to the maintenance operatives. This is particularly relevant when there is a requirement for secure isolation from Electricity Board Distribution Boards.
- 8.5.5 Tests shall be carried on all equipment in accordance with the manufacturer's instructions.
- 8.5.6 The Contractor shall rectify any defects and recommendations found at the time of testing.
- 8.5.7 The tests to be conducted are as follows:

- Polarity - if the polarity is incorrect the Contractor shall cease all further tests on the unit and immediately report the defect to the Service Manager.
- Visual Inspection
- Earthing
- Continuity of the IPC
- Earth fault loop impedance
- Operation of RCD

The Contractor shall ensure that no electronic components are damaged as a result of the testing procedure and that all units are left in working order prior to the operative leaving the Site.

Polarity

- 8.5.8 A test of polarity shall be made and it should be verified that all fuses and single pole control devices are connected in the phase conductor only, making sure there are no live components on any of the poles.

Visual Inspection

- 8.5.9 A visual inspection shall be made at the head and base of the unit to verify that the electrical equipment has been correctly installed and meets a minimum of IP2X standard and that there is no visible damage which might impair safety.

Earthing

- 8.5.10 All earth connections shall be clean and electrically sound using crimped terminations. The supplementary earthing between the components shall also be sound.

Continuity of Protective Conductors

- 8.5.11 Using two spare cores check insulation resistance to earth and continuity of conductor.

Earth Fault Loop Impedance Zs

- 8.5.12 The earth fault loop impedance shall be measured at the controller and at each pole top.

- 8.5.13 The measured impedance value shall be equal to or less than the value shown in BS 7671 for the particular rating of the protective device employed.
- 8.5.14 Where the impedance Z_s is in excess of the value indicated in the current IEE regulations then the Contractor shall measure the external earth fault loop impedance Z_e at the supply point. Should this be in excess of the value stated in BS 7671 for the type of protective device fitted then this information shall immediately be passed to the Service Manager for further action. Where the Z_e is less than this value then the Contractor shall carry out further investigations to determine the reasons of the high Z_s .
- 8.5.15 Should the Contractor be unable to diagnose the cause of the high Z_s impedance reading then he shall isolate the installation by removing the fuse, place a warning notice inside the unit and report this to the Service Manager

Operation of RCD's

- 8.5.16 The effectiveness of RCD's shall be determined in accordance with BS 7671 2008 and any subsequent amendments.

8.6.1 ANNUAL INSPECTION - SPECIAL EQUIPMENT

- 8.6.2 Special equipment shall be maintained in accordance with the manufacturer's instructions.
- 8.6.3 Wherever practicable work shall be carried out with the equipment disconnected from the power supply.

8.7 VARIABLE MESSAGE SIGNS - ROTATING PRISM

- 8.7.1 Clean all sign faces with suitable cleansing agent.
- 8.7.2 Check sign rotates freely and displays legends correctly.
- 8.7.3 Lubricate, with a suitable agent, the cams and rotating shafts and gear mechanism of the sign.
- 8.7.4 Check for the ingress of foreign bodies and moisture.
- 8.7.5 Inspect fixings for security and safety.
- 8.7.6 Inspect poles for corrosion and damage.
- 8.7.7 Check operation of RCD's.
- 8.7.8 Ensure equipment is left in full working order.

8.8 VARIABLE MESSAGE SIGNS / VEHICLE ACTIVATED SIGNS Inc LED

- 8.8.1 Clean all sign faces with suitable cleansing agent.

- 8.8.2 Check sign displays legends correctly – liaise with Employer's control room to request test messages if necessary.
- 8.8.3 Check warning flasher lamps for operation, if fitted.
- 8.8.4 For Vehicle Activated signs check operation of detection equipment.
- 8.8.5 Check for the ingress of foreign bodies and moisture.
- 8.8.6 Inspect fixings for security and safety.
- 8.8.7 Inspect poles for corrosion and damage.
- 8.8.8 Check operation of RCD's.
- 8.8.9 Ensure equipment is left in full working order

8.9 CAR PARK COUNT INDUCTIVE LOOP DETECTION

- 8.9.1. Check loop detection is functioning.
- 8.9.2. Check loop detector card is operating within tolerances and adjust or replace as necessary.
- 8.9.3. Test detector loop and feeder for insulation resistance (measured in megaohms) and continuity resistance (measured in ohms).

8.10 ANPR CAMERAS AND DIAL UP CCTV

- 8.10.1 Check operation of camera/number plate reader.
- 8.10.2 Cleans camera housing and lenses.

8.11 ANNUAL INSPECTION – INVENTORY OF EQUIPMENT

- 8.11.1 The Contractor shall carry out and provide the Service Manager with a written inventory of equipment currently on site during each annual inspection.

8.12 ANNUAL INSPECTION – TALL POLES AND MAST ARMS

- 8.12.1 This section relates to structures over or alongside the Highway Authority's roads that meet or surpass either of the following criteria:
 - i) All structures greater than a 3 metre span
 - ii) High masts \geq 20 metres
- 8.12.2 The Design Manual for Roads and Bridges Parts 1 and 5 detail the design requirements for the structural inspection of highway structures.



- 8.12.3 Inspections shall be carried out to ensure the safety of the public and to enable the maintenance of structures to be carried out in a planned and systematic manner. There are four main categories of inspection as described in below.

8.13 SUPERFICIAL INSPECTION

- 8.13.1 A cursory check for obvious deficiencies, which might lead to accidents or high maintenance, costs if not dealt with immediately. Inspectors should carry out appropriate remedial action should a defect be identified and inform the Engineer or Engineer's Representative without delay.

8.14 GENERAL INSPECTION

- 8.14.1 A visual inspection of representative parts of the structure at intervals of not more than 2 years following a general or principal inspection. Both superficial and general inspections may be carried out from ground level. The results of the inspection are entered onto a report and sent to the Service Manager within **5 Working Days** of the inspection.

8.15 PRINCIPAL INSPECTION

- 8.15.1 A close examination of all the inspectable parts of the structure at intervals not exceeding 6 years usually carried out by specialist consulting engineers. Principal inspections should be carried out from a suitable platform allowing close inspection of all parts of the structure. The inspection shall consist of the following elements.

- 1 A thorough visual inspection of each unit over 100% of exterior surfaces including protective coating, welds, foundation fasteners and lantern fasteners and brackets.
- UT1 Ultrasonic wall thickness test to assess area of slipover tube for internal corrosion.
- UT2 Ultrasonic wall thickness test to assess area of tube base for internal corrosion
- UT3 Ultrasonic longitudinal scans of fixing studs for transverse cracks
- MPI1 Magnetic Particle Crack test to arm end plate weld
- MPI2 Magnetic Particle Crack test to cuff ring/tube weld
- MPI3 Magnetic Particle Crack test to mitre tube butt weld
- MPI4 Magnetic Particle Crack test to service hatch corner radii
- MPI5 Magnetic Particle Crack test to main column to base plate weld
- MPI6 Magnetic Particle Crack test to locking nuts of main fixing studs
- MP17 Magnetic Particle Crack test to first 200mm of seam weld.



8.16 SPECIAL INSPECTION

- 8.16.1 Usually carried out by specialist consulting engineers to investigate a specific problem that may have been identified during an inspection or following, for example, storm or RTC damages.
- 8.16.2 The inspector shall make an assessment of the risks for each individual situation and inspection technique, consulting other bodies as appropriate.
- 8.16.3 It is also a legal requirement that the provisions of the Approved Codes of Practice, Management of Health and Safety at Work Regulations 2015, Personal Protective Equipment at Work Regulations 1992 and Construction (Design & Management) Regulations 2015 (CDM 2015) as appropriate are observed.
- 8.16.4 The contractor shall arrange appropriate traffic management and access platform together with any consultation with other statutory bodies, including NRSWA notices.
- 8.16.5 The contractor shall, where appropriate, remove any cover to expose base-plate and fasteners and reinstate it on completion of the inspection.
- 8.16.6 A written report in duplicate on the condition of each element of each site shall be completed by the inspecting engineer generally following the format detailed in the appendices to this brief, with recommendations for remedial work.
- 8.16.7 Any remedial work which can be, should be undertaken whilst on site.
- 8.16.8 The inspecting engineer shall, as a minimum, be qualified to PCN Level 2 (Personnel Certification in Non-Destructive Testing) of the British Institute of Non-Destructive Testing (BINDT). The PCN is an international scheme for the certification of NDT technicians and supervisors and meets BS EN ISO 9712 requirements.

8.17 CONTRACTORS OBLIGATIONS

- 8.17.1 The Contractor should note that during the first year of this Contract the principal inspection should be carried out and subsequently at the intervals set out in the Design Manual for Roads and Bridges (DMRB).
- 8.17.2 The Contractor will be expected to obtain the services of an approved Sub-Contractor to carry out these operations at the same time as one of their lamp changing visits. It is proposed to pay for this inspection on a chargeable basis.

APPENDIX 1: PERIODIC INSPECTION REQUIREMENTS

ITEM DESCRIPTION

- | | |
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| 1 | Controller serial number, type, EPROM number and Firmware Issue number |
| 2 | RAM battery to be checked in the controller and LGD battery in OMU and replaced if necessary. |



- 3 Data sheets, log-book and drawing including schematic cable diagram are present in the controller cabinet
- 4 Mode of operation.
- 5 Operation of all signal lamps and regulatory signs.
- 6 Detector Fault Monitoring running in accordance with the configuration.
- 7 Operation of pushbuttons and other manual inputs.
- 8 Illumination of all 'wait' and other indicator lamps.
- 9 Operation of audible and tactile signals.
- 10 Check alignment and if required adjust alignment of signal heads.
- 11 Check and if required adjust alignment of above ground detectors.
- 12 Check louvres are not damaged.
- 13 Note physical condition of:
 - (i) poles
 - (ii) earth connections and wiring to poles
 - (iii) all bonding and earthing
 - (iv) signal heads, including louvres and hoods
 - (v) pushbutton housing
 - (vi) above ground detector housing
 - (vii) signal brackets
 - (viii) backing boards
 - (ix) regulatory box sign
 - (x) loop and feeder slots and their sealing
 - (xi) variable message sign
 - (xii) vehicle activated sign
 - (xiii) school crossing flashing ambers
 - (xiv) road markings, pedestrian studs and tactile paving
- 14 Check poles are secure in retention sockets.
- 15 Check for any signal heads, signs or above ground detectors that are obscured by vegetation or other street furniture include photos to highlight issues found.
- 16 Check accessibility of Controller / Auxiliary Cabinets include photos to highlight issues found.
- 17 Check operation of red lamp monitoring.
- 18 Check operation of all User selected and fall-back modes.
- 19 Note minimum green, maximum green, intergreen, CMX and pedestrian black out timings.
- 20 Check lamp dimming and fault log contents.
- 21 Check reversion to fallback mode of operation if applicable
- 22 Check all detectors are operating correctly.
- 23 Check all manual panel facilities and illumination of all indicators
- 24 Check operation of cableless linking.
- 25 Check operation of any local links to other apparatus.
- 26 Check all equipment clock times including BST and GMT
- 27 Check illumination and operation of variable message and vehicle activated signs.
- 28 Check operation of speed assessment / speed discrimination equipment (SAE/SDE)
- 29 Check operation of Outstation Monitoring Unit (OMU).
- 30 Check operation of Outstation Transmission Unit (OTU).
- 31 Check condition of earth connections, wiring, pole cap assemblies and termination blocks, including all earth loop impedance test (ELIT) readings.



- 32 Check condition of Controller / Auxiliary Cabinet base seals, cabinet bases with grommets, compression bolts, door seals, locks and hinges and lubricate / repair or replace if necessary.
- 33 Lubricate / repair all locks, hinges and compression bolts on Controller / Auxiliary Cabinets, VMS, VAS, SID, LED Information Signs including Car Park signs.
- 34 Clean external and internal housing for VMS VAS SID, LED Information Signs including Car Park signs.
- 35 Electricity meter reading with date and time where applicable.
- 36 Any other miscellaneous comments.
- 37 When the inspection is complete a photograph is to be taken of inside the controller.