SPECIFICATION 709

ELECTRONIC SPEED LIMIT SIGNS

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## SPECIFICATION 709
### ELECTRONIC SPEED LIMIT SIGNS
#### REVISION REGISTER

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SPECIFICATION 709
ELECTRONIC SPEED LIMIT SIGNS

GENERAL

709.01 SCOPE

1. The work under this specification consists of supply, installation, testing and commissioning, documentation, training, maintenance, and hand-over requirements for electronic speed-limit signs and associated infrastructure. Lane Use Management Signs (LUMS) are not considered as part of the scope of this Specification.

709.02 REFERENCES

1. Australian Standards, MAIN ROADS Western Australia Standards and MAIN ROADS Western Australia Test Methods are referred to in abbreviated form (e.g. AS 1234, MRS 67-08-43 or WA 123). For convenience, the full titles are given below:

   Acts and Regulations

   Occupational Safety and Health Act 1984
   Occupational Safety and Health Regulations 1996

   Australian Standards

   AS 1170.1 Structural Design Actions – Permanent, Imposed and other actions
   AS 1170.2 Structural Design Actions – Wind Actions
   AS1742.2 Manual of Uniform Traffic Control Devices – Traffic Control Devices for General Use
   AS 1743 Road Signs – Specifications
   AS 4086 Secondary Batteries for use with Stand-alone Power Systems
   AS 4509 Stand-alone Power Systems
   AS 5156 Electronic Speed Limit Signs

   Australian/New Zealand Standards

   AS/NZS 3000 Electrical Installations – Wiring Rules

   MAIN ROADS Specifications

   Specification 202 TRAFFIC
709.03 DEFINITIONS

1. Applicable terms and definitions, in addition to those provided in Main Roads Glossary of Terms and AS 5156, are listed below:

**ACMA**  
Australian Communications and Media Authority

**Group**  
A collection of signs within an immediate area, controlled by a single Group Controller. A Group may consist of one or more signs.

**PHCS**  
Product Host Control System, the software provided by the sign supplier or manufacturer for control of the sign

**Sign**  
An electronic speed limit sign (ESLS) including electronics signs used for school zones, shopping precincts and/or freeways.

**Site**  
A collection of signs in a larger area, typically associated with a common area such as a school or a shopping precinct. A site may consist of one or more Groups.

**TOC**  
Traffic Operations Centre

**TMS**  
Traffic Management System, the software used to remotely control a sign

**VDU**  
Visual display unit

709.04 – 709.05 NOT USED

PRODUCTS AND MATERIALS

709.06 GENERAL

1. Signs and associated equipment provided shall comply with AS 5156 unless otherwise specified.  

2. All equipment covered by this specification shall comply with the requirements of AS/NZ 6100.6.3.

3. All telecommunications and radio communications equipment covered by this specification shall comply with relevant requirements of the Australian Communications and Media Authority (ACMA). Such equipment will be labelled with an ACMA issued “A-Tick” or “C-Tick” or “RCM”.

4. Prior to manufacture, the Contractor shall certify to the MAIN ROADS Representative that detailed designs of sign layout, fabrication and assembly drawings, calculations, specifications and certifications of the signs and sign components conform to the requirements of the Specification.  

**HOLD POINT**
5. The Contractor shall demonstrate that materials and products used meet the requirements of this Specification and shall highlight where they differ from those specified. Any deviations from the requirements of this Specifications requires approval from Main Roads WA AMTS.

6. An electronic speed limit sign and associated infrastructure includes the following items:
   a) Sign post, or alternative mounting method
   b) Electronic sign, including sign control
   c) Sign Controller, including firmware
   d) Battery, charge controller and Solar Panel, as required
   e) Communications hardware
   f) Static signs and tags

7. Signs and associated equipment shall be designed to meet MAIN ROADS clearance requirements, as shown on drawing 201031-0015. Any additional provisions required due to below-minimum lateral clearance shall be approved by MAIN ROADS.

8. Where an electronic speed limit group consists of two or more electronic speed limits signs the signs shall operate in a Master – Slave configuration, with a Group Controller acting as the Master.

9. Where an electronic speed limit group contains only one electronic speed limit sign that sign shall be considered a Group Controller.

709.07 SIGN POST

1. The sign shall be mounted on a post unless specified otherwise by MAIN ROADS.

2. The sign post shall comply with Table 1 of MAIN ROADS Standard drawing 201031-0015.

3. The sign post shall be coloured with Golden Yellow Y14 colour powder coated.

4. The footing for the sign post shall be designed as per Main Roads standard drawing 201331-0010

5. The design of the sign post and footing, fully fitted with equipment, shall meet AS/NZS 1170.2.

709.08 ELECTRONIC SIGN

709.08.01 VISUAL DISPLAY UNIT

1. The Visual Display Unit (VDU), shall have the following features:
   a) White matrix display with the ability to display a speed range from 20kmh to 110kmh in 10kmh increments.
b) Red illuminated annulus. The annulus pixel configuration shall be as per Table 2.3 of AS 5156.

c) Matt black background.

d) Non-reflective, high impact, UV-resistant front viewing window where required.

709.08.02 DISPLAY ELEMENTS

1. Unless otherwise stated the sign display shall comply with AS 5156.

2. The numerals shall not flash while a sign is displaying a speed limit.

709.08.03 SIGN ENCLOSURE

1. The sign enclosure shall meet the requirements in AS 5156 Section 4.

2. The sign enclosure shall be made of marine grade aluminium (minimum of 2.5mm thick) and be Golden Yellow Y14 colour powder coated.

3. The sign enclosure shall incorporate a mechanism to adjust its angle to achieve the correct line of sight.

4. The front window of the VDU shall be designed, coated, or treated to prevent or minimise fogging.

5. Each sign shall be capable of being post mounted.

6. The sign shall be rear-mounting unless specified differently in project brief and design drawings.

7. The sign enclosure shall have a lockable door, not opening to the rear, which opens with the standard Main Roads 247E key and positively closes the door against the seal ensuring a minimum ingress protection rating of IP55. Key details can be obtained from the MAIN ROADS Representative.

8. The enclosure shall be able to securely store all required equipment with the exception of the solar panel.

709.09 SIGN CONTROL

709.09.01 GENERAL

1. The sign controller shall comply with AS 5156 Section 3.

2. The sign controller shall be housed in the sign enclosure.

3. The controller shall allow remote control of each function of its sign, either via a group controller or direct to the TMS if not grouped with a Group Controller.
4. The controller shall integrate with the existing serial based control software. This is currently software supplied by AD Engineering but is to be changed to STREAMS in the future, consequently the sign controller shall:

a) Communicate using the FSS Application Layer Protocol.

b) Be upgradeable to use the TSI-SP-003 protocol and be fully compliant with STREAMS.

c) Be able to be upgraded as b) above remotely without hardware changes.

5. The controller shall provide, but not be limited to, the following operations:

a) The ability to flash the inner ring(s) of the annulus while the outer ring(s) stays on.

b) The ability to flash the inner Red annulus LED ring(s) at a rate of 1 Hz, with a 50% duty cycle.

c) The ability to turn the VDU on and off.

d) The ability to program and store on / off times for the VDU for a minimum of two calendar years, with a minimum of two on and two off commands per day. Leap years need to be provided for.

e) The ability to alter the programmed on / off times of these signs.

f) The ability to have self-diagnosis and error reporting functions.

g) The ability to change the display number.

h) The ability to blank the display if the loss of a number of LEDs causes the displayed speed to become unclear or incorrect.

6. The sign firmware shall be configurable to not support any possible speeds greater than the maximum for the road.

709.09.03 ERROR REPORTING

1. Monitoring, fault logging and reporting functions shall comply with AS 5156 Clause 3.6, with the addition of reporting:

a) An angle alarm acknowledging that the sign has been moved past a +/- 15-degree angle from vertical.

709.10 COMMUNICATIONS SYSTEM

709.10.01 GENERAL

1. The Group Controller shall communicate to the TMS via suitable hardware, as per clause 709.27.
2. The master sign shall communicate with all slave signs within its group. The slave signs shall be able to communicate to their master sign but not with any other sign in their group.

3. The communications hardware shall include for synchronising the flash sequence of all signs facing the same approach.

709.10.02 COMMUNICATIONS PROTOCOL

1. Master and Slave signs shall securely communicate with one another via a local wireless link.

2. The communications protocol shall support the full functionality of the sign as described in this specification and the functionality described in AS 5156 Appendix B.

709.10.03 CLOCK

1. The sign shall be fitted with a real-time clock which provides time and date with accuracy and details as specified within AS 5156.

2. Adjacent signs shall have their clocks synchronised to within a minimum of 1/20th of a second.

709.11 GROUP CONTROLLER

1. The Group Controller shall have no hardware differences to other signs. All differences shall be software only.

2. The Group Controller shall act as a master sign controller for its local slave signs. The Group Controller shall only control on group of signs.

3. The Group Controller shall have the following characteristics as a minimum:

   a) Be able to support at least three slave signs.
   b) Continually monitor each connected sign and log any errors or abnormal events.
   c) Periodically monitor, log and report the operation of each connected sign individually. The frequency of the log shall be configurable and schedulable.
   d) Command signs to display only the permissible frame combinations for that respective site.
   e) Allow local and remote reset of individual slave and master signs
   f) Accept or reject valid or invalid commands made by the TMS and PHCS.
   g) Generate a unique electronic identification for each sign.
709.12 MARKINGS

1. All markings shall be marked and labelled with durable and weatherproof materials in accordance with AS 5156.

709.13 REQUIREMENTS FOR MAINS POWERED SIGNS

1. The sign shall be provided with a mains supply unless otherwise specified.

2. The sign shall convert mains power to extra-low voltage levels for internal use, in accordance with AS/NZS 3000.

709.13.01 BACKUP BATTERY

1. The sign shall be equipped with a battery backup and it shall comply with the requirements of clause 709.15.

709.14 REQUIREMENTS FOR SOLAR POWERED SIGNS

1. Where mains power is not available, the sign shall be provided with a solar power supply.

2. The sign shall be equipped with a battery and it shall comply with the requirements of clause 709.15

709.14.01 SOLAR PANEL

1. The solar power specific requirements shall comply with requirements of AS 5156, AS 4509.2 and AS 4086.2.

2. The solar panel shall be securely connected to the sign post at the top of the pole on an adjustable theft resistant mount, and positioned to receive maximum sunlight. The solar panel mounting shall be designed for the wind region in which it is to be installed. The mounting arrangement shall be securely locked in position and tightened sufficiently to prevent the solar panel from becoming mis-aligned during heavy winds.

3. The post mounting shall be provided suitable for the environmental region and associated post design.

4. The solar panel shall have suitable impact resistance for the environmental region in which it is to be installed.

5. The solar panel shall be capable of continuously maintaining normal operation of the sign and full battery charge with exposure to 6 hours of winter sunlight.

6. The solar panel shall be capable of fully charging the battery from the low charge level cut-off point, in direct winter sunlight, in a maximum of four operational days.

7. The solar panel shall be rated to allow for degradation in performance of 0.5% per year for a period of ten years.
709.15 BATTERY REQUIREMENTS

1. The battery shall comply with the requirements of AS 4509 and AS 4086. Standards

2. The battery shall be provided with a charge controller that: Charge Control
   a) Prevents the battery from being overcharged.
   b) Prevents damage to the battery from over discharge.
   c) Prevents damage due to overheating.
   d) Prevents discharge back through the solar panel even if the panel is defective.

709.15.01 BATTERY

1. The battery shall be sized such that it will illuminate the sign message for a period of 24 hours per day for two days and provide all communications and control functionality continuously for the same two days from a normally operational charged state without receiving any further charge from the solar panel Battery Capacity

2. The battery shall have a charge rate of C8 or greater to provide a maximum charge period of 8 hours at rated maximum charge current. Battery Charge

3. The battery(s) shall be either an AGM or proven Lithium based rechargeable type. The battery(s) shall have a minimum life expectancy of 2 years under all anticipated environmental conditions and minimum operational conditions, as defined in 709.15.01 point 1. Battery Type

709.16 STATIC SIGNS AND SUPPLIMENTARY PLATES

1. Tags and signs used shall be of retro-reflective Class 1 sheeting, conforming to all design parameters detailed in Specification 601 and AS 1743. School Zone

2. Tags and signs are to be positioned as shown in Annexure 709 A. Times of Operation Tag

3. School Zone Signs shall have the following signs and tags attached:
   a) The School Zone metallic panel shall be securely attached to the pole above the VDU and display the words “SCHOOL ZONE”, as indicated in Annexure 709 A. End School Zone Sign
   b) The Times of Operation metallic tag shall be securely attached to the pole below the VDU, as indicated in the Annexure 709 A and display the times of school zone operation, which will correspond to the times the VDU shall be turned on.
   c) The End School Zone sign shall display the words “END SCHOOL ZONE”, and be securely attached to the pole at the rear of the VDU.

“School Zone” Tag

Times of Operation Tag

End School Zone Sign
4. When the School Zone is in a Speed Zone other than 50 km/hr, the relevant speed limit sign shall be installed under the End School Zone sign.

**709.17 TEST SIGN**

1. A master and slave test sign shall be provided to MAIN ROADS Western Australia for testing and examination. Provision of the test sign will not be required if an identical sign has previously been tested and passed by MAIN ROADS, or if MAIN ROADS specifies otherwise.

2. The test signs shall be provided complete with all communications devices, firmware, control software, installation and operation manuals and other to provide a fully functional master / slave group to allow verification of form, function and integration requirements.

3. The test signs are to be supplied with solar panels and batteries as well as an alternate main power supply.

4. The test signs shall be provided ahead of production units delivery for approval by the MAIN ROADS Representative. This approval is required prior to the release of delivery of the production units.

**709.18 – 709.25 NOT USED**

**INSTALLATION**

**709.26 GENERAL**

1. Before commencing any work, the type and location of all surface and underground utility services at the work site shall be fully determined. If the signs are to be solar powered then the surrounding overhead vegetation and high structures need to be taken into account for the positioning of the sign to reduce the amount of shadowing on the solar panel.

2. The Contractor shall take all precautions necessary to avoid interference with any underground, surface or overhead utility services.

3. Suitable barriers shall be erected around excavations. If access is required across them, the excavations are to be covered instead.

4. Earthworks shall be carried out in accordance with Specification 302.

5. Disturbed pavement surfaces for non-motorised traffic such as concrete or brick-paved areas and pathways shall be reinstated to original condition to the satisfaction of the MAIN ROADS Representative.

6. Any surplus or waste materials, including off-cuts, packaging, etc. shall be removed from the site by the Contractor who shall also be responsible for all cartage and tipping charges.
7. Installation of post mounted units on a bridge structure shall be to MAIN ROADS Structure Engineer’s approval. The MAIN ROADS Representative shall be given notice at least 24 hours prior to the installation. 

HOLD POINT

8. The sign shall be installed so that it meets MAIN ROADS clearance requirements for that road, as per drawing 9548-106.

Clearance

9. The VDU shall be securely attached to the signpost.

VDU Attachment

10. The VDU shall be aimed towards oncoming traffic 100m down the carriageway from the VDU. Signs installed on the left hand side of the roadway shall be aimed at the centre of the left most lane of oncoming traffic. Signs installed on the right hand side of the roadway shall be aimed at the centre of the right most lane of oncoming traffic. After aiming all aiming bolts on the mounting arrangement shall be securely locked in position and tightened sufficiently to prevent the VDU from becoming misaligned during heavy winds.

VDU Aiming

11. Static signs shall be oriented as per AS1742.2 Appendix D

Static Sign Aiming

12. Each sign shall be supplied pre-programmed by the Contractor to operate between the specific times and calendars for the planned site. The pre-programmed times for the signs will be advised by the MAIN ROADS Representative.

Pre-programming

13. Each site shall be assigned a site asset number, group number and each sign a sign number. The numbers shall be made up of 50mm black characters on a 50mm x 60mm background of adhesive class 2 yellow retro-reflective, material as per AS/NZS 1906 Part 1.

Asset Numbering

14. The numbers shall be fixed vertically to the sign post 200mm below the bottom of the lowest static sign and face towards the road.

15. The asset number shall be read from top to bottom, site number top most followed by the group number and ending with the sign number below.

709.27 COMMUNICATIONS

1. Each electronic speed limit sign shall be connected to the current MAIN ROADS control system via an approved communication connection.

Approved Communication

2. The sign shall be able to be fully incorporated into, and remotely monitored and controlled via, MAIN ROADS’ current control software for electronic speed limit signs. Further details can be obtained from the MAIN ROADS Representative.

Monitor and Control

3. If an electronic sign is within 100m of MAIN ROADS optical fibre or an existing SCATS ADSL site, it shall be incorporated into this existing communications infrastructure where possible.

Optical fibre

4. The Contractor shall give the MAIN ROADS Representative a minimum of two weeks’ notice if a SIM card is required for the sign(s). The MAIN ROADS Representative can then arrange the supply of the required number of SIM cards to the Contractor.

SIM card
709.28  TRAFFIC MANAGEMENT

1. Provision is to be made for vehicular traffic and pedestrians during the works, in accordance with Specification 202 and the Traffic Management for Road Works Code of Practice and Australian Standard AS 1743.2. At all times the safety of the public and the person(s) carrying out the works is paramount.

2. Prior to installation works being carried out on site, the Contractor shall certify to the MAIN ROADS Representative that adequate planning and provision has been made for traffic management in order to conform to the requirements of the Specification.

709.29 – 709.80  NOT USED

AS BUILT AND HANDBOVER REQUIREMENTS

709.81  TESTING

1. All equipment shall be subjected to Factory Acceptance Tests by the sign Vendor before delivery, to ensure compliance with performance requirements as stated in this document and in AS5156. A suitable documented quality plan shall be in place to ensure consistency of testing. The MAIN ROADS Representative shall be notified of Testing 7 days in advance to allow for a MAIN ROADS nominated representative to be present at testing.

2. The sign Vendor shall be present to perform the Site Acceptance Testing and Systems Integration Acceptance Testing of a minimum of the first two sites installed unless specified otherwise. Presence of the Vendor will not be required if an identical sign has previously been installed, tested and passed, or if MAIN ROADS specifies otherwise The Contractor shall provide for all consumables and tools necessary for installation and testing.

3. The signs shall be subject to site acceptance testing of all their functions, before commissioning, including but not limited to:
   a) Power Supply,
   b) Display performance,
   c) Local Communications, and
   d) Reporting.
4. The signs shall be subject to systems integration acceptance testing of all functions between the sign and the TMS, before commissioning, including but not limited to:
   a) Communications and remote access facilities via the TMS,
   b) Reporting,
   c) Programming,
   d) Scheduling, and
   e) Fault Management.

5. An inspection and test plan detailing each stage of the FAT, SAT and SIAT tests shall be submitted for review and approval by the MAIN ROADS Representative prior to release of the signs for delivery.

6. Documentation is required showing the results of tests performed on each electronic sign during testing. This documentation is to include the type of test performed, the component or process being tested, and the outcomes of the test and signed off for release for delivery. Testing documentation for each sign shall be attached within the packing or enclosed within the sign and be in a sealed envelope or similar.

709.82 MANUFACTURER SPECIFIC SOFTWARE

1. The Vendor shall provide any software required for the configuration of the sign/s to Main Roads WA prior to the Site Acceptance Testing and Systems Integration Acceptance Testing.

709.83 AS BUILT DOCUMENTATION

1. The Contractor shall provide full documentation in the form of drawings as per MAIN ROADS' Electrical Infrastructure Asset Drawing Guidelines.

2. Final documentation is to consist of electronic and hardcopy sets including:
   a) A complete inventory of all components installed in each sign, at each site.
   b) Installation, operation and maintenance manuals for all equipment.
   c) Drawings and datasheets for all equipment.
3. The inventory of components shall include, for each sign at the site, all fields required for the Main Roads Electrical Service ESLS Database, including but not limited to:
   a) SIM Number
   b) Phone number
   c) IP Address
   d) Battery details (make, model, voltage, capacity)
   e) Solar Panel details (make, model, size, rating)

The Vendor shall confirm specific inventory requirements with the MAIN ROADS Representative prior to commencing the installation works.

709.83.1 DRAWINGS

1. Drawings are to be as-constructed. Each drawing should be supplied in two (2) A3 paper copies, and two (2) electronic copies, one in Portable Document Format (pdf) and one in AutoCAD R14 format.

2. Drawings are to consist of:
   a) General arrangement drawings, in 1:250 scale. These are to include: (i) all equipment installed above and below ground, (ii) equipment asset numbers (iii) the location and route of any installed conduits, (iv) all electrical and communications cable sizes, cable runs and points of attachment, and (v) the general background, such as kerb lines.
   b) Communications cabinet drawings showing (i) electrical equipment, including power supply and surge protection, and (ii) communications equipment, including transceiver/modem, terminations, and cables.
   c) Electrical wiring diagrams, including interconnections and interfaces between all equipment.
   d) Updated electrical layout drawings, where installed near other electrical assets such as traffic signals, street lighting, etc.
   e) Updated electrical cable charts for any affected existing cabinets, re-issued to the cabinet.

709.83.2 INSTALLATION, OPERATION AND MAINTENANCE MANUAL

1. The operations and maintenance manual supplied with the signs shall meet the minimum requirements of AS 5156 Clause 3.9, with the following changes:
   a) Occupational Health & Safety (OHS) instructions shall be in line with Occupational Safety and Health Act and Regulations for Western Australia
2. The installation manual supplied with the signs shall include as a minimum:
   a) A description of the method of installation of all hardware and software.
   b) Details of all settings for hardware (including torques) and software.

709.84 TRAINING

1. The Contractor is to provide basic training to relevant MAIN ROADS personnel on the installation, operation and maintenance of all installed equipment. This is to include the correct use of remote access, and be additional to the training manuals to be provided. During training MAIN ROADS will provide suitable office and workshop facilities.

2. Field training will include installation and the SAT of two sites as detailed in 709.81 including assistance with commissioning.

3. Basic and / or field training will not be required if an identical sign has previously been installed, or if MAIN ROADS specifies otherwise.

709.85 MAINTENANCE DURING DEFECTS PERIOD

1. Any failure of, or damage to, an electronic school zone sign (or component) shall be fixed before the start of the next school zone period, as long as the failure is not reported to the Contractor (by MAIN ROADS or the sign itself) less than 2 hours before the start of the next school zone period. In such cases, the failure shall be fixed prior to the commencement of the following school zone period.

2. Any failure of, or damage to, an Electronic Speed Limit Sign (or component) that is not a school zone sign shall be fixed within 24 hours of the fault being reported to the Contractor (by MAIN ROADS or the sign itself).

709.86 – 709.90 NOT USED

CONTRACT SPECIFIC REQUIREMENTS

709.91 FIRST CLAUSE TITLE (+ OTHER CLAUSES – SEE SPECIFICATION GUIDANCE NOTES)

709.92 – 709.99 NOT USED (IF THERE ARE NO REQUIREMENTS)
## ANNEXURE 709A – MAIN ROADS STANDARD DRAWINGS

The following Main Roads standard sign drawings are available on the Main Roads web site.

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<td>Supplementary Plate to Enhance School Zone Signs MR-RS-17</td>
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<tr>
<td>9548-106</td>
<td>MRWA Drawing</td>
<td>Location Details for One Post Sign</td>
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</table>
SPECIFICATION 709 GUIDANCE NOTES

DELETE THESE GUIDANCE NOTES FROM FINAL DOCUMENT AFTER USING FOR REFERENCE

All edits to downloaded TDP documents shall be tracked (most word processing software allows this to be done automatically). Deletions shall be struck through e.g. example. Insertions shall be in italics e.g. example. If all information relating to a clause is to be deleted then the clause number should be retained and the words "NOT USED" should be inserted.

The proposed documents with tracked changes shall be submitted to the Project Manager for review and approval prior to printing the final document. When the document is approved the tracked changes option shall be turned off.

The Custodian of this specification is the Electrical Engineer

CONTRACT SPECIFIC REQUIREMENTS TO ADD OR DELETE

The following clauses are to be placed under CONTRACT SPECIFIC REQUIREMENTS as required.

NONE AT THIS TIME
# SPECIFICATION AMENDMENT CHECKLIST

**Specification**

<table>
<thead>
<tr>
<th>Specification</th>
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<tr>
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**Amended by:**

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**Verified by:**

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**Contract**

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### ITEM DESCRIPTION

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**Note:** All changes/amendments on the standard model specification must be shown in Tracked Change mode until approved.

1. Specification was reviewed and amended where required.
2. **CONTRACT SPECIFIC REQUIREMENTS** are identified and incorporated where required. (See Specification Guidance Notes).
3. Any new Materials/Products in addition to those stated in the Specification have been approved by the Custodian. Provide details at 14.
4. Amended standard clauses? Obtained endorsement from the custodian and approved by Manager Contract Management Practice.
5. Clause deletions shown as ‘NOT USED’.
6. New or amended **INSPECTION & TESTING** parameters included in Specification have been checked by Custodian.
7. **ANNEXUREs** completed (Refer Specification Guidance Notes).
8. **AS BUILT** and **HANDOVER** requirements incorporated where required.
9. Proposed alterations to the **Standard Method Measurement (SMM)** have been reviewed and approved by Specification and Contracts Officer.
10. Confirmed that the completed Specification reflects the intent of the design.
11. Specification format and styles checked.
12. **SPECIFICATION GUIDANCE NOTES** deleted.
13. **TABLE OF CONTENTS** updated.
14. Supporting information prepared and submitted to Team Leader or Senior Project Manager for Review and Approval.

Further action necessary: See Attached documentation.

Approved by: ____________________________