

Materials Testing Manual

Publication Update

Edition 5, Amendment 2 of the *Materials Testing Manual* (MTM) has been issued as at October 2019.

Implementation

Notwithstanding any contractual requirements for projects current as of 8 October 2019 or any requirements for NATA accreditation, the MTM should be implemented immediately.

For existing projects, testing should continue using the methods published at the start of the contract. It is not the intention to force unnecessary rework on existing projects.

The *Materials Testing Manual* applies to all road projects and other work the department is responsible for and is therefore applicable to our Consultants and Contractors.

Edition 5, Amendment 2 – October 2019

Part	Test Method	Description of change
1	Introduction	<ul style="list-style-type: none"> Add abbreviation APHA to Table 2
5	Q106	<ul style="list-style-type: none"> Remove reference to Note 8.6 from Step 5.1.5
	Q135A	<ul style="list-style-type: none"> Renumber clauses 3.2.7 and 3.2.8 to 3.3 and 3.4
	Q135B	<ul style="list-style-type: none"> Add curing requirements for lime, lime/flyash and lime/slag for UCS, RLT, CR and AWT testing to Table 1
	Q135C	<ul style="list-style-type: none"> Align oven curing temperatures in Table 1 with the requirements for the oven in clause 3.2
	Q136A	<ul style="list-style-type: none"> Replace achieved dry density with UCS in clause 9.3
	Q142B	<ul style="list-style-type: none"> Amend Step 5.11.1, Note 9.2 and Table 1 to align compaction requirements for layer and blows to AS 1289.5.2.1
12	Q708B	<ul style="list-style-type: none"> Amend clause 6.7 i) to only record defects related to culverts Remove clause 7.2 and related reporting requirement in clause 8.1 i) Remove requirement to report calibration relationship used in clause 8.1 d) Include requirement to report surface type in clause 8.1 Remove requirement to report GNSS coordinates from clause 8.2

Edition 5, Amendment 1 – July 2019

Part	Test Method	Description of change
	All	<ul style="list-style-type: none"> Include requirement to report method used in the form “The number of this test method, that is Q###”
1	Introduction	<ul style="list-style-type: none"> Add reference to <i>Austroads Glossary of Terms</i> for definitions to Subsection 3.2 Add reference to <i>Austroads Glossary of Terms</i> for abbreviations to Subsection 3.4 Add reference to ASTM International methods to Section 5 Remove definitions for earthworks, in situ stabilisation, nominal size and stabilisation from Table 1. These definitions are now contained in the <i>Austroads Glossary of Terms</i> Remove abbreviations GNSS, GPS, IRI, LS, MDD, OMC, PI, PMB and UCS from Table 2. These abbreviations are now contained in the <i>Austroads Glossary of Terms</i> Remove reference to ISO 11648-2 from Table 4

Part	Test Method	Description of change
		<ul style="list-style-type: none"> Remove test methods Q202, Q205A, Q205B, Q205C, Q214A, Q214B, Q217, Q319, Q320, Q705 and Q706 from Table 5 Add test methods Q050 and Q060 to Table 2.
2	Application	<ul style="list-style-type: none"> Add Section 1 – Purpose to the document Consolidate all references in the document into a new Section 2 Rewrite Introduction and Background sections throughout the document Replace any requirements or tables that are reproductions from other sources with a reference to the original source Update parts of the document to align with the latest editions of TMR Technical Specifications MRTS07A, 07B, 07C and 09 Update parts of the document to align with the proposed new edition of the Pavement Rehabilitation Manual
3	Q020	<ul style="list-style-type: none"> Remove references to MRTS04, 30 and 40 from Section 1 Include Step 3.2 referencing MRTS01 for acceptance constant Amend reporting requirements for mean and standard deviation in Step 5.1 Add Step 5.2 to report characteristic value and reference to MRTS01 Add Step 5.4 including reporting of source of acceptance constant, identification of specification requiring reporting of characteristic value and requirement to report use of unrounded data Remove test methods Q134 and Q482 from Note 6.1 Add test methods AS 2891.9.2 and AS 2891.9.3 to Note 6.2 Add test methods AS 2891.9.2 to Note 6.3 Remove Tables 1, 2, 3, 4 and 5
4	Q050	<ul style="list-style-type: none"> Replace relevant sections with references to equivalent parts of AS 1289.1.4.1 and AS 1289.1.4.2 Allow use of computer generated random numbers
	Q060	<ul style="list-style-type: none"> Remove sampling frame, shield board and mechanical stream cutter from apparatus list in Section 4 Adjust number sample increments to align with AS 1141.3.1 in Step 5.1 Replace techniques in Subsections 7.1, 7.2, 8.1, 8.3, 8.4, 8.6, 9.1, 9.3, 10.1 and 10.2 with references to equivalent parts of AS 1141.3.1 Adjust sampling process to align with AS 1141.3.1 in Sub-sections 7.3, 7.4, 8.4, 9.2 and 9.3 Remove Sub-section 8.2 Remove Section 11 Remove Notes 14.4 and 14.5 Adjust minimum sample and sample increment masses to align with AS 1141.3.1 in Tables 1 and 2
	Q061	<ul style="list-style-type: none"> Remove Farmers Friend shovel from apparatus, clause 3.3.3 Remove sampling using Framers Friend shovel from Step 6.5.1 Include Step 6.1.7 for stabilised materials to mark or otherwise identify the sampling location so additional testing may be performed at the location after compaction is complete
5	Q106	<ul style="list-style-type: none"> Remove Steps 5.1.5 and 5.1.6 from Section 5 Remove Note 8.6
	Q113A	<ul style="list-style-type: none"> Correct reference to Note 8.3 in clause 3.1 Remove the specific blow distribution requirements from Step 5.3.3
	Q113B	<ul style="list-style-type: none"> Remove the specific blow distribution requirements from Step 5.3.3
	Q113C	<ul style="list-style-type: none"> Remove levelling plate, level and rigid foundation and straightedge from Section 3 Remove mould oil from section 4

Part	Test Method	Description of change
		<ul style="list-style-type: none"> Remove Note 8.5
	Q115	<ul style="list-style-type: none"> Correct references to notes in Steps 5.3.2 and 10.3 c) Remove rounding of calculated results from Steps 9.1.1, 9.1.2 and 9.3.3 Remove Note 11.4 to align test method with requirements of technical specifications such as MRTS10
	Q125D	<ul style="list-style-type: none"> Remove levelling plate, level and rigid foundation, mallet and straightedge from Section 3 Remove mould oil from section 4 Remove Note 11.2
	Q135A	<ul style="list-style-type: none"> Include apparatus for machine mixing in Subsection 3.1 List apparatus for amelioration separately in Subsection 3.2 Align requirements for rammer with AS test methods in clause 3.2.5 Add a balance and measuring cylinder to Section 3 Exclude the use of bagged supplies of dry stabilising agents in Section 4 Exclude the use of quicklime in Section 4 Replace the term "conditioning" with 'amelioration" throughout the method Add new Section 7 for machine mixing
	Q135B	<ul style="list-style-type: none"> Include techniques for curing slab specimens in Steps 4.2 a), 4.3 and Table 1
	Q136A	<ul style="list-style-type: none"> Add sealable containers and scarifying tool to Section 4 Include reporting a table of working time data in Section 9 Include reporting a plot of working time data in Section 9 Replace Figures 1 and 2 with examples showing curves of best fit
	Q136B	<ul style="list-style-type: none"> Include reporting a table of working time data in Section 11 Include reporting a plot of working time data in Section 11
	Q137	<ul style="list-style-type: none"> Add steel rammer, material height gauge, sealable containers and mixing apparatus to Section 3 Add mould oil to Section 4 Add Note 10.2 with dimensions of material height gauge Add Note 10.2 for mould oil Add Table 1 with dimensions of RLT equipment Add Table 2 with dimensions of rammers
	Q138A	<ul style="list-style-type: none"> In clause 3.2.1 change collar thickness from 9.5 mm to 4.75 mm to align requirements of ASTM D5581 Amend moisture adjustment for dry stabilised agent in Step 6.1.3
	Q138B	<ul style="list-style-type: none"> In clause 3.1.1 change collar thickness from 9.5 mm to 4.75 mm to align requirements of ASTM D5581
	Q139	<ul style="list-style-type: none"> Replace reference to Test Method Q138 with Q138A and Q138B in Section 2 Amend reporting requirements for individual specimens and average results in clauses 8.7, 8.8 and 8.9
	Q140A	<ul style="list-style-type: none"> Include requirement to sample using Test Method Q061 Section 6 in Step 4.1.3 b) ii Add requirement that moisture content samples be placed in a drying oven within the same work shift as the material is placed to Steps 4.1.3 b) ii and 4.2.2 Add requirement to complete wet density testing within 24 hours of the end of the work shift in which the material is placed
	Q142A	<ul style="list-style-type: none"> Remove the specific blow distribution requirements from Step 5.11.2 b)

Part	Test Method	Description of change
		<ul style="list-style-type: none"> In Step 5.15 add requirement that moisture content samples be placed in a drying oven within the same work shift as the material is placed In Step 5.10 b) remove reference to Test Method Q140A
	Q142B	<ul style="list-style-type: none"> Remove the specific blow distribution requirements from Step 5.11.2 b) In Step 5.15 add requirement that moisture content samples be placed in a drying oven within the same work shift as the material is placed In Step 5.10 b) remove reference to Test Method Q140A
	Q144A	<ul style="list-style-type: none"> Include reference to Test Method Q061 Section 6 for sampling in Step 3.4.1
	Q145A	<ul style="list-style-type: none"> Add balance, levelling plate, rubber mallet, level and rigid foundation, straightedge, mixing apparatus and scarifying tool to Section 3 Add mould oil to section 4 Add Note 10.1 for mould oil Remove Note 11.2
	Q148	<ul style="list-style-type: none"> Add scarifying tool to Section 3 Remove reference to Test Method Q145A from Section 3 Add mould oil to Section 4 Include techniques for preparing and compacting stabilised specimens in Section 5 Include compacted material in Step 7.17
	Q149	<ul style="list-style-type: none"> Remove Step 4.6
	Q251A	<ul style="list-style-type: none"> Remove level and rigid foundation, levelling plate, straightedge, mallet from Section 3 Remove mould oil from section 4 Remove Note 9.3 Remove reference to Technical Note 151 – Testing of Materials for Lime Stabilisation from Note 9.6
	Q251B	<ul style="list-style-type: none"> Remove dimension requirements for rubber mallet from clause 3.9 Add calculations for achieved compacted dry density to Section 7 Amend Notes 8.5 and 8.6 to allow target compaction moisture contents other than OMC to be used
	Q252	<ul style="list-style-type: none"> Include requirements to determine, calculate and report WPI using cone plasticity index to Sections 3, 4 and 5 Remove reference to Note 8.8 in Step 4.1
	Q257	NEW METHOD
7	Q202	WITHDRAWN
	Q205A	WITHDRAWN
	Q205B	WITHDRAWN
	Q205C	WITHDRAWN
	Q214A	WITHDRAWN
	Q214B	WITHDRAWN
	Q215	WITHDRAWN
	Q217	WITHDRAWN

Part	Test Method	Description of change
	Q227	NEW METHOD
8	Q305	<ul style="list-style-type: none"> Remove Table 5 and Figure 1 and replace with references to 101.6 mm apparatus in AS 2891.5 clause 4 (b) and Figure 1 Remove references to 150 mm apparatus in Section 3 and Table 2 Replace reference to withdrawn Test method Q301 with AS 2891.1.1 in Step 5.6
	Q319	WITHDRAWN
	Q320	WITHDRAWN
12	Q708B	<ul style="list-style-type: none"> Replace the term lane with section throughout the method Remove reference to test lot minimum and maximum size from Section 2 Include a definition for section in Section 3 Add the option of using an automatic trigger with the two laser profilometer in Section 4 Add the option to use Austroads test method AG:AM/T002 for roughness measurement validation Define the test length as containing a maximum number of 100 m test sections in Step 6.1 Reduce the lead-in length from 100 to 30 m in Step 6.1 Require no testing be performed when raining in Step 6.5 Increase the number of runs required from one to three in Step 6.6 Add more events during testing to be recorded in Step 6.7 Add a list of features that may provide location references in Step 6.8 Calculate IRI for each wheel path based on 3 runs in Step 7.1 Include criteria for excluding data in Step 7.2 Include requirement to report areas excluded from analysis in Section 8 Include requirement to report any location references in Section 8 Remove requirement for two operators to be used when automatic trigger is used in Note 9.2 Remove Note 9.3
	Q721	NEW METHOD
	Q723	NEW METHOD

Edition 5 – November 2018

Part	Test Method	Description of change
All	All	<ul style="list-style-type: none"> Minor editorial, format and style changes. Replace “must” with “shall”. Improve style by replacing passive voice with active voice. Improve style by breaking long sentences and simplifying sentences. Review notes to methods and amend as appropriate to ensure they are for guidance. Move any mandatory requirements in notes to the main body of the test method.
1	Introduction	<ul style="list-style-type: none"> Add new Section 4 for referenced documents, including Table 4.1 for Australian Standards and Table 4.2 for International Standards. Revise Section 5 to reflect the more common use of National and International standards in TMR technical specifications. Add Section 7 to indicate that Notes to Methods are for guidance within this manual. Add definitions for constant mass, coarse-grained soil, medium-grained soil and fine-grained soil to Table 1.

Part	Test Method	Description of change
		<ul style="list-style-type: none"> Remove test methods Q212A, Q301, Q302A, Q302B and Q313 from Table 2. Add test methods Q103B, Q201, Q202, Q205A, Q205B, Q205C, Q214A, Q214B, Q215, Q217, Q319 and Q320 to Table 2.
2	Application	<ul style="list-style-type: none"> Add new part to manual Include contents of Technical Notes 149, 150, 151, 178 and 179. Replace reference to "this technical note with "this section". Remove Appendix A and place contents in Section 6. Replace references to Appendix A with Section 6.
3	Q010	WITHDRAWN
	Q020	<ul style="list-style-type: none"> Remove reference to Test method Q306A in Note 6.2. Add references to AS 1289.5.4.1 and AS 1289.5.7.1 to Note 6.1, Table 2 and Table 5. Remove reference to MRTS04 from Table 1.
4	Q050	<ul style="list-style-type: none"> Correct reference for random stratified sampling in Section 3. Correct references to Notes in Section 7 and 8.
	Q060	<ul style="list-style-type: none"> Replace references to standard AS2884.1 with ISO 11648-2. Add new Subsection 7.3 to allow sampling of a moving stream using a loader bucket. Add new Subsection 7.4 to allow sampling of a moving stream using discharge into a truck. Move the content of Note 14.3 to Step 7.1.3. Move the content of Note 14.4 to Steps 7.2, 7.4, 8.1.6 b), 8.2.5, 8.3.4, 8.4.2 c), 8.5.6 b), 8.6.6 b), 9.1.2 c), 9.2.2 b), 9.3.3, 10.1.4, 10.2.4 b), 11.1.8 and 11.2.6. Move the content of Note 14.5 to Steps 8.1.5, 8.5.5 and 8.6.5. Move the content of Note 14.6 to Steps 8.1.6, 8.2.4, 8.3.3, 8.5.6 and 8.6.6.
	Q061	<ul style="list-style-type: none"> Amend Section 2 to include the sampling of discharge from plant. Add new Subsection 7.1 to allow sampling of a moving stream using a loader bucket. Add new Subsection 7.2 to allow sampling of a moving stream using discharge into a truck.
	Q070	<ul style="list-style-type: none"> Amend to provide improve clarity of application of test method in Section 2. Add specimen preparation to scope in Section 2. Add specimen preparation apparatus to Section 3. Add Section 6 – Preparation of specimens, previously part of Q303A. Add specimen preparation notes to Section 9. Move the content of Note 9.2 to Step 5.1.
	Q080	<ul style="list-style-type: none"> Replace the term "bitumen" with "binder" or "bituminous binder" throughout the method. Move references to examples of sampling cocks from Section 3 to Note 10.2 Remove Section 4. Move the content of Note 9.2 to Step 5.1. Separate the sampling from spray bars from other locations in Section 4. Move the content of Note 10.2 to Section 3. Move the content of Note 10.3 to Subsection 4.8. Move the content of Note 10.5 to Steps 4.5 and 6.5. Move the content of Note 10.6 to Steps 4.6, 5.4, 6.6 and 7.7.
5	Q101	<ul style="list-style-type: none"> Replace references to standard AS 1152 with ISO 3310. Replace references to Test Method Q102A with AS 1289.2.1.1. Replace references to Test Method Q102B with AS 1289.2.1.4.

Part	Test Method	Description of change
		<ul style="list-style-type: none"> Replace references to Test Method Q102D with AS 1289.2.1.6. Replace references to Test Method Q010 with AS 1289.2.3.1. Move the content of Note 7.3 to clause 4.2.
	Q101B	<ul style="list-style-type: none"> Add a flat bottomed scoop to Section 3. Move the content of Note 6.1 to Steps 4.2.6 and 5.2.8.
	Q101C	<ul style="list-style-type: none"> Replace references to standard AS 1152 with ISO 3310. Replace references to Test Method Q102A with AS 1289.2.1.1.
	Q101D	<ul style="list-style-type: none"> Replace references to standard AS 1152 with ISO 3310. Move the content of Note 6.3 to clause 4.5. Remove "shall" from Note 6.5.
	Q101E	<ul style="list-style-type: none"> Replace references to standard AS 1152 with ISO 3310. Move the content of Note 10.2 to Clause 3.3.2. Replace "shall" with "should" in Note 10.6.
	Q101F	<ul style="list-style-type: none"> Include Note 11.5 from Test Method Q129 in clause 3.5, to exclude mills and grinders that heat material above 50°C. Replace references to standard AS 1152 with ISO 3310. Remove Note 8.2 containing definition of drying to constant mass. This definition is now in the Introduction Table 1.
	Q102A	WITHDRAWN
	Q102B	WITHDRAWN
	Q102D	WITHDRAWN
	Q103A	<ul style="list-style-type: none"> Replace references to standard AS 1152 with ISO 3310. Move the content of Note 9.5 to Section 4. Remove Note 9.6 containing definition of drying to constant mass. This definition is now in the Introduction Table 1. Move the content of Note 9.7 to Sub-section 6.1. Move the content of Notes 9.9, 9.10 and 9.11 to Sub-section 6.2. Move the content of Note 9.13 to Step 6.5.8.
	Q103B	WITHDRAWN
	Q103C	WITHDRAWN
	Q103F	<ul style="list-style-type: none"> Replace references to standard AS 1152 with ISO 3310. Move Note 10.2 to Clause 5.1. Replace "must" with "should" in Note 10.4.
	Q104A	<ul style="list-style-type: none"> Replace references to standard AS 1152 with ISO 3310. Replace references to Test Method Q102A with AS 1289.2.1.1.
	Q104D	<ul style="list-style-type: none"> Replace references to standard AS 1152 with ISO 3310. Replace references to Test Method Q102A with AS 1289.2.1.1.
	Q105	<ul style="list-style-type: none"> Replace references to Test Method Q102A with AS 1289.2.1.1. Remove reference low plasticity materials from Step 4.1. Remove Step 4.2. Replace "shall" with "is" in Note 8.2.

Part	Test Method	Description of change
	Q106	<ul style="list-style-type: none"> Remove 2nd paragraph from Section 2. Remove Sub-section 5.3 for air-drying of specimens. Remove requirement to report air-drying from Section 7. Remove Note 8.7 containing definition of drying to constant mass. This definition is now in the Introduction Table 1.
	Q109	WITHDRAWN
	Q109A	WITHDRAWN
	Q109B	WITHDRAWN
	Q113A	<ul style="list-style-type: none"> Replace references to standard AS 1152 with ISO 3310. Replace references to Test Method Q102A with AS 1289.2.1.1. Replace references to Test Method Q109 with AS 1289.3.5.1. Replace references to "apparent particle density" to "soil particle density". Allow the use of a mechanical compactor in clause 3.12.
	Q113B	<ul style="list-style-type: none"> Replace references to standard AS 1152 with ISO 3310. Replace references to Test Method Q102A with AS 1289.2.1.1. Replace references to Test Method Q109 with AS 1289.3.5.1. Replace references to "apparent particle density" to "soil particle density". Allow the use of a mechanical compactor in clause 3.12.
	Q113C	<ul style="list-style-type: none"> Replace references to standard AS 1152 with ISO 3310. Replace references to Test Method Q102A with AS 1289.2.1.1. Add Step 5.2.2 for the calculation of the target compaction moisture content. Replace optimum moisture content with target compaction moisture content in Step 5.2.6.
	Q114B	<ul style="list-style-type: none"> Remove Table 1 and include references to AS 1289.6.3.2 Figure 1 for example of apparatus and tolerances in Section 3. Replace references to Test Method Q102A with AS 1289.2.1.1.
	Q115	<ul style="list-style-type: none"> Replace references to standard AS 1152 with ISO 3310. Remove mixing and moulding apparatus from Section 3. Remove laboratory mix procedure from Section 5 and replace with a reference to new test method Q251A. Remove related notes and tables. Remove field mix procedure from Section 5 and replace with a reference to new test method Q251B. Remove related notes and tables. Replace reference to Q303A with Q070 in Step 5.3.2. Remove moulding procedure for laboratory mixed material from Section 6 and replace with a reference to new test method Q251A. Remove related notes and tables. Remove moulding procedure for field mixed material from Section 6 and replace with a reference to new test method Q251B. Remove related notes and tables. Add requirement to report ATIC registration number to Section 11.
	Q118	<ul style="list-style-type: none"> Replace references to standard AS 1152 with ISO 3310. Move the content of Note 8.5 to Step 6.2.
	Q120B	<ul style="list-style-type: none"> Replace references to standard AS 1152 with ISO 3310.
	Q122A	<ul style="list-style-type: none"> Replace references to standard AS 1152 with ISO 3310.
	Q122B	<ul style="list-style-type: none"> Replace references to standard AS 1152 with ISO 3310.

Part	Test Method	Description of change
	Q125D	<ul style="list-style-type: none"> Replace references to standard AS 1152 with ISO 3310. Replace references to Test Method Q102A with AS 1289.2.1.1. Remove Note 11.6 containing definition of drying to constant mass. This definition is now in the Introduction Table 1.
	Q129	<ul style="list-style-type: none"> Move part of Note 11.2 to clause 4.1.
	Q131B	<ul style="list-style-type: none"> Move the content of Note 10.5 to Step 7.18.
	Q133	<ul style="list-style-type: none"> Replace references to standard AS 1152 with ISO 3310. Replace references to Test Method Q102A with AS 1289.2.1.1. Correct reference to Test Method Q101B in Step 5.4.1. Update reference to available lime index to Test Method AS 4489.6.1 in Note 8.3.
	Q134	<ul style="list-style-type: none"> Replace references to Test Method Q102A with AS 1289.2.1.1. Add requirement to report ATIC registration number to Section 8.
	Q135A	<ul style="list-style-type: none"> Add requirement to obtain ATIC registration number to Section 4. Replace "overnight" in Step 6.2.3 b) with "at least 12 hours and not exceeding 72 hours". Add Note 7.11 to reference MRTS07A.
	Q135B	<ul style="list-style-type: none"> Remove soaked and unsoaked CBR testing from Table 1. Remove bitumen emulsion curing from Table 1. Add allowable working time testing to Table 1. Align curing times of bound and lightly bound material to the relevant specifications.
	Q135C	NEW METHOD
	Q136A	<ul style="list-style-type: none"> Replace "additive" with "stabilising agent". Replace references to standard AS 1152 with ISO 3310. Replace references to Test Method Q102A with AS 1289.2.1.1. Replace "design additive" with "target stabilising agent content" in Section 2. Move the content of Note 10.1 to Clause 4.2. Include standard test conditions in Sub-section 7.2. Include reference to Test method Q145A in Sub-section 7.2 for determining the target moisture content. Include reference to Test method Q135A in Sub-section 7.2 for determining the mass of additive/water and the mixing of the test portions. Add requirement to report ATIC registration number to Section 9.
	Q136B	<ul style="list-style-type: none"> Replace references to standard AS 1152 with ISO 3310 Replace references to Test Method Q102A with AS 1289.2.1.1. Amend times for storing in 40°C oven and 25°C environmental cabinet to align with Test Method Q135C in Step 9.3.2.
	Q137	<ul style="list-style-type: none"> Replace references to standard AS 1152 with ISO 3310. Replace references to Test Method Q102A with AS 1289.2.1.1. Replace references to Test Method Q109 with AS 1289.3.5.1. Replace references to "apparent particle density" to "soil particle density". Amend Step 5.1.6 to specify the use of a minimum curing time from Table 1. Add Table 1 with curing times for materials.
	Q138A	<ul style="list-style-type: none"> Renumber method from Q138 to Q138A.

Part	Test Method	Description of change
		<ul style="list-style-type: none"> • Remove references to GP cement or cement and replace with blended lime/flyash or lime/flyash. • Replace foaming agent with foaming additive throughout the method. • Remove references to field mixing material from Section 2. • Replace references to standard AS 1152 with ISO 3310. • Include apparatus requirements for the foamed bitumen plant in 3.1.1. • Include the use of a clamp ring for the compaction block in Section 3. • Amend oven temperature requirement in clause 3.1.3 from 180 to 100°C. • Include apparatus requirements for the mixer in 3.1.4. • Amend thickness of cylinder mould in Step 3.2.1 from 12.7 to 6.35 mm to align with ASTM D5581. • Add sub-section 3.3 to include apparatus for checking the foaming characteristics of bitumen • Include 9.5 mm sieve in Step 5.2 • Replace references to Test Method Q102A with AS 1289.2.1.1. • Remove sub-section 5.3 for field mixing samples. • Add reference to Austroads test method AG:PT/T301 to Note 8.9. • Replace "overnight" in Note 8.10 with "at least 12 hours and not exceeding 72 hours".
	Q138B	NEW METHOD
	Q139	<ul style="list-style-type: none"> • Replace references to standard AS 4115 with ISO 6789. • Remove curing apparatus from Section 4. • Remove Section 5. • Remove specific curing details from Section 6 and replace with references to new Test Method Q135C. • Add requirement for specimen condition and squareness of ends in Step 6.1.1. • Replace reference to Q303A with Q070 in Step 6.5.2. • Change layout of reporting requirements in Section 9. • Remove Note 10.2.
	Q140A	<ul style="list-style-type: none"> • Remove references to wet density ratio from Section 1. • Remove references to wet density ratio from Section 2. • Remove definition of relative compaction (wet density ratio) from Section 3. • Remove requirements for testing earthworks from Step 4.1.3. • Remove Subsection 5.2 containing calculations related to reference wet density. • Remove reporting requirements related to Test Method Q143C from Section 6. • Remove reporting requirements related to Test Method Q143C from Notes 7.2 and 7.3.
	Q141B	<ul style="list-style-type: none"> • Replace references to Test Method Q102A with AS 1289.2.1.1. • Replace references to Test Method Q102B with AS 1289.2.1.4. • Replace references to Test Method Q102D with AS 1289.2.1.6. • Replace references to Test Method Q010 with AS 1289.2.3.1. • Remove Section 5 containing definitions for fine-grained, medium-grained and coarse-grained soils. These definitions are in the Introduction to this manual.
	Q142A	<ul style="list-style-type: none"> • Replace references to standard AS 1152 with ISO 3310. • Replace references to Test Method Q102A with AS 1289.2.1.1. • Replace references to Test Method Q102B with AS 1289.2.1.4. • Replace references to Test Method Q102D with AS 1289.2.1.6. • Replace references to Test Method Q010 with AS 1289.2.3.1. • Replace references to Test Method Q109 with AS 1289.3.5.1.

Part	Test Method	Description of change
		<ul style="list-style-type: none"> Replace references to "apparent particle density" to "soil particle density". Amend Step 5.10 to clarify the time limits on compaction of test portions containing stabilising agents. Add requirement to report ATIC registration number to Section 7. Replace sender's number with sample number in Section 7. Amend Table 2 to allow the use of a Type B mould where there are small amounts of oversize retained on the 19.0 mm sieve. Move the content of Note 9.1 to Clause 3.2.
	Q142B	<ul style="list-style-type: none"> Replace references to standard AS 1152 with ISO 3310. Replace references to Test Method Q102A with AS 1289.2.1.1. Replace references to Test Method Q102B with AS 1289.2.1.4. Replace references to Test Method Q102D with AS 1289.2.1.6. Replace references to Test Method Q010 with AS 1289.2.3.1. Replace references to Test Method Q109 with AS 1289.3.5.1. Replace references to "apparent particle density" to "soil particle density". Amend Step 5.10 to clarify the time limits on compaction of test portions containing stabilising agents. Add requirement to report ATIC registration number to Section 7. Replace sender's number with sample number in Section 7. Amend Table 2 to allow the use of a Type B mould where there are small amounts of oversize retained on the 19.0 mm sieve. Move the content of Note 9.1 to Clause 3.2.
	Q142C	WITHDRAWN
	Q143	<ul style="list-style-type: none"> Remove reference to density and percentage of oversize on a wet basis from Section 1. Remove references to Test Method Q143C from Section 5. Remove calculations for density and percentage of oversize on a wet basis from Section 5. Remove requirement to report the condition of the oversize (wet or dry) from Section 6. Remove Note 7.1 containing definition of drying to constant mass. This definition is now in the Introduction Table 1. Remove Note 7.2. Remove references to Test Method Q143C from Note 7.3.
	Q144A	<ul style="list-style-type: none"> Replace sender's number with sample number in Section 6. Remove references to earthworks from Sections 2, and 5.
	Q145A	<ul style="list-style-type: none"> Replace references to Test Method Q102A with AS 1289.2.1.1. Replace references to Test Method Q109 with AS 1289.3.5.1. Replace references to "apparent particle density" to "soil particle density".
	Q146	<ul style="list-style-type: none"> Replace references to Test Method Q109 with AS 1289.3.5.1. Replace references to "apparent particle density" to "soil particle density". Move the content of Note 6.1 to Step 3.2.
	Q147B	<ul style="list-style-type: none"> Replace reference to Q303A with Q070 in Step 5.1.1. Remove Note 8.2 containing definition of drying to constant mass. This definition is now in the Introduction Table 1.
	Q148	<ul style="list-style-type: none"> Replace references to standard AS 1152 with ISO 3310. Replace references to Test Method Q102A with AS 1289.2.1.1. Replace references to Test Method Q109 with AS 1289.3.5.1. Replace references to "apparent particle density" to "soil particle density".

Part	Test Method	Description of change
		<ul style="list-style-type: none"> Amend Step 5.6 to specify the use of a minimum curing time from Table 1. Add Table 1 with curing times for materials.
	Q149	<ul style="list-style-type: none"> Replace references to Test Method Q102A with AS 1289.2.1.1.
	Q171	<ul style="list-style-type: none"> Remove requirements for moisture containers to have lids from Sections 3, 4 and 5. Replace the drying to constant mass definition in Step 4.16 with requirements from AS 1289.2.1.1. Include reference to table in reporting requirements in Section 6. Include Table 1 with rounding requirements for reported moisture content values.
	Q250	<ul style="list-style-type: none"> Replace references to Test Method Q102A with AS 1289.2.1.1. Replace references to Test Method Q102B with AS 1289.2.1.4. Replace references to Test Method Q102D with AS 1289.2.1.6. Replace references to Test Method Q010 with AS 1289.2.3.1.
	Q251A	NEW METHOD
	Q251B	NEW METHOD
	Q252	NEW METHOD
	Q253	NEW METHOD
6	Q171	<ul style="list-style-type: none"> Remove requirement for containers with lids from clause 3.6. Remove references to lids from Step 4.10 to 4.14 and Step 5.1. Change the process for drying samples to constant mass in Step 4.16 to align with AS 1289.2.1.1. Add reference to Table 1 to clause 6.1. Replace "must" with "should" in Notes 7.1. Replace "shall" with "should" in Notes 7.4. Move the content of Note 7.7 to Step 4.16. Add table 1 with reporting requirements for moisture content.
	Q172	<ul style="list-style-type: none"> Replace "shall" with "should" in Note 8.1.
	Q181A	WITHDRAWN
	Q181C	<ul style="list-style-type: none"> Replace references to standard AS 1152 with ISO 3310. Replace references to Test Method Q102A with AS 1289.2.1.1. Replace references to Test Method Q142A with AS 1289.5.1.1.
	Q188	<ul style="list-style-type: none"> Move the content of Note 8.1 to Step 5.5.1.
7	Q201	<ul style="list-style-type: none"> Replace references to standard AS 1152 with ISO 3310. Remove references to Q103B. Remove references to cover aggregate from Sections 1 and 2. Replace reference to Test Method Q103B with AS 1141.11.1 in Step 5.1.1. Remove 19.0 – 16.0 mm and 16.0 to 13.2 mm fractions and associated Note from Table 1. Remove Note 8.1 containing definition of drying to constant mass. This definition is now in the Introduction Table 1.
	Q202	<ul style="list-style-type: none"> Method amended to directly reference an Australian Standard Test Method.
	Q203	<ul style="list-style-type: none"> Replace references to standard AS 1152 with ISO 3310. Replace Test Method "BS 903: Part A8 with BS ISO 4662 in Table 2 Notes.

Part	Test Method	Description of change
		<ul style="list-style-type: none"> Replace Test Method "BS 903: Part A26 with BS ISO 48 in Table 2 Notes.
	Q205A	<ul style="list-style-type: none"> Method amended to directly reference an Australian Standard Test Method.
	Q205B	<ul style="list-style-type: none"> Method amended to directly reference an Australian Standard Test Method.
	Q205C	<ul style="list-style-type: none"> Method amended to directly reference an Australian Standard Test Method.
	Q208A	WITHDRAWN
	Q208B	<ul style="list-style-type: none"> Replace references to standard AS 1152 with ISO 3310. Remove Note 10.7 containing definition of drying to constant mass. This definition is now in the Introduction Table 1.
	Q211	<ul style="list-style-type: none"> Replace references to standard AS 1152 with ISO 3310. Replace Test Method Q214 with AS 1141.6.1 in Section 1. Remove Note 10.2 containing definition of drying to constant mass. This definition is now in the Introduction Table 1.
	Q212A	WITHDRAWN
	Q212B	<ul style="list-style-type: none"> Include temperature tolerance for oven in Section 3. Include temperature tolerance for water bath in Section 3. Move Note 9.2 to Clause 4.1.
	Q214	WITHDRAWN
	Q214A	<ul style="list-style-type: none"> Method amended to directly reference an Australian Standard Test Method.
	Q214B	<ul style="list-style-type: none"> Method amended to directly reference an Australian Standard Test Method.
	Q215	<ul style="list-style-type: none"> Method amended to directly reference an Australian Standard Test Method.
	Q217	<ul style="list-style-type: none"> Method amended to directly reference an Australian Standard Test Method.
	Q221A	WITHDRAWN
	Q221B	WITHDRAWN
	Q224A	WITHDRAWN
	Q224B	WITHDRAWN
	Q225	WITHDRAWN
	Q226	WITHDRAWN
	Q227	WITHDRAWN
	Q228	<ul style="list-style-type: none"> Replace references to standard AS 1152 with ISO 3310. Remove Note 9.3 containing definition of drying to constant mass. This definition is now in the Introduction Table 1.
	Q229A	<ul style="list-style-type: none"> Replace references to standard AS 1152 with ISO 3310. Remove Note 9.3 containing definition of drying to constant mass. This definition is now in the Introduction Table 1.
	Q229B	<ul style="list-style-type: none"> Replace references to standard AS 1152 with ISO 3310.

Part	Test Method	Description of change
		<ul style="list-style-type: none"> Remove Note 9.2 containing definition of drying to constant mass. This definition is now in the Introduction Table 1.
	Q230	<ul style="list-style-type: none"> Replace references to standard AS 1152 with ISO 3310. Include reference to ASTM 5519 Figure 1 for example of apparatus in clauses 4.3 and 4.9.
8	Q301	WITHDRAWN
	Q302A	WITHDRAWN
	Q302B	WITHDRAWN
	Q303A	<ul style="list-style-type: none"> Remove masonry saw from Section 3. Remove sub-section 4.2 for trimming specimens using a masonry saw. Amend Step 4.4 to allow either air-drying or vacuum drying using Test Method Q324. Move the first sentence of Note 5.1 to Step 4.4. Move the second sentence of Note 5.1 to Section 3. Remove notes related to the use of a masonry saw from Section 5.
	Q304A	<ul style="list-style-type: none"> Replace reference to withdrawn Test method Q302B with AS 2891.1.2 in Step 5.1. Amend Step 5.1 to allow either air-drying or vacuum drying using Test Method Q324.
	Q305	<ul style="list-style-type: none"> Replace reference to withdrawn Test method Q301 with AS 2891.1.1 in Step 5.6. Move the contents of Note 8.2 to Section 3.
	Q306A	WITHDRAWN
	Q306C	<ul style="list-style-type: none"> Amend Step 5.1.1 to allow sample preparation by either Test Methods Q303A or AS 2891.1.2. Amend Step 5.1.2 to allow either air-drying or vacuum drying using Test Method Q324. Replace reference to withdrawn Test method Q302A with AS 2891.1.2 in Note 8.2. Move the contents of Note 8.3 to Section 3. Replace "0.54°C" with "0.54C" in Note 8.5.
	Q308A	<ul style="list-style-type: none"> Replace references to standard AS 1152 with ISO 3310. Insert missing "±" symbol in Step 5.9.4. Replace reference to withdrawn Test method Q301 with AS 2891.1.1 in Step 5.3. Move the contents of Note 10.4 to Steps 6.2.1 and 6.3.1. Move the contents of Note 10.9 to Subsection 7.2. Move the contents of Note 10.10 to Subsection 7.1. Move the contents of Note 10.11 to Step 7.3.7.
	Q308C	<ul style="list-style-type: none"> Replace references to standard AS 1152 with ISO 3310. Replace reference to withdrawn Test method Q301 with AS 2891.1.1 in Step 5.2. Move the contents of Note 10.3 to Step 5.7. Move the contents of Note 10.5 to Steps 6.2.1 and 6.3.1. Move the contents of Note 10.7 to Subsection 7.2. Move the contents of Note 10.8 to Subsection 7.1. Move the contents of Note 10.9 to Step 7.3.7.
Q309	<ul style="list-style-type: none"> Replace references to standard AS 1152 with ISO 3310. Replace Test Method Q103B with AS 1141.11.1 in Steps 5.9, 5.11, 5.13 and 5.14. Replace reference to withdrawn Test method Q301 with AS 2891.1.1 in Step 7.17. Replace reference to withdrawn Test method Q313 with AG:PT/T236 in Step 7.22. 	

Part	Test Method	Description of change
		<ul style="list-style-type: none"> Move the contents of Note 9.7 to Step 7.11.
	Q310	<ul style="list-style-type: none"> Replace reference to withdrawn Test method Q301 with AS 2891.1.1 in Step 5.2. Amend Note 8.1 to more clearly define the test temperature requirements.
	Q311	<ul style="list-style-type: none"> Remove reference to withdrawn Test method Q306A in Step 3.1. Amend Note 6.3 to include an adjustment to the water absorption for the proportion of added filler. Delete reference to Test Method Q214 in Note 6.3.
	Q312	<ul style="list-style-type: none"> Replace references to standard AS 1152 with ISO 3310.
	Q313	WITHDRAWN
	Q314	<ul style="list-style-type: none"> Remove reference to withdrawn Test method Q306A in Step 3.1.
	Q315	<ul style="list-style-type: none"> Replace reference to withdrawn Test method Q301 with AS 2891.1.1 in Step 5.1.
	Q317	<ul style="list-style-type: none"> Replace Test Method Q214B with AS 1141.6.1 in Step 3.2. Replace Test Method Q214A with AS 1141.5 in Step 3.3. Replace "m" with "mm" in Step 4.2.
	Q318	<ul style="list-style-type: none"> Replace references to Test Method Q221B with AS 1141.4. Replace references to "compacted unit mass" to "compacted bulk density". Replace Test Method Q214B with AS 1141.6.1 in Step 3.2.
	Q319	<ul style="list-style-type: none"> Method amended to directly reference an Austroads Test Method.
	Q320	<ul style="list-style-type: none"> Method amended to directly reference an Austroads Test Method.
	Q321	<ul style="list-style-type: none"> Remove reference to withdrawn Test method Q306A in Step 3.4. Delete reference to Test Method Q214 in Notes 6.2 and 6.3.
	Q325	<ul style="list-style-type: none"> Amend Step 5.5.2 to allow sample preparation by either Test Methods Q303A or AS 1289.1.2.
9	Q358	<ul style="list-style-type: none"> Replace references to standard AS 1152 with ISO 3310.
	Q372	<ul style="list-style-type: none"> Replace reference to withdrawn Test method Q301 with AS 2891.1.1 in Step 5.2.1.
10	Q456	<ul style="list-style-type: none"> Move the contents of Note 10.6 to Section 3.
	Q470	<ul style="list-style-type: none"> Replace "overnight" in Step 4.2.4 and 4.2.6 with "at least 12 hours". Update references from AS 1012.13 to AS 1012.8.4 for sampling concrete, moulding and curing specimens in Section 4.1.
	Q476	WITHDRAWN
	Q477	<ul style="list-style-type: none"> Replace references to standard AS 1152 with ISO 3310.
11	Q601	WITHDRAWN
	Q604	<ul style="list-style-type: none"> Replace references to standard AS 2163 with ISO 4788.
	Q605	WITHDRAWN
	Q606	WITHDRAWN
	Q607	WITHDRAWN
	Q631	WITHDRAWN

Part	Test Method	Description of change
12	Q704	<ul style="list-style-type: none"> Replace references to standard AS 1152 with ISO 3310. Replace Test Method "BS 903: Part A8 with BS ISO 4662 in Table 2 Notes. Replace Test Method "BS 903: Part A26 with BS ISO 48 in Table 2 Notes.
	Q705	WITHDRAWN
	Q705B	<ul style="list-style-type: none"> Replace "shall" with "should" in Note 8.1.
	Q706	WITHDRAWN
	Q708B	<ul style="list-style-type: none"> Remove "shall" from Steps 5.1.1 c), 5.1.3 a), 5.1.3 b), 5.3.3 and 6.1. Remove "must" from Sub-section 5.2. Remove "shall" from Notes 9.3, 9.4, 9.5 and 9.6.
	Q708D	<ul style="list-style-type: none"> Remove "shall" from Step 4.5.
	Q711A	<ul style="list-style-type: none"> Replace references to Test Method Q221A with AS 1141.4. Replace references to "loose unit mass" to "uncompacted bulk density".
	Q720	<ul style="list-style-type: none"> Replace references to standard AS 1152 with ISO 3310.
	Q721	WITHDRAWN

Edition 4, Amendment 4 – December 2017

Part	Test Method	Description of change
1	Introduction	<ul style="list-style-type: none"> Add test method Q101E and Q136 to Table 2. Remove test methods Q116A, Q124 and Q181A from Table 2.
2	Q020	<ul style="list-style-type: none"> Add Table 2 with acceptance constants for MRTS04. Add Table 3 with acceptance constants for MRTS30.
3	Q060	<ul style="list-style-type: none"> Correct references to Notes in Steps 8.2.4 and 8.3.3.
4	Q101E	<ul style="list-style-type: none"> Remove publication date from Pavement Design Supplement in Note 10.4.
	Q104A	<ul style="list-style-type: none"> Add 0.425 mm sieve to apparatus. Add new Note 9.2 to clarify the mixing process.
	Q104D	<ul style="list-style-type: none"> Add 0.425 mm sieve to apparatus. Add new Note 8.1 to clarify the mixing process.
	Q113A	<ul style="list-style-type: none"> Replace Table 3 with curing times published in Q113B.
	Q115	<ul style="list-style-type: none"> Change nominal diameter of levelling plate from 104 to 140 mm. Amend Step 8.1 to clarify the requirements for capping specimens.
	Q116A	WITHDRAWN
	Q124	WITHDRAWN
	Q136	<ul style="list-style-type: none"> Renumber method from Q136 to Q136A Include compaction process from Q115 Section 6.3 November 2014 into Step 7.2.1. Replace maximum dry density and symbol (MDD) with achieved dry density and symbol (ADD) throughout the method.

Part	Test Method	Description of change
	Q136B	NEW METHOD
	Q140A	<ul style="list-style-type: none"> Remove Steps 5.1.5 and 5.2.6. Replace reference to Test Method Q136 with Q136A in Note 7.1
	Q143	<ul style="list-style-type: none"> Replace symbols for dry mass of oversize with symbols for wet mass of oversize in Step 5.1.
	Q145A	<ul style="list-style-type: none"> Correct references to Notes in Steps 6.4 and 6.5
5	Q172	<ul style="list-style-type: none"> Replace reference to withdrawn Test method Q173A with AS 1289.6.4.1 in Step 4.1
	Q181A	WITHDRAWN

Edition 4, Amendment 3 – September 2017

Part	Test Method	Description of change
1	Introduction	<ul style="list-style-type: none"> Replace Pavement Design Manual with Pavement Design Supplement in the list of departmental publications in Section 1. Add MRTS10 <i>Plant-mixed Lightly Bound Pavements</i> to the list of Transport and Main Roads Technical Specifications in sub-section 3.2. Table 2 containing equivalent methods revised.
2	Q020	<ul style="list-style-type: none"> Allow the use of results from Q306B and Q306C in the same lot by referencing Note 6.3 from Step 3.1. Add a note to Table 1 to allow linear interpolation of values. Change the rounding of the relative compaction for Test Method Q140A in Table 3 from 0.1 to 0.5%. Change the rounding of the stabilising agent content for Test Method Q314 in Table 3 from 0.01 to 0.1%. Change the description of the test in Table 3 from relative density (asphalt) to relative compaction.
3	Q050	<ul style="list-style-type: none"> Remove Section 5. Definitions for random sampling, stratified random sampling and systematic stratified random sampling are included in MRTS01 <i>Introduction to Technical Specifications</i>.
	Q060	<ul style="list-style-type: none"> Remove some definitions in Section 5. Definitions for lot and sub-lot are included in MRTS01 <i>Introduction to Technical Specifications</i>. Definitions for nominal size, sample and sampling location are included in the Introduction to this manual. Add new Section 11 for representative sampling from compacted or uncompacted layers of pavement or earthworks.
	Q061	<ul style="list-style-type: none"> Remove Section 4. Definition for lot is included in MRTS01 <i>Introduction to Technical Specifications</i>. Definitions for nominal size, sample and sampling location are included in the Introduction to this manual. Amend Step 5.3.4 to align with the requirements of <i>Nuclear Gauge Testing Manual</i> Test Method N01. Include Sub-section 5.4 for sampling for stabilisation testing. Add plant required for Sub-section 5.4 to Section 3.
	Q080	NEW METHOD
4	Q101E	<ul style="list-style-type: none"> Incorporate most requirements of Road and Maritime Services Test Methods T102 and T103 into method.
	Q103A	<ul style="list-style-type: none"> Add 0.212 mm sieve to apparatus to reflect changes in AS 1726.
	Q103C	<ul style="list-style-type: none"> Minor editorial changes. Add 0.212 mm sieve to apparatus to reflect changes in AS 1726.

Part	Test Method	Description of change
		<ul style="list-style-type: none"> • Add 0.425 mm sieve to apparatus to allow calculation of fines ratio. • Amend calculation in Step 6.1.5 b) by removing "1000" and "A". • Remove the graphing of effective depth against hydrometer reading from Step 6.1.6 a). • Remove the requirement to report hydrometer calibration data from Step 6.2.7 and replace with the determination of a linear regression relationship. • Include the recording of the elapsed time of hydrometer reading in minutes in Step 7.6.5 b). • Include calculations for sieve results and fines ratio in Section 8. • Include reporting of sieve results and fines ratio in Section 9. • Remove Note 10.7.
	Q109	<ul style="list-style-type: none"> • Amend Section 1 to remove reference to reporting interval. • Change the rounding of the apparent particle density in Section 6 from 0.001 to 0.01 t/m³.
	Q109A	<ul style="list-style-type: none"> • Amend Section 1 to remove reference to reporting interval. • Change the value for comparing duplicate tests in Step 6.2 from 0.020 to 0.02 t/m³. • Change the rounding of the apparent particle density (fine fraction) in Section 7 from 0.001 to 0.01 t/m³. • Change the water density values in Table 1 from four significant figures to three significant figures.
	Q109B	<ul style="list-style-type: none"> • Amend Section 1 to remove reference to reporting interval. • Change the value for comparing duplicate tests in Step 5.2 from 0.020 to 0.02 t/m³. • Change the rounding of the apparent particle density (coarse fraction) in Section 6 from 0.001 to 0.01 t/m³. • Change the water density values in Table 1 from four significant figures to three significant figures.
	Q113A	<ul style="list-style-type: none"> • Amend preparation requirements in Step 5.1.2 to discard material retained on 19.0 mm sieve and thoroughly remix the sieved material • Amend preparation requirements in Step 5.1.3 to include a reference to Test method Q101 Steps 6.2.4 to 6.2.6. • Add requirement to record the times for the commencement and completion of curing and a reference to Note 8.9 to Step 5.1.5. • Remove rounding of calculated values in Step 6.1.1. • Reference Test Method Q102A for rounding of moisture content values in Section 7. • Change the rounding of the compacted dry density in Section 7 from 0.001 to 0.01 t/m³. • Change the rounding of the optimum moisture content (OMC) in Section 7 to 0.5% for all moisture content values. • Include definition of CBR MDD for reporting in Step 7.1.4. • Include definition of CBR OMC for reporting in Step 7.1.5. • Add requirement to report the duration of curing and the method to determine plasticity in Section 7. • Include the use of visual/tactile assessment of plasticity to determine the curing period in Note 8.9. • Amend Table 4 to change reporting intervals for CBR values.
	Q113B	<ul style="list-style-type: none"> • Amend preparation requirements in Step 5.1.2 to discard material retained on 19.0 mm sieve and thoroughly remix the sieved material. • Amend preparation requirements in Step 5.1.3 to include a reference to Test Method Q101 Steps 6.2.4 to 6.2.6. • Add requirement to record the times for the commencement and completion of curing and a reference to Note 8.9 to Step 5.1.5. • Remove rounding of calculated values in Step 6.1.1. • Reference Test Method Q102A for rounding of moisture content values in Section 7. • Change the rounding of the compacted dry density in Section 7 from 0.001 to 0.01 t/m³.

Part	Test Method	Description of change
		<ul style="list-style-type: none"> • Change the rounding of the optimum moisture content (OMC) in Section 7 to 0.5% for all moisture content values. • Include definition of CBR MDD for reporting in Step 7.1.4 • Include definition of CBR OMC for reporting in Step 7.1.5 • Add requirement to report the duration of curing and the method to determine plasticity in Section 7 • Include the use of visual/tactile assessment of plasticity to determine the curing period in Note 8.9. • Amend Table 4 to change reporting intervals for CBR values.
4	Q113C	<ul style="list-style-type: none"> • Amend preparation requirements in Step 5.1.2 to discard material retained on 19.0 mm sieve and thoroughly remix the sieved material. • Amend preparation requirements in Step 5.1.3 to include a reference to Test Method Q101 Steps 6.2.4 to 6.2.6. • Add requirement to record the times for the commencement and completion of curing and a reference to Note 8.9 to Step 5.2.5. • Align Step 5.5.6 with reporting requirements, that is, final moisture contents are obtained and reported. • Change the value for comparing achieved and target compacted dry density in Step 6.2 from 0.020 to 0.02 t/m³. • Align Step 6.5 with reporting requirements, that is, swell is measured and reported. • Change the rounding of the target compacted dry density in Section 7 from 0.001 to 0.01 t/m³. • Change the rounding of the nominated relative compaction in Section 7 from 0.1 to 0.5%. • Reference Test Method Q102A for rounding of moisture content values in Section 7. • Add requirement to report the duration of curing and the method to determine plasticity in Section 7. • Include the use of visual/tactile assessment of plasticity to determine the curing period in Note 8.9. • Amend Table 4 to change reporting intervals for CBR values.
	Q114B	<ul style="list-style-type: none"> • Amend Table 2 to change reporting intervals for CBR values.
	Q115	<ul style="list-style-type: none"> • Amend preparation requirements in Step 5.1.2 to discard material retained on 19.0 mm sieve and thoroughly remix the sieved material. • Amend Step 5.1.3 to require a minimum of three UCS test portions to be prepared. • Add Notes 12.6 and 12.7 to provide guidance on preparing test specimens. • Replace Sub-section 6.2 with a reference to Test Method Q145A for the compaction of field mixed specimens. • Amend Step 8.1.1 to allow specimens with ends levelled using a surface plate to be tested uncapped. • Add Step 8.1.2 to not require the capping of the surface compacted against the mould baseplate. • Include the reporting of achieved compacted dry density and achieved compaction moisture content for field in Section 11 for field mixed materials.
	Q134	<ul style="list-style-type: none"> • Include a 4 hour time limit between mixing and completion of test in Section 2. • Add Sub-section 5.3 to check the minimum sample size and buffer solution volume will provide a temperature rise of at least 4°C.
	Q135B	<ul style="list-style-type: none"> • Amend Table 1 to allow 28 day curing for lightly bound cement/cementitious blended materials.

Part	Test Method	Description of change
	Q136	<ul style="list-style-type: none"> • Include a default target moisture content of OMC in Section 2. • Amend preparation requirements in Step 6.2 to discard material retained on 19.0 mm sieve and thoroughly remix the sieved material. • Amend Sub-section 8.1 to clarify the plotting of the working time v mean achieved maximum dry density and the use of the plot to determine the working time for MDD. • Amend Sub-section 8.2 to clarify the plotting of the working time v mean UCS and the use of the plot to determine the working time for UCS. • Correct reference in Step 7.3.1. • Change symbol in Step 7.2.1 f) from MRR to MDD.
4	Q137	<ul style="list-style-type: none"> • Include a definition of the gauge length for the extensometer in the Section 3. • Amend preparation requirements in Step 4.4 to include a reference to Test Method Q101 Steps 6.2.4 to 6.2.6. • Add Note 9.4 to allow the dimensions of the mould to be used in place of trying to measure fragile specimen dimensions.
	Q138	<ul style="list-style-type: none"> • Replace reference to 19.0 mm sieve with a 37.5 mm sieve in Section 2. • Include Interfoam as a suggested foaming additive in Section 4. • Amend preparation requirements in Step 5.2 to include a reference to Test Method Q101 Steps 6.2.4 to 6.2.6. • Modify the calculations in Step 6.1.5 to ensure the correct bitumen mass is used to calculate the mass of foaming agent required. • Amend Steps 7.1.2 to 7.1.6 to ensure the correct process is used to determine the mass of foaming agent required.
	Q139	<ul style="list-style-type: none"> • Include a reference to Test Method Q070 for obtaining cored specimen in Section 2. • Relax the tolerance on oven curing times from 2 hours to 4 hours in Subsections 6.1 to 6.4. • Provide additional detail to specimen setup in Subsection 7.1 and Note 10.3 • Amend the process for preconditioning and test setting determination to clarify the use of computer and software control in Subsection 7.4 and Notes 10.4 and 10.5. • Allow the reporting of testing where the preconditioning did not achieve a resilient strain within the specified range in Step 9.3.
	Q140A	<ul style="list-style-type: none"> • Include an option to calculate a maximum characteristic relative compaction for a lot in Step 5.1.6 and 5.2.7. • Include an option to calculate a minimum characteristic relative compaction for a lot in Step 5.1.7 and 5.2.8. • Add the calculation and reporting of adjusted moisture variation in Sections 5 and 6. • Change the rounding of the relative compaction in Section 6 from 0.1 to 0.5%. • Change the rounding of the adjusted laboratory reference dry or wet density in Section 6 from 0.001 to 0.01 t/m³. • Change the rounding of the maximum dry density or maximum converted wet density in Section 6 from 0.001 to 0.01 t/m³. • Change the rounding of the optimum moisture content or the estimated optimum moisture content in Section 6 from 0.1 to 0.5%. • Change the rounding of the density of the dry or wet oversize in Section 6 from 0.001 to 0.01 t/m³. • Change the rounding of the compacted dry or wet density in Section 6 from 0.001 to 0.01 t/m³. • Remove Table 1. • Include a reference to relevant technical specifications or annexure's as the source of working times for materials in Note 7.1 to replace Table 1.
	Q141B	<ul style="list-style-type: none"> • Amend Section 1 to include reference to maximum test-hole depth.

Part	Test Method	Description of change
		<ul style="list-style-type: none"> Amend the definition of depth limits in Step 6.1 and Table 1 from "maximum practical depth" to "maximum depth". Amend the maximum test-hole depth in Step 6.1 and Table 1 from 250 mm to 300 mm. Remove the rounding of calculated values from Steps 10.1 to 10.3. Change the rounding of the compacted dry or wet density in Section 11 from 0.001 to 0.01 t/m³.
	Q142A	<ul style="list-style-type: none"> Add requirement to record the times for the commencement and completion of curing to Steps 5.7.1, 5.7.2 and 5.7.3. Include curing times aligned with Q113C by adding a reference to Note 9.9, Note 9.10 and Table 3 to Step 5.7.1. Change the rounding of the standard maximum dry density in Section 7 from 0.001 to 0.01 t/m³. Change the rounding of the standard optimum moisture content in Section 7 from 0.1 to 0.5%. Remove "standard" from clauses 7.2 and 7.3. Include reporting of compactive effort (standard) used in Section 7. Add requirement to report the duration of curing and the method to determine plasticity in Section 7 for materials without stabilising agents. Amend Note 9.1 to allow the use of mechanical compaction provided it is comparable to manual compaction. Include the use of visual/tactile assessment of plasticity to determine the curing period in Note 9.9. Include a relaxation of curing times for compaction control testing in Note 9.10.
	Q142B	<ul style="list-style-type: none"> Add requirement to record the times for the commencement and completion of curing to Steps 5.7.1, 5.7.2 and 5.7.3. Include curing times aligned with Q113C by adding a reference to Note 9.9, Note 9.10 and Table 3 to Step 5.7.1. Change the rounding of the standard maximum dry density in Section 7 from 0.001 to 0.01 t/m³. Change the rounding of the standard optimum moisture content in Section 7 from 0.1 to 0.5%. Remove "modified" from clauses 7.2 and 7.3. Include reporting of compactive effort (standard) used in Section 7. Add requirement to report the duration of curing and the method to determine plasticity in Section 7 for materials without stabilising agents. Amend Note 9.1 to allow the use of mechanical compaction provided it is comparable to manual compaction. Include the use of visual/tactile assessment of plasticity to determine the curing period in Note 9.9. Include a relaxation of curing times for compaction control testing in Note 9.10.
	Q142C	<ul style="list-style-type: none"> Replace reference to Appendix C with Test Method Q101C in Step 5.6. Add calculation of moisture correction to Section 6. Add calculation and reporting of moisture variation to Sections 6 and 7. Change the rounding of the maximum converted wet density in Section 7 from 0.001 to 0.01 t/m³. Remove the reporting of the optimum added/removed moisture content in Section 7. Change the rounding of the estimated optimum moisture content in Section 7 from 0.1 to 0.5%. Include reporting of compactive effort (standard) used in Section 7. Amend Note 9.1 to allow the use of mechanical compaction provided it is comparable to manual compaction. Add Note 8.9 to define the range of application for moisture correction.
	Q143	<ul style="list-style-type: none"> Amend Step 5.1 to allow the use of the wet mass of oversize material when calculating the volume of oversize. Change the rounding of the density of the dry or wet oversize in Section 6 from 0.001 to 0.01 t/m³.

Part	Test Method	Description of change
	Q144A	<ul style="list-style-type: none"> Amend Subsection 3.1 to apply to sampling of quarry materials only. Add Subsection 3.2 for sampling of plant mixed materials other than foamed bitumen. Add Subsection 3.3 for sampling of plant mixed foamed bitumen. Add Step 5.5.2 for checking the assigned values for plant mixed materials other than foamed bitumen. Add Step 5.5.3 for checking the assigned values for plant mixed foamed bitumen. Change the rounding of the assigned maximum dry density in Section 6 from 0.001 to 0.01 t/m³. Change the rounding of the assigned optimum moisture content in Section 6 from 0.1 to 0.5%. Change the rounding of the assigned density of the dry or wet oversize in Section 6 from 0.001 to 0.01 t/m³. Remove "standard or modified" from clauses 6.1 and 6.2. Include requirement to report the sieve used to determine oversized material, that is, 19.0 or 37.5 mm. Include reporting of compactive effort (standard) used in Section 7
	Q145A	<ul style="list-style-type: none"> Include the scarification of layers to promote bonding and interlock in Step 6.5. Remove the rounding of calculated values from Steps 7.1 to 7.4. Change the rounding of the target compacted dry density in Section 8 from 0.001 to 0.01 t/m³. Change the rounding of the nominated relative compaction in Section 8 from 0.1 to 0.5%. Change the rounding of the achieved compacted dry density in Section 8 from 0.001 to 0.01 t/m³. Change the rounding of the achieved relative compaction in Section 8 from 0.1 to 0.5%.
	Q146	<ul style="list-style-type: none"> Change the rounding of the compacted dry density in Section 5 from 0.001 to 0.01 t/m³. Change the rounding of the apparent particle density in Section 5 from 0.001 to 0.01 t/m³.
	Q147B	<ul style="list-style-type: none"> Change the rounding of the compacted density in Section 7 from 0.001 to 0.01 t/m³. Change the water density values in Table 1 from 4 significant figures to three significant figures.
	Q148	<ul style="list-style-type: none"> Amend preparation requirements in Step 4.4 to include a reference to Test method Q101 Steps 6.2.4 to 6.2.6.
5	Q181C	<ul style="list-style-type: none"> Amend placement conditions in Table 2.
	Q190	WITHDRAWN
6	Q201	<ul style="list-style-type: none"> Change reference to Q103A in Step 5.2.3 a) from Step 6.2 to 6.1.
	Q214	<ul style="list-style-type: none"> Change the rounding of the apparent particle density in Section 7 from 0.001 to 0.01 t/m³. Change the rounding of the particle density on a dry basis in Section 7 from 0.001 to 0.01 t/m³. Change the rounding of the particle density on a saturated surface-dry basis in Section 7 from 0.001 to 0.01 t/m³. Change the rounding of the water absorption in Section 7 from 0.01 to 0.1%.
	Q214A	<ul style="list-style-type: none"> Change the rounding of the apparent particle density (fine fraction) in Section 7 from 0.001 to 0.01 t/m³. Change the rounding of the particle density on a dry basis (fine fraction) in Section 7 from 0.001 to 0.01 t/m³. Change the rounding of the particle density on a saturated surface-dry basis (fine fraction) in Section 7 from 0.001 to 0.01 t/m³. Change the rounding of the water absorption (fine fraction) in Section 7 from 0.01 to 0.1%. Change the water density values in Table 2 from four significant figures to three significant figures.
	Q214B	<ul style="list-style-type: none"> Change the rounding of the apparent particle density (coarse fraction) in Section 6 from 0.001 to 0.01 t/m³.

Part	Test Method	Description of change
		<ul style="list-style-type: none"> Change the rounding of the particle density on a dry basis (coarse fraction) in Section 6 from 0.001 to 0.01 t/m³. Change the rounding of the particle density on a saturated surface-dry basis (coarse fraction) in Section 6 from 0.001 to 0.01 t/m³. Change the rounding of the water absorption (coarse fraction) in Section 6 from 0.01 to 0.1%. Change the water density values in Table 1 from four significant figures to three significant figures.
7	Q304B	<ul style="list-style-type: none"> Minor editorial changes. Add new Step 5.17 and remove Note 8.3 to replace the assumed permeability value for low permeability or impermeable specimens and require testing of replacement specimens with lower compaction.
	Q306B	<ul style="list-style-type: none"> Permit the testing of prepared production mix without drying by adding an exception to the method.
	Q306C	<ul style="list-style-type: none"> Amend Step 5.1.6 to refer to mass of silicone in Table 1 as a guide to the mass of sealant required. Amend the title for Table 1 to reflect the change in Step 5.1.6.
	Q306D	<ul style="list-style-type: none"> Minor editorial change to method
	Q307A	<ul style="list-style-type: none"> Permit the use of a larger pycnometer for mixes with a nominal size of 20 mm or greater.
	Q308A	<ul style="list-style-type: none"> Method directly referencing an Australian Standard Test Method, replaced by a full text Test Method. Include an oven in the apparatus in Section 3. Include Step 5.2 for warming the asphalt using an oven. Include a reference to Note 10.6 in Step 5.9.4 which clarifies the process for heating binders where fumes are not evident.
	Q308D	<ul style="list-style-type: none"> Permit the use of ignition furnaces with for example, infrared heating, to be used at lower operating temperatures.
	Q317	<ul style="list-style-type: none"> Method directly referencing either an Australian Standard or Austroads Test Method, replaced by a full text Test Method.
11	Q708B	<ul style="list-style-type: none"> Include reference to Austroads Test Method in Section 1. Remove redundant references from Sections 1. Align definitions in Section 3 with definitions in the Austroads Test Method AG:AM/T001. Include apparatus for calibration of laser displacement transducers in Clause 4.3. Include validation of the system for distance measurement using Austroads Test Method AG:AM/T005 in Subsection 5.2. Include validation of the system for roughness measurement using Austroads Test Method AG:AM/T003 in Subsection 5.2, except that the Roads and Maritime Services loop in New South Wales must be used. Replace Subsection 5.3 for equipment validation with a Subsection for Pre-test checks. Include the requirement to check demountable equipment each time it is fitted to a vehicle. Change the method of measurement from the half-car model to quarter-car model to align the method with the Austroads Test Method AG:AM/T001. The changes have been made to Sections 2, 3, 7 and 8. Include a requirement to ensure sudden braking or acceleration of the vehicle is avoided in Step 6.6.3. Change the relationship for converting the IRI results to NAASRA results from half-car model to quarter-car model in Section 7.
	Q708C	<ul style="list-style-type: none"> Include reference to Austroads Test Method in Section 1.

Part	Test Method	Description of change
		<ul style="list-style-type: none"> Remove redundant references from Sections 1. Align definitions in Section 3 with definitions in the Austroads Test Method AG:AM/T001. Change the method of measurement from the half-car model to quarter-car model to align the method with the Austroads Test Method AG:AM/T001. The changes have been made to Sections 2, 3, 6 and 7. Change the relationship for converting the IRI results to NAASRA results from half-car model to quarter-car model in Section 6. Amend Section 7 to no longer require the reporting of NAASRA results.
	Q708D	<ul style="list-style-type: none"> Include reference to Austroads Test Method in Section 1. Remove redundant references from Sections 1. Align definitions in Section 3 with definitions in the Austroads Test Method AG:AM/T001. Change the method of measurement from the half-car model to quarter-car model to align the method with the Austroads Test Method AG:AM/T001. The changes have been made to Sections 2, 3, 6 and 7. Change the relationship for converting the IRI results to NAASRA results from half-car model to quarter-car model in Section 6. Amend Section 7 to no longer require the reporting of NAASRA results.
	Q721	NEW METHOD

Edition 4, Amendment 2 – December 2016

Part	Test Method	Description of change
1	Introduction	<ul style="list-style-type: none"> Add definitions for bulk sample, nominal size, sample, sample increment, sampling location, size fraction, sub-sample, test location and test portion to Table 1. Add references for MRTS06 <i>Reinforced Soil Structures</i>, MRTS09 <i>Plant-mixed Pavement Layers Stabilised using Foamed Bitumen</i> and MRTS35 <i>Recycled Materials for Pavements</i> to Section 3.
4	Q138	<ul style="list-style-type: none"> Amend apparatus requirements to align with new Austroads Test Method. The mould and compaction hammer requirements now comply with the requirements of ASTM D5581 in Section 3.2, Note 8.2 and Table 1. Increase the maximum particle size from 19.0 mm to 37.5 mm in Clause 3.4 and Section 5. Allow the use of a Type A mould for determining the maximum dry density and optimum moisture content in Step 5.1.5. Add Note 8.6 to explain part of the mixing water calculation in Step 6.1.3. Amend Note 8.7 to include comment on monitoring and adjusting the binder loss factor. Amend the suggested compaction portion size in Note 8.11.
	Q139	<ul style="list-style-type: none"> Editorial changes to ensure consistency of terminology. Amend the scope to include a reference to plant mixed foamed bitumen. Include requirements for preparing samples to be used for plant mixed foamed bitumen stabilisation in Subsection 6.2. Remove optionality for testing of three day cured modulus in Step 6.3.1. Include requirements for testing field mixed samples obtained from plant mixed foamed bitumen stabilisation in Subsection 6.4. Include reference to three, seven and fourteen day modulus and retained modulus testing in Sections 8 and 9. Include plant mixed reporting requirements to Section 9.

Part	Test Method	Description of change
		<ul style="list-style-type: none"> • Include requirement to report if the field mixed material is sampled from an in situ mixed or plant mixed in Section 9. • Include requirement to report if the laboratory mixed material is to be used as an in situ mixed or plant mixed material in Section 9.
	Q250	NEW METHOD

Edition 4, Amendment 1 – March 2016

Part	Test Method	Description of change
All		<ul style="list-style-type: none"> • Use standard definitions from Transport and Main Roads Technical Specifications and <i>Materials Testing Manual</i>. • Minor editorial changes to documents. • All Test Methods updated with new Corporate logo header. Blue line in each footer removed.
1	Introduction	<ul style="list-style-type: none"> • Include standard definitions in Section 3 and Table 1. • Table 2 containing equivalent methods revised.
2	Q020	<ul style="list-style-type: none"> • For concrete Test Method Q482 add new Table 2 for k values and add rounding requirements to Table 3. • Add Test Method Q311 to Note 6.1, Table 1 and Table 3. • Amend Sections 2, 3 and 6 to state that Test Methods used in determining the properties of a lot must be the same. • Change the description of the test in Table 3 from relative dry density to relative compaction.
3	Q050	<ul style="list-style-type: none"> • Correct reference to note in Step 9.1.1.
	Q070	<ul style="list-style-type: none"> • NEW METHOD
4	Q101	<ul style="list-style-type: none"> • Add a 9.50 mm sieve to Section 3. • Replace 4.75 mm sieve with 9.50 mm sieve in Step 6.2.3.
	Q102A	<ul style="list-style-type: none"> • Amend Section 1, 3 and 5 to remove requirement for close fitting lids for coarse and medium-grained materials. • Amend Section 6 and add Table 2 to change reporting intervals.
	Q102B	<ul style="list-style-type: none"> • Amend Section 1, 3 and 5 to remove requirement for close fitting lids for coarse and medium-grained materials. • Amend Section 6 and add Table 2 to change reporting intervals.
	Q102D	<ul style="list-style-type: none"> • Amend Section 1, 3 and 5 to remove requirement for close fitting lids for coarse and medium-grained materials. • Amend Section 6 and add Table 2 to change reporting intervals.
	Q103A	<ul style="list-style-type: none"> • Add calculation and reporting of grading coefficient. • Add 2.00 mm sieve to apparatus. • Add fines ratio, Cu, Cc and grading coefficient to scope. • Add Note 9.1 with reference for grading coefficient.
	Q103F	<ul style="list-style-type: none"> • NEW METHOD
	Q104D	<ul style="list-style-type: none"> • Amend source statement to remove reference to Table 1.
	Q105	<ul style="list-style-type: none"> • Amend Step 4.1 to select oven drying procedure for low plasticity materials. • Amend Step 4.2 to select air drying procedure for medium and high plasticity materials.

Part	Test Method	Description of change
		<ul style="list-style-type: none"> • Include Table 2 with definitions of low, medium and high plasticity materials.
	Q106	<ul style="list-style-type: none"> • Add Note 8.3. • Remove Note 8.5. • Amend Step 5.1.5 to select oven drying procedure for low plasticity materials. • Amend Step 5.1.6 to select air drying procedure for medium and high plasticity materials. • Amend Steps 5.4.1 c) and 5.4.2 c) to require the scalpel to be used to mark the length of the bar. • Include Table 2 with definitions of low, medium and high plasticity materials.
	Q113A	<ul style="list-style-type: none"> • Amend Step 5.1.5 to specify the use of a minimum curing time from Table 3. This aligns the methods with the latest Australian Standard method. • Remove Note 8.9. • Process for removing water and draining the specimen in Steps 5.4.5 to 5.4.6 has been amended.
	Q113B	<ul style="list-style-type: none"> • Amend Step 5.1.5 to specify the use of a minimum curing time from Table 3. This aligns the methods with the latest Australian Standard method. • Remove Note 8.9. • Process for removing water and draining the specimen in Steps 5.4.5 to 5.4.6 has been amended.
	Q113C	<ul style="list-style-type: none"> • Amend Step 5.1.5 and 5.2.5 to specify the use of a minimum curing time from Table 3. This aligns the methods with the latest Australian Standard method. • Remove Note 8.9. • Process for removing water and draining the specimen in Steps 5.4.5 to 5.4.6 has been amended. • Correct material height gauge dimensions in Note 8.4.2.
	Q115	<ul style="list-style-type: none"> • Change reference to coring method in Step 5.3.1 from Q302A to Q070. • Remove reference to scarifying layers from Step 6.2.5. • Correct references to Notes throughout method.
	Q131B	<ul style="list-style-type: none"> • Remove Step 6.8
	Q135A	<ul style="list-style-type: none"> • Correct references to Notes throughout method. • Add compaction apparatus to Section 3. • Add Table 1 and Note 7.2 for compaction apparatus. • Amend conditioning processes in Section 6 to be specific for lime (2 day mixing process) and other dry additives such as cement, blended cements, lime/flyash and so on.
	Q135B	<ul style="list-style-type: none"> • Correct references to Notes throughout method. • Add requirements for placing soaking weights on CBR specimens during air curing and immersed water curing to Step 4.2.1.
	Q136	<ul style="list-style-type: none"> • Replace nominated working time limit with allowable working time throughout the method. • Include definition for allowable working time from Test Method Q140A. • Include missing symbol in Step 7.2.1 f).
	Q137	<ul style="list-style-type: none"> • Replace various terms such as unbound pavement material with unbound material throughout the method. • Amend Step 5.5 to change the degree of saturation limit from greater than 2.0% to greater than 4.0%. • Remove the requirement to sample a moisture content after testing in Step 6.2.4.
	Q138	<ul style="list-style-type: none"> • Replace 30-60 minute delay period in the foaming and mixing process in Subsection 7.2 with 45 minute conditioning period. This aligns the process and terminology with Test Method Q135A. • Add requirement for C170 bitumen to be free of cutter, flux and other additives. • Amend apparatus definition for an extrusion jack in Clause 3.2.4.

Part	Test Method	Description of change
	Q139	<ul style="list-style-type: none"> Change reference to coring method in Step 6.3.1 from Q302A to Q070.
	Q140A	<ul style="list-style-type: none"> Use standard definitions for materials in Step 4.1.3 from the Introduction to this manual and Transport and Main Roads Technical Specifications.
	Q141B	<ul style="list-style-type: none"> Add crushed rock and stabilised materials to the scope of the method. Amend particle size criteria and test hole depths in Table 1.
	Q142A	<ul style="list-style-type: none"> Replace a reference to a 19.0 mm sieve in the scope to a 37.5 mm sieve.
	Q142B	<ul style="list-style-type: none"> Replace a reference to a 19.0 mm sieve in the scope to a 37.5 mm sieve.
	Q142C	<ul style="list-style-type: none"> Replace a reference to a 19.0 mm sieve in the scope to a 37.5 mm sieve.
	Q144A	<ul style="list-style-type: none"> Use standard definitions for materials in the Scope and Sections 3 and 5 from the Introduction to this manual and Transport and Main Roads Technical Specifications.
	Q146	<ul style="list-style-type: none"> Use standard definitions for materials in the Scope, Section 3 and Notes from the Introduction to this manual and Transport and Main Roads Technical Specifications.
6	Q201	<ul style="list-style-type: none"> Amend method to allow the use of fractions obtained from particle size distribution method AS 1141.11.1. Correct reference to Q103A in Step 5.2.3.
	Q214	NEW METHOD
	Q229A	<ul style="list-style-type: none"> Remove requirement for constant temperature environment in Section 3 and Step 6.3. Amend Step 6.3 to require storing of test portion and water in the abrasion jar in a room at $23^{\circ}\text{C} \pm 3^{\circ}\text{C}$ before testing.
	Q229B	<ul style="list-style-type: none"> Remove requirement for constant temperature environment in Section 3 and Step 6.3. Amend Step 6.3 to require storing of test portion and water in the abrasion jar in a room at $23^{\circ}\text{C} \pm 3^{\circ}\text{C}$ before testing.
	Q230	<ul style="list-style-type: none"> NEW METHOD
7	Q301	<ul style="list-style-type: none"> Method amended to directly reference an Australian Standard Test Method.
	Q302A	<ul style="list-style-type: none"> Method amended to directly reference an Australian Standard Test Method.
	Q302B	<ul style="list-style-type: none"> Method amended to directly reference an Australian Standard Test Method.
	Q303A	<ul style="list-style-type: none"> Amend Note 5.1 to clarify the requirements for air drying of core samples.
	Q305	<ul style="list-style-type: none"> Remove reference to hammer face from hotplate requirement in Clause 3.9. Remove reference to hammer face from Step 5.4. Amend Steps 5.11 and 5.13 to remove requirement for 50 hammer blows and replace with reference to a specified number of blows. Amend Steps 6.4, 6.5 and Note 9.14 to require the immersion of breaking head segments in water where practicable. Add requirement to report number of blows applied to each face of the test specimens to Section 8. Amend Note 9.10 to require the application of 50 blows to the face of each specimen if a number is not specified.
	Q306A	<ul style="list-style-type: none"> Clarify the use of air drying in Step 5.1.2 and Note 8.2. Amend rounding of known density of paraffin wax to 0.001 t/m^3 in Clause 4.1.
	Q306B	<ul style="list-style-type: none"> Method amended to directly reference an Australian Standard Test Method.
	Q306C	<ul style="list-style-type: none"> Clarify the use of air drying in Step 5.1.2 and Note 8.2. Amend rounding of known density of paraffin wax to 0.001 t/m^3 in Clause 4.1.

Part	Test Method	Description of change
	Q306D	<ul style="list-style-type: none"> Method amended to directly reference an Australian Standard Test Method.
	Q307A	<ul style="list-style-type: none"> Method amended to directly reference an Australian Standard Test Method.
	Q308A	<ul style="list-style-type: none"> Method amended to directly reference an Australian Standard Test Method.
	Q308D	<ul style="list-style-type: none"> Method amended to directly reference an Austroads Test Method.
	Q311	<ul style="list-style-type: none"> Add Test Method Q306D and Q306E to Step 3.1. Include calculation and reporting of minimum and maximum characteristic percentage by volume of air voids in Sections 4 and 5. Amend the binder absorption calculations in Note 6.3.
	Q315	<ul style="list-style-type: none"> Amend Clause 3.1 to allow the sampling of both laboratory mix or plant produced mix. Allow compacted density to be determined using Test Method Q306B by amending Step 5.6 and adding Note 8.1. Amend the calculation in Step 6.2 to calculate a tensile strength in kPa. Amend Step 6.3 to round the average tensile strength to the nearest 10 kPa. Change the average tensile strength units to units to kPa in Step 6.4. Amend the rounding of reported results in Step 7.3 and 7.4. Amend Section 7 to allow the reporting of tensile strength in kPa.
	Q317	<ul style="list-style-type: none"> Method amended to directly reference an Australian Standard or Austroads Test Method.
	Q320	<ul style="list-style-type: none"> Amend 3.1.2 to align the requirements of the wheel tracker table with the current Austroads method.
	Q321	<ul style="list-style-type: none"> Amend the binder absorption calculations in Note 6.2.
	Q322	<ul style="list-style-type: none"> Amend the apparatus specifications and working tolerances in Table 1.
	Q324	<ul style="list-style-type: none"> NEW METHOD
	Q325	<ul style="list-style-type: none"> NEW METHOD
9	Q456	<ul style="list-style-type: none"> Amend Note 10.5.
	Q473	<ul style="list-style-type: none"> Amend method to include testing of moulded specimens.
	Q477	<ul style="list-style-type: none"> Amend the foreign materials definitions in Table 2.
	Q482	<ul style="list-style-type: none"> NEW METHOD
	Q483	<ul style="list-style-type: none"> NEW METHOD
	Q484	<ul style="list-style-type: none"> NEW METHOD
	Q485	<ul style="list-style-type: none"> NEW METHOD
10	Q603	<ul style="list-style-type: none"> Amend Step 5.2.8 to align the mass of sample to provide a similar binder film thickness as the Australian Standard.
11	Q712	<ul style="list-style-type: none"> Amend the apparatus definition in Clause 3.1.

Edition 4 – November 2014

Part	Test Method	Description of change
All	All	<ul style="list-style-type: none"> Reissued with minor editorial, format and style changes. References to Test Method Q101 have been updated. Replace Material Safety Data Sheet (MSDS) with Safety Data Sheet (SDS).

Part	Test Method	Description of change
		<ul style="list-style-type: none"> Amend the definition of oven dry constant mass to "... is considered to have reached a constant mass when the difference between successive weighings, after a further 1 hour drying at 105-110°C, is not more than 1 percent of the total of the previous moisture losses" as appropriate. Amend the definition of oven dry constant mass to "... is considered to have reached a constant mass when the difference between successive weighings, after a further 4 hours drying at 45-50°C, is not more than 1 percent of the total of the previous moisture losses." as appropriate. Amend the definition of air dry constant mass to "... is considered to have reached a constant mass when the difference between successive weighings, after a further 24 hours air drying, is not more than 0.03 percent" as appropriate. Remove references to Test Methods Q102C and Q102E. Standard formats for Test Method titles have been applied.
1	Introduction	<ul style="list-style-type: none"> Tables containing equivalent methods revised.
2	Q020	<ul style="list-style-type: none"> NEW
3	Q050	<ul style="list-style-type: none"> Add recording and reporting requirements to method.
	Q060	<ul style="list-style-type: none"> Remove reference to "Farmers Friend Shovel" in Section 3. Add reporting requirements to method.
	Q061	<ul style="list-style-type: none"> Remove Figure 1. Add reporting requirements to method.
4	Q101	<ul style="list-style-type: none"> Method reviewed and rewritten. Remove Appendices 1 to 4. Include references to previously published methods Q101A, Q101B, Q101C, Q101D, Q101E and Q101F. Include contemporary equipment such as shredder and mulching style sample preparation machines. Include a section on pre-treatment. Include special preparation requirements for a non-standard material, Winton sandstone.
	Q101E	<ul style="list-style-type: none"> Amend to allow pre-treatment of materials other than Winton sandstone.
4	Q102C	<ul style="list-style-type: none"> WITHDRAWN
	Q102E	<ul style="list-style-type: none"> WITHDRAWN
	Q105	<ul style="list-style-type: none"> Source amended to allow subsampling of material at different moisture contents. Where testing is for compliance subsampling remains at a moisture content higher than the liquid limit. Otherwise subsampling may be undertaken when the material is plastic enough to be shaped into a ball. Steps 4.1 and 4.2 have been amended to reflect the change above.
	Q109A	<ul style="list-style-type: none"> Amended the requirements for a water bath in Section 3 to require it operate at a constant temperature within the within the range of 20 to 30°C to within $\pm 1.0^\circ\text{C}$. Amend the vacuum requirement in Step 5.8 and add Note 9.3 to assist consistent interpretation of this requirement. The density of water is determined using the temperature of the constant temperature environment. Remove requirements to measure the temperature of the contents of the bottle. Allow for the determination of the mass of bottle filled with water to be undertaken either after each determination of soil volume or at a regular interval.
	Q113A	<ul style="list-style-type: none"> Include a 19.0 mm and 9.50 mm sieve in Section 3. Amend Section 7 to separate mandatory from optional reporting requirements.
	Q113B	<ul style="list-style-type: none"> Include a 19.0 mm and 9.50 mm sieve in Section 3. Amend Section 7 to separate mandatory from optional reporting requirements.

Part	Test Method	Description of change
	Q113C	<ul style="list-style-type: none"> • Include a 19.0 mm and 9.50 mm sieve in Section 3.
	Q114B	<ul style="list-style-type: none"> • Amend Section 7 to remove reporting requirements already specified in sampling methods, NATA requirements or that are no longer required.
	Q115	<ul style="list-style-type: none"> • Amend Section 11 to remove reporting requirements already specified in sampling methods, NATA requirements or that are no longer required.
	Q117A	<ul style="list-style-type: none"> • WITHDRAWN
	Q121	<ul style="list-style-type: none"> • WITHDRAWN
	Q125A	<ul style="list-style-type: none"> • WITHDRAWN
	Q125B	<ul style="list-style-type: none"> • WITHDRAWN
	Q131A	<ul style="list-style-type: none"> • WITHDRAWN
	Q134	<ul style="list-style-type: none"> • The calculations for determining the relationship between stabilizing agent content and temperature rise have been included in Section 7. • The calculations of determining the calibration constants have been included in Section 7. The calculation of test data revised to allow for the use of a simpler format of the calibration relationship. • The reporting requirements in Section 8 have been amended to report the new calibration relationship determined in Section 7. • A requirement to check the temperature difference between the test portion and buffer solution has been added in Step 6.6 and Note 9.4 and 9.6. The allowable temperature difference is the same as the similar Australian Standard method. • Requirements for the test environment have been relaxed in Steps 5.1.4 and included in Notes 9.3 and 9.4. • Techniques for warming or cooling the test portion have been included in Note 9.6. • Amend Section 8 to remove reporting requirements already specified in sampling methods, NATA requirements or that are no longer required.
	Q136	<ul style="list-style-type: none"> • Insert Table 1 and remove references to Table 2.
4	Q137	<ul style="list-style-type: none"> • Amend Section 8 to remove reporting requirements already specified in sampling methods, NATA requirements or that are no longer required.
	Q138	<ul style="list-style-type: none"> • Replace references to 37.5 mm sieve with 19.0 mm sieve in Sections 2, 3 and 5. • Amend Step 5.1.5 to require the use of a Type A mould for compaction testing. • Add a moisture adjustment for dry stabilized agent in Step 6.1.3. • Change the calculation for foaming agent to a mass required rather than volume. • Amend the foaming process in Subsection 7.1. • Add a 30-60 minute delay or dwell period into the foaming and mixing process in Subsection 7.2.
	Q139	<ul style="list-style-type: none"> • Amend the vacuum requirement in Subsections 6.1 and 6.2 and add Note 10.2 to assist consistent interpretation of this requirement. • Amend the preparation requirements for laboratory, field and core samples in Section 6. • Add calculation and reporting of average modulus values in Sections 8 and 9. • Change reporting requirements in Section to reflect changes in Section 6, 8 and 9.
	Q140A	<ul style="list-style-type: none"> • Include the calculation of characteristic values of a lot by referencing Test Method Q020 in Section 5. • Include the reporting of characteristic values of a lot by referencing Test Method Q020 in Section 6. • Method amended to reflect a change in sampling for determination of oversize percentage and density. These samples are now taken from the material obtained for moisture density relationship testing (Q142A, Q142B or Q142C).

Part	Test Method	Description of change
	Q140B	<ul style="list-style-type: none"> WITHDRAWN
	Q141B	<ul style="list-style-type: none"> Amend Section 11 to remove reporting requirements already specified in sampling methods, NATA requirements or that are no longer required. Method amended to reflect a change in sampling for determination of oversize percentage and density. These samples are now taken from the material obtained for moisture density relationship testing (Q142A, Q142B or Q142C). Determination of oversize content in Subsection 9.5 and reporting of oversize percentage and density in Section 11 have been removed.
	Q142A	<ul style="list-style-type: none"> Some additional information required for reports has been removed from Section 7. Include reporting of sieve used to determine percentage oversize in Section 7. Method amended to reflect a change in sampling for determination of oversize percentage and density. These samples are now taken from the material obtained for moisture density relationship testing. Subsections 5.3 to 5.7 and Section 7 have been amended to allow for the determination and reporting of oversize percentage and density. Amend Step 5.7.2 to only prepare portions where the stabilizing agent is incorporated in the laboratory. Add Step 5.7.3 for portions prepared from samples where the stabilizing agent was incorporated insitu.
	Q142B	<ul style="list-style-type: none"> Some additional information required for reports has been removed from Section 7. Include reporting of sieve used to determine percentage oversize in Section 7. Method amended to reflect a change in sampling for determination of oversize percentage and density. These samples are now taken from the material obtained for moisture density relationship testing. Subsections 5.3 to 5.7 and Section 7 have been amended to allow for the determination and reporting of oversize percentage and density. Amend Step 5.7.2 to only prepare portions where the stabilizing agent is incorporated in the laboratory. Add Step 5.7.3 for portions prepared from samples where the stabilizing agent was incorporated insitu.
4	Q142C	<ul style="list-style-type: none"> Remove reference to ASTM 5080 from scope and calculations from Section 6. Some additional information required for reports has been removed from Section 7. Include reporting of sieve used to determine percentage oversize in Section 7. Method amended to reflect a change in sampling for determination of oversize percentage and density. These samples are now taken from the material obtained for moisture density relationship testing. Subsections 5.3 to 5.7 and Section 7 have been amended to allow for the determination and reporting of oversize percentage and density. Reporting requirements in 7.4 and 7.5 changed from mandatory to as required. References to field moisture content changed to insitu moisture content.
	Q142E	<ul style="list-style-type: none"> WITHDRAWN
	Q143	<ul style="list-style-type: none"> Include the definition for drying to constant mass in Note 7.1. The calculations of of oversize percentage and density in Section 5 have been amended to reflect changes in Test Methods Q142A, Q142B and Q142C.
	Q144A	<ul style="list-style-type: none"> Section 3 amended to clarify the requirements for obtaining samples of manufactured, insitu stabilized and unprocessed materials. Section 3 amended to include requirements for checking insitu stabilized and unprocessed materials. Some additional information required for reports has been removed from Section 6. The terminology for obtaining a new assigned value if the check infringes the criteria in Table 1 has been modified to align with the requirements in Test Method N01 Subsection 4.5.2.
	Q145A	<ul style="list-style-type: none"> Remove the use of subsidiary moisture content Test Methods from Section 6. Remove requirement to scarify compacted surface from Section 6.

Part	Test Method	Description of change
		<ul style="list-style-type: none"> Amend Section 8 to remove reporting requirements already specified in sampling methods, NATA requirements or that are no longer required.
	Q146	<ul style="list-style-type: none"> Include the calculation of characteristic values of a lot by referencing Test Method Q020 in Section 4. Include the reporting of characteristic values of a lot by referencing Test Method Q020 in Section 5. Amend Section 5 to remove reporting requirements already specified in sampling methods, NATA requirements or that are no longer required.
	Q147B	<ul style="list-style-type: none"> Amend the vacuum requirement in Step 5.1.3 and add Note 8.1 to assist consistent interpretation of this requirement. Update the process for drying the specimen to constant mass in Subsection 5.3.
	Q148	<ul style="list-style-type: none"> Amend Section 8 to remove reporting requirements already specified in sampling methods, NATA requirements or that are no longer required.
	Q149	<ul style="list-style-type: none"> Amend Section 6 to remove reporting requirements already specified in sampling methods, NATA requirements or that are no longer required.
5	Q152A	<ul style="list-style-type: none"> WITHDRAWN
	Q171	<ul style="list-style-type: none"> Amend Section 6 to remove reporting requirements already specified in sampling methods, NATA requirements or that are no longer required.
	Q172	<ul style="list-style-type: none"> Amend Section 7 to remove reporting requirements already specified in sampling methods, NATA requirements or that are no longer required.
	Q173A	<ul style="list-style-type: none"> WITHDRAWN
	Q177	<ul style="list-style-type: none"> WITHDRAWN
5	Q178	<ul style="list-style-type: none"> WITHDRAWN
	Q181B	<ul style="list-style-type: none"> WITHDRAWN
	Q181C	<ul style="list-style-type: none"> Include a 19.0 mm and 9.50 mm sieve in Section 3. The reporting requirements in Section 7 have been amended to report the moisture content at placement and after shearing to the nearest 0.1%. Some additional information required for reports has been removed.
	Q183	<ul style="list-style-type: none"> WITHDRAWN
	Q185	<ul style="list-style-type: none"> Method reviewed and rewritten.
6	Q201	<ul style="list-style-type: none"> Method amended to allow the use of particle size distribution methods Q103A and Q103B.
	Q203	<ul style="list-style-type: none"> Amend source to include change to slotted sieve and the use of UK reference aggregate. Remove figures 1 and 2 and replace with references to AS 1141.40 Figure 1 and AS 1141.42 Figure 1. Change specification for slotted sieve aperture to 7.2 mm in Section 3 and Table 1. Amend Section 4 and Note 8.1 to include the use UK reference aggregate and details of suppliers of both Panmure and UK reference aggregates. Amend the acceptance range for unpolished reference specimens to 65 to 80 for Panmure and 60 to 68 for UK in Step 5.2.7. Amend grit feed rate to 2.0 ± 0.5 g/min in Steps 5.3.2 b) and 5.4.5. Amend the minimum acceptable value for polished reference specimens to 48 for Panmure and 43 for UK in Step 5.6.8 and Notes 8.8 and 8.9. Amend the minimum acceptable value for sample mean value for polished reference specimens to 48 to 54 for Panmure and 43 to 49 for UK in Step 6.2.4 and Notes 8.8 and 8.11. Amend the calculation in Step 6.2.5 to allow the use of values of 51 for Panmure and 46 for UK reference aggregates.

Part	Test Method	Description of change
		<ul style="list-style-type: none"> • Include a requirement to report the source of reference aggregate used in Section 7. • Amend Section 7 to remove reporting requirements already specified in sampling methods, NATA requirements or that are no longer required.
	Q205A	<ul style="list-style-type: none"> • Remove Figure 1 and replace with reference to AS 1141.22 Figure 1.
	Q205B	<ul style="list-style-type: none"> • Remove Figure 1 and replace with reference to AS 1141.22 Figure 1.
	Q206	<ul style="list-style-type: none"> • WITHDRAWN
	Q208A	<ul style="list-style-type: none"> • Move the constant mass definition from Step 5.6.3 to Note 10.6.
	Q208B	<ul style="list-style-type: none"> • Move the constant mass definition from Step 5.2.5 to Note 10.6.
	Q209	<ul style="list-style-type: none"> • WITHDRAWN
	Q212B	<ul style="list-style-type: none"> • Method reviewed and rewritten.
	Q212C	<ul style="list-style-type: none"> • Method reviewed and rewritten.
	Q214A	<ul style="list-style-type: none"> • Amended the requirements for a water bath in Section 3 to require it operate at a constant temperature within the within the range of 20 to 30°C to within $\pm 1.0^{\circ}\text{C}$. • The density of water is determined using the temperature of the constant temperature environment. Remove requirements to measure the temperature of the contents of the flask. • Allow for the determination of the mass of the flask filled with water to be undertaken either after each determination of particle volume or at a regular interval.
	Q215	<ul style="list-style-type: none"> • Amend the scope to limit the tests to aggregates derived from rounded gravel.
	Q228	<ul style="list-style-type: none"> • NEW
6	Q229A	<ul style="list-style-type: none"> • NEW
	Q229B	<ul style="list-style-type: none"> • NEW
7	Q301	<ul style="list-style-type: none"> • Add recording and reporting requirements to method.
	Q302A	<ul style="list-style-type: none"> • Amend recording requirements. • Add reporting requirements to method.
	Q302B	<ul style="list-style-type: none"> • Amend recording requirements. • Add reporting requirements to method.
	Q307A	<ul style="list-style-type: none"> • Amend the vacuum requirement in Subsection 3, Step 6.12 and add Note 9.10 to assist consistent interpretation of this requirement.
	Q314	<ul style="list-style-type: none"> • Include the calculation of characteristic values of a lot by referencing Test Method Q020 in Section 4. • Include the reporting of characteristic values of a lot by referencing Test Method Q020 in Section 5.
	Q315	<ul style="list-style-type: none"> • Amend the vacuum requirement in Subsection 3 to assist consistent interpretation of this requirement.
	Q319	<ul style="list-style-type: none"> • Method reviewed and rewritten.
	Q320	<ul style="list-style-type: none"> • Method reviewed and rewritten.
	Q323	<ul style="list-style-type: none"> • NEW
9	Q457A	<ul style="list-style-type: none"> • WITHDRAWN. Method to be revised and reissued in 2015.
	Q457B	<ul style="list-style-type: none"> • Method reviewed and rewritten.
	Q458	<ul style="list-style-type: none"> • WITHDRAWN
	Q476	<ul style="list-style-type: none"> • Reissued with reference to new Australian standards.
11	Q704	<ul style="list-style-type: none"> • Some additional information required for reports has been removed from Section 7.

Part	Test Method	Description of change
	Q705B	<ul style="list-style-type: none"> Amend Section 6 to remove reporting requirements already specified in sampling methods, NATA requirements or that are no longer required.
	Q708A	<ul style="list-style-type: none"> WITHDRAWN
	Q720	<ul style="list-style-type: none"> Amend Section 6 to remove reporting requirements already specified in sampling methods, NATA requirements or that are no longer required.

Superseded