



Australian Government

MSL973009 Conduct field-based acceptance tests for construction materials

Release: 1

MSL973009 Conduct field-based acceptance tests for construction materials

Modification History

Release 1. Supersedes and is equivalent to MSL973009A Conduct field-based acceptance tests for construction materials

Application

This unit of competency covers the ability to conduct in situ tests to confirm the acceptability of raw or manufactured, construction materials prior to or after their use. Personnel are expected to be able to work independently and liaise with site personnel to ensure that testing is conducted safely and efficiently. They may transport samples and/or equipment to and from the site, as necessary, and prepare test pieces on-site for later laboratory testing.

This unit of competency is applicable to laboratory personnel working in the geotechnical and construction material testing industry sectors who conduct relatively quick and straightforward control and compliance tests using established test methods. These tests could involve aggregates, concrete, soils, road pavement or other specialised construction materials.

The unit could also be relevant to laboratory technicians working in the water/wastewater and trade waste industry sectors.

While no specific licensing or certification requirements apply to this unit at the time of publication, laboratory operations are governed by relevant legislation, regulations and/or external accreditation requirements. Local requirements should be checked.

Pre-requisite Unit

Nil

Competency Field

Testing

Unit Sector

Elements and Performance Criteria

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

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|---|---|-----|--|
| 1 | Prepare for field-based acceptance tests | 1.1 | Review job request to identify the test method and equipment involved, samples to be collected and/or test pieces to be prepared |
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- 1.2 Identify hazards and workplace safe work procedures associated with the site, samples, test methods and equipment used
 - 1.3 Confirm site location, access, timing and any special test requirements
 - 1.4 Assemble all required equipment/materials and check that they are fit for purpose
 - 1.5 Stow equipment/materials to ensure their safe transport, as necessary
 - 1.6 Arrange transport to site, as necessary
 - 1.7 Liaise with appropriate personnel on arrival at site to ensure safety and minimise disruption to other workers during testing/sampling
- 2 **Perform field tests**
 - 2.1 Identify locations for in situ tests in accordance with test method or client instructions
 - 2.2 Set up, check and operate test equipment safely and in accordance with workplace procedures and test method
 - 2.3 Perform tests as specified in test method or workplace procedures
 - 2.4 Take sufficient test measurements to ensure reliable data
 - 2.5 Recognise obvious errors or atypical data and take appropriate corrective actions
 - 2.6 Recognise and record details of site conditions that may impact on data quality
 - 2.7 Seek advice to deal with any situation beyond own technical competence
- 3 **Collect site samples and prepare test pieces**
 - 3.1 Identify locations for sample collection in accordance with test method or client instructions
 - 3.2 Seek advice if samples cannot be collected or if sampling procedures require modification
 - 3.3 Obtain required samples and maintain their integrity in

- accordance with sampling procedures or test method
- 3.4 Label all samples to ensure their traceability
- 3.5 Recognise and record any information about the sample appearance or site conditions that may impact on sample integrity
- 3.6 Prepare required test pieces and organise their safe curing, storage and/or transport in accordance with test method
- 4 **Finalise field testing**
- 4.1 Re-instate all disturbed surfaces in accordance with workplace procedures
- 4.2 Clean all equipment (and vehicle as necessary) to avoid environmental damage, including stormwater run-off and/or transfer of pests
- 4.3 Check that all equipment/materials are present and undamaged prior to re-stowing them for safe transport, as necessary
- 4.4 Notify appropriate site personnel on completion of tests and prior to leaving site
- 4.5 Check serviceability of test equipment on return to base, before storage
- 4.6 Complete site safety plans, equipment logs and test reports in accordance with workplace procedures
- 5 **Maintain a safe work environment**
- 5.1 Use safe work procedures and personal protective equipment (PPE) to ensure personal safety and that of others
- 5.2 Minimise environmental impacts of testing/sampling and generation of waste
- 5.3 Collect and/or dispose of all waste in accordance with environmental/quarantine requirements and workplace procedures

Foundation Skills

This section describes those language, literacy, numeracy and employment skills that are essential to performance.

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for different work environments and conditions that may affect performance. Essential operating conditions that may be present (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) are included.

Standards, codes, procedures and/or workplace requirements

Standards, codes, procedures and/or workplace requirements include the latest version of one or more of:

- Australian and international standards covering the requirements for the competence of testing and calibration laboratories, laboratory safety and quality management
- national work health and safety (WHS) standards and codes of practice, national measurement regulations and guidelines, and environmental legislation and regulations
- standard methods for testing construction materials, such as soils, aggregates, concrete and asphalt
- specific codes, guidelines, procedures and methods, such as:
 - AustRoads test methods, State/Territory Road Authority test methods
 - National Association of Testing Authorities (NATA) documents regarding construction materials testing (Field application document)
- workplace documents, such as standard operating procedures (SOPs); quality and equipment manuals; calibration and maintenance schedules; material safety data sheets (MSDS) and safety procedures; material, production and product specifications; production and laboratory schedules; workplace recording and reporting procedures; waste minimisation and safe disposal procedures; and maps, site plans and site safety plans
- sampling and testing procedures for specific sites, clients and samples

Field-based acceptance tests

Field-based acceptance tests include, but are not limited to, one or more of:

- testing of concrete, such as:
 - consistency (e.g. slump)
 - making and curing of concrete cylinders

- air content
- Schmidt hammer
- testing of soils, such as:
 - field density (e.g. compaction control)
 - coarse particle distribution (e.g. rock protection layers and embankments)
 - dynamic cone penetration (DCP)
 - Clegg hammer
 - sample cores from stabilised pavements
- testing of asphalt and bitumen seals, such as:
 - temperature of freshly laid asphalt
 - field density
 - texture depth
 - permeability
 - aggregate spread rate and binder spray rate

Appropriate corrective actions

Appropriate corrective actions include one or more of:

- carefully re-reading of procedures and checklists
- logically checking equipment set-up
- checking calibration, zero error and drift for the measuring instrument
- repeating test measurements
- checking data entry and transcription for errors
- seeking advice

Site samples and test pieces

Site samples and test pieces include, but are not limited to, one or more of:

- site samples of aggregates, soil, concrete and road pavement
- beams and cylinders for subsequent laboratory testing, such as Brazil test and Marshall stability/flow test
- asphalt cores and slabs for testing wheel tracking and fatigue

Workplace safety procedures

Workplace safety procedures include, but are not limited to, one or more of:

- recognising and observing hazard warnings and safety signs/barriers
- labelling of samples, reagents and hazardous materials
- use of PPE, such as hard hats, hearing protection, gloves, safety glasses, coveralls, respirators and safety boots

- handling and storing hazardous material and equipment in accordance with labels, MSDS, manufacturer instructions, and workplace procedures and regulations
- following established safe handling procedures for tasks involving manual handling
- cleaning and decontaminating equipment and work areas regularly using recommended procedures

WHS and environmental management requirements

WHS and environmental management requirements include:

- complying with WHS and environmental management requirements at all times, which may be imposed through state/territory or federal legislation. These requirements must not be compromised at any time
- applying standard precautions relating to the potentially hazardous nature of samples

Unit Mapping Information

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Links

Companion Volume implementation guides are found in VETNet -

<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=5c63a03b-4a6b-4ae5-9560-1e3c5f462baa>

Assessment Requirements for MSL973009 Conduct field-based acceptance tests for construction materials

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Performance Evidence

Evidence of competence in this unit must satisfy all of the requirements of the elements and performance criteria, and include demonstration of:

- liaising with site personnel to ensure that sampling and testing is conducted safely and efficiently
- conducting at least three (3) different in situ tests to confirm the acceptability of raw or manufactured construction materials prior to or after their use
- collecting field samples and preparing test pieces safely and accurately within the required timeframe on at least two (2) occasions
- recognising obvious errors or atypical data and taking appropriate corrective actions
- maintaining security, integrity and traceability of field samples, test pieces, test data, results and documentation
- cleaning, checking, safely transporting and storing test and sampling equipment
- following workplace procedures for safe work and minimising environmental impacts.

Knowledge Evidence

Must provide evidence that demonstrates knowledge of:

- the purpose and principles of construction materials tests performed as part of job role and key preparation/measurement steps in the test method
- the properties of construction materials under test
- calculation steps to give results in appropriate units and precision
- expected values for sample type and sources of uncertainty (and methods for control) in construction materials tests routinely used in job role
- pre-use checks and operating procedures for test equipment
- procedures for recording and reporting test results, calculations, site observations, and handling unexpected or atypical results and equipment problems
- procedures for ensuring traceability of samples, test pieces, test data and results
- workplace confidentiality requirements relevant to job role
- relevant hazards, work health and safety (WHS) and environmental management requirements.

Assessment Conditions

- Judgement of competence must be based on holistic assessment of the evidence. Assessment methods must confirm consistency of performance over time, rather than a single assessment event.
- This unit of competency is to be assessed in the workplace or a simulated workplace environment. A simulated workplace environment must reflect realistic operational workplace conditions that cover all aspects of workplace performance, including the environment, task skills, task management skills, contingency management skills and job role environment skills.
- Foundation skills are integral to competent performance of the unit and should not be assessed separately.
- Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.
- Knowledge evidence may be collected concurrently with performance evidence or through an independent process, such as workbooks, written assessments or interviews (provided a record is kept in each case).
- This unit of competency may be assessed with:
 - MSL922001 Record and present data
 - MSL943001 Work safely with instruments that emit ionising radiation
 - MSL943002 Participate in laboratory or field workplace safety
- Holistic assessment methods include:
 - review of test data, results and records generated by the candidate
 - feedback from supervisors and clients regarding the candidate's ability to work independently and conduct a range of field-based acceptance tests reliably, safely and efficiently
 - oral/written questions about workplace procedures and test methods relevant to their job role.
- Access is required to instruments, equipment, materials, workplace documentation, procedures and specifications associated with this unit, including, but not limited to:
 - sampling and test equipment and materials specified in the test method
 - test methods and description of test set-up, data sets and records
 - calculator and/or computer and relevant software or laboratory information system.
- Assessors must satisfy the assessor competency requirements that are in place at the time of the assessment as set by the VET regulator.
- The assessor must demonstrate both technical competence and currency.
- Technical competence can be demonstrated through:
 - relevant VET or other qualification/Statement of Attainment AND/OR
 - relevant workplace experience.
- Currency can be demonstrated through:
 - performing the competency being assessed as part of current employment OR
 - having consulted with a laboratory about performing the competency being assessed within the last twelve months.

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