



Australian Government

MSL974027 Monitor performance of structures

Release: 1

MSL974027 Monitor performance of structures

Modification History

Release	Comments
Release 1	This version was released in <i>MSL Laboratory Operations Training Package Release 2.0</i>. Supersedes and equivalent to MSL974013 Monitor performance of structures. Foundation skill information added. Range of conditions removed. Assessment requirements amended.

Application

This unit of competency describes the skills and knowledge to monitor civil engineering structures (such as roads, dams, embankments, open cut faces, bridges, tunnels, towers and other concrete/steel erections) to measure their performance, confirm design parameters or measure the effects of improvements or rehabilitation. The unit involves confirming the requirements of the monitoring activities, liaising with site personnel, performing monitoring activities, setting up monitoring equipment, collecting reliable data and reporting results. Personnel are also expected to interpret results in the field, recognise/rectify obvious errors or unexpected results and troubleshoot common problems.

This unit applies to laboratory personnel working in the geotechnical, construction material testing, civil engineering and mining industry sectors.

No licensing or certification requirements exist at the time of publication. However, regulations and/or external accreditation requirements for laboratory operations exist, so local requirements should be checked. Relevant legislation, industry standards and codes of practice within Australia must also be applied.

Pre-requisite Unit

MSL973021 Conduct field-based acceptance tests for construction materials

Competency Field

Testing

Elements and Performance Criteria

Elements describe the essential outcomes.

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

- | | | |
|---|---|---|
| 1 | Confirm requirements for monitoring activities | <p>1.1 Review job request to confirm the purpose and objectives of monitoring activities with supervising staff</p> <p>1.2 Review emergency plans, site hazards, risk assessments, safe work procedures and environmental requirements, associated with the monitoring activities and site requirements</p> <p>1.3 Review any available data from previous monitoring at the site to identify expected values and any trends in results</p> <p>1.4 Liaise with client to arrange site access, confirm timing and clarify the need for permits, induction training or any other special requirements</p> <p>1.5 Confirm details of monitoring instruments to be used, parameters to be measured and the data formats required by users</p> |
| 2 | Prepare for monitoring activities | <p>2.1 Complete all administrative requirements and obtain appropriate approvals/permits</p> <p>2.2 Make appropriate travel arrangements to and from the site, as required</p> <p>2.3 Assemble all required instruments, equipment and supplies and check that they are fit for purpose</p> <p>2.4 Stow monitoring instruments, equipment and supplies to ensure their safe transport</p> <p>2.5 Liaise with appropriate personnel on arrival at site to ensure safety and minimise disruption to other workers during monitoring</p> <p>2.6 Complete site induction as necessary</p> |
| 3 | Collect and verify monitoring data | <p>3.1 Use barriers and signage to control access to work area in accordance with workplace safety procedures</p> |

Elements describe the essential outcomes.

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

- 3.2 Perform pre-use checks of instruments and trial measurements to ensure they are operating within specifications
- 3.3 Identify location for monitoring in accordance with work instructions and/or test method
- 3.4 Operate instruments safely and in accordance with work instructions, test method, and/or manufacturer specifications
- 3.5 Take sufficient measurements to ensure that data meets quality requirements
- 3.6 Recognise obvious errors or atypical data and take appropriate corrective actions
- 3.7 Recognise and record/photograph details of site conditions that may impact on data quality
- 3.8 Seek advice to deal with any situation beyond own technical competence

4 Finalise monitoring activities

- 4.1 Remove signage and barriers and reinstate all disturbed surfaces in accordance with workplace procedures
- 4.2 Ensure all data is stored safely before shutdown of instrument/equipment
- 4.3 Clean all instruments and equipment (and vehicle as necessary) to avoid environmental damage, including stormwater run-off and/or transfer of pests
- 4.4 Check that all instruments, equipment and supplies are present and undamaged before re-stowing them for safe transport
- 4.5 Notify appropriate site personnel on completion of monitoring activities and prior to leaving site
- 4.6 On return to base, check serviceability of instruments and equipment before storage
- 4.7 Download data into laboratory/workplace information management system in accordance with workplace

Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
	procedures
	4.8 Complete site safety plans, instrument/equipment logs and test reports in accordance with workplace procedures
	4.9 Notify supervising staff on completion of activities
	4.10 Report any significant issues arising from monitoring activities to appropriate personnel
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 monitoring activities 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.

- Numeracy skills to estimate and calculate simple scientific quantities, such as stress, strain and pressure.

Other foundation skills essential to performance are explicit in the performance criteria of this unit.

Unit Mapping Information

Equivalent to MSL974013 Monitor performance of structures, Release 1.

Links

MSL Laboratory Operations Companion Volume Implementation Guide is available from VETNet -

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

Assessment Requirements for MSL974027 Monitor performance of structures

Modification History

Release	Comments
Release 1	This version was released in <i>MSL Laboratory Operations Training Package Release 2.0</i>. Supersedes and equivalent to MSL974013 Monitor performance of structures. Foundation skill information added. Range of conditions removed. Assessment requirements amended.

Performance Evidence

There must be evidence the candidate has completed the tasks outlined in the elements and performance criteria of this unit, and:

- safely monitored at least 3 different civil engineering structures to measure their performance, confirm design parameters and/or measure the effects of improvements or rehabilitation.

Knowledge Evidence

There must be evidence the candidate has knowledge of:

- purpose and principles of monitoring activities routinely performed in job role and the properties of materials and/or structures being monitored
- operating procedures for monitoring instruments and equipment routinely used in job role, including the pre-use checks, function of key components, effects of varying key controls, connections, data acquisition fundamentals and common problems
- basic instrument fault identification and rectification procedures
- expected measurement values, precision, units, sources of uncertainty and methods for their control
- performing calculations and dealing with unexpected or atypical results and/or equipment problems
- standard methods for sampling and testing construction materials, such as soils, aggregates, concrete and asphalt
- typical monitoring activities:
 - displacement and vibration
 - pressure and force
 - temperature
 - setting time

- strain
- cracking (visual assessment of road condition)
- defect mapping
- moisture
- water levels
- movement of chemical ions through structures
- specific codes and guidelines:
 - AustRoads test methods
 - State/Territory Road Authority test methods
- awareness of environmental sustainability issues as they relate to the work task
- legal, ethical and work health and safety (WHS) requirements specific to the work task.

Assessment Conditions

Skills must have been demonstrated in the workplace or in a simulated environment that reflects workplace conditions and contingencies. The following conditions must be met for this unit:

- use of suitable facilities, equipment and resources, including:
 - access to civil engineering structures and relevant site documentation
 - survey equipment, monitoring instruments and equipment, such as transducers, accelerometers, load cells, piezometers, strain gauges and thermocouples
 - signal conditioning and data storage devices, such as amplifiers, data loggers and portable computers
 - global positioning system (GPS) and communication equipment
 - digital camera
 - signage, warning lights and boundary tape/cones, umbrellas and shade structures
 - workplace procedures, test methods and description of monitoring activities, data sets and records, and work instructions.

Assessors must satisfy the NVR/AQTF mandatory competency requirements for assessors.

Links

MSL Laboratory Operations Companion Volume Implementation Guide is available from VETNet -

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