



Australian Government

MSL974028 Classify soils

Release: 1

MSL974028 Classify soils

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 MSL974014 Classify soils. Foundation skills information added. Range of conditions removed. Assessment requirements amended.

Application

This unit of competency describes the skills and knowledge to classify soils for geotechnical and civil construction purposes using the symbols and descriptors specified in the Australian Standard for Geotechnical Site Investigations (AS 1726-2017 Geotechnical site investigations, or its replacement). The unit involves confirming the client's requirements, physical examination of site samples, interpreting field observations and test results and assignment of an appropriate soil classification. Personnel are expected to recognise and rectify obvious errors or unexpected results, perform confirmatory tests if required and seek advice to deal with situations beyond their own technical competence.

This unit applies to laboratory technicians working in the construction, mining and drilling industry sectors under the guidance of a geotechnical paraprofessional or engineer.

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
MSL973022	Conduct laboratory-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 Prepare to classify soil samples | <ul style="list-style-type: none">1.1 Review job request and any accompanying documentation to identify purpose of soil classification and client's information needs1.2 Identify any hazards and relevant safe work procedures associated with the types of site samples1.3 Inspect supplied samples and test data, compare with specifications and record and report any discrepancies1.4 Liaise with client when supplied samples, test data and/or job request forms do not comply with workplace procedures and resolve any problems1.5 Assemble required equipment/materials and check that they are fit for purpose |
| 2 Examine properties of soil samples | <ul style="list-style-type: none">2.1 Assess appearance and feel of soil to determine moisture condition2.2 Use moulding/indentation tests, penetrometer and/or density index data to determine soil consistency2.3 Identify the soil's major, secondary and minor components and the proportion of each2.4 Assign a soil colour based on own observations and review of field log sheets2.5 Determine soil structure based on own observations and review of available zoning, defect and cementing data recorded for undisturbed field samples2.6 Review any additional observations and test data that may identify soil origin |
| 3 Analyse available test results | <ul style="list-style-type: none">3.1 Compare supplied mechanical test data with standard classification values for different soil types3.2 Compare particle size and percentage composition data with standard classification values for different soil |

Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.	
		types
	3.3	Compare other laboratory test results with own observations to confirm assignment of plasticity, grading and strength of soil samples
	3.4	Recognise anomalies or unexpected results and, if necessary, recheck specimens and test results and conduct repeat tests to ensure reliable results
4 Record soil classification	4.1	Use standard symbols and descriptors to assign a valid soil classification
	4.2	Record and store client's soil classification, samples and test data in accordance with workplace procedures
	4.3	Maintain confidentiality of client information 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 other personnel
	5.2	Clean work area and collect, recycle or dispose of all waste in accordance with workplace procedures
	5.3	Clean and check serviceability of test equipment before storage

Foundation Skills

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

- Numeracy skills to:
 - read graphs and tables to extract classification data, such as D10, D30 and D60 points
 - perform accurate calculations, such as coefficients of curvature and uniformity for gravels and sands.

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

Unit Mapping Information

Equivalent to MSL974014 Classify soils, 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 MSL974028 Classify soils

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Performance Evidence

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

- correctly examined, analysed and classified at least 3 of the following samples:
 - gravel
 - sand
 - silt
 - clay
- accurately interpreted job requests, client specifications and the relevant requirements of *AS 1726-2017 Geotechnical site investigations*, or its replacement.

Knowledge Evidence

There must be evidence the candidate has knowledge of:

- terms, symbols and requirements of *AS 1726-2017 Geotechnical site investigations*, or its replacement, used to perform soil classifications as part of job role
- common purposes and client requirements for soil classifications conducted as part of job role
- differences between classification of soils for agricultural and engineering purposes
- common causes of misclassification of soils, such as:
 - identification of hard clay as sand or gravel
 - clayey gravels can have high plasticity
 - non-representative or contaminated samples
 - selecting inappropriate tests (e.g. clay-DCP and sand-penetrometer)
- testing methods used for soil classifications as part of job role
- common tests used to identify soil properties:
 - visual examination

- soil/water properties, including moisture content; liquid, dispersion and permeability
- material density tests
- particle size and shape tests
- soil deformation characteristics
- soil strength tests, including pocket penetrometer, standard penetration test, dynamic cone penetrometer and vane shear
- chemical tests, such as pH and organic matter
- 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 job requests, client requirements, relevant site documentation and samples
 - workplace procedures, standards, test methods and equipment manuals
 - equipment and materials specified in test methods
 - safety clothing and equipment, including helmets, boots, gloves, earmuffs and glasses.

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

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